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BEYOND THE OPEN DOOR:

Increasing Student Success in the California Community Colleges

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Executive Summary

In a policy brief released in February 2007, titled *Rules of the Game*, we presented data indicating that rates of completing certificates, degrees and transfers to universities in the California Community Colleges (CCC) are low. More importantly, we concluded that low completion is in part due to state policies which have produced barriers to the CCC's ability to better foster student success and completion. This report presents more in-depth results of those analyses and offers recommendations for policy reforms aimed at improving student success. Another Institute report, due for release later this year, will describe how state finance policies for the CCC contribute to low completion and will offer additional suggestions for policy reform.

California's Future at Risk

Researchers, policymakers, and educators are beginning to recognize several factors important to any discussion of postsecondary student success:

1. **The future of our state economy is tied to increasing the number of Californians who both enter and complete their college education.** Several recent studies have projected a shortage of educated workers in California unless the state increases degree production in its colleges and universities. Changes in California's economy require workers with more education and a greater ability to adapt their skills to a changing labor market. Disparities in educational attainment across racial/ethnic populations and socioeconomic groups are an increasing danger, as population growth is occurring primarily among populations with historically lower rates of college enrollment and completion.

2. **California cannot continue to rely on attracting college-educated workers from other states and countries to meet the needs of its information-based economy.** While this strategy has worked in the past, recent research by the Public Policy Institute of California indicates that the state will not be able to import enough workers from other states and countries to meet the needs. Competition for skilled workers is increasing, and California's high cost of living puts us at a disadvantage. It is likely that the state will need to improve rates of degree attainment among Californians in order to meet the demand for educated workers.

3. **The community colleges are the only pathway to a college education and upward mobility for many Californians.** The California Community College system is indispensable to any effort to increase degree production, given that nearly three-quarters of the state's public undergraduates attend community colleges. Rates of completion must increase in the CCC in order to ensure that there are enough educated adults to maintain the social and economic health of the state.

4. **The job of educating California community college students isn't easy.** Community colleges serve an incredibly diverse range of students, many of whom are under-prepared for college-level work, hold full-time jobs, provide financial support to their families, have limited English language proficiency, come from disadvantaged families, or lack clear educational goals. Despite these challenges, the community colleges are expected to succeed in fulfilling a variety of vital missions with far less funding per student than what is provided to K-12 schools and the California State University (CSU) and University of California (UC) systems.

In this report, we use the term "student success" as it was recently defined "in its simplest form" by two national experts in higher education policy, Peter Ewell and Jane Wellman– "getting students into and through college to a degree or certificate." Ewell and Wellman acknowledge that there are numerous potential meanings of student success beyond degree attainment, but conclude that possession of a college credential "will remain the essential policy measure for the foreseeable future." While arguments can certainly be made for broader definitions of success in California's community colleges, the social and economic imperative to ensure that there are enough college-educated workers in California makes it reasonable to equate "success" with "completion" for the purposes of this policy-focused discussion. In doing so, we include the intermediate achievements that represent progress toward completion, like retention, course completion and finishing needed remediation.

The February policy brief generated a considerable amount of controversy, in large part because it was interpreted as critical of the system for factors that are largely outside of its control, such as students' preparation, their competing life priorities, and system funding levels. But the Institute's research is not aimed at evaluating the CCC. Rather, the research is intended to heighten awareness among state leaders about the state's need for an educated workforce and citizenry, and to identify changes in state policy that can help the CCC, in concert with other educational segments, meet that need.

Ultimately, state policymakers are responsible for ensuring that California's population is sufficiently educated to maintain the social and economic health of the state. Discussions about the rates of success among CCC students in completing certificates and degrees are essential because of the huge role that community colleges play in educating Californians. This focus on the CCC is not meant to minimize the role that the UC and the CSU have in helping improve educational outcomes in the state. Improvement is needed throughout the education enterprise and collaborative efforts will be especially important. This research focuses on the CCC because it serves by far the most students, including large numbers who later attend UC and CSU.

"Multiple Missions" do Not Preclude Attention to Completion Rates

Given the broad set of missions assigned to the community colleges, there has long been a justifiable resistance to completion rate measures that do not account for these multiple missions. Community college officials around the country have historically shared these concerns about the calculation of graduation and transfer rates, but increasingly recognize the importance of monitoring these rates as part of state efforts to strengthen educational capital. It is possible to have constructive policy discussions about increasing rates of completion in the CCC within the context of the community colleges' multiple missions. In an effort to encourage such discussions, this report uses a method presented in the earlier policy brief to distinguish between those who seek a degree or certificate and those who do not, and applies that method in analyzing student success among degree seekers in California's community college system.

California Must Increase Community College Student Completion

Applying the method to the 1999-2000 incoming cohort of students, this study found that approximately one in four degree seekers in the cohort "completed" – meaning they earned a certificate or degree, transferred to a four-year university, or achieved some combination of those outcomes within six years of enrolling in a community college. About three percent of all degree seekers earned a certificate, 11 percent earned an associate's degree and 18 percent transferred to a university (there is overlap, as some students achieved more than one outcome). Seventy-six percent of degree seekers did not achieve any of these outcomes within six years of enrolling in community college.

These results confirm other research indicating that rates of persistence and completion in community colleges are low, likely too low to meet the needs of the workforce and to ensure continued economic growth and prosperity for individuals and the state.

California has one of the most accessible community college systems in the country, and Californians are rightfully proud of that. But the reality of low completion rates begs the question: access to what? We need to do more than open the door to college. Providing true opportunity for upward mobility

through higher education requires that community colleges have the capacity – both in terms of adequate resources and supportive public policies – to help students meet their educational goals.

State and CCC Policy can Affect Student Success

The amount of resources available to community colleges obviously affects their ability to help students succeed. State appropriations provided per full-time student at the CCC are less than 60 percent of that for students at the CSU and less than one-third that of students at the UC. When state funds and student fee revenue are considered together, CSU has about 2.5 times the per-student funding as the CCC and UC has about 5 times the funding. While strict comparisons are hard to interpret in view of the different missions assigned to each segment, many reasonably question why community college students, who are among the most expensive to teach given their considerable needs for intensive instructional and support services, should receive so much less funding than students at four-year institutions. It is certainly the case that the comparatively low level of funding in the CCC puts a premium on the effective use of those limited resources. For the community colleges to best help the state meet its goals of educating more Californians, there must be additional resources and policy reforms so that the CCC has both the resource capacity and the policy environment to help students succeed.

The research literature points to many factors that affect student success in community colleges, including factors related to 1) the students themselves and what characteristics they bring with them to college, 2) the course-taking and enrollment patterns students follow while attending college, and 3) the policies and practices of colleges. These research findings provide guidance for potential actions state policy-makers and the CCC can take to improve student success.

For this report, we analyzed relevant data for the 1999-2000 cohort of degree-seeking CCC students, and confirmed many of the relationships noted in the research literature. In particular, completion rates for this cohort of students varied according to student characteristics, including:

- Gender, with higher rates of completion among female students (26%) compared to male students (22%);
- Age, with rates of completion decreasing as the age of the student increased upon initial enrollment (27% completion for students age 17 to 19, 21% for age 20 to 29, 18% for age 30 to 39, and 16% for age 40 or older);
- Race/ethnicity, with Asian and white students completing at higher rates (33% and 27%, respectively), than Latino and black students (18% and 15%, respectively);
- Socioeconomic status, with a completion rate of 27 percent among students attending a college in an area with personal income in the highest quartile relative to other CCC populations (a proxy for student income), compared to a completion rate of 22 percent among students attending a college in an area with income in the lowest quartile;
- Academic preparation, with a completion rate of 28 percent among students attending a college with average academic preparation levels in the highest quartile relative to other CCCs (a proxy for student academic preparation), compared to a completion rate of 19 percent among students attending a college with average academic preparation in the lowest quartile; and
- Students' commitment to a goal of completion, with the rate of completion higher for students who demonstrated more commitment to a goal of transfer or certificate/degree completion (35%) than for students who demonstrated less commitment (29%) or no commitment (19%) to the goal.

Consistent with other research, we found that CCC completion rates also varied according to selected course-taking and enrollment patterns. Students were more likely to complete if they:

- attended full-time in a majority of terms (47% compared to 12% for part-time);
- enrolled continuously over the period they attended (40% compared to 24% for students who stopped out);
- enrolled in an orientation course (32% compared to 23% for students who did not);
- avoided excessive course dropping (35% compared to 9% for students who dropped many courses); and
- avoided frequent late registration for courses (27% compared to 21% for students who often enrolled late).

These descriptive results were mostly confirmed through a statistical method known as regression analysis. With the exception of enrolling in an orientation course, each of the factors had a statistically significant, independent influence on the likelihood of a student completing a community college program. The results for enrolling in an orientation course varied across different models, perhaps, in part, related to the difficulty of accurately measuring that variable in the dataset.

With respect to the policies and practices of colleges, the research literature indicates that colleges can contribute to higher completion rates by:

- having an institutional focus on student success;
- using instructional methods such as learning communities that integrate student support services with instruction and increase student engagement with their peers;
- offering a comprehensive and integrated set of student support services and ensuring that students make use of those services;
- assessing students' skills in math and English and placing them in courses appropriate for their level of college readiness, with remedial work beginning immediately upon enrollment if it is needed; and
- sending strong and consistent messages to prospective students about what it means to be college ready, so as to increase the preparation levels of incoming students.

The student cohort data used for much of this research do not allow an investigation of these particular aspects of institutional policy, or of the important issues related to the teaching and learning process in the classroom. But the report includes an in-depth, qualitative review of assessment and placement policies and the system's overall approach to student advising.

Current Assessment and Placement Policies are Not Fostering Student Success

With such a large share of CCC students under-prepared for college when they enroll, analyzing the impact of assessment and placement policies is critical to understanding student success and rates of completion in the community college system. The system's approach to assessment and placement diverges in important ways from trends in other states and from the lessons outlined above about the factors that influence student success. Assessment and placement are voluntary as practiced at many colleges across the system, and policies are extremely decentralized: each of the 109 colleges determines its own assessment instruments, cut-off scores, and "multiple measures" to be used in recommending placement.

The CCC system itself has recognized that the process needs reform, and the Chancellor, the Board of Governors, the Academic Senate, and system and college researchers are actively involved in discussing possible reforms. Activity on the issue is occurring in the context of the implementation of the System's Strategic Plan and the related Basic Skills Initiative. As part of the Basic Skills Initiative, a comprehensive literature review was used to identify best practices, and an assessment instrument was developed to enable colleges to assess how well their own practices conform to those identified in the literature. Regional workshops are ongoing to provide technical assistance to colleges on ways to improve basic skills instruction.

Our discussion of the CCC assessment and placement process in intended to inform these efforts with a particular focus on issues of statewide policy. Our analysis indicates that the current process is not fostering student success in three respects:

The current process is not effective in helping students meet their educational goals.

Current assessment and placement policies are ineffective primarily because they place the priority on the process at the expense of outcomes for students. The process is designed to minimize barriers to students in course enrollment, protect local autonomy, and guard against legal action against the system. Colleges often give students the independence to make their own choices in spite of, or without, the best professional guidance. This independence allows

many students to circumvent basic skills courses – either by avoiding assessment altogether (only about 60 percent of degree-seeking students in the cohort we studied were assessed) or by choosing not to enroll in the remedial courses into which they were referred if assessed. Course pre-requisites are difficult to establish, leading, in many cases, to easy student access to courses for which they may not be prepared and to reduced standards in college-level courses, where faculty must accommodate students who lack proficiency in reading and writing. In addition, the policies do little to help students better prepare for college-level work before they arrive at community college. The most powerful reform efforts in other states now involve conveying clear standards of college readiness to help students arrive at colleges prepared for college-level work.

The process is not serving its intended purpose of treating all students equitably.

The CCC assessment and placement process has evolved over the years in response to concerns that there were unfair barriers to minority students gaining access to college-level classes. However, the current system does not promote equity, but rather interferes with efforts to help students overcome academic barriers. Under the current decentralized process, students are treated differently, depending on which college they attend, in terms of the standardized assessments used, the standards of "college readiness" reflected in placement recommendations, the particular choice of multiple measures relied upon by each individual college, and the degree to which course prerequisites are developed and enforced to regulate access to courses.

The process is excessively costly and administratively complex.

The complex, decentralized process entails significant costs. Each college is required to have a matriculation advisory committee, and to expend considerable time and effort in test development and validation efforts, in addition to the Chancellor's Office expenditures for psychometric consultants, the Matriculation Advisory Committee, the Assessment Advisory Group, and the Matriculation unit. Owing to budget cuts in recent years, the Chancellor's Office lacks the staff needed to fully enforce the myriad regulatory requirements, and many colleges lack the staff to fully engage the process as intended due to college size, or cuts in research staff, or both. As a result, the process as described in the many pages of regulations, guidelines, manuals, and memos, is not as rigorous or valid as it was designed to be. Regardless of initial intentions, the process has evolved into a large administrative enterprise in which the elaborate process for approval of instruments and prerequisites has overshadowed the needs of students.

The coalescing efforts across the community college system to review and reform the assessment and placement process are well justified. This is a tremendous opportunity to make a difference in the outcomes for the millions of Californians who depend on the CCC for brighter futures. Serving under-prepared students has become perhaps the most important mission of the CCC. The Basic Skills Initiative stands to instill new energy and wherewithal into the classroom and across college campuses. Changes to the assessment and placement process will complement those efforts and give college faculty and staff the best chance to help students become prepared for college success.

Policy Changes Could Increase Student Success

California's future depends heavily on its system of higher education; the community colleges, by virtue of their sheer size and vital set of missions, are the linchpin of that system. Public policy can be a powerful tool for shaping the state's future. Despite the fact that many current state and system policies explicitly address student success goals, Californians are not getting the results that they need. It is imperative that the colleges be given the resources they need and that lawmakers enact policies that will foster the best use of these resources to promote student success.

This research addresses a vital, but necessarily limited set of policy issues. More attention is needed to a variety of related issues, such as K-12 reforms to increase student preparation levels, innovations in teaching and learning and the kinds of faculty development needed to implement such efforts in the community colleges, what happens to the students who don't complete an academic program at the CCC, factors related to student success in the UC and CSU systems, and how greater collaboration across educational segments could increase student success across the educational system.

The following recommendations—derived from our review of the research literature and our analysis of the factors associated with greater student success in community

colleges—are intended to capture the momentum building across the system about increasing student success in California's community colleges, and suggest directions for new approaches. Implementation of some of these recommendations would require legislative changes, while others could be accomplished through regulatory changes at the system level or changes in campus policies and practices. Some changes will require additional resources, while others could be accomplished within current funding levels. A well-considered combination of increased resources and policies better targeted toward student success should yield significant gains in the educational outcomes for Californians.

Recommendations

1. Encourage direct college-going after high school
2. Send clear messages to high school students, teachers, and counselors about college-readiness standards in the CCC
3. Encourage UC and CSU to offer baccalaureate coursework on community college campuses
4. Provide substantive orientation to college for all degree-seeking students to help them understand what their options are, what resources are available to them, and what is expected of them to maximize their chances of success
5. Require degree-seeking students to declare a specific program focus and update their program intent annually
6. Enhance financial aid and provide incentives to encourage students to work less and attend college on a more full-time and continuous basis
7. Structure programs to encourage completion of shorter-term credentials along the pathway to longer-term credentials
8. Remove the prohibition on campus-based fees, giving colleges the option of using them as a means to guide students toward more successful enrollment patterns
9. Support college efforts to evaluate the impact of orientation courses, learning communities and other innovations that integrate academics with intensive student support services, particularly on first-generation and under-represented minority students, and expand such instructional offerings where proven effective
10. Revise assessment and placement policies to ensure that prospective students receive clear and consistent messages about college readiness and that all degree-seeking students receive the full benefit of professional guidance to enroll in the courses that will best promote their success
11. Expand counseling, advising and other student support programs with the goal of ensuring that more students receive such services on an intensive and ongoing basis
12. Collect and maintain additional data in order to answer key questions and monitor progress in student success and completion

Providing true educational opportunity for Californians requires that the California Community Colleges keep the door wide open to growing numbers of Californians and that the state provide the needed resources and enact the best possible public policies to ensure that students can succeed in earning the college degrees that they seek and that the state needs.

California's Future at Risk

In their recent report, *America's Perfect Storm*, researchers from the Educational Testing Service (ETS) concluded that, under current trends, as better-educated workers retire they will be replaced by individuals with lower levels of education and skills, placing the economic health and social fabric of the nation at risk (Kirsch, Braun, Yamamoto, & Sum, 2007). California is at the forefront of trends identified as the primary forces behind the threat – unequal distribution of education and skills, changes in the economy, and demographic shifts.

Table 1 shows the substantial disparities in current educational attainment and college enrollment across racial/ethnic populations in California, with white and Asian adults substantially more likely to have or be pursuing a college degree than black and Latino adults.

There are also disparities across age groups that support the conclusions of the ETS research. Only 36 percent of California's younger workers – those ages 25 to 34 – have an associate's degree or higher, compared to 41 percent of those ages 45 to 64.[1] Table 2 shows that California's rank among states is slipping in regard to the educational attainment levels of the working-age population. California ranks second among the 50 states in the share of the population age 65 or older with an associate's degree or higher. However, among younger workers ages 25-34, California ranks 30th among the states.

Dramatic changes have occurred in California's economy in recent years, with increasing globalization, the decline in defense and other manufacturing industries, and the rise of industries related to information technology. These changes favor workers with more education and a greater ability to adapt their skills to a changing labor market, leaving workers with lower levels of education and obsolete skill sets at a distinct disadvantage (Benner, 2000). This changing

Table 1
Racial/Ethnic Disparities in Educational Attainment and College Enrollment

Race/Ethnicity	Percent of Population Age 25+ with AA or Higher	Percent of Population Age 18 to 24 Enrolled in College
Asian /Pacific Islander	54%	60%
White	47%	43%
Black	32%	32%
Hispanic / Latino	15%	22%

Source: US Census Bureau, 2005 American Community Survey, Table B15002 (attainment age 25+) and Census 2000 Summary File 4, Table PCT63 (college enrollment age 18-24)

Table 2
California is Becoming Less Educated than Other States

Age Group	Rank among States in Share of Population with AA or Higher	Rank among States in Share of Population with BA or Higher
65 and older	2nd	5th
45 to 64	11th	10th
35 to 44	21st	16th
25 to 34	30th	23rd

Source: NCHEMS Information Center for Higher Education Policymaking and Analysis (www.higheredinfo.org) based on data from the US Census Bureau, 2005 American Community Survey

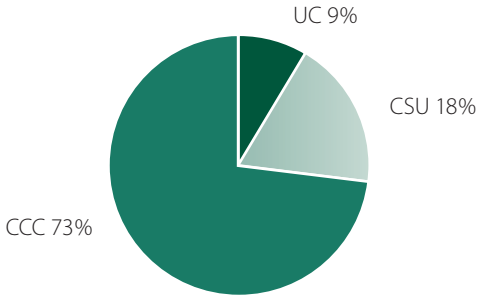
economy has been accompanied by dramatic demographic changes. Latinos represented 22 percent of the working-age population (ages 25 to 64) in 1990, growing to 29 percent by 2000, and expected to reach 40 percent by 2020 and 49 percent by 2040.[2] Without significant reductions in the disparities in educational attainment shown in Table 1, the average education level of California's workforce and the state's per capita income will decline,[3] leading to a deteriorating tax base and increasing difficulty for the state to provide services to its people.

Three recent studies of California's workforce warn that without increased degree production in the state's colleges and universities there will be a shortage of educated workers (Johnson & Reed, 2007; Fountain & Cosgrove, 2006; Baldassare & Hanak, 2005). California has historically relied on its ability to attract college-educated workers from other states and countries to meet the needs of its information-based economy. A new analysis by the Public Policy Institute of California indicates that California's leaders should not continue to rely on importing educated workers, since current trends indicate that even strong growth in net domestic and international migration would leave the state far short of meeting projected needs for skilled workers (Johnson & Reed, 2007). Increasing competition for educated workers in other states and countries, along with California's high cost of living, mean that the state can only hope to meet the need for college-educated workers by improving rates of degree attainment among its native population.

Community Colleges Can be a Part of the Solution with Increased Rates of Student Success

The California Community College (CCC) system is indispensable to reversing these troubling trends. By design of the 1960 Master Plan for Higher Education, the 109 campuses of the CCC serve the majority of college students. Under statewide admission criteria, only the top one-third of high school graduates are eligible for direct enrollment in a public university; two thirds of California's graduating seniors gain access to higher education through the CCC. Many in the top one-third choose to attend a community college, and the CCC is the access point to higher education for most older students.

Figure 1:
Most Public Undergraduates Attend the CCC



In all, about 73 percent of California's public undergraduates attend community colleges, as shown in Figure 1.

A number of national reports and projects, including several in California, have emphasized the need to focus on student success in higher education, and particularly in community colleges which enroll the largest number of students most at risk of not finishing college.[4] The CCC system itself has made student success a cornerstone theme of its new Strategic Plan and there are countless efforts across the individual colleges to improve student success. The professional organization of CCC institutional researchers has begun holding annual conferences on student success – aided by empirical research into student success issues. This report is aimed at building on those efforts by documenting extensively and systematically patterns of student success system-wide, connecting those factors to state and system policies, and suggesting policies that should be examined for changes that could improve completion rates. Policy change is an important consideration in the efforts to improve student success because it can enable some of the individual efforts that are proving successful, but on a small scale, to be institutionalized across the system and have a much greater impact on student success statewide. State policies provide incentives for CCC's to behave in certain ways and have a powerful effect on student behavior. Making sure the right incentives are in place is the job of state lawmakers.

"Multiple Missions" Can be Honored In Computations of Completion Rates

State Workforce Needs Require Monitoring of Completion Rates

Unlike students who enroll in the University of California (UC) or the California State University (CSU), students often enroll in community college for reasons other than earning a degree or a certificate. By design of the state's Master Plan, the CCC offer academic and vocational programs at the lower division level, as well as remedial instruction, non-credit adult education, and workforce training (California Department of Education, 1960). Many of these pursuits do not require program completion in order for students to successfully achieve their purposes. The community colleges admit any student "capable of profiting from the instruction offered" (p. 70).

There may be personal and economic benefits to individuals related to attending a community college even if no college credential is ever earned. Research shows that there are some economic benefits to earning community college credits without finishing a degree. For example, Marcotte (2006) demonstrated a five percent increase in annual earnings associated with every year of community college credits earned (30 credits would generally equate to one year). But research also demonstrates there are negligible economic benefits to accumulating only a small number of credits (Marcotte, 2006; Bailey, Kienzl, & Marcotte, 2004). Other researchers have concluded that the credential itself is more important in the labor market than accumulating community college credits, particularly in promoting continuity of employment (Adelman, 2005), making it essential to monitor completion rates for those community college students who do seek to earn a college credential.

Given the broad set of missions assigned to the community colleges, system officials have justifiably been wary of completion rate measures that do not account for the CCC's multiple missions. Community college officials around the country have historically shared these concerns about the calculation of graduation and transfer rates, but have increasingly recognized the importance of monitoring these rates as part of state efforts to strengthen educational capital. For example, Texas officials have stated that "enrollments in our colleges and universities must increase by the year 2015 by 630,000 students. But enrolling more people is not enough – they must graduate, too. Texas will not achieve the results it needs if students do not succeed in their higher education endeavors."[5]

Identifying Likely "Degree Seekers"

In view of the need to close the achievement gap and address the shortage of educated workers, state lawmakers need to understand completion rates among community college students. The existence of multiple missions need not prevent such policy discussions. In an effort to encourage discussions, this research proposes a method to distinguish between those who seek a degree or certificate and those who do not, and applies that method in analyzing student success among degree seekers in the CCC.[6] Using student record data obtained from the CCC Chancellor's Office, we studied the cohort of more than 500,000 students who initially enrolled in a credit course(s) during the 1999-2000 academic year.[7] The dataset included demographic and course-taking records for each student, including course-taking records for all colleges within the CCC that a student enrolled in over a six-year period, through 2004-05. The dataset also included records of all degrees/certificates earned and transfers to four-year universities through 2004-05.

Unambiguous data about student intentions as they enroll in a community college are not currently collected.[8] In the absence of clear information, we developed a method to identify "degree seekers" (a term we use to include both degrees and certificates). There are many possible ways to measure student intent, as demonstrated

in several recent research projects on CCC students (Johnson & Reed, 2007; California Postsecondary Education Commission [CPEC], 2007; Sengupta & Jepsen, 2006). The method used here is intended to 1) recognize the multiple missions of the colleges, which include job training and skill development, personal development and enrichment, awarding certificates and degrees in addition to preparing students for transfer to a university, and 2) acknowledge the uncertainty in identifying students' specific goals. The method we use does not attempt to identify students' specific intent (i.e., transfer, degree, or certificate) as other studies have done, and therefore does not yield a transfer rate for students intending to transfer or a graduation rate for students intending to earn an associate's degree. Rather, it is used to calculate an overall "completion rate," defined as the rate of completing any one (or more) of the three outcomes among all students identified as "degree seekers," and also to note what share of all degree seekers accomplish each of the completion outcomes. We exclude those who appear to be attending a CCC for something other than to complete a credential or program.

In defining "degree seekers," we relied on a review of research literature on community college students, consultation with the Center for Student Success of the Research and Planning Group for California Community Colleges, discussions with other community college professionals, and an examination of the characteristics of students in the cohort who actually completed a certificate or degree or transferred to a university. Based on those considerations, we used three criteria to designate students as likely intending to complete a community college program.

1. Student was age 17 to 19 at the time of initial enrollment

Research demonstrates that younger community colleges students are more likely than older students to report a goal of earning a degree or transferring to a university, and are more likely to actually achieve that goal. For example, one major study using data on community college students from the National Center for Education Statistics (NCES) reported that, based on students' stated purpose for enrolling and the type of program in which they enrolled, about 90 percent of those enrolling as first-time college students in a community college intend to earn some kind of postsecondary credential. The study found that younger students were substantially more likely to report that they intended to earn a degree or certificate, more likely to be enrolled in a program leading to a credential, and more likely to complete a program (Hoachlander, Sikora, Horn, & Carroll, 2003).[9]

In the CCC dataset used in the current study, nearly 70 percent of completions occurred among students who were under 20 years of age at initial enrollment (80 percent occurred among students under age 25). In addition to being the group most likely to enroll with a completion goal and to actually complete a program, younger students have the greatest potential for increasing their lifetime earnings based on attaining a college credential, and for generating the substantial benefits to the state that accrue through higher tax receipts, lower expenditures on health, social service, and criminal justice programs, greater civic participation, and other public benefits related to a more educated population. The potential benefits make it especially important to examine rates of completion for younger students.

We excluded from the cohort all students ages 17 to 19 who were concurrently enrolled in high school and community college, as well as those already enrolled in a four-year university.[10] Therefore, students age 17 to 19 in the remaining cohort generally represented traditional college students enrolling in higher education shortly after high school who can reasonably be assumed to be likely degree seekers.

2. Student identified a goal of degree or certificate completion or transfer to a university upon enrollment or after meeting with a counselor [11]

In the CCC cohort analyzed for this report, two-thirds of students who successfully completed had expressly stated a goal of earning a certificate or degree or transferring to a university. This is about equal to the percentage of completers who were age 17 to 19, suggesting that stated goal is as reasonable an indicator of degree intent as enrolling in college at an earlier age. Research demonstrates that students who state that their primary reason for enrolling is to transfer or complete a certificate/degree are more likely to persist and earn some kind of credential (Bailey, Jenkins, & Leinbach, 2005; Zucker, Dawson, & Carroll, 2001).

Given the state's need to increase the number of college credentials awarded and its interest in supporting completion among students who have that as a goal, this study defined all students who indicate a goal of completion as likely degree

seekers, though no assumption was made about students' specific completion goal (i.e., certificate, degree, or transfer). Many students check these goals without a full understanding of the implications of the degree goal or of their preparedness to achieve the goal. Nevertheless, in view of the research cited above and the dire needs of the state for graduates with degrees and certificates, it serves no useful purpose to assume that students who set goals of degree completion should not be taken seriously.

3. Student demonstrated an intent to finish a program by completing at least 12 units of coursework and attempting a transfer- or degree-level English or math course

This criterion uses course enrollment behavior to capture likely degree seekers who may have been older when they initially enrolled, and who may never have stated a goal of completion, but whose course enrollments implied intent to complete some kind of community college program. It is similar to the criterion developed by the CCC Chancellor's Office for accountability reporting.[12]

Students who met one or more of these three criteria were defined as likely degree seekers (the majority of degree seekers met more than one of the criteria). Using this method, 60 percent of students in the 1999-2000 entering cohort were seeking a degree or certificate and 40 percent were not. The fact that NCES researchers found that 90 percent of new community college students seek a credential suggests that the CCC provides access to students with a broader variety of goals than many other states.

For readers familiar with the CCC Chancellor's Office accountability report (Drummond & Perry, 2007), Table 3 summarizes the difference between the definition of degree seekers used here and the system's definition of "students who showed intent to complete" (p. 700). Because the Chancellor's Office includes no students who leave without completeing 12 units, their cohort is much smaller. The different definitions and cohort composition result in different rates of completion.[13]

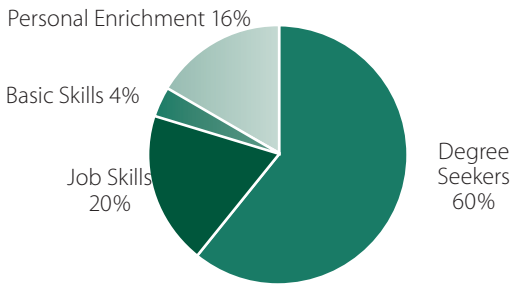
Table 3
Differing Definitions of Degree Seekers

	Institute for Higher Education Leadership & Policy	**Chancellor's Office**
Definition of Likely Degree Seekers	First-time CCC students who: • Were 17-19 years old at the time of initial enrollment; and/or • Indicated a goal of completing a certificate or degree or transferring to a university; and/or • Completed 12 or more units of coursework and enrolled in a transfer- or degree-level English or math course	First-time CCC students who: • Completed 12 or more units of coursework; and • Enrolled in a transfer- or degree-level English or math course, or an advanced occupational course
Share of 1999-2000 Cohort who Meet Criteria	60%	39%

Non-Degree Seekers Pursue Job Skills, Basic Skills or Personal Enrichment

Among the 40 percent of the entering cohort that were non-degree seekers, students fell into three different categories based on the types of courses in which they enrolled (see Figure 2). All three groups of non-degree seekers differ from degree seekers in important ways beyond their goals. As shown in Table 4, non-degree seekers are more likely to be white. More of them enroll in the community colleges after having already earned a college degree. On average they enroll for fewer terms than degree seekers, and take fewer courses while they are enrolled. The three groups of non-degree seekers are similar to each other in the number of terms attended and the numbers of units attempted and completed. The differences from degree seekers on those enrollment characteristics suggest that the criteria we use distinguish well between degree seekers and non-degree seekers.

Figure 2:
Three Categories of Non-Degree Seekers Represent 40% of Incoming Students



Much of the enrollment activity of non-degree seekers represents an important contribution of the community colleges to improving the skills of the state's workforce. A majority of non-degree seekers (58%) were enrolled to pursue either job skills or basic skills that one can assume would help them enter or advance in the workplace. Nevertheless, in view of the consensus pointing to shortages of degrees and certificates in the labor force, the remainder of this report focuses on patterns of student progress and success for the 60 percent of students who were seeking a college credential, in order to identify policy changes that could increase rates of success.

Table 4
Differences across Student Populations

	Degree Seekers (60%)	Non-Degree Seekers (40%)		
		Job Skills	Basic Skills	Personal Enrichment
Gender				
Female	53%	47%	61%	58%
Male	47%	53%	39%	42%
Average Age at Enrollment	23	40	35	40
Race/Ethnicity				
White	42%	57%	19%	57%
Latino	29%	21%	51%	20%
Asian	17%	11%	19%	12%
Black	9%	8%	9%	8%
Other	3%	3%	2%	3%
Education Level at Enrollment				
No High School Completion	16%	16%	38%	14%
High School Diploma/GED	80%	56%	56%	53%
AA Degree	2%	6%	2%	5%
BA Degree	2%	22%	4%	28%
Average Terms Attended[1]	6.2	2.5	2.5	2.9
Average Total Units Attempted	55	10	12	10
Average Total Units Completed	38	7	6	6
Average Successful Course Completion Ratio[2]	61%	68%	45%	58%

1 Average number of terms enrolled over the 6-year period, including summer terms

2 Defined as the share of courses successfully completed with a grade of A – C (or Credit if the course was pass/fail)

Degree Seekers: Completion Rates are Low

CCC students are, by virtue of the eligibility criteria set forth in the Master Plan for Higher Education, generally less prepared for college than UC and CSU students. They typically work, with 80 percent of CCC students working an average of 32 hours per week (Zumeta & Frankle, 2007), and they face many life challenges outside of their college careers. For that reason, it is unreasonable to expect that completion rates in the community colleges would approach those of four-year institutions. Sometimes, perhaps often, students drop out for reasons well beyond the control of a community college. But a review of the data reveals completion rates that are too low to sustain the kinds of equity gains and economic growth that California needs. Therefore, it is incumbent upon researchers with an interest in state public policy to examine what might be done to increase the success of community college students, taking into account the challenges that many of those students bring with them into the college environment.

A Look at Outcomes after Six Years

Approximately one in four degree seekers in the cohort completed a community college program – meaning they earned a certificate or degree, transferred to a four-year university, or achieved some combination of those outcomes within six years of enrolling in community college.[14] Table 5 shows retention rates, the percentage of degree seekers completing each outcome, and the overall completion rate. Sixty-two percent of degree seekers re-enrolled in the next term (excluding summer) following their initial term of enrollment, and half were still enrolled one year after their initial term. Over their entire period of enrollment during the six years studied, degree-seeking students successfully completed 61 percent of the courses they enrolled in. About three percent of all degree seekers earned a certificate, 11 percent earned an associate's degree and 18 percent transferred to a four-year university. Seventy-six percent of degree seekers did not achieve any of these outcomes within six years of enrolling in community college.[15]

Table 5
Retention and Completion among Degree Seekers

	Percent of Degree Seekers
Retention	
To Second Term[1]	62%
To Second Year[2]	50%
Successful Course Completion Ratio[3]	61%
Completion	
Certificate[4]	3%
Associate Degree	11%
Transfer to University	18%
Overall Completion Rate[5]	24%

Notes:

[1] Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2] Fall to fall or spring to spring, depending on initial term

[3] Defined as the share of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses)

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

Some "Completers" End Up with No College Degree

Although we define transfer to a four-year institution as "completion," many transfer students end up with no college degree. In California, an associate's degree is not required in order to transfer, and the requirements for transfer and for earning an associate's degree are different. Nearly two-thirds of students in the cohort studied who transferred to a university did so without earning an associate's degree. The majority of CCC transfer students enroll in the CSU system,[16] where about 69 percent of community college transfers earn a bachelor's degree within six years.[17] Transfer students without an associate's degree who fail to complete the baccalaureate have no college degree to show for their considerable efforts. Other research has demonstrated that students who are awarded an associate's degree before transfer to a university are more likely to graduate (Wellman, 2002; McCormick & Carroll, 1997; Grubb, 1991), a finding that has been used by some states to develop "Transfer AA" degrees in an effort to ease the transfer process and encourage degree completion.[18]

A Note on "Transfer-Ready" Students

While it is not defined here as "completion," some degree seekers completed a sufficient number of transferable units but did not actually transfer. The CCC Chancellor's Office defines "transfer-ready" students as those who completed at least 60 transferable units with a grade point average (GPA) of 2.0 or above, including the completion of both transfer-level English and math.[19]

An additional 2.5 percent of degree seekers in the cohort met this requirement but did not achieve one of the completion outcomes (certificate/degree/transfer). In other words, if these students were included in our definition of "completion," we would report a completion rate of 26.5 percent instead of 24 percent. While it is not a large percentage, it represents nearly 8,000 students. Some of these "transfer-ready" students may not have actually been eligible for transfer, as a specific set of transferable courses is required for transfer to each of the state's universities (and even to each major/department within the universities). However, when thousands of CCC students are successfully completing so many transferable courses without earning a certificate or associate's degree, or continuing their study at a university, it is a substantial loss to California.

Further research is needed to explore the barriers to transfer for these students and how to remove those barriers, and to determine whether additional efforts could be made to encourage these students to complete certificates or degrees during their time enrolled in community college.[20]

Summary

These results confirm other research indicating that rates of persistence and completion in community colleges are low (CPEC, 2007; Sengupta & Jepsen, 2006; Hoachlander et al., 2003; Woodlief, Thomas, & Orozco, 2003; Berkner, He, Cataldi, & Knepper, 2002). While some degree-seeking community college students who do not transfer or earn a credential may meet other personal goals, researchers, policymakers and educators across the country are concerned that completion rates are too low to meet the needs of the workforce, and to ensure continued economic growth and prosperity for individuals and the nation (Bailey et al., 2005). Understanding the factors that influence completion rates is essential to any effort to increase rates of success in the CCC.

Many Factors Affect Student Success

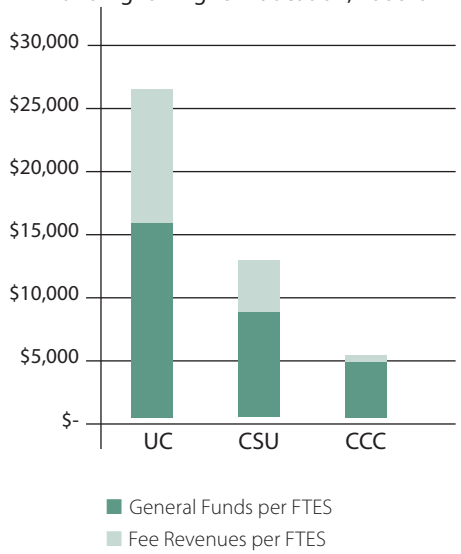
In this report, we use the term "student success" as it was recently defined by two national experts in higher education policy – "getting students into and through college to a degree or certificate" (Ewell & Wellman, 2007, p. 2). Ewell and Wellman acknowledge that there are numerous potential meanings of student success beyond degree attainment but conclude that possession of a college credential "will remain the essential policy measure for the foreseeable future" (p. 5). While arguments can certainly be made for broader definitions of success, the social and economic imperative to ensure that there are enough college-educated workers in California makes it reasonable to equate "success" with "completion" for the purposes of this policy-focused discussion. In doing so, we recognize the intermediate achievements that represent progress toward completion, like retention, course completion and finishing needed remediation.

Overall Funding Levels

The amount of resources available to community colleges obviously affects their ability to help students succeed. State appropriations provided per full-time student at the CCC are less than 60 percent of that for students at the CSU and less than one-third that of students at the UC, as shown in Figure 3. The low amount of fee revenues collected by the CCC, compared to the other two segments, makes the differences in total funding even greater. When state funds and student fee revenue are considered together, CSU has about 2.5 times the per-student funding as the CCC and UC has about 5 times the funding. While strict comparisons are hard to interpret in view of the different missions assigned to each segment, it is hard to understand why community college students, who are among the most expensive to teach given their considerable needs for intensive instructional and support services, should receive so much less funding than students at the four-year institutions.

The comparatively low level of funding in the CCC puts a premium on the effective use of those limited resources. The purpose of this report is to identify factors that influence student success so that state and system policies might be reformed accordingly. For the community colleges to best help the state meet its goals of educating more Californians, there must be additional resources and policy reforms so that the CCC has both the resource capacity and the policy environment to help students succeed.

Figure 3:
Funding for Higher Education, 2006-07



Source: Legislative Analyst's Office, Analysis of the 2007-08 Budget Bill

Sorting Out Success Factors

In an effort to understand low rates of persistence and completion, many studies have examined factors related to success among community college students. While these studies have used different sources of data and widely varying methodologies, they have revealed a number of broad categories of factors consistently related to student success and the likelihood of degree completion.[21] The factors relate to 1) who the students are and what characteristics they bring with them to college, 2) the course-taking and enrollment patterns students follow while attending college, and 3) the policies and practices

of higher education institutions. For the first two categories, the following sections describe specific factors that previous research has demonstrated to be related to student success and degree completion. For each factor, we review relevant research literature and outline our findings using the CCC cohort data.

The final category, institutional policies and practices, is framed somewhat differently due to limitations of the CCC dataset that preclude quantitative analysis. Instead, we review the relevant research literature on two topics (student support services and learning communities) and comment on the data shortcomings at the system level. Following that, we devote a special section to an extensive review of the assessment and placement process in the CCC. Assessing student skill levels and helping them enroll in appropriate classes is vitally important to the success of today's community college students, many of whom are unprepared for college-level work when they arrive and unfamiliar with the college environment and multiplicity of courses and programs. The CCC has recognized both the importance of the assessment/placement process and the shortcomings of the current approach, as the Board of Governors, the Chancellor, and the Academic Senate are all variously engaged in reviewing the process with an eye to reform.

Student Characteristics

Demographic factors like age, race, and gender are commonly found to be associated with student success. Students' socioeconomic status, academic preparation for college, and their goals and aspirations are also consistently found to be strongly related to postsecondary success. The impact of demographic and other characteristics on student success are important to understand given that state and institutional policies and programs can be used to help reduce disparities.

Age

The Literature. Research consistently finds that younger community college students are more likely to transfer or complete a degree (Adelman, 2005; Hoachlander et al., 2003; Hoachlander & Carroll, 1989). It is easy to imagine the circumstances that make completion more challenging for older degree seekers, who are more likely to have work and family responsibilities that compete with efforts to focus on higher education (Gooden & Matus-Grossman, 2002; Horn & Carroll, 1996). In addition, research suggests that students who delay college are more likely to have lower family incomes, lower levels of parental education, and lower academic preparation levels – all factors that reduce the likelihood of completion (Horn, Cataldi, & Sikora, 2005).

Analysis of CCC Data. In our analysis, we found that the older degree-seeking students were upon initial enrollment, the less likely they were to complete. As shown in Table 6, the overall rate of completion was 27 percent for students enrolling at age 17 to 19, 21 percent for students age 20 to 29, 18 percent for students age 30 to 39, and 16 percent for students enrolling at age 40 or older. Transferring and earning an associate's degree are more common among younger students, while the likelihood of earning a certificate increases with age.[22] While the community colleges are and should be commended for being accessible to students of all ages, research clearly demonstrates that students who delay college enrollment take on an additional risk of never completing a degree.

Race/ethnicity

The Literature. Research also generally finds lower rates of college completion among black and Latino students compared to white and Asian students (Sengupta & Jepsen, 2006; Hoachlander et al., 2003; Woodlief et al., 2003). Racial/ethnic differences in outcomes are often attributed to other important factors that vary by race including level of academic preparation and socioeconomic status.[23] Also, under-represented minority students are more often the first person in their family to attend college, which has been found to be negatively associated with college persistence and completion (Alfonso, 2006; Warburton, Bugarin, & Nunez, 2001).

There is evidence that some Latino students may face a unique barrier to transferring to a university, compared to other minority groups and disadvantaged populations, because of relatively stronger ties to home and family and a reluctance to leave home to pursue higher education (Gonzalez, Jovel, & Stoner, 2004; Auerbach, 2004; Delgado-Gaitan, 2002; Ginorio & Huston, 2001; Rendon, Justiz, & Resta, 1988). Survey research on first-generation college students has found that "being able to live at home" and "the school was close to home" are more common reasons for a particular college choice among this

population (Nunez & Cuccaro-Alamin, 1998). Other research concludes that the transition experience from the home culture to the academic culture is one of the greatest challenges confronting first-generation Latino students (Lara, 1992; Rendon, 1992).

Analysis of CCC Data. Our findings are consistent with national research on this topic. Black and Latino students were found to have lower rates of completion than white and Asian students (see Table 6). The percentage of students earning a certificate did not vary much by race/ethnicity. Latino students were retained to a second term and second year at about the same rate as white students, yet their far lower likelihood of transfer to a university resulted in a substantially lower rate of completion. These disparities are of critical importance because Latino students make up the fastest-growing population within community colleges as well as the California workforce.

Gender

The Literature. The rates at which women enroll in and complete higher education have increased faster than those for men over the last couple of decades. National data suggest that women are more likely to complete a degree within five years of postsecondary enrollment than men, but more men are still persisting after that period, which suggests that they may take longer to complete (Peter & Horn, 2005).

Analysis of CCC Data. In the current analysis, we found somewhat higher rates of retention and completion for women, particularly in the share of students earning associate's degrees (see Table 6). Sixty-four percent of all associate degrees awarded by the community colleges in 2004-05 went to women (women represented 56% of enrollment), with the percentage much higher in some disciplines with high numbers of awards like health services.[24]

Table 6
Retention and Completion among Degree Seekers by Student Demographic Factors

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion Rate[5]
By Age at Enrollment:							
17 – 19	67%	54%	59%	2.2%	11%	22%	27%
20 – 29	57%	44%	63%	4.0%	10%	14%	21%
30 – 39	55%	42%	68%	6.1%	10%	8%	18%
40 or older	51%	39%	70%	6.2%	8%	6%	16%
By Race/Ethnicity							
White	62%	50%	64%	3.1%	12%	21%	27%
Asian	70%	58%	67%	4.1%	13%	25%	33%
Latino	63%	50%	56%	3.2%	10%	13%	18%
Black	52%	39%	49%	2.8%	7%	11%	15%
By Gender:							
Female	64%	52%	63%	3.8%	13%	19%	26%
Male	61%	48%	59%	2.5%	8%	17%	22%
By Income Quartile[6]:							
Highest quartile	63%	52%	63%	2.6%	10%	22%	27%
3rd quartile	64%	51%	62%	3.0%	11%	19%	25%
2nd quartile	63%	51%	60%	3.7%	10%	17%	23%
Lowest quartile	60%	47%	60%	3.4%	11%	15%	22%

1 Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

2 Fall to fall or spring to spring, depending on initial term

3 Calculated as the number of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses) divided by the total number of courses enrolled in

4 Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

5 Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

6 Based on an aggregate measure of the average income of households in the zip codes of students attending each college

Socioeconomic Status

The Literature. Research on postsecondary success consistently demonstrates that the likelihood of completing a degree is related to students' socioeconomic status (Adelman, 2005, 2006). Higher-income community college students are more likely to complete an associate degree or to transfer to a university, although lower-income students are sometimes found to earn certificates at a higher rate (Bailey et al., 2005).

Analysis of CCC Data. Unfortunately, data on individual students' socioeconomic status are not available in the CCC data used for this study. However, researchers in the CCC Chancellor's Office have developed an Economic Service Area Index (ESAI) for each college as a proxy measure for use in studying the impact of socioeconomic status on student outcomes. The ESAI for a particular college represents a weighted average of the income of households in the home zip codes of students attending that college.[25] Table 6 shows that students attending colleges with an ESAI in the lowest quartile had an overall completion rate of 22 percent, compared to a rate of 27 percent for students attending colleges with an ESAI in the highest quartile.[26]

Academic Preparation

The Literature. A student's level of academic preparation coming out of high school is consistently found to be one of the strongest predictors of postsecondary success and likelihood of completing a college degree (Adelman, 1999, 2006; Berkner et al., 2002; Altonji, 1996). Students who initially enroll in community colleges generally have lower levels of academic preparation than those who enroll in a four-year college or university (Adelman, 2005; Bailey et al., 2005). Among enrolled community college students, those who completed a more rigorous set of high school courses or who scored higher on measures of academic skills are more likely to earn a postsecondary credential (Hoachlander et al., 2003).

Large numbers of CCC students are under-prepared for college-level work when they enroll, although precise figures are difficult to find. CCC researchers recently reported that over 70 percent of students who take assessment tests upon enrollment place into remedial math, and 42 percent of tested students place into remedial English (Center for Student Success, 2005). The Chancellor of the CCC recently stated that 90 percent of incoming students test below college level in math and over 70 percent test below college level in reading and/or writing (Fisher, 2007). The outlook for CCC students who start out in remedial math and reading courses is often grim. Only one-quarter of students initially enrolling in a reading fundamentals course in community college ever enroll in a transfer-level English class, and only 10 percent of students beginning in a basic math course ever enroll in a transferable math course (Center for Student Success, 2005).

Analysis of CCC Data. Data on students' academic preparation levels are not available in the CCC data used for this study. College entrance exams are not required for enrolling in the community colleges, and high school transcripts are not routinely collected from new students. Some students take assessment tests upon entry to the community colleges in order to measure their English and math skills for appropriate placement into courses. However, the results of these tests are not included in the statewide data system, and many students are never assessed. In order to have a measure of student academic preparation levels at each college, researchers in the CCC Chancellor's Office developed the Student Average Academic Preparation (SAAP) measure - an indicator of the average academic preparation levels of incoming students in each college (Bahr, 2002).[27]

Table 7 (on next page) shows the results of using the SAAP as a proxy to calculate completion rates by students' level of academic preparation. Students attending colleges with a SAAP in the lowest quartile had an overall completion rate of 19 percent, compared to a rate of 28 percent for students attending colleges with a SAAP in the highest quartile.[28] The percentage of students earning certificates and associate degrees did not vary much across quartiles of academic preparation, but transfer increased substantially with level of academic preparation.

Table 7
Retention and Completion among Degree Seekers by Academic Preparation Level (aggregate measure)

	Retention		Course Completion Ratio[3]	Completion			
Level of Academic Preparation[6]	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion Rate[5]
Highest Quartile	63%	51%	63%	2.6%	11%	23%	28%
3rd Quartile	65%	52%	62%	3.6%	12%	20%	26%
2nd Quartile	62%	49%	60%	2.8%	10%	17%	23%
Lowest Quartile	60%	48%	59%	3.7%	10%	13%	19%

[1]Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2]Fall to fall or spring to spring, depending on initial term

[3] Calculated as the number of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses) divided by the total number of courses enrolled in

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers

[6] Based on an aggregate measure of the average academic preparation of students attending each college

Student Goals and Commitment

The Literature. Research points to the important influence of student goals and aspirations on postsecondary success and attainment (Adelman, 2006; Hoachlander et al., 2003). For example, the Community College Research Center found that community college students who state that their primary reason for enrolling is to transfer are much more likely to persist and earn some kind of credential or to transfer than are students who state that they are enrolling for job skills, even after controlling for demographic factors like age and race/ethnicity (Bailey et al., 2005). Zucker and his colleagues (2001) reported that students with the highest level of postsecondary degree attainment were those who had reported the highest aspirations on enrollment, while those with the lowest attainment had reported the lowest aspirations.

Rather than relying only on students' stated goal, other researchers have developed measures of students' level of commitment to completing a community college program based on multiple characteristics or enrollment patterns. Adelman (2005) used a variable measuring the consistency of community college students' educational expectations over time, finding that this variable was a stronger predictor of the likelihood of moving on to a four-year college than level of academic preparation or socioeconomic status. Horn, Nevill and Griffith (2006) measured students' level of commitment based on stated goal, credit load, and enrollment in a formal degree program. They found that community college students who demonstrated a strong commitment to finishing a program of study were more likely to persist for one year than students who demonstrated less commitment or no commitment to such a goal.

Analysis of CCC Data. An examination of completion among the full cohort of CCC students confirmed that students who indicated a goal of completing a certificate, degree, or transfer were more likely to actually complete one of those outcomes than students who indicated a non-completion goal such as educational development/discovery or increasing job skills. That fact, combined with the research literature confirming the importance of student goals, led us to include stated goal as one of the criteria for defining "degree seekers."

Using a typology similar to that used by Horn and her colleagues (2006), we found that students who were "more committed" to a goal of completing a program, defined as those who stated a goal of completion and attended at least half time (6+ units) throughout their enrollment,[29] had the highest rates of retention to a second term (67%) and completion (35%). Students included in the "less committed" category had a completion rate of 29 percent, while less than 20 percent of students defined as "not committed" completed within six years. The rate of successfully completing courses did not vary across "commitment" groups (see Table 8).

Table 8
Retention and Completion among Degree Seekers by Level of Commitment *(with definition adapted from Horn et al., 2006)*

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion Rate[5]
Level of Commitment[6]							
More Committed (19%)	67%	51%	61%	2.7%	15%	30%	35%
Less Committed (22%)	63%	47%	60%	3.5%	13%	22%	29%
Not Committed (59%)	61%	51%	61%	3.2%	9%	13%	19%

[1] *Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000*

[2] *Fall to fall or spring to spring, depending on initial term*

[3] *Calculated as the number of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses) divided by the total number of courses enrolled in*

[4] *Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.*

[5] *Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.*

[6] *"More committed" = attended at least half time throughout enrollment and stated a goal of transfer/degree/certificate. "Less committed" = attended at least half time throughout enrollment, but did not state a goal of completion. "Not committed" = did not attend at least half time throughout enrollment.*

Student Course-taking and Enrollment Patterns

Beyond the individual and demographic factors reviewed above, a growing body of research indicates that students' course-taking and enrollment patterns while in college have an impact on successful completion. This line of research represents a shift from the traditional focus on what students bring with them to college to a focus on what happens during their enrollment. This research is important for identifying more successful patterns of course-taking and enrollment which might then guide the development or refinement of related state and institutional policies.

Full-time Attendance

The Literature. Research demonstrates that community college students are the least likely to enroll full time, compared to students beginning at public or private four-year institutions or private two-year institutions (Berkner, et al., 2002). But full-time attendance is the enrollment pattern most often shown to be correlated with successful outcomes. Students who attend community college full time have higher rates of retention, transfer and degree completion (Alfonso, 2006; Hoachlander, et al., 2003; Woodlief et al., 2003; Berkner, et al., 2002; Wyman, 1997; Hoachlander & Carroll, 1989). The success rates of part-time students lag behind those of full-time students even when controlling for factors like gender, family income, and educational expectations (Chen & Carroll, 2007). Some of the benefits of full-time attendance may be related to greater "social integration" into college life (Tinto, 1993).[30] Part-time students have less interaction with faculty outside the classroom than full-time students, and receive less counseling and academic advising (Community College Survey of Student Engagement [CCSSE], 2006). Also, higher credit loads may force students to manage their time better and make academics their top priority (Szafran, 2001).

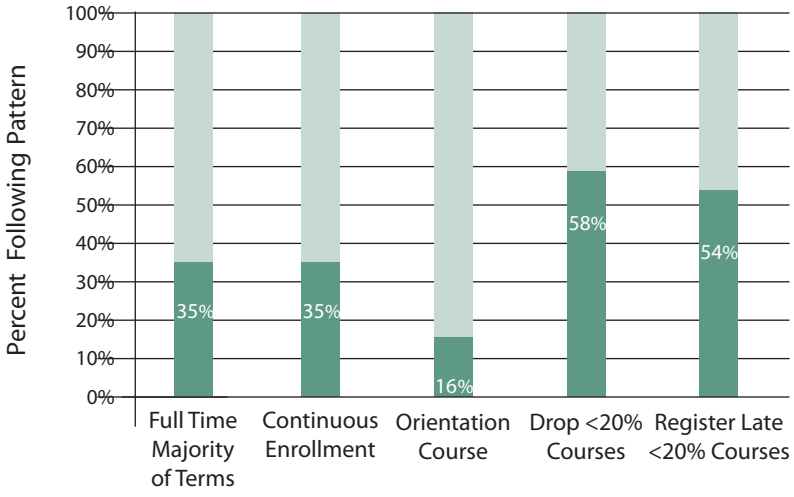
Closely related to full-time attendance is the number of hours worked. College students who work more than 15 to 20 hours per week have lower GPAs, fewer credits completed, and lower persistence rates (Pascarella & Terenzini, 2005). Community college students who work 30 or more hours per week are considerably less likely to complete than students who work fewer hours (Hoachlander, et al., 2003; Summers, 2003). Recent research suggests that over 80 percent of CCC students work, averaging 32 hours per week, leading the authors to conclude that California's community college students are working too much to the detriment of success and completion rates (Zumeta & Frankle, 2007).

Also related to full-time attendance, a growing part of the research literature has tied first-year credit accumulation to earning credentials. Accumulating at least 20 credits during the first year seems to provide students with momentum toward completion (Adelman, 2006; McCormick, 1999). Early credit accumulation is particularly important for younger

students. In a recent study, younger community college students who accumulated at least 20 non-remedial credits in the first year were 7.6 times as likely to graduate as younger students who did not (Calcagno, Crosta, Bailey, & Jenkins, 2006). Similarly, accumulating credits during summer terms has been related to a greater likelihood of transfer for community college students (Adelman, 2005).

Analysis of CCC Data. There are many ways to define full-time attendance. In order to finish a 60-unit associate degree or transfer program in the traditional two-year period, a student would have to enroll in 15 units over four consecutive semesters. Very few CCC students follow that pattern. The definition of "full time" for the purposes of federal financial aid requires enrollment in 12 or more units per semester. For the current analyses, we defined as full time any student who enrolled in 12 or more units during the majority of terms they attended (excluding summer). For example, a student who enrolled for a total of six (fall/spring) terms would be considered full time if he or she enrolled in 12 or more units during at least four of those terms. Just over one-third (35%) of degree-seeking students met this more lenient standard of full-time attendance (see Figure 4). Full-time attendance declined with age, and was lower for Latino and black students than for white and Asian students (see Appendix 1, Table 1-1).

Figure 4
Percent of Degree Seekers Following More Effective Enrollment Patterns



Even with a definition of "full time" that does not require consistent full-time attendance, our analysis shows that "full-time" CCC students are far more likely to persist and successfully complete courses and programs of study. In fact, these students were four times as likely to complete a degree or transfer to a university and twice as likely to earn a certificate (see Table 9).[31] Full-time attendance was related to higher completion rates for all racial/ethnic populations and all age groups (see Appendix 1, Table 1-1). For older students, the impact of full-time attendance was slightly less, with the likelihood of completing a degree or transfer about three times higher for full-time students over age 30. Latino students who attended full time in a majority of terms were more than five times as likely to transfer as their part-time counterparts.

Continuous Enrollment

The Literature. Maintaining continuous enrollment, without "stopping out" for one or more terms (other than summer), is strongly associated with higher degree completion (Adelman, 2005, 2006; Alfonso, 2006). Remaining continuously enrolled has been shown to increase the probability of degree completion or transfer among community college students by more than 20 percent, after controlling for other important factors like socioeconomic status (Adelman, 2005). As with full-time enrollment, research suggests that community college students are less likely than their counterparts at four-year institutions or two-year private institutions to remain continuously enrolled (Berkner et al., 2002).

Analysis of CCC Data. We defined continuously enrolled students as those who enrolled in successive terms (excluding summer) without stopping out, throughout their period of enrollment in community college. "Continuous" enrollment is not relevant for students who only attended a community college for one term (fall/spring), so those students were excluded from the analyses on this topic. Just over one-third (35%) of degree-seeking students enrolled continuously (see Figure 4). As shown in Table 9, 40 percent of students who attended continuously completed, compared to 24 percent of those who stopped out for one or more terms. The rate of completing an associate's degree or transferring was about twice as high for students who remained continuously enrolled, although the rate of certificate

completion was about the same whether students were continuously enrolled or stopped out. Students who attended continuously completed more of their courses successfully (69%) than students who stopped out (61%). Continuous enrollment was related to higher completion rates for all racial/ethnic populations, but it does not appear to be as important for older students, whose completion rates are low regardless of attendance patterns (see Appendix 1, Table 1-2). While traditional-aged students who enrolled continuously were about twice as likely to complete, there was only a small (3 percentage point) difference in completion rates for students in their 30s, and no difference for students over age 40.

Course Dropping

The Literature. Several recent studies have concluded that excessive course withdrawals have a negative impact on postsecondary success and completion (Adelman, 1999, 2005, 2006; Summers, 2000). Withdrawing from or repeating 20 percent or more of courses has been shown to decrease the probability of degree completion by nearly half (Adelman, 2006). In a study of community college students, Adelman (2005) found that excessive course withdrawals and repeats reduced the probability of transfer by 39 percent.

Some recent research suggests that course dropping is common in the CCC. A study of one beginning cohort of students in the Los Angeles Community College District found that nearly half (46%) of students dropped at least one course during their first term of enrollment, with more than 20 percent of all enrollments (by that cohort of students) dropped in that term (Maxwell, Hagedorn, Cypers, & Moon, 2003). The persistence rate to a second semester was lower for students who had dropped three or more of their course enrollments during the first term. Also, students who dropped large numbers of courses had lower GPAs (Hagedorn, Maxwell, Cypers, Moon, & Lester, 2003).

Several researchers have studied the reasons for course dropping among community college students. Practical concerns account for a large share of course withdrawals, including family or work obligations or other personal problems (Hayward, 2003; Conklin, 1997). However, the reasons for dropping "high attrition" courses (those where 40% or more of students dropped the course) are more often related to course scheduling, course difficulty, workload in the course, dislike of the instructor or other factors over which colleges could exert some control (Conklin, 1997).

Researchers have also concluded that students who withdraw late in the term may be using liberal withdrawal deadlines to avert failure and avoid academic probation (Daubman, Williams, Johnson, & Crump, 1985). However, some evidence suggests that students who receive an initial failing grade are more likely to be successful when repeating the course than are students who dropped the course before repeating it (Spurling, 2006). The author of that study concluded that staying engaged in the educational process by finishing the course gave students who failed an advantage when repeating the course over those who withdrew.

Altering institutional policies around course dropping has been shown to decrease the number of course drops. Research in one institution found that some students engaged in chronic course dropping. While such students represented 29 percent of the student population, they accounted for 57 percent of units dropped. After changing its policies to allow students to get a "W" (withdrawal) grade in no more than 14 units over their academic career, the college saw a significant decline in the number of courses dropped (Fleming, Hill, & Merlin, 1985).

Analysis of CCC Data. On average, degree-seeking students in the cohort we studied dropped nearly 22 percent of the courses they enrolled in. Only enrollments as of the census date (about the 3rd week of the term) are included in the dataset, so this figure does not include courses dropped during the early part of the term when many students drop and add courses before deciding on a final schedule. Younger students dropped more of their courses than older students, and black and Latino students dropped more often than white and Asian students (see Appendix 1, Table 1-3).

Excessive course dropping was associated with lower rates of retention and completion. Overall, students who dropped fewer than 20 percent of their courses were about four times as likely to complete. Thirty-five percent of students who dropped fewer than one in five courses completed, compared to nine percent of students who dropped a higher share of courses (see Table 9). There was some variation among racial/ethnic populations and age groups, although the relationship between course dropping and completion held for all students (see Appendix 1, Table 1-3).

Late Registration

The Literature. Research on the impact of registering late for classes has generally concluded that late registrants have higher course withdrawal rates, lower GPAs, and lower retention rates (Freer-Weiss, 2004; Smith, Street, & Olivarez, 2002; Summers, 2000). Men, older students who delayed college entry, students with lower academic preparation levels, and part-time students are more likely to register late, giving them a profile that closely resembles that of students at high risk for attrition (Freer-Weiss, 2004). Late registrants may also differ from other students in confidence, academic and organizational skills, and motivation (Weiss, 1999).

Analysis of CCC Data. Studies have defined late registration in a number of ways, from enrolling in a course only a few days before it begins, to registering a week or more into the term. We defined registering "late" as enrolling in a course after the first day of the term.[32] By this definition, degree-seeking students, on average, registered late for about one in four of their courses. Late registration did not vary much by age, but black students were more likely to register late, enrolling for nearly one-third of their courses after the first day of the term (see Appendix 1, Table 1-4).

Registering late for many courses was associated with lower rates of completion, although the differences were not as large as for full-time attendance, continuous enrollment, and excessive course dropping. Students who enrolled late for more than one in five courses had an overall completion rate of 21 percent, compared to a completion rate of 27 percent for students who registered late less often (see Table 9). The impact of late registration was greater for younger students than for older students (see Appendix 1, Table 1-4). The impact was smallest for black students.

Orientation Course

The Literature. A number of studies have demonstrated the benefit to students of taking an orientation or "college success" course upon enrollment in college. Studies done in both four-year universities (Sidle & McReynolds, 1999; Boudreau & Kromney, 1994) and community colleges (Derby & Smith, 2004; Zimmerman, 2000; Stovall, 1999; Glass & Garrett, 1995) indicate that students who take an orientation course upon enrollment in college complete their courses at higher rates, earn more total credits, maintain higher GPAs, and are more likely to persist and graduate. The positive effects are particularly strong for minority students (Stovall, 1999; Strumpf & Hunt, 1993).

In studies on orientation courses, enrollment in the orientation course was generally voluntary and, while comparison groups of similar students who did not take such a course were used, it is possible that students who enroll in orientation courses have some immeasurable difference in level of motivation or commitment that accounts for their greater success. One study at a university attempted to account for this weakness in determining causation (Strumpf & Hunt, 1993). Out of a group of students who indicated interest in taking an orientation course, half were randomly chosen to be in the course while the other half served as a control group. Students taking the course had substantially higher retention rates over the following three semesters, leading the authors to conclude that the content and process of orientation courses contribute significantly to retention rates beyond the effects of motivation alone.

A recent analysis of a statewide cohort of Florida community college students found that those who enrolled in a student success course were more likely to persist, earn a degree, and transfer than were students who did not take such a course, after controlling for a number of student characteristics (Zeidenberg, Jenkins, & Calcagno, 2007). The authors note that these courses may help community college students "to develop clearer goals for education and careers, better ideas of what it takes to succeed in college, and some practical skills for success in college" (p. 8).

Analysis of CCC Data. There are many courses in the CCC that could be considered "orientation" courses.[33] Some of them are aimed at specific groups such as adult re-entry students or students who are economically or educationally disadvantaged. Others are aimed more generally at assisting new students in learning about their educational options and the programs and services that are available to help them succeed. There is no special coding of orientation courses in the statewide data system, so we had to rely on course titles to identify which students enrolled in such a course. Typical course titles included, "Making College Count," "Orientation to College," and "College Success." Only about one in six degree-seeking students enrolled in such a course (see Figure 4),

with younger students more likely to have done so than older students (see Appendix 1, Table 1-5).

Students who enrolled in an orientation course were more likely to persist and to complete a certificate/degree or transfer (see Table 9). About a third (32%) of students who took an orientation course completed, compared to less than a quarter (23%) of students who did not take a course. The positive relationship between taking an orientation course and completion held for students of all ages and racial/ethnic groups (see Appendix 1, Table 1-5).

Table 9
Retention and Completion among Degree Seekers by Selected Enrollment Patterns

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion Rate[5]
Attendance Status[6]:							
Full-time	79%	67%	69%	4.8%	22%	37%	47%
Part-time	55%	43%	57%	2.3%	5%	8%	12%
Continuous Enrollment[7]:							
Continuous, no stop-out	100%	65%	69%	4.1%	19%	33%	40%
Not continuous (stop-out)	67%	61%	61%	3.9%	10%	17%	24%
Course Dropping[8]:							
Dropped < 20%	65%	53%	78%	4.8%	17%	26%	35%
Dropped >= 20%	60%	47%	38%	1.0%	3%	8%	9%
Late Registration[9]:							
Registered late < 20%	62%	50%	63%	3.6%	13%	20%	27%
Registered late >= 20%	63%	51%	59%	2.7%	9%	16%	21%
Orientation Course[10]:							
Took course	75%	64%	62%	3.9%	16%	24%	32%
Did not take course	60%	48%	61%	3.1%	10%	17%	23%

[1] Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2] Fall to fall or spring to spring, depending on initial term

[3] Calculated as the number of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses) divided by the total number of courses enrolled in

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

[6] Full-time students were defined as those who enrolled in 12+ units during the majority of terms they attended the CCC; all others defined as part-time.

[7] Continuously enrolled students were those who enrolled in successive terms, without stopping out, throughout their enrollment (excluding summer). "Continuous" is not relevant for students who only enrolled for one fall/spring term, so those students are excluded. The 100% second-term retention rate for continuously enrolled students is a function of the definition of "continuous"- students who enrolled continuously, without stopping out, would all have enrolled during the next successive fall/spring term after their first term.

[8] Represents percentage of courses dropped after the census date (pre-census enrollments not in data set). Used 20% as cutoff based on Adelman (2006). Also, the average share of course enrollments dropped by degree seekers was about 20%, so the split approximates those above and below the average.

[9] "Late" registration was defined as enrolling after the first day of the term. The average share of courses for which students registered late was about 24% for all degree seekers.

[10] Orientation courses have no special identifying code in the data, and were therefore identified based on the course title (e.g., "Orientation to College", "College Success", "College Survival Skills", "Making College Count", and many others)

Which Factors Really Matter?

The descriptive analyses of CCC data discussed thus far suggest that students are more likely to complete a certificate/degree or transfer to a university if they:

- enroll in a community college soon after high school;
- are Asian or white;
- are female;
- attend a college with higher average levels of academic preparation among the students;
- attend a college in a higher income area;
- demonstrate commitment to a goal of completing a program;
- attend full-time;
- enroll continuously;
- enroll in an orientation course;
- drop fewer than one in five of their course enrollments; and
- enroll late for fewer than one in five of their course enrollments.

Some of these factors are likely related to each other, and looking at them only separately could over-estimate their relationship to student success and completion. For example, our descriptive analyses showed that black and Latino students were less likely to complete, but race/ethnicity could also be reflecting the impact on student outcomes of lower average academic preparation levels and financial resources.

To determine the impact of each of the variables on the likelihood of program completion, we used a statistical method known as regression analysis, a technique that allows researchers to isolate the effects of specific factors on completion. For readers interested in technical details, the methods and results of the regression models are described in Appendix 3. In this section, we highlight the main findings of the analyses. Table 10 displays the variables that were found to have either a positive or negative independent impact on the probability of a student completing a certificate or degree and/or transferring to a university.

Table 10
Summary of Effects of Variables on the Probability of Completion

Factors that Increase the Likelihood of Completion	Factors that Lower the Likelihood of Completion
Continuous Enrollment	Late Registration
Full-Time status	Course Dropping
Female	Age
Asian	Hispanic/Latino
White	Black
Total Enrollment (in most cases)	
Economic Service Area Index	
Student Average Academic Preparation (in most cases)	

The results for enrolling in an orientation course were ambiguous – it was not significantly related to the likelihood of completion in some models, and had a negative effect in other models after controlling for other factors. It is possible, even likely, that our measure of which students took an orientation course was not entirely accurate. We relied on course title, which may not have allowed for accurate identification of all orientation courses. Given the positive impact of such courses demonstrated in other research, particularly for disadvantaged students, more study of the impact of these courses among CCC students is warranted.

Some of these findings could be directly relevant to discussions of policy reforms to increase completion among CCC students, including policies related to late registration and course dropping, and reforms that may encourage early college attendance and full-time, continuous enrollment. Other findings are not as easily interpreted and applied to policy changes, including those related to students' race/ethnicity. The regression models included variables intended to control for students' socioeconomic status and academic preparation levels, factors that sometimes eliminate racial/ethnic differences in regression models of success in higher education. It is not clear whether the results demonstrating independent effects of race/ethnicity reflect inadequate measurement of income and academic preparation (student-level measures of these factors were not available), or whether they indicate a real difference across groups of students or the way students are served by the colleges. In any case, finding effective strategies to reduce racial/ethnic disparities in success and completion is essential, and finding strategies that work for certain groups of students can help target investment of resources to achieve the best overall outcomes.

College Policies and Practices

We return now to the third set of factors found in the research literature to influence student success - the policies and practices of higher education institutions. As noted earlier, data limitations prevented us from performing the kind of quantitative analysis we presented above for factors related to student characteristics and course-taking/enrollment patterns.

Student Support Services

The Literature. Kuh and his colleagues (2005) argue that student success is most closely related to the time and energy students devote to educationally purposeful activities. Effective institutional policies and practices, in their view, are those that increase levels of student engagement in the college experience by ensuring that students have substantial interaction with faculty and peers, opportunities for active and collaborative learning, and access to supportive services designed to provide clear pathways to success. Jenkins (2006) concludes that rates of student success are higher in colleges that:

- have an institutional focus on student retention and outcomes, not just enrollments;
- offer targeted support for minority students;
- have good alignment among student support services;
- offer support for faculty development;
- take an experimental approach to improving instruction and support services; and
- use data to evaluate student outcomes and improve programs.

Research suggests that students who more frequently utilize student support services and counseling are better adjusted to college life, more likely to be committed to the goal of a college degree, and more likely to persist toward earning that degree (Grant-Vallone, Reid, Umalli, & Pohlert, 2004; Chaney, Muraskin, Cahalan, & Goodwin, 1998). Student services are especially important to minority and first-generation college students. Jenkins (2006) concluded that minority students are more likely to succeed in community colleges that have targeted support services and programs specifically designed for them. Students themselves seem to confirm the importance of good support services, since dissatisfaction

with student services and counseling is often cited as a reason for leaving community college (Adelman, 2005; Metzner, 1989 as cited in Purnell & Blank, 2004).

Others have noted the effectiveness of "intensive" or "intrusive" advising for increasing success rates among disadvantaged minority or other at-risk students, wherein colleges seek out students in need of support rather than waiting for the students to seek help (Trippi & Cheatham, 1989). One CCC campus tested a student services model involving extended orientation services, "intrusive" advising and counseling services, tutorial support, and extra- and co-curricular activities outside the classroom (Tovar & Simon, 2003). Students receiving enhanced services through this intensive program had higher GPAs, higher course success rates, and lower probationary rates than students in a control group.

Rosenbaum and his colleagues (2006) agree that support services play a critical role in student success. They argue that private occupational colleges serve similar student populations as community colleges, but have higher completion rates (Stephan & Rosenbaum, 2006, as cited in Rosenbaum, Deil-Amen, & Person, 2006). They attribute the difference to the "package deal" offered by occupational colleges – the policies and procedures they use to help students succeed. Using a qualitative case study approach to compare the two kinds of institutions, they conclude that community colleges could improve completion rates by:

- providing students with a highly structured plan for attaining an explicit goal in a specified time frame;
- bolstering incentives for completion by compressing educational units into dependable time blocks and shorter terms, and awarding shorter-term credentials on the way to longer-term degrees;
- assuming greater responsibility for informing students, guiding their choices, and preventing mistakes through frequent mandatory advising, group advising, peer cohorts, and student information systems;
- teaching professionally relevant social skills and work habits along with academic and job skills; and
- developing more systematic employer contacts and job placement procedures.

Based on a review of research and focus groups with community college students, Purnell and Blank (2004) argued that student services must be comprehensive, addressing the full range of academic, personal, and financial problems common to community college students. Academic advising, financial aid counseling, career and personal counseling, and tutoring and other academic support services are all important. Bringing a variety of types of services together under one roof, and bundling services together in programs aimed at specific groups of non-traditional students may be especially effective. A recent report estimated that the median ratio of students to counselors in the CCC ranged from 1,400:1 in 1994 to 1,700:1 in 2001 (Woodlief et al., 2003), suggesting that most students in California's community colleges receive services that fall far short of ideal.

CCC Data. Student support services are provided to CCC students primarily through the various components of the matriculation process, including admissions, orientation, assessment and testing, counseling, and student follow-up. In addition, some students participate in programs like Extended Opportunity Programs and Services (EOPS) that provide enhanced counseling and other student support services to targeted groups of disadvantaged students. The CCC data system includes information on which of these services each student has accessed. However, the data are not regularly updated and maintained by all colleges and are, therefore, not reliable for analyses on the impact of matriculation and student services on student outcomes (personal communication with Patrick Perry, Vice Chancellor of Technology, Research and Information Services, August 4, 2005). A principal reason that the data are not reliable is that the matriculation funds allocated through a categorical funding item are distributed to colleges based on enrollments, not matriculation services provided. The lack of connection between funding levels and services provided seems inconsistent with the findings in the research literature that these services should receive a high priority in community colleges.

Learning Communities

The Literature. Some colleges create small learning communities for beginning students. Most often, a learning community involves a group of students taking several classes together as a cohort, with the instructors of those classes coordinating course outlines and jointly reviewing student progress. Alternatively, some colleges offer supplemental instruction, whereby a group of students enrolled in a course meets regularly outside of class to review course content and study skills. There are relatively few examples of research connecting the use of learning communities to student outcomes in community colleges. Tinto (1997) evaluated the course success and retention rates of community college students in learning communities, finding that students in learning communities were more likely to pass a set of courses than were other students enrolled in those courses, and they were more likely to re-enroll the following year. An examination of supplemental instruction workshops at a large community college in California found that students participating in the workshops were more likely to join study groups and meet with students outside of class than were students enrolled in the same courses but not participating in the workshops (Maxwell, 1998).

A three-year evaluation of learning communities in multiple institutions concluded that community college participants had higher rates of retention and earned the same or better grades than students taking stand-alone courses (Minkler, 2002). Student surveys and focus groups have found that community college students are more satisfied with the learning community experience than with traditional courses, and feel that the courses contribute to their intellectual development, confidence, and motivation for learning (Harnish, 2006; Minkler, 2002). Finally, a preliminary evaluation done as part of the Opening Doors Demonstration Project[34] found that students randomly assigned to learning communities were more likely to pass their first semester courses and less likely to drop courses than were similar students in a randomly assigned control group (Bloom & Sommo, 2005). Second-term retention rates and course pass rates in the second term did not differ between the two groups.

CCC Data. While learning communities are in use at some community colleges in California, the system's data do not allow for identification of students participating in learning communities in order to examine their rates of success. However, the limited research available does suggest that learning communities may be an effective strategy for improving outcomes, particularly for disadvantaged students. One ongoing study of developmental education in the CCC indicates that intensive learning communities (those that connect courses and involve intentional community building among students along with counseling and academic support) have a positive impact on student engagement and longer-term successes such as retention and persistence, even when an impact on course grades in learning community classes cannot be documented (personal communication with Rose Asera, Carnegie Foundation for the Advancement of Teaching, June 19, 2007). [35]

Assessment and Placement Policies

The topic of assessment and placement requires a special discussion because of the attention it is now receiving within the CCC system, as its leaders endeavor to increase student success. The Chancellor, the Board of Governors (BOG), the faculty through the Academic Senate, and the staff within the system have all become involved in efforts to improve this process. BOG action on evaluating statewide mandatory assessment is currently scheduled for November 2007. This analysis is offered as part of the record to be considered as these reform efforts proceed.

After a brief mention of the data limitations, we offer a review of the literature to provide a context for examining California's policies. We then describe our research methods, summarize the process of assessment and placement in the CCC, describe how that process diverges from both national practice and the research literature, and evaluate its impact on students.

Community colleges enroll many students with insufficient academic preparation for college (Adelman, 2005; Bailey et al., 2005). Therefore, the policies and practices that institutions follow for assessing incoming students' basic skills proficiency and placing them in appropriate courses and course sequences are an important area to examine for their impact on student success. However, the CCC data that we analyzed for this report did not allow us to examine in a quantitative manner the impact of assessment and placement policies on student success because 1) not all students are assessed, 2) the results of assessment tests are not collected centrally by the system, and 3) students are not always required to take remedial classes (called "basic skills") even if referred to those classes by their assessment results.

The lack of data and the mostly voluntary nature of the assessment/placement process also prevented us from including any analysis of course-taking behaviors relating to basic skills in the previous section on student course-taking and enrollment patterns. For example, this study was unable to answer the following questions:

- Do students who enter needing remediation have better retention and completion rates if they:
  - begin their remediation in their first semester?
  - complete all of their basic skills courses within a set number of terms or before taking a set number of total units?
  - take basic skills courses in the recommended order?
  - take basic skills courses in combination with some college-level courses?
- What are the retention and completion rates for students who place into remediation but choose to ignore the recommended placement and enroll in college-level English and/or math courses?
- What portion of students entering with skills that would place them several levels below college-level English or math ever complete their basic skills, move into college-level work, earn a degree, or transfer?

These questions cannot be answered because there is no way to identify entering students who "need remediation" since many are not assessed at all or delay assessment for semesters or years. Even if we were to study those students who do enroll in remedial courses, it would not be clear whether the course they enrolled in was the one into which they were referred based on assessment results. Due to these data limitations, we engaged in an extensive qualitative study of the CCC assessment and placement process.

Literature Review

An extensive body of research has examined the relationships among student outcomes and policies and practices related to assessment of basic skills, placement into appropriate courses, and remedial education.[36] Students enter the community colleges with a range of backgrounds and objectives. However, they often share an important characteristic in being under-prepared for college-level work, making policies related to assessment, placement, and remediation especially important. Students who enroll with deficiencies in reading, writing and math skills are far less likely to ever complete a college program compared to students who enroll with college-level skills, and the more remedial courses they need to take, the less likely they are to persist and earn degrees (Rosenbaum et al., 2006; Adelman, 1998, 2006). Students who need developmental courses in math may be more likely to complete remediation and transition to college-level work than those who need remediation in writing (Office of Program Policy Analysis & Government Accountability [OPPAGA], 2007).

Developmental education can be effective in improving the skills of under-prepared students, with some research demonstrating that students who successfully complete remediation and transition into college-level courses have persistence and success rates similar to those who start directly in college-level courses (OPPAGA, 2007; JBL Associates, 2006b; Bettinger & Long, 2005; Waycaster, 2001; McCabe, 2000). Some higher education leaders have argued that assessment and placement policies and practices should be used as policy levers to minimize the need for remediation at the college level and improve rates of postsecondary success (Venezia, Callan, Finney, Kirst, & Usdan, 2005).

Standardization of Policies

A recent analysis of assessment and placement policies for community colleges in several states outlines five choices that states can make related to assessment and placement (Perin, 2006):

1. whether assessment should be mandatory or voluntary;
2. whether placement should be mandatory or voluntary;
3. whether students should be required to begin remediation immediately upon enrollment;
4. the assessment instrument(s) that should be used; and
5. the setting of cut scores to determine proficiency levels.

States (and colleges) make choices that determine where they fall on a continuum that extends from mandating remediation for all who need it to an open access policy that allows all students to enroll in classes of their choice, regardless of skill levels. Perin classifies this continuum as "laissez-faire" to "micromanagement," and identifies California as taking a laissez-faire approach. Assessment regulations are complex and colleges can decide who is exempt from the process. In general, assessment is intended to be mandatory for degree-seeking students (yet many are not assessed), but placement is voluntary, colleges are granted flexibility in the choice of assessment instruments and cut scores (as long as they follow the appropriate approval processes), and students are not required to enroll immediately in remediation or to enroll in remediation at all.

Prince (2005) discusses similar policy choices, but focuses on whether policy decisions are decentralized or standardized across community colleges within a state. Arguments against standardization focus on concerns that 1) states would set the bar too low, 2) colleges would seek exemptions and weaken the impact of standardized policies, 3) cost and capacity issues would impede statewide implementation, and 4) standardized policies would serve as barriers to college-level courses for minority, low-income and first-generation students who should have a "right to fail."

Arguments in favor of standardization relate to both effectiveness and efficiency, Prince (2005) argues, as standardized policies would improve the ability of institutions

to place students appropriately in courses where they could succeed, would allow for better tracking and analysis of the effectiveness of developmental education, and would facilitate better alignment across educational sectors as college readiness would be better defined. Prince finds that more than half of the states that require assessment and placement in remedial education specify one or more approved assessment tests. He contends that states should 1) set policy for assessment and placement as part of a K-16 approach to reducing the number of students needing remediation, 2) identify a few tests for colleges to administer and consider using tests already taken in high school, and 3) improve data analysis to monitor developmental education outcomes.

Signals about College Readiness

Sending signals about college readiness is a theme in several recent reports. In a policy brief for the *Achieving the Dream* project,[37] Prince (2005) concludes that placement and cut-off scores are an important tool of state policy to influence student success because "they can send a strong and consistent signal to high schools regarding what it means to be academically prepared for college work" (p. 10). In a review of policies in several states, Bueschel (2004) noted that the increasing need for remediation in college has to do with information and signals communicated to high school students. She found that students are often unaware of the existence and importance of placement exams at community colleges, or of the relationship between college readiness and the likelihood of success in college. Bueschel found that many students in California view community colleges as a "second chance" and are surprised to find that they have to take any assessment tests at all given the messages they receive about open access.

Kirst, Antonio, and Bueschel (2004) also report a lack of awareness among California students about college requirements and expectations, the process of being assessed and placed, and the implications of assessment testing in determining the pathway to a degree. The researchers emphasize that assessment policies can provide a signal for expectations, a signal students would be better off receiving early in high school. They argue that community colleges in California view assessment as only a measure of skills to be used for placement, with any "signaling" to students being an afterthought.

The Achieving the Dream policy brief noted above cautions that the signals sent by clear and consistent placement and cut-off policies will be effective in improving student success only if they are a part of a set of policies that align college expectations with high school standards so that students have the opportunity to learn the skills they need to succeed in college courses (Prince, 2005).

Using Standardized Test Scores

Whether assessment instruments are standardized across colleges or not, how the test results are used in placing students into courses is another important consideration. Several studies have concluded that using multiple measures that include consideration of high school curriculum, high school grades, and student motivation are more effective than standardized scores alone for placing students into appropriate course levels. Armstrong (2000) examined whether test scores were predictive of course grades, and found a low correlation, a result supported by other studies (Hughes & Nelson, 1991). Armstrong attributed the low correlation to the impact of student dispositional characteristics and instructor grading practices on course grade. He concluded that colleges should use students' previous academic performance in conjunction with test scores in making placement decisions.

Marwick (2004) came to the same conclusion after examining the impact of alternative placement policies for math on course success and persistence to another math course. He found that test scores provide valuable information for placement, but used alone they tend to place students in lower-level math classes than methods that use multiple measures, keeping some students out of higher-level classes where they are likely to have succeeded. He recommends that test scores be used in conjunction with high school coursework and grades, and that placement be at the higher level when test scores suggest lower-level placement than high school preparation.

Making Assessment, Placement and Remedial Enrollment Mandatory

There is a general consensus in the literature about the value of making assessment of basic skills and appropriate placement into courses mandatory for students (JBL Associates, 2006a; Boylan, 2002; McCabe, 2000; American Association of Community Colleges, 2000; Rouche & Rouche,

1999; Neuberger, 1999; Amey & Long, 1998; Fonte, 1997). One study demonstrated that students enrolled in colleges where they were required to undergo assessment were more likely to successfully complete developmental courses than were students enrolled in colleges where assessment was voluntary (Boylan, Bliss, & Bonham, 1997). And other research has found that students who follow placement recommendations and enroll in remedial courses are more likely to persist and complete a degree or transfer than those students with similar test scores who waive remedial placement (Bettinger & Long, 2005; Weissman, Silk, & Bulakowski, 1997; Mitchell, 1989).

Hadden (2000) notes that mandatory placement is far more common at four-year institutions than at community colleges, due to the concern in community colleges that it restricts student choice and does not allow students the "right to fail" (p. 831). He argues that community colleges have "replaced the closed door with the revolving door" (p. 832) by permitting students to enroll in courses for which they are not prepared. While he concedes that some students may not enroll rather than take mandated remedial courses, he questions whether such students would persist when faced with failure in college-level courses, and contends that more under-prepared students will be successful if they receive needed remediation.

That view is supported by research demonstrating that students with skill deficiencies have better outcomes if they enroll in remedial courses immediately upon enrolling in community college, rather than delaying or avoiding remedial placement (Weissman, Silk, & Bulakowski, 1997; Weissman, Bulakowski and Jumisko, 1997; Castator and Tollefson, 1996). A typical concern with mandating immediate enrollment in remedial courses is that students will lose interest and motivation, a problem that could be alleviated by allowing students to take some college-level courses simultaneously (Academic Senate for California Community Colleges, 2004) or by more substantive curricular reforms that involve integrating basic skills content into subject matter courses (Grubb, 1999). However, Weissman and her colleagues (1997) argue that students who are deficient in reading and/or writing should be strongly encouraged to focus initially only on remediation of those skills, given their importance to success in all college-level courses, while those requiring remediation in math only should be allowed to simultaneously enroll in college-level courses in other areas.

Importance of Support Services

The research literature indicates that students with skill deficiencies have better outcomes if they receive a comprehensive set of student support services (Boylan, 2002; Boylan & Saxon, 2002; Neuberger, 1999; Rouche & Rouche, 1999; McCabe & Day, 1998). Counseling and advising services provided along with developmental education lead to higher GPA and successful completion of remedial courses (Boylan et al., 1997). Support services are most effective if they include orientation, individual and group tutoring, peer support, study skills training, and academic counseling and advising (McCabe & Day, 1998). To be effective, these services should not just be offered, but should be fully integrated into the structure of remedial programs, with counselors working closely with faculty and being included in program planning and evaluation activities (Boylan & Saxon, 2002; Maxwell, 1997).

Research Methods

CCC data report the portion of students that were assessed, although there are no data collected at the system level on the results of those assessments. Among the degree seekers in the cohort we studied, 61 percent took an assessment test in English and/or math (see Table 11), though often later than their first term of enrollment. Asian and Latino students had the highest rate of taking assessment tests, while black students were the least likely to take the tests.[38] Younger students were more likely to be assessed than older students.

Table 11
Percent of Degree Seekers taking Assessment Tests in English and/or Math

	Percent Assessed
All Degree Seekers	**61%**
Age:	
17 – 19	66%
20 – 29	59%
30 - 39	47%
40+	35%
Race/Ethnicity:	
Asian	69%
White	57%
Latino	67%
Black	51%

The colleges themselves collect data on the results of assessment and placement, but whether and how the data are used by college faculty and staff to track the success of under-prepared students is a matter of local discretion. Colleges are likely impeded by a lack of resources in institutional research offices for analyzing the data, and a lack of structures for systematically sharing the results with faculty and administrators.

In an effort to improve understanding of the relationships among assessment, placement and student performance, we collected and analyzed data from three individual community colleges that had data on assessment results that are not reported to the system level (see Appendix 2 for the details of these analyses). The results revealed substantial variation across colleges in the share of students who get assessed and in how strongly colleges enforce placement recommendations. Many students who were assessed in the three colleges examined either enrolled in English and math courses other than the ones determined by the colleges to be most appropriate to their level of readiness, or never enrolled in any English or math courses. There was some evidence that this relaxed enforcement of placement recommendations had an impact on student success, in that students were generally more likely to successfully complete an English or math course when they enrolled in the recommended course level.

Given the limited ability to study the impact of assessment and placement policies from college or system data, our analysis relies primarily on a review of available printed materials including the extensive set of statutes, regulations, and guidelines available on the website of the Matriculation Unit of the Chancellor's Office. Institute researchers also attended several workshops conducted for college matriculation staff, interviewed Chancellor's Office staff, college research staff, and vice presidents of student services and instruction across the system, reviewed reports and written communications on the topic from the Academic Senate and college and system offices, and reviewed the research literature summarized above.

Summary of the Process

Statutory and Regulatory Context

CCC policies on assessment and placement are part of a larger set of activities called "matriculation services" that were first codified in the Seymour-Campbell Matriculation Act of 1987 (California Education Code sections 78210-78218). This law established the Matriculation program of the CCC, intended to ensure that students receive the educational services necessary for success. The part of the statute related to assessment (section 78213) specifies that assessment instruments must be reviewed and approved by the Board of Governors to ensure that they are culturally sensitive and that they are used as an advisory tool to assist students in the selection of an educational program, and not to exclude students from admission to community college.

It is the Board of Governors' regulations for implementing the above statutes (Title 5) that provide the framework in which assessment and placement operate. These regulations were first adopted in 1990 but were revised in 1991 following a legal challenge by the Mexican American Legal Defense and Educational Fund (MALDEF) which was concerned that the approach to assessing and placing students in courses was disproportionately directing Latino students into remedial courses. The revised regulations made several clarifications that have shaped the process since then.[39] With these changes, Title 5 regulations:

- Specify that a basic skills course prerequisite can only be established if districts validate through "sound research practices" that a student is "highly unlikely to succeed in the course" unless the student has completed the prerequisite course;
- Require that prerequisites must be established on a course-by-course basis and not across the curriculum (e.g., a college's history department faculty may not set a requirement that students attain proficiency in reading before taking any history courses offered by the department that require reading college-level history texts; prerequisites must instead be validated for each prerequisite in relation to each history course); and
- Require districts to use "multiple measures" to place students into courses, i.e., districts cannot use any single assessment instrument for placement purposes.

Process for Validating Assessment Instruments

Title 5 regulations, along with extensive supporting documentation from the Chancellor's Office, set forth a highly structured process that colleges must follow for gaining approval of assessment instruments. Although Chancellor's Office approval is ultimately required, the assessment instrument selection process is fully decentralized, with each district selecting or creating the assessment instruments that it wishes to have approved. There are three categories of instruments: 1) second-party instruments developed by outside organizations such as ACT; 2) locally-developed assessments; and 3) locally-managed assessments, which are pre-existing instruments that are proposed to be adapted for local use. The approval process pertains to all assessment instruments, including second-party instruments. Specifically, colleges must submit documentation for review that addresses five standards:

1. ***Content validity.*** The college must demonstrate that the instrument tests what it is intended to. Faculty members at each college must review the test content and rate the extent to which every item on the test measures a skill or knowledge that is considered necessary for entry into a course, and summarize the results. This type of validity must be demonstrated for every test with respect to every course for which it is used to place students.

2. ***Reliability.*** The college must document that the test yields consistent results when repeated for the same student, when scored by different raters, or when different essay prompts are used. For gaining approval of a second-party test, colleges must review the evidence supplied by the test developer and ensure that it is applicable to the local college. For locally-developed instruments, colleges must provide evidence based on their own original research conducted according to specified methodologies.

3. ***Rule out test bias.*** The college must demonstrate that the test is not culturally or linguistically biased, and that it does not contain insensitive or offensive material. No data are required for second-party tests if there is adequate evidence of a lack of bias presented by the test developer. For local instruments, colleges must form a panel of "impacted" members from the college or the community based on ethnicity, culture, gender, disability, etc. with a minimum of two to three individuals representing each group. The panel must review every assessment instrument and issue findings, documenting who participated and what their findings were for each test.

4. ***Cut score validity.*** When first submitting a test for the Chancellor's approval, the college can document the validity of any proposed cut scores by either of two methods: (a) the "judgmental" method, by which a panel of faculty members reviews each test item-by-item and projects the percentage of students at each level (e.g., beginning, intermediate, advanced) that would correctly answer the item, and sets cut scores based on compiling these projections, or (b) the "criterion-related" method, in which the college experiments by administering the test to students and comparing their course grades with their test scores. When a test is up for renewal of its approval status, empirical data must be submitted to validate whether the initial cut scores have proven to be valid, using either of two methods: (a) "criterion validity," by which the college provides empirical data that compares students' test scores with their course grades (approval standard calls for a correlation coefficient of .35), or (b) "consequential validity," by which the college administers a survey to faculty and students around the 4th week of class asking if the course placement seems correct for the students enrolled in the course.

5. ***Rule out "disproportionate impact."*** The college must demonstrate that use of the test and cut scores is not resulting in students from certain groups being referred to lower-level courses in greater proportions than their representation among the tested population. For initial approval of a test, a college must only submit and implement a plan for testing for disproportionate impact. When a test is up for renewal, the college must produce empirical evidence according to specified procedures, and document the steps that were taken to mitigate any disproportionate impact that was detected.

The documentation addressing these standards is maintained locally for second-party tests and is not required to be submitted to the Chancellor. For locally-developed and locally-managed tests, colleges must submit the package of information to psychometricians at the University of Kansas who serve as consultants for the Chancellor in the approval process. The consultants provide preliminary feedback and indicate whether colleges need to provide additional information. A final packet of documentation must then be submitted to the Chancellor's Matriculation Advisory Committee for approval. The Committee can grant full (6 years), provisional (3 years) or probationary (2 years) approval, which dictates the schedule for re-submitting the instrument for renewal.

The above description only begins to describe the complexities of the process, which is more fully described in twenty-one pages of "Matriculation Regulations" in Title 5 of the California Code of Regulations and an 80-page manual and other supportive material prepared by the Chancellor's Office. In addition, Chancellor's Office staff periodically offer full-day workshops aimed at college staff who manage the assessment validation process. We attended two of the workshops at which additional explanatory documents were distributed along with sample worksheets to show how colleges should approach and document each stage of the process.

Multiple Measures

Even when assessment tests receive approval through this process, the colleges cannot advise specific course placement based only on the results of a test. In addition to test scores, they must use non-test "multiple measures." The specific multiple methods used vary by college and can differ from counselor to counselor and student to student. Commonly used measures are educational histories (relevant coursework and GPA), the student's educational objective, unit load, employment status (hours of work), and subjective information obtained from interviews, such as motivation and anxiety about a particular course placement. The purpose of multiple measures is to draw upon the professional knowledge of the counseling staff to augment the information available from assessment test results.

Course Prerequisites

It is common procedure across academia for colleges to designate certain courses as prerequisites for entry into another course or set of courses. The regulations adopted by the BOG place strict constraints on colleges' ability to establish prerequisites. First, while prerequisites may readily be set for sequences within a discipline (e.g., Economics 101A as a prerequisite for Economics 101B), prerequisites cannot be set across disciplines (e.g., English as a prerequisite for History or Algebra as a prerequisite for Chemistry) without firm documentation that students who do not take the prerequisite course are unlikely to succeed in the course which has set the prerequisite. Second, "blanket prerequisites" may not be set, as noted earlier. These requirements can be prohibitive to meet, particularly for smaller colleges that lack sufficient institutional researchers to provide the necessary documentation.

Divergence from National Policies and Practices

California's policies allow assessment and placement to be voluntary in many colleges, and are decentralized in that each of the 109 colleges determines its own assessment instruments and cut-off scores used in recommending placement. According to the Chancellor's Office website, there are currently 34 second-party tests approved and 133 locally-developed or locally-managed instruments. In these respects, California seems to be at odds with national trends – trends that have been shaped by the consistency of the research literature in favor of more mandatory and more standardized approaches to the remediation of basic skills deficiencies.

Many states require all community college students to be assessed, and mandate placement into appropriate course levels based on test results. Many states mandate specific assessment instruments or allow colleges to choose from a small number of second-party tests. No other states allow the use of such a large number of test instruments. Some states, including Florida, Minnesota, Oklahoma, and Texas, require institutions to use standardized cut-off scores to place students into courses. Most states, however, leave the setting of cut-off scores to individual colleges (Jenkins & Boswell, 2002).

In view of the growing call among researchers and policy leaders to strengthen the messages about college readiness that are sent to prospective students, a few states have begun to implement completely standardized polices aimed at minimizing confusion among students about what it means to be college ready. For example, New York's College Now program is designed to prepare New York City's public high school students for college. The program, a joint effort of the City University of New York (CUNY) and the New York City Department of Education, provides all prospective students with specific criteria for demonstrating college readiness in reading, writing, and mathematics as measured by a standardized set of assessment tools and agreed upon minimum scores.[40] Students who do not demonstrate college readiness in one or more of the three subject areas are required to take the relevant CUNY Skills Assessment Test(s), which relies on a standardized assessment instrument and uniform cut-off scores to determine basic skills needs. Students requiring remediation must then enroll in developmental courses at the community colleges and successfully complete those before enrolling in college-level course work.

The assessment and placement process of the CCC reflects the culture of decentralization and local autonomy across the system. The Chancellor's Office "Assessment Q and A" explains that "each college has a singularly distinct student population and curriculum and therefore needs the freedom and flexibility to assume the role of selecting its assessment instruments accordingly."[41] This argument suggests that no single standard of "college readiness" can be set for community college students. Moreover, the fact that second-party tests must undergo special review for their applicability to California settings reflects a view that California students have needs or characteristics not adequately addressed in the extensive testing and validation processes used by national test developers.

Yet in spite of the decentralized approach, colleges are heavily regulated in their individual selection of instruments. Such *regulated decentralization* is characteristic of the system in general but in this instance appears to reflect the caution that the system has taken to avoid future legal action regarding its use of assessment in placing students in classes. Table 12 summarizes the ways in which the CCC policies diverge from those suggested in the research literature and being adopted by other states.

Table 12
California's Assessment/Placement Policies Diverge from National Trends

Dimensions of Policy	What National Research Suggests will Improve Student Success	What California Community Colleges Do
Preparation for College	Clear messages to prospective students about college readiness	A variety of messages due to college variation in assessment instruments and standards
Assessment	Mandatory assessment of all degree-seeking students	Policies on who must be assessed vary across the system; many students avoid assessment
Placement	Mandatory placement into remedial coursework for students who are deficient in basic skills	Often voluntary; colleges that establish and enforce course prerequisites may then make course placement mandatory (with student right to challenge)
Basic skills coursework	Early enrollment in basic skills coursework	Students may delay basic skills; in some cases students can't get into the courses when they try to enroll due to college budget constraints
Prerequisites	Enforce course prerequisites to ensure students are prepared to succeed in their coursework	Uneven across the system; some colleges find the process too cumbersome to carry out given research staff limitations, and others lack the software systems to effectively "block" students from enrolling in courses where prerequisites have been set

Analysis of the Assessment/Placement Process

Our analysis of the assessment and placement process in the CCC indicates that the process falls short in three respects:

- It is not effective in helping students meet their educational goals;
- It does not ensure that students are treated equitably; and
- It is excessively costly and administratively complex.

We discuss each of these findings in turn.

The Process is Not Effective

The low completion rates documented earlier in this paper, and the review of the literature and practices of other states suggest that several of our existing policies are not helping students succeed in college. The current assessment and placement process is ineffective primarily because it has placed the priority on the process at the expense of outcomes for students. The process is designed to minimize barriers to students in their course enrollment, honor local autonomy, and guard against legal action against the system. Attention to student outcomes is secondary to those process concerns – not unimportant, but secondary nonetheless. This focus on removing barriers reflects a priority on giving students the independence to make their own choices in spite of, or without, the best professional guidance. This independence allows many students to circumvent basic skills courses, which significantly decreases their chances of success in college-level courses.

Erring on the side of easy access by students into courses across the curriculum has also, through BOG regulations, discouraged the establishment of prerequisites for enrolling in college-level courses. Our interviews with college vice presidents revealed that while there is great variation across the system, most colleges do not adopt and enforce course prerequisites to any great extent. Officials cited several reasons for this, including the difficulty of complying with the regulatory requirements. Most interviewees were of the opinion that stronger enforcement of prerequisites would improve student success.

According to several college officials who we interviewed, the lack of course prerequisites has two consequences – both unfavorable for student success. It allows students to readily enroll in courses for which they are not prepared, increasing their chances of failure and discouragement, and likely contributing to high drop-out rates. It may also lead faculty to "accommodate" non-proficient students in class by reducing course requirements and expectations – in short, by reducing standards. For example, one college did a study of forty courses that satisfy University of California transfer requirements (known as IGETC) and found that in only two of the forty courses, fewer than 50 percent of students who had scored below college-level reading on their assessments passed the course (personal communication with Kevin Bray, Coordinator of Research, Sierra College, August 4, 2006). In other words, more than half of students who had *not* reached college-level reading proficiency passed transfer-level courses in thirty-eight of the forty courses. This means that very few transfer courses would be allowed to set prerequisites (using a 50 percent criterion for likelihood of failure without such prerequisite). To the extent that this represents the circumstances in other CCCs, it suggests that standards may have suffered as a result of various pressures to keep access to courses open and course enrollments healthy.

The deference to local autonomy, while of obvious importance in such a diverse, locally governed system, can pose difficulties for students. Assessments vary widely across the state but can also vary across colleges within a single district. This means that students who are assessed at one college must often be assessed again at a different college – possibly with different instruments and different placements results. At the large, four-college Los Rios District, for example, counselors developed a chart detailing which colleges accept which assessments from each of the other colleges.[42] One college will accept all assessments from the other three with the exception of math assessments at one college; another college will accept reading, writing, and math assessments but none in English as a Second Language (ESL). A third will conditionally accept all assessments from all the other three colleges; a fourth will accept no ESL or math assessments from any of its three sister colleges and will accept only raw (not using the results) scores from two of the three sister colleges in reading while accepting no reading assessments from the third sister college (personal communication with Ray Mapeso, Counselor, Cosumnes River College, July 6, 2007). Such lack of portability of assessments across and within districts can

be confusing and discouraging to students and can raise questions in students' minds about the logic and value of the assessment and placement process.[43]

Even if one accepts the emphasis on process, the process itself appears logically flawed. The process, with mandated "multiple measures," is predicated on the belief that individual tests are not valid, unbiased means to place a student in courses. Yet enormous time and effort has been expended in validating hundreds of individual tests since the adoption of the regulations. Additionally, cut scores must be validated based on an analysis of students' performance in courses in light of their scores on the test even though their test results may not have placed them in that course. A student may enroll in a course despite a test result owing to 1) the use of multiple measures or 2) the student ignoring the placement results. The process works at cross purposes by requiring exhaustive efforts to try to validate individual tests but prohibiting their enforcement.

Interviews with college staff involved in the process confirmed our judgment that the process rests on a false precision. Despite numerous "rigorous" validation studies, there is no evidence that the current assessment and placement process has any positive effect on student course completion or persistence. The correlations between assessment instruments and student success have never met the level required by the Chancellor's Office (.35), and such correlations are "virtually impossible" to achieve (personal communication with Ken Meehan, Director of Institutional Research, Fullerton College, December 13, 2005). Four years ago the Chancellor's Office lost one-third of its matriculation funding as part of system budget reductions and efforts have failed since then to demonstrate to the state Legislature that the matriculation process improves student success. Nevertheless, the process continues at great cost in time and money, and instruments continue to be approved and used.

A final concern is perhaps the most vital: the process was developed, and is implemented, with an exclusive focus on how to treat students who have already entered the CCC system. The policy does not help students better prepare themselves for college-level work before they arrive. Yet the reform efforts now viewed as most promising by national experts involve ways to improve student preparation to reduce the need for colleges to provide remediation. Conveying clear standards of college readiness is an important means of helping students arrive at colleges prepared for college-level work. By establishing, in effect, 109 different definitions of "college readiness," the CCC assessment/placement policies impede reform efforts in middle school and high school to help students prepare for college success.

The CCC system itself has recognized that the process needs reform. In 2004, the Research and Planning (RP) Group for the CCC sent a letter to the Chancellor asking for changes to the assessment and placement process. The letter included the following statement:

> "[A]fter 18 years' experience with the colleges' processes and 18 years' perspective on the outcomes, it is the belief of the RP Group that California's community college students are not well served by the current approach, the implementation of which has resulted in great inconsistency in measures, processes, and placement outcomes from college to college. Those inconsistencies, in turn, have created unnecessary barriers for students entering the community colleges and for students attempting to transfer within our system. The existence of 109 assessment processes has made it difficult, if not almost impossible, to consider aligning placement in community college basic skills courses with the exit standards of the secondary system."[44]

As a result of this letter, the Chancellor directed the Academic Senate to study the process and make recommendations. Several years earlier the Senate had released a report that was similarly critical of the assessment/placement process. Among its findings then were that 1) more than one-third of the students who were assessed as needing further work in basic skills did not enroll in basic skills courses and 2) one-quarter of districts responding to a survey reported that their assessment process does not adequately place students into basic skills courses (Academic Senate for California Community Colleges, 2004).

In response to the Chancellor's request, the Senate formed a task force which issued recommendations calling for further study of the major issues such as exploring the feasibility of statewide assessment, mandatory orientation, assessment and placement, and mandatory enrollment in college-preparatory courses prior to enrollment in college-level work.[45]

The Chancellor has called for an analysis of the changes to statute and regulation that would be needed to implement mandatory assessment and placement in the CCC and the Board of Governors held a special meeting on the topic after which it directed the Chancellor's Office to "begin the process of evaluating the implementation of a system-wide uniform common assessment with multiple measures of all community college students in consultation with the Community College League of California, Academic Senate and other community college partners for consideration and adoption by the BOG by not later than November, 2007." [46] After the BOG meeting, the Consultation Council convened a new task force, chaired by the Academic Senate, to respond to the BOG motion.

The Academic Senate has adopted several resolutions that signal its commitment to improving the process. One encourages colleges to use assessment findings of other colleges to reduce multiple testing for students who attend more than one college.[47] Another states that "research overwhelmingly supports the notion that early assessment and completion of developmental coursework improves student achievement" and resolves to report on best practices for ensuring that students complete their developmental coursework early. In a Spring 2007 action the Senate resolved to continue to participate fully in all statewide discussions on assessment but expressed concern about the timeline set by the Board of Governors for the evaluation of mandatory statewide assessment (Academic Senate for California Community Colleges, 2007).[48]

Further activity on the issue is occurring in the context of the implementation of the System's Strategic Plan and the related Basic Skills Initiative. An implementation group will make recommendations to the Consultation Council that, along with recommendations from the Assessment Task Force, will go to the BOG. In short, there is a growing recognition within the system that the current process is not effective.

The Process Does Not Ensure Fair Treatment of all Students

In its 1988 legal challenge, MALDEF asserted that there were unfair barriers to minority students gaining access to college-level classes, barriers that kept students out of courses in which they could succeed. However, the BOG regulations that have evolved over these nineteen years in response to MALDEF's concerns have not helped increase completion rates of Latino students – as evidenced by the 18 percent completion rate for Latinos compared to 24 percent for the whole student cohort that we studied.

The policies that were developed to address equity concerns have two major features:

- Reliance on multiple measures to minimize the use of standardized tests in placing students in courses; and
- Local option in the development and selection of assessments as a means to deal with diverse populations and in the degree to which prerequisites are used to control student access to classes.

The use of multiple measures to supplement standardized testing is a sound response to the equity concerns raised by MALDEF. However, it is unclear that a decentralized and highly variable process for selecting assessments, establishing and enforcing prerequisites, and translating assessment results into course placement is effective in addressing equity concerns. To the contrary, it could be argued that the current process creates impediments to the equitable treatment of students. Under the current process, students are treated differently, depending on which college they attend, in terms of the standardized assessments used, the standards of "college readiness" reflected in placement recommendations, the particular choice of multiple measures used by the college, and the access to courses. These differences across colleges result both from local choice and fiscal necessity, as small colleges with limited research staff may forgo adoption of the assessments they would prefer and forgo the establishment of course prerequisites that would prevent students from enrolling in classes for which they were not prepared to succeed.

The process designed to address equity issues has not put such issues to rest. While the intent of the policies may have been to give colleges the tools to respond to individual student needs, the outcome seems to be an increased possibility of inequitable treatment and inadequate professional guidance to help students succeed in college.

The Process is Excessively Costly and Administratively Complex
This is a highly complex process that involves significant costs. Each college is required to have a matriculation advisory committee, and college institutional researchers, testing center staff, and selected faculty members of each college expend considerable time and effort in test development and validation efforts. The Chancellor's Office expends considerable resources on the process, including annual expenditures for psychometric consultants, and to support the Matriculation Advisory Committee, the Assessment Advisory Group and the Matriculation Unit in the Chancellor's Office. Much of the time of Matriculation Unit staff is spent on test validation and approval processes, and on holding workshops for colleges to explain the policies and the complex processes.

The process would be even more costly if colleges and the system office were able to fully implement it. Owing to budget cuts in recent years, the Chancellor's Office lacks the staff needed to fully enforce the myriad regulatory requirements outlined in these documents. And many colleges lack the staff to fully engage the process as intended due to college size, or cuts in research staff, or both. As a result, the process as described in the regulations, guidelines, manuals, and memos, is not as rigorous or valid as it sounds. In short, regardless of initial intentions, the process has evolved into a large administrative enterprise in which the elaborate process for approval of instruments and prerequisites has overshadowed the needs of students.

Attention to Reforms are Timely

The coalescing efforts across the community college system to review and reform the assessment and placement process are well justified, according to the above analysis. The current system is not effective in promoting student success or in treating students equitably. It is costly and burdensome and diverts attention and resources from the all-important task of helping students succeed in and beyond basic skills coursework.

While it will not be easy to make fundamental changes to such a core part of the enterprise, the ongoing efforts involve key constituencies and reflect genuine efforts to incorporate new ideas and approaches. The research literature and national trends toward increased standardization of assessments, mandatory assessment of degree-seeking students, and greater willingness to direct students to courses in which they are prepared to succeed offer important lessons for all who are working to increase student success.

This is a tremendous opportunity to make a difference in the outcomes for the millions of Californians who depend on the CCC for brighter futures. Serving under-prepared students has become perhaps the most important mission of the CCC. The Basic Skills Initiative stands to instill new energy and wherewithal into the classroom and across college campuses. Changes to the assessment and placement process will complement those efforts and give college faculty and staff the best chance to help students become prepared for college success.

Policy Changes Can Increase Student Success

California's future depends heavily on its system of higher education; the community colleges, by virtue of their sheer size and vital set of missions, are the linchpin of that system. Public policy can be a powerful tool for shaping the state's future. It can be used to ensure consistency across institutions, which is essential to providing clear messages to students about college readiness and what it takes to be successful in higher education. It can foster better alignment across educational segments, a critical issue in a state where the community colleges play such a large role in providing initial access to postsecondary education. State policy can incorporate incentives for colleges to behave in certain ways and for students to make certain choices, aimed at improving student success and degree completion for the benefit of individuals and the state's workforce and economy.

"Every program, every service, every academic policy is perfectly designed to achieve the exact outcome it currently produces. If a program isn't producing the desired outcome, the only rational action is to modify or discontinue it" (CCSSE, 2006, pg. 10).

The recommendations provided here derive from a review of the research literature and an analysis of the factors associated with greater student success using data on the California Community Colleges. The recommendations are organized according to the three categories of factors discussed earlier in the report, and are intended as broad outlines of new policy directions. Implementation of some of these recommendations would require legislative changes, while others could be accomplished through regulatory changes at the system level or changes in campus policies and practices. Some changes will require additional resources, while others could be accomplished within current funding levels. A well-considered combination of increased resources and policies better targeted toward student success should yield significant gains in the educational outcomes for Californians.

Student Characteristics

1. Encourage direct college-going after high school

A leading researcher on postsecondary student outcomes noted in a recent report that public policies that increase the proportion of students entering community college shortly after high school graduation should yield greater retention and success (Adelman, 2005). He also noted that entering college directly from high school, along with more rigorous academic preparation, provides the greatest chance of increasing degree completion among Latino students in particular (Adelman, 2006). Our results support his conclusions. It is important to keep access open to older students, and to ensure that colleges offer classes and support services at times and locations convenient for non-traditional students with greater work and family obligations. But the relationship between student age and likelihood of degree completion is clear - substantial benefits accrue both to students and the state when college attendance occurs earlier. Programs that inform middle and high school students about college options, college preparation requirements, and the benefits of early attendance could be helpful in encouraging more students to follow traditional college pathways.

"One demographic variable makes an enormous difference in…any postsecondary outcome or process – age at the time of first entry to postsecondary education" (Adelman, 2005, p. 119).

2. Send clear messages to high school students, teachers, and counselors about college-readiness standards in the CCC

In California, high school students who are exploring college options generally receive clear messages about the kind of high school preparation that is required for admission to and success in the UC and CSU systems, including the courses they must take and requirements related to GPA and college entrance exams.[49] The CSU's Early Assessment Program[50] has received national acclaim for providing high school students with feedback about their readiness for college in a manner that leaves them time during their senior year in high school to address any skill deficits. In contrast, students considering enrolling in a community college do not receive clear messages about what it takes to be ready to succeed in the CCC. The community colleges do an exceptional job of promoting the colleges as an option for high school students by emphasizing the low fees, diverse programs, and open admissions. However, being an open-access system need not preclude the colleges from ensuring that high school students understand that, while no specific courses, grades or test scores are required for admission, CCC colleges are higher education institutions and, as such, have standards that students must meet in order to successfully complete a CCC program. Ideally, the CCC will send clear messages about college readiness by standardizing its approach to assessment and placement across the 109 colleges. But, short of that major reform, there is much that could be done just through traditional modes of communicating with high schools and prospective students.

> Students "think their low high school achievement won't hurt their educational attainment. Students know that open admissions will allow them access to college, and they report that they can wait to exert effort until they get to college" (Rosenbaum, Deil-Amen, & Person, 2006, pg. 68).

3. Encourage UC and CSU to offer baccalaureate coursework on community college campuses

Latino students in the CCC cohort studied for this report were retained and earned certificates and associate degrees at rates equal or close to those of white students, but they were substantially less likely to transfer to a four-year institution. Increasing transfer success is critical, given that Latinos are more likely than other students to use the community college as a route to the baccalaureate degree (Fry, 2002). Additional efforts to ensure that Latino students have access to information about transfer options and financial aid programs, and continued efforts across the colleges to provide a welcoming and supportive atmosphere, will help make transfer a more viable option. But given the research evidence suggesting that Latinos may be disproportionately deterred by the financial and social costs of transferring, which often involve relocation, having UC and CSU campuses offer baccalaureate coursework and programs on community college campuses might offer another alternative for increasing transfer rates and baccalaureate completion among Latino students. It is a strategy already in use in several community colleges in rural areas of the state, or other areas where distance to a university is a factor impeding transfer. For example, students at College of the Canyons can earn a bachelor's degree from several public and private universities through the college's University Center without having to travel to a university campus.

4. Provide substantive orientation to college for all degree-seeking students to help them understand what their options are, what resources are available to them, and what is expected of them to maximize their chances of success

While the multiple missions of community colleges make it difficult to discern the goals of students, the research reviewed in this report indicates that most students (especially those of traditional college age) have high aspirations. Many CCC students indicate upon enrollment that their goal is to transfer to a university or complete a certificate or degree program. While stated goals can be tentative and based on too little information about options and requirements, community colleges should, as part of their mission, aim to influence student goals and even raise the aspirations of students who lack concrete goals (Bailey et al., 2005). Ensuring that students receive substantive orientation to college could help students develop appropriate goals and ensure that colleges are aware of students' intentions. Given the need for educated workers, the CCC must find ways to assist students who aspire to a college credential to achieve their goals.

> "…it is certainly problematic to discount students' stated goals on the basis of the argument that…educators know, despite what the students say, that students have modest goals… there are clear economic benefits to credentials… so high educational expectations should be seen as a rational economic goal for students" (Bailey et al., 2005, p. 23).

5. Require degree-seeking students to declare a specific program focus and update their program intent annually

Tracking students' specific program intent is necessary in order for the colleges to provide clear guidance to degree-seeking students about the pathways that would allow them to progress quickly toward the selected program. It is also necessary in order to track rates of success and to understand whether enough students are pursuing particular certificate and degree programs to produce the workers needed by local employers and the state economy.

Student Course-taking and Enrollment Patterns

6. Enhance financial aid and provide incentives to encourage students to work less and attend college on a more full-time and continuous basis

Full-time, continuous attendance is related to better outcomes for all kinds of students. While there are many circumstances that lead students to attend part-time and to stop-out for one or more terms, state and institutional policies can be used to encourage full-time, continuous attendance. For example, colleges could offer early registration to students who enrolled full-time during the previous term, making it easier for these students to get the courses they need to complete their programs. At the state level, enhanced financial aid policies could help students reduce their hours of work and ensure that financial circumstances are not a barrier to more successful enrollment patterns. Because access to the CCC has been historically framed around low fees, financial aid policy has emphasized low fees and fee waivers, rather than overall college affordability. This focus on low fees gives low-income students a false sense of opportunity, since fees account for only five percent of the total cost of attending a community college in California (Zumeta & Frankle, 2007). CCC students are left with higher levels of unmet financial need than community college students in other states, helping to account for why so few of them attend full

> "A key consequence of the unmet need for financial aid is that CCC students work too much…These patterns almost certainly contribute to the CCC system's low persistence, completion and transfer rates..."(Zumeta & Frankle, 2007, p. 47).

time and why so many work excessive hours (Zumeta & Frankle, 2007; Institute for Higher Education Policy, 2006; Cofer & Somers, 2001). If we expect to increase rates of persistence and completion for low-income students, fee and financial aid policies in California cannot continue to give inadequate attention to the items that represent 95 percent of the total cost for CCC students, including room, board, textbooks, childcare and transportation.

7. Structure programs to encourage completion of shorter-term credentials along the pathway to longer-term credentials

There are substantial income gains to earning a college credential, yielding benefits for both individuals and the state. Yet too many CCC students fail to get any credential, even after completing a substantial number of courses. Research indicates that students who complete one credential are more likely to be successful when pursuing another, higher credential, but CCC programs are not generally structured in a way that would enable or encourage students to earn intermediate credentials. Requirements for a certificate may not count toward a related longer-term certificate or associate's degree. And requirements for transfer do not match those for earning an associate's degree, so many transfer students who do not ultimately complete a baccalaureate are left with no college degree. Wherever possible, CCC programs should be structured in a way that would enable students to earn shorter-term credentials along the pathway to longer-term degrees, and colleges should monitor student records to ensure that students are awarded any credentials for which they have completed the requirements. State and system policies should be modified in ways that would encourage completion of an associate's degree prior to transfer.

> Colleges should "…create incentives for students to follow the enrollment paths most likely to lead to retention and… attainment. For instance, we know that students are more likely to complete the baccalaureate degree if they complete their associate degree prior to transfer" (Wellman, 2002, p. 47).

8. Remove the prohibition on campus-based fees, giving colleges the option of using them as a means to guide students toward more successful enrollment patterns

Policies limiting the number of course withdrawals and course repeats could contribute significantly to higher transfer and degree completion rates (Adelman, 2006). Colleges could enact rules limiting course withdrawals and repeats, as well at late course registration. If the state removed the current prohibition on campus-based fees, colleges would have the option of imposing a fee on students who want to register late for a course, withdraw from a course past a certain point in the term, or repeat a course that they previously dropped. Such fees would provide an incentive to students for timely registration and careful choices about course enrollment, while generating revenue for the colleges. Institutions should also consider policies requiring special permission or an additional fee to register for more than a specified number of units to limit the hoarding of courses that reduces availability to other students (Moran, Bausili, & Kramer, 1995).

> "Institutions control grading policy, can set tighter temporal boundaries and conditions for no-penalty withdrawals, and limit the number of repeats ... In the longer term, tightening these policies can only benefit students" (Adelman, 2005, p. 120).

9. Support college efforts to evaluate the impact of orientation courses, learning communities and other innovations that integrate academics with intensive student support services, particularly on first-generation and under-represented minority students, and expand such instructional offerings where proven effective

The available research literature suggests that the CCC should consider expanding the use of orientation courses, learning communities and other supportive academic innovations as a means of helping first-generation and under-represented minority students. If designed well and implemented effectively, orientation courses may help such students overcome deficits in "college knowledge" by learning about the college environment and what it takes to be successful in completing a certificate/degree or transfer program. Learning communities, supplemental instruction, and other supportive academic programs designed carefully to involve intentional community building among students along with counseling and academic support, may be effective in getting students more engaged in their courses and increasing their level of interaction with faculty members and other students - critical factors in retention and success. Such strategies merit further study and consideration, particularly related to the kinds of planning, organization, and professional development activities that would be required to yield improvements in student success.

> "…many experts believe that students' academic and social experiences during their first semester of college often determine whether they will persist in school over the long term" (Bloom & Sommo, 2005, p. 45).

College Policies and Practices

10. Revise assessment and placement policies to ensure that prospective students receive clear and consistent messages about college readiness and that all degree-seeking students receive the full benefit of professional guidance to enroll in the courses that will best promote their success

The decentralized policies regarding assessment and placement in the CCC are not serving the best interests of students. The research literature and our analysis suggest that the system should:

- Implement a program similar to CSU's Early Assessment Program or make other efforts to use the assessment/placement process to contribute to better college preparation among high school students;
- Make assessment mandatory for all degree-seeking students;
- Require students to enroll in appropriate English and math courses based on assessment results (using multiple measures);
- Standardize the assessment tests used, with more reliance on second-party instruments;
- Standardize the procedures for using multiple measures to make them more equitable across colleges; and

> Among researchers at the National Postsecondary Education Cooperative's Symposium on Postsecondary Student Success, "the effectiveness of mandatory assessment and directed placement was deemed sufficiently well documented to implement these policies more consistently and on a broader scale" (Ewell & Wellman, 2007, p. 9).

- Require students with remedial needs to begin addressing any skill deficits during their first term.

As noted earlier, CCC officials are working to revise policies related to assessment and placement. This is reflected in the recent BOG directive to officials in the Chancellor's Office to evaluate the implementation of a system-wide uniform assessment process in all colleges.[51]

11. Expand counseling, advising and other student support programs with the goal of ensuring that more students receive such services on an intensive and ongoing basis

CCC students are increasingly coming from low-income households and under-represented minority populations. These students come to college without the educational capital that could help them successfully navigate the complex higher education system. These students need more support services than current resources, policies, and counselor-to-student ratios can provide. Research suggests that components of a comprehensive student services program for community college students include academic guidance and counseling, personal guidance and counseling, career counseling, tutoring, and supplemental supports such as transportation and child care assistance. A number of state and system policies make it difficult for the colleges to develop and implement such a comprehensive set of services. In particular, the requirement that 50 percent of funds be spent on direct classroom instruction leaves some colleges without the flexibility to hire a mix of faculty and staff appropriate to their student populations (Shulock & Moore, 2007). The 109 colleges serve very different populations of students, and one-size-fits-all policy prescriptions do not allow colleges to adjust service levels to meet the needs of their particular students. While additional funds will be needed to expand student services, also needed are policies that provide college administrators with the flexibility to allocate college funding in ways designed to maximize student success.

> Community colleges should "shift the burden of information from students to advisors, who would take responsibility for assuring student progress…Mandatory frequent advising… could have the valuable benefits of keeping students on the right track and catching their mistakes early" (Rosenbaum, Deil-Amen, & Person, 2006, p. 241).

Data Needs

12. Collect and maintain additional data in order to answer key questions and monitor progress in student success and completion

The CCC Chancellor's Office collects a substantial amount of student-level data, but additional information should be collected on:

- students' educational goals, including changes in those goals over time;
- the specific certificate/degree/transfer program students are intending to follow;
- assessment results for English and math, along with course placement recommendations;
- academic preparation level upon enrollment (e.g., high school curriculum and GPA for younger students);
- socioeconomic status (e.g., household income); and
- students' use of matriculation and student support services.

These additional data elements would allow the Chancellor's Office and researchers to better track student progress, identify successful course-taking and enrollment patterns, and monitor the impact of individual characteristics and college services on student success. Given the importance to California's future of increasing educational attainment among growing minority populations, data collection and reporting efforts should monitor student outcomes by race/ethnicity. The recent CCC accountability report (Drummond and Perry, 2007) did not disaggregate data by race/ethnicity, a problem that would be addressed in the higher education accountability system currently under consideration in the Legislature (SB 325, Scott).

> "Institutions need to improve their ability to collect disaggregated data in order to inform programmatic and policy decisions about retention…as well as to ensure efficient use of limited resources" (Engle & O'Brien, 2007, p. 53).

Summary

There are a number of underlying causes of the low completion rates in the CCC. Many of the students who enroll in the colleges lack sufficient academic preparation for college-level work and have limited exposure to the kind of information about college options and processes that so many university students take for granted. They often bring with them to college an array of personal and economic challenges that can interfere with their academic careers. Community colleges are under-funded given the expansive set of missions assigned to them and the challenge of serving students who need substantial services and institutional resources to be successful. But the social and economic imperative for California leaves no room for resignation in the face of these challenges.

Policy *matters*, as completion rates can be influenced by state policy choices and the regulations that guide the implementation of those policies at the system and college levels. Improving success rates will take cooperative and concerted effort by state lawmakers, the Chancellor's Office, the Board of Governors, local boards, and the faculty and staff of the community colleges, all of whom are committed to student success. Through its new Strategic Plan, the CCC system has placed a renewed emphasis on increasing student success. Implementation efforts are well underway and demonstrate new levels of cooperation across the system and a willingness to question traditional approaches. But existing state policies and entrenched institutional practices can slow or limit the ultimate effectiveness of these efforts. With the state's continuing structural budget deficit and the various competing demands for limited resources, substantial gains in system funding may remain a longer-term vision. But policy changes, such as those recommended here, can promote more effective use of the system's resources, whatever their level, to realize the promise of educational opportunity and the benefits that educated Californians will bestow on future generations.

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Appendix 1: Detailed Data Tables

Table 1-1: Retention and Completion by Full-Time Attendance[6]

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion[5]
All Degree Seekers:							
Full-Time (35%)	79%	67%	69%	4.8%	22%	37%	47%
Part-Time (65%)	55%	43%	57%	2.3%	5%	8%	12%
By Gender:							
Male							
Full-Time (35%)	78%	66%	67%	3.8%	18%	36%	44%
Part-Time (65%)	53%	40%	54%	1.9%	3%	7%	10%
Female							
Full-Time (35%)	80%	68%	71%	5.7%	26%	38%	49%
Part-time (65%)	58%	45%	59%	2.7%	6%	9%	14%
By Race/Ethnicity:							
White							
Full-Time (36%)	79%	67%	72%	4.2%	22%	42%	50%
Part-Time (64%)	54%	41%	60%	2.4%	5%	9%	14%
Asian							
Full-Time (46%)	84%	74%	74%	5.8%	23%	42%	53%
Part-Time (54%)	61%	48%	61%	2.6%	5%	11%	15%
Latino							
Full-Time (28%)	77%	66%	65%	5.4%	22%	30%	39%
Part-Time (72%)	58%	46%	53%	2.3%	5%	6%	10%
Black							
Full-Time (30%)	68%	54%	55%	4.8%	15%	23%	31%
Part-Time (70%)	47%	33%	46%	1.9%	3%	5%	8%
By Age:							
17 to 19							
Full-Time (41%)	82%	70%	68%	3.3%	22%	42%	49%
Part-Time (59%)	58%	46%	52%	1.4%	4%	9%	12%
20 to 29							
Full-Time (31%)	70%	57%	72%	7.2%	21%	27%	41%
Part-Time (69%)	52%	39%	59%	2.6%	5%	8%	12%
30 to 39							
Full-Time (19%)	70%	57%	72%	13.3%	22%	18%	38%
Part-Time (81%)	52%	39%	68%	4.5%	7%	6%	14%
40+							
Full-Time (15%)	70%	59%	71%	15.4%	21%	14%	36%
Part-Time (85%)	49%	36%	70%	4.6%	6%	5%	12%

[1] *Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000*

[2] *Fall to fall or spring to spring, depending on initial term*

[3] *Defined as the share of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses)*

[4] *Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.*

[5] *Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.*

[6] *Full-time students were defined as those who enrolled in 12+ units during the majority of terms they attended the CCC; all others defined as part-time.*

Table 1-2: Retention and Completion by Continuous Enrollment[6]

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion[5]
All Degree Seekers:							
Continuous (35%)	100%	65%	69%	4.1%	19%	33%	40%
Stopped Out (65%)	67%	61%	61%	3.9%	10%	17%	24%
By Gender:							
Male							
Continuous (36%)	100%	65%	67%	3.3%	15%	32%	38%
Stopped Out (64%)	65%	60%	59%	3.2%	8%	15%	21%
Female							
Continuous (35%)	100%	65%	71%	4.7%	22%	33%	43%
Stopped Out (65%)	68%	62%	63%	4.5%	12%	17%	26%
By Race/Ethnicity:							
White							
Continuous (37%)	100%	66%	72%	3.8%	20%	37%	45%
Stopped Out (63%)	66%	60%	64%	3.8%	11%	19%	26%
Asian							
Continuous (40%)	100%	71%	74%	4.8%	20%	39%	48%
Stopped Out (60%)	74%	69%	66%	4.8%	13%	23%	31%
Latino							
Continuous (33%)	100%	64%	64%	4.0%	17%	24%	31%
Stopped Out (67%)	68%	62%	58%	3.8%	9%	11%	18%
Black							
Continuous (30%)	100%	54%	58%	3.5%	14%	22%	28%
Stopped Out (70%)	59%	52%	50%	3.8%	7%	11%	17%
By Age:							
17 to 19							
Continuous (37%)	100%	70%	67%	2.9%	20%	39%	45%
Stopped Out (63%)	68%	62%	57%	2.5%	10%	19%	24%
20 to 29							
Continuous (32%)	100%	54%	72%	5.7%	17%	22%	34%
Stopped Out (68%)	64%	60%	66%	4.9%	11%	15%	24%
30 to 39							
Continuous (32%)	100%	52%	74%	7.8%	14%	13%	26%
Stopped Out (68%)	65%	60%	73%	8.3%	12%	10%	23%
40+							
Continuous (33%)	100%	51%	75%	8.6%	12%	9%	23%
Stopped Out (67%)	64%	60%	75%	9.1%	11%	8%	22%

Notes:

[1] Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2] Fall to fall or spring to spring, depending on initial term

[3] Defined as the share of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses)

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

[6] Continuously enrolled students were those who enrolled in successive terms, without stopping out, throughout their enrollment (excluding summer). "Continuous" is not relevant for students who only enrolled for one fall/spring term, so those students are excluded from the analyses in this table. The 100% second-term retention rate for continuously enrolled students is a function of the definition of "continuous"- students who enrolled continuously, without stopping out, would all have enrolled during the next successive fall/spring term after their first term.

Table 1-3: Retention and Completion by Course Dropping[6]

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion[5]
All Degree Seekers (Avg % dropped = 22%):							
Dropped < 20% (58%)	65%	53%	78%	4.8%	17%	26%	35%
Dropped >= 20% (42%)	60%	47%	38%	1.0%	3%	8%	9%
By Gender:							
Male (Avg % = 22%)							
< 20% (57%)	63%	52%	76%	3.9%	13%	25%	32%
>= 20% (43%)	58%	45%	35%	0.7%	2%	7%	8%
Female (Avg % = 21%)							
< 20% (59%)	67%	55%	80%	5.6%	20%	27%	38%
>= 20% (41%)	62%	48%	39%	1.2%	3%	8%	10%
By Race/Ethnicity:							
White (Avg % = 20%)							
< 20% (61%)	65%	53%	81%	4.4%	17%	29%	38%
>= 20% (39%)	59%	46%	39%	1.0%	3%	8%	10%
Asian (Avg % = 19%)							
< 20% (63%)	73%	62%	83%	6.0%	19%	32%	43%
>= 20% (37%)	67%	54%	42%	0.8%	3%	13%	15%
Latino (Avg % = 23%)							
< 20% (53%)	65%	53%	74%	5.1%	16%	19%	28%
>= 20% (47%)	61%	48%	37%	1.0%	3%	5%	7%
Black (Avg % = 29%)							
< 20% (46%)	54%	42%	72%	4.6%	12%	17%	25%
>= 20% (54%)	51%	37%	30%	1.2%	2%	5%	7%
By Age:							
17 to 19 (Avg % = 23%)							
< 20% (55%)	70%	59%	77%	3.4%	19%	34%	40%
>= 20% (45%)	63%	51%	37%	0.7%	3%	9%	10%
20 to 29 (Avg % = 21%)							
< 20% (60%)	60%	48%	79%	5.9%	15%	19%	30%
>= 20% (40%)	52%	38%	38%	1.1%	2%	6%	8%
30 to 39 (Avg % = 18%)							
< 20% (66%)	56%	44%	82%	8.1%	13%	11%	24%
>= 20% (34%)	52%	37%	41%	2.2%	3%	4%	7%
40+ (Avg % = 17%)							
< 20% (70%)	52%	41%	83%	8.0%	11%	7%	20%
>= 20% (30%)	50%	34%	40%	2.1%	2%	3%	6%

Notes:

[1] Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2] Fall to fall or spring to spring, depending on initial term

[3] Defined as the share of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses)

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

[6] Represents percentage of courses dropped after the census date (pre-census enrollments not in data set). Used 20% as cutoff based on Adelman (2006). Also, the average share of course enrollments dropped by degree seekers was about 20%, so the split approximates those above and below the average.

Table 1-4: Retention and Completion by Late Registration[6]

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion[5]
All Degree Seekers:							
(Avg % late = 24%):							
Registered Late < 20% (54%)	62%	50%	63%	3.6%	13%	20%	27%
Registered Late >= 20% (46%)	63%	51%	59%	2.7%	9%	16%	21%
By Gender:							
Male (Avg % late = 25%)							
Late < 20% (52%)	59%	47%	61%	2.9%	10%	19%	24%
Late >= 20% (48%)	62%	50%	57%	2.1%	7%	15%	19%
Female (Avg % late = 23%)							
Late < 20% (55%)	64%	52%	65%	4.2%	15%	21%	29%
Late >= 20% (45%)	64%	51%	61%	3.2%	10%	17%	23%
By Race/Ethnicity:							
White (Avg % late = 22%)							
Late < 20% (59%)	62%	50%	66%	3.5%	14%	23%	30%
Late >= 20% (41%)	62%	49%	62%	2.4%	9%	18%	23%
Asian (Avg % late = 24%)							
Late < 20% (52%)	70%	58%	70%	4.6%	15%	28%	36%
Late >= 20% (48%)	71%	59%	65%	3.5%	11%	22%	29%
Latino (Avg % late = 25%)							
Late < 20% (51%)	61%	49%	58%	3.5%	11%	14%	20%
Late >= 20% (49%)	64%	52%	55%	2.8%	8%	11%	16%
Black (Avg % late = 31%)							
Late < 20% (42%)	49%	36%	50%	3.3%	8%	11%	16%
Late >= 20% (58%)	55%	41%	48%	2.4%	6%	10%	15%
By Age:							
17 to 19 (Avg % late = 24%)							
Late < 20% (53%)	67%	55%	61%	2.6%	14%	25%	30%
Late >= 20% (47%)	66%	54%	56%	1.7%	9%	19%	23%
20 to 29 (Avg % late = 24%)							
Late < 20% (55%)	54%	42%	64%	4.3%	11%	14%	22%
Late >= 20% (45%)	59%	46%	62%	3.7%	9%	13%	20%
30 to 39 (Avg % late = 24%)							
Late < 20% (55%)	52%	40%	69%	6.5%	11%	9%	20%
Late >= 20% (45%)	58%	44%	67%	5.7%	8%	8%	17%
40+ (Avg % late = 25%)							
Late < 20% (55%)	49%	37%	71%	7.1%	9%	7%	17%
Late >= 20% (45%)	55%	41%	68%	5.2%	7%	5%	14%

Notes:

[1] Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2] Fall to fall or spring to spring, depending on initial term

[3] Defined as the share of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses)

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

[6] "Late" registration was defined as enrolling after the first day of the term

Table 1-5: Retention and Completion by Taking an Orientation Course[6]

	Retention		Course Completion Ratio[3]	Completion			
	To Second Term[1]	To Second Year[2]		Certificate[4]	Associate Degree	Transfer to University	Overall Completion[5]
All Degree Seekers:							
Took Course (16%)	75%	64%	62%	3.9%	16%	24%	32%
Did not Take Course (84%)	60%	48%	61%	3.1%	10%	17%	23%
By Gender:							
Male							
Took Course (15%)	74%	63%	60%	2.7%	12%	23%	29%
Did not Take Course (85%)	58%	46%	58%	2.5%	8%	16%	20%
Female							
Took Course (16%)	76%	65%	64%	4.8%	19%	24%	34%
Did not Take Course (84%)	62%	50%	63%	3.6%	12%	18%	25%
By Race/Ethnicity:							
White							
Took Course (14%)	75%	64%	65%	4.0%	16%	27%	35%
Did not Take Course (86%)	61%	48%	64%	2.9%	11%	20%	26%
Asian							
Took Course (18%)	82%	73%	69%	4.0%	19%	32%	41%
Did not Take Course (82%)	68%	56%	67%	4.1%	12%	24%	31%
Latino							
Took Course (16%)	75%	63%	59%	3.7%	14%	17%	24%
Did not Take Course (84%)	61%	48%	56%	3.1%	9%	12%	17%
Black							
Took Course (18%)	68%	55%	50%	3.8%	11%	15%	21%
Did not Take Course (82%)	49%	36%	49%	2.6%	6%	10%	14%
By Age:							
17 to 19							
Took Course (18%)	77%	66%	61%	2.8%	16%	27%	33%
Did not Take Course (82%)	65%	52%	58%	2.1%	10%	21%	25%
20 to 29							
Took Course (12%)	70%	57%	65%	5.2%	15%	15%	27%
Did not Take Course (88%)	55%	42%	63%	3.8%	9%	13%	20%
30 to 39							
Took Course (9%)	69%	57%	69%	10.5%	17%	10%	27%
Did not Take Course (91%)	54%	40%	68%	5.7%	9%	8%	17%
40+							
Took Course (7%)	74%	60%	69%	11.7%	15%	7%	25%
Did not Take Course (93%)	50%	37%	70%	5.8%	8%	6%	15%

Notes:

[1] Fall to spring or spring to fall, depending on whether initial term was fall 1999 or spring 2000

[2] Fall to fall or spring to spring, depending on initial term

[3] Defined as the share of courses successfully completed with a grade of C or better (or "credit" for pass/fail courses)

[4] Includes all for-credit certificates reported to the Chancellor's Office. Only certificates of 18 units or more are required to be reported.

[5] Defined as the number of degree-seekers who completed a certificate, degree or transfer (without double counting those who achieved more than one of these outcomes) divided by the total number of degree-seekers.

[6] Orientation courses have no special identifying code in the data, and were therefore identified based on the course title (e.g., "Orientation to College", "College Success", "College Survival Skills", "Making College Count", and many others)

Appendix 2: Assessment, Placement and Student Success at Three California Community Colleges

In order to get a glimpse at the nature of assessment and placement policies in the CCC, we obtained three-year longitudinal cohort data, beginning with first-time, full-time students initially enrolling in 2002, from three community colleges. One of the colleges was in an urban area in the northern part of the state, one was in an urban area in the southern region, and the other was in a suburban area in the southern region. All were medium to large institutions.

Data obtained from the three colleges were used to examine the following questions:

1. How many students are assessed?
2. How many students who are assessed actually enroll in the recommended courses?
3. Is enrollment in the recommended English/math courses a predictor of successful course completion?

Share of Students Assessed

The share of students assessed in English and math varied substantially among the three institutions. The percent of students assessed in English ranged from a low of 43 percent at College C to a high of 72 percent at College B. Similar variations were evident in math, with College C assessing only 47 percent of their students compared to 63 percent at College A.

Table 2-1
Percent of Students Assessed in English and Math

	English	Math
College A	67.0%	63.3%
College B	72.6%	60.6%
College C	42.9%	47.0%

Enrollment in Recommended Course Level

One of the primary concerns expressed by the Academic Senate for California Community Colleges (2004) is the disparity between the number of students assessed and the number who actually enroll in the recommended courses. In order to understand this relationship, we examined the share of students who enrolled in English and math courses at the level recommended based on their assessment results (information that is not available in the statewide data). The data show that 70 to 78 percent of students at all three colleges enrolled in the recommended level of English. At Colleges A and C, over 70 percent of students enrolled in the recommended level of math, but the figure was much lower (45%) for College B. In all three colleges, students were less likely to follow placement recommendations in math. Table 2-2 also shows that substantial numbers of students who were assessed never enrolled in any level of English or math. At Colleges A and B, a greater percentage of students never enrolled in a math course, which is consistent with research that suggests that students are more likely to postpone math enrollment.

Table 2-2
Percent of Students who Followed English and Math Placement Recommendation

	Enrolled in Recommended Course	Enrolled in Course Not Recommended	Never Enrolled
College A			
English	69.5%	22.4%	8.1%
Math	71.2%	28.0%	16.3%
College B			
English	71.2%	16.2%	12.6%
Math	45.3%	30.3%	24.4%
College C			
English	78.1%	7.2%	14.7%
Math	77.2%	9.2%	13.6%

Tables 2-3, 2-4, and 2-5 show the first course students enrolled in based on the placement recommendation they were given. Generally, at all three colleges, students who were advised to enroll in transfer-level math or English had the highest rate of following the placement recommendation. The likelihood of enrolling in the recommended course decreased along with the recommended course level.

At Colleges B and C, students were more likely to enroll in the course levels that were recommended. At College B, students were more likely to enroll in a different class when the recommendation was two and three levels below transfer math, and when the recommendation was three levels below transfer English. Of all three colleges, College B showed the greatest consistency in enrollment in English courses based on placement recommendation.

Among the three colleges, College C showed the greatest consistency in enrollment in math courses based on placement recommendation. At College C, students were also more likely to follow the placement recommendation in English when the recommendation was one or two levels below transfer English.

Table 2-3
College A, First Math & English Class Attempted by Level Recommended

Math	**First Math Enrollment**			
Recommendation	**Transfer Math**	**1 Level Below**	**2 Levels Below**	**3 Levels Below**
Transfer Math	93%			
1 Level Below		73%		
2 Levels Below			64%	
3 Levels Below				56%
English	**First English Enrollment**			
Recommendation	**Transfer English**	**1 Level Below**	**2 Levels Below**	**3 Levels Below**
Transfer English	95%			
I Level Below		74%		
2 Levels Below			63%	
3 Levels Below				16%

$p \leq .000$

Table 2-4
College B, First Math & English Class Attempted by Level Recommended

Math	First Math Enrollment			
Recommendation	**Transfer Math**	**1 Level Below**	**2 Levels Below**	**3 Levels Below**
Transfer Math	93%			
1 Level Below		97%		
2 Levels Below			85%	
3 Levels Below				38%
p≤.000				
English	**First English Enrollment**			
Recommendation	**Transfer English**	**1 Level Below**	**2 Levels Below**	3 Levels Below
Transfer English	98%			
I Level Below		94%		
2 Levels Below			95%	
3 Levels Below				85%
p≤.000				

Table 2-5
College C, First Math & English Class Attempted by Level Recommended

Math	First Math Enrollment			
Recommendation	**Transfer Math**	**1 Level Below**	**2 Levels Below**	**3 Levels Below**
Transfer Math	90%			
1 Level Below		85%		
2 Levels Below			92%	
3 Levels Below				93%
p≤.000				
English	**First English Enrollment**			
Recommendation	**Transfer English**	**1 Level Below**	**2 Levels Below**	
Transfer English	86%			
I Level Below		94%		
2 Levels Below			95%	
p≤.000				

Success in English and Math Courses

At the center of the assessment and placement debate is whether or not students who are assessed and enroll in the recommended placement course are more successful than students who are assessed but decide to enroll in a course different from that recommended. Tables 2-6 and 2-7 show that, at Colleges A and B, students who followed the placement recommendation were more likely to pass their first English and math class with a C or better compared to those students who did not follow the placement recommendation. College C produced results that showed the opposite, although the results from College C were not statistically significant.

Table 2-6
Share of Students Earning a Grade of C or Better in First English Class by whether Placement Recommendation was Followed

	Enrolled in Recommended Course	Enrolled in Course Not Recommended
College A*	56.7%	52.8%
College B*	61.7%	55.3%
College C	60.7%	68.6%

*p≤.05

Table 2-7
Share of Students Earning a Grade of C or Better in First Math Class by whether Placement Recommendation was Followed

	Enrolled in Recommended Course	Enrolled in Course Not Recommended
College A*	61.6%	50.4%
College B*	53.1%	29.8%
College C	59.3%	64.3%

*p≤.05

Summary

These findings suggest that assessment and placement practices vary substantially across community colleges in California. Colleges vary in how many students they assess and how strongly they enforce placement recommendations. Between seven percent and 30 percent of assessed students enrolled in English and math courses other than the ones determined by the colleges to be most appropriate to their level of readiness. Substantial shares of students never enrolled in an English or math course over the three years following their assessment. The analysis suggests that lax enforcement of placement recommendations can have an impact on student success, given that students were generally more successful when they enrolled in the recommended courses.

Appendix 3: Regression Analysis of Factors Related to Completion

Regression analyses were conducted for the subset of degree seekers who were enrolled for more than one (fall/spring) term. Students enrolled for only one term were excluded since one of the factors under examination was "continuous" enrollment. We defined "continuous" as enrolling during successive terms (excluding summer term or winter intercession) throughout a students' entire period of attendance over the six years. Thus, "continuous" enrollment was not relevant for students who only attended during one fall or spring term. The variables used in the regression models are listed and defined in Table 3-1. For students who attended more than one CCC, variables that refer to college characteristics were based on the first college the student enrolled in. Table 3-2 shows the means and standard deviations for each variable, for all students and for several sub-populations.

Table 3-1: Variables Used in Regression Models

Complete	Dichotomous variable indicating whether student completed a certificate or degree, and/or transferred to a university during the six-year period
Continuous	Dichotomous variable indicating whether student enrolled continuously, without stopping out, during fall/spring terms
Half_fulltime	Dichotomous variable indicating whether student attended full time (12+ units) in at least half of the main (fall/spring) terms they were enrolled
Orientation	Dichotomous variable indicating whether student enrolled in a for-credit orientation course
Pct_late	Percentage of student's course enrollments where the student registered late (after first day of the term)
Drop	Percent of course enrollments the student dropped over the entire 6 years (or whatever portion they were enrolled)
Female	Dichotomous variable set to 1 for female students
Age	Student's age at the time of initial enrollment in the CCC
Asian	Dichotomous variable set to 1 for Asian students
Black	Dichotomous variable set to 1 for black students
Hispanic	Dichotomous variable set to 1 for Hispanic/Latino students
White	Dichotomous variable set to 1 for white students
Enrollment	Total headcount enrollment during fall 1999 term at the student's college
ESAI*	Economic Service Area Index of the student's college
SAAP*	Student Average Academic Preparation of the student's college
Urban	Dichotomous variable indicating whether student attended a college in an urban area
Rural	Dichotomous variable indicating whether student attended a college in a rural area
Suburban	Dichotomous variable indicating whether student attended a college in a suburban area
CSU_miles	Miles to the nearest CSU campus from the college student attended

** For descriptions of these variables, see the subsections on socioeconomic status and academic preparation in the section titled Many Factors Affect Student Success.*

Table 3-2: Means (and standard deviations) for Selected Variables

	All Degree Seekers (260,215)	Full-Time Students (122,702)	Part-Time Students (137,513)	Asian Students (42,127)	Black Students (20,815)	Hispanic Students (69,804)	White Students (102,517)
Complete	.28 (.45)	.45 (.50)	.14 (.34)	.37 (.48)	.19 (.39)	.21 (.41)	.32 (.47)
Continuous	.35 (.48)	.46 (.50)	.25 (.43)	.40 (.49)	.30 (.46)	.33 (.47)	.37 (.48)
Half_fulltime	.47 (.50)	-	-	.56 (.50)	.44 (.50)	.40 (.49)	.49 (.50)
Orientation	.17 (.38)	.23 (.42)	.12 (.32)	.19 (.40)	.21 (.41)	.17 (.38)	.16 (.36)
Pct_late	.22 (.21)	.21 (.17)	.24 (.24)	.23 (.21)	.29 (.24)	.23 (.21)	.20 (.20)
Drop	.20 (.19)	.18 (.17)	.21 (.21)	.18 (.18)	.26 (.22)	.21 (.19)	.18 (.19)
Female	.54 (.50)	.54 (.50)	.54 (.50)	.53 (.50)	.54 (.50)	.56 (.50)	.54 (.50)
Age	22.16 (8.49)	20.43 (6.36)	23.69 (9.77)	21.96 (7.93)	23.41 (9.52)	21.26 (7.03)	22.64 (9.30)
Asian	.16 (.37)	.19 (.40)	.13 (.34)	-	-	-	-
Black	.08 (.27)	.07 (.26)	.09 (.28)	-	-	-	-
Hispanic	.37 (.44)	.23 (.42)	.31 (.46)	-	-	-	-
White	.39 (.49)	.41 (.49)	.38 (.49)	-	-	-	-
Enrollment	17,363 (7,522)	17,244 (7,444)	17,469 (7,589)	19,076 (7,427)	16,093 (7,733)	17,367 (7,437)	16,539 (7,407)
ESAI	49,286 (11,336)	49,552 (11,819)	49,048 (10,882)	52,800 (11,750)	46,068 (9,802)	46,638 (9,985)	49,909 (11,753)
SAAP	48.21 (4.68)	48.51 (4.71)	47.95 (4.64)	48.26 (4.06)	45.67 (5.42)	46.06 (4.45)	49.71 (3.89)
Urban	.32 (.47)	.32 (.47)	.33 (.47)	.39 (.49)	.55 (.50)	.35 (.48)	.25 (.43)
Rural	.10 (.30)	.11 (.31)	.09 (.29)	.03 (.18)	.05 (.22)	.09 (.29)	.15 (.36)
Suburban	.57 (.49)	.57 (.49)	.57 (.49)	.57 (.49)	.40 (.49)	.56 (.50)	.60 (.49)
CSU_miles	19.90 (21.06)	20.11 (21.60)	19.71 (20.56)	14.97 (14.13)	17.17 (17.67)	19.18 (21.36)	23.65 (23.38)

Regression analysis is used as a methodology to find the most appropriate statistical relationship between a set of explanatory variables and a specific dependent variable, in this case "COMPLETE." Specifically, in the two sets of regressions displayed in Tables 3-3 and 3-4, the Ordinary Least Squares (OLS) technique is employed. This technique has been proven to be best under most plausible statistical circumstances. OLS creates a linear function from the raw data, thereby estimating coefficients that convey numerical relationships between each of the explanatory variables and COMPLETE.

The first set of models presented in Table 3-3 includes "fixed effects" for each college, which allows the models to "take into account" or "control for" the specific characteristics of each of the community colleges in the analysis. The second set of models presented in Table 3-4 removes these fixed effects and replaces them with a set of college-specific variables in an attempt to quantify and disaggregate some of the known characteristics of each college.

The dichotomous nature of the COMPLETE variable suggests that a Logit technique may be more appropriate than OLS. However, interpretation of Logit results is often more complicated. To check the OLS results presented here for robustness, the Logit technique was employed and the statistical significance and relative magnitudes were found to be nearly identical to those generated by the OLS technique. Thus, we present and describe the OLS results.

Table 3-3: Regression Results on the Likelihood of Completion Using College Fixed Effects (t-statistics)

	Model 1: All Degree Seekers (260,215)	Model 2: Full-Time Students (122,702)	Model 3: Part-Time Students (137,513)	Model 4: Asian Students (42,127)	Model 5: Black Students (20,815)	Model 6: Hispanic Students (69,804)	Model 7: White Students (102,517)
Continuous	.07* (42.97)	.09* (33.23)	.04* (17.15)	.06* (14.25)	.06* (10.16)	.07* (21.11)	.08* (28.82)
Fulltime	.23* (134.87)	-	-	.26* (56.44)	.16* (28.04)	.21* (67.24)	.25* (86.76)
Orientation	-.006* (-2.54)	-.014* (-3.95)	.003 (0.97)	-.026* (-4.18)	.004 (0.65)	.015* (3.45)	-.012* (-2.89)
Pct_Late	-.18* (-39.89)	-.24* (-30.32)	-.11* (-22.74)	-.20* (-16.33)	-.14* (-11.14)	-.16* (-20.30)	-.18* (-24.88)
Drop	-.72* (-159.96)	-1.17* (-149.70)	-.39* (-78.84)	-.84* (-66.94)	-.53* (-40.31)	-.60* (-75.08)	-.79* (-108.33)
Female	.043* (26.46)	.046* (17.93)	.038* (19.41)	.044* (10.49)	.013* (2.39)	.040* (13.68)	.047* (17.74)
Age	-.003* (-27.72)	-.005* (-26.69)	-.0002* (-2.27)	-.007* (-24.01)	.0003 (1.07)	-.002* (-8.27)	-.003* (-16.88)
Asian	.040* (11.31)	.045* (8.48)	.021* (4.88)	-	-	-	-
Black	-.022* (-5.32)	-.030* (-4.45)	-.007 (-1.47)	-	-	-	-
Hispanic	-.044* (-13.31)	-.054* (-10.28)	-.028* (-7.29)	-	-	-	-
White	.016* (5.12)	.014* (2.83)	.017* (4.62)	-	-	-	-
Constant	.38* (88.44)	.76* (112.51)	.23* (48.92)	.53* (56.43)	.27* (25.49)	.29* (46.36)	.39* (76.13)
R-squared	.220	.201	.063	.236	.144	.175	.225

** significant at p < .05 or better*

Table 3-4: Regression Results on the Likelihood of Completion *Without* College Fixed Effects (t-statistics)

	Model 8: All Degree Seekers (260,215)	Model 9: Full-Time Students (122,702)	Model 10: Part-Time Students (137,513)	Model 11: Asian Students (42,127)	Model 12: Black Students (20,815)	Model 13: Hispanic Students (69,804)	Model 14: White Students (102,517)
Continuous	.08*	.09*	.04*	.06*	.06*	.07*	.08*
	(43.79)	(34.50)	(17.36)	(14.08)	(10.27)	(20.88)	(29.30)
Fulltime	.24*	-	-	.27*	.16*	.21*	.25*
	(140.72)			(57.62)	(28.76)	(68.04)	(87.76)
Orientation	-.007*	-.017*	.001	-.021*	.002	.005	-.006
	(-3.25)	(-5.58)	(0.45)	(-3.81)	(0.34)	(1.28)	(-1.58)
Pct_Late	-.15*	-.21*	-.09*	-.16*	-.12*	-.14*	-.16*
	(-36.44)	(-27.74)	(-20.28)	(-13.69)	(-9.88)	(-18.33)	(-22.18)
Drop	-.71*	-1.17*	-.38*	-.83*	-.52*	-.59*	-.78*
	(-160.20)	(-151.14)	(-78.92)	(-66.41)	(-40.77)	(-74.13)	(-106.95)
Female	.043*	.045*	.039*	.044*	.014*	.041*	.049*
	(26.33)	(17.46)	(19.78)	(10.41)	(2.59)	(13.81)	(18.40)
Age	-.003*	-.005*	-.0001	-.007*	.0003	-.002*	-.003*
	(-25.48)	(-25.64)	(-1.16)	(-24.29)	(1.05)	(-8.86)	(-16.90)
Enrollment (1,000's)	.0011*	.0012*	.0007*	.0011*	.0004	.0007*	.0017*
	(8.16)	(5.65)	(4.86)	(3.43)	(0.96)	(3.03)	(7.44)
Urban	.004*	-.004	.011*	-.008	.0008	-.014*	.011*
	(2.11)	(-1.14)	(4.96)	(-1.53)	(0.13)	(-4.37)	(3.04)
CSU_miles	.0002*	.0001	.0002*	-.0001	.0002	.0002*	.0001
	(3.56)	(1.19)	(4.20)	(-0.37)	(1.38)	(2.03)	(1.60)
ESAI (1,000's)	.0016*	.0026*	.0006*	.0018*	.0005	.0003	.0013*
	(18.90)	(19.50)	(4.86)	(7.38)	(1.55)	(1.88)	(10.01)
SAAP	.0017*	.0012*	.0011*	.0004	-.0011	.0002	.0028*
	(7.85)	(3.45)	(4.33)	(0.55)	(-1.56)	(0.58)	(7.01)
Constant	.18*	.54*	.12*	.39*	.28*	.25*	.14*
	(17.71)	(33.66)	(10.83)	(13.14)	(8.98)	(14.39)	(7.40)
R-squared	.217	.200	.061	.239	.144	.176	.229

* significant at p < .05 or better

Overall, the regression analyses suggest that, after controlling for all factors in the models, eight factors had a positive and statistically significant relationship with the likelihood of completion. Students had a higher probability of completing a program if they:

- attended full time;
- enrolled continuously;
- were female;
- were Asian or white;
- had a higher income (using proxy variable);
- were better prepared academically for college (in most models, using proxy variable); or
- attended a larger college (in most models, with size defined as total enrollment).

Another set of variables had a statistically significant negative relationship with the likelihood of completion. The likelihood of completion declined with increases in:

- students' age;
- the percentage of courses dropped; and
- the percentage of courses with late registration.

Students also had a lower probability of completing a program if they were Latino(a) or black.

Several variables yielded ambiguous results, including distance to the nearest CSU campus, attending a community college in an urban area, and enrolling in an orientation course. Taking an orientation course was not significantly related to the likelihood of completion in some models, and had a negative effect in other models after controlling for other factors. It is possible, even likely, that our measure of which students took an orientation course was not entirely accurate. We relied on course title, which may not have allowed for accurate identification of all orientation courses.

[1] Calculated from Table B15001 "Sex by Age by Educational Attainment for the Population 18 Years and Over," US Census Bureau, 2005 American Community Survey

[2] Calculated from *Race/Ethnic Population with Age and Sex Detail 1990-1999* (May 2004) and 2000-2050 (July 2007), California Department of Finance, Demographic Research Unit.

[3] For a discussion of how per capita income has already been on the decline relative to the national average, see National Center for Higher Education Management Systems (2005)

[4] For example the Achieving the Dream Project, funded by the Lumina Foundation, is a multi-year initiative focused on increasing success among community college students in earning certificates and degrees. The Changing Direction Project of WICHE, also funded by Lumina, examined how to structure financial aid and financing policies to maximize student success. In the Opening Doors Demonstration Project, MDRC is working with community colleges in several states to design and implement new types of financial aid, enhanced student services, and curricular and instructional innovations, with the goal of helping low-income students complete college credentials. The James Irvine Foundation is working with MDRC on the Student Support Partnership Integrating Resources and Education (SSPIRE) Initiative, an effort to raise degree completion among low-income and under-prepared community college students in California through integrating student services and academic instruction. The Carnegie Foundation for the Advancement of Teaching and Learning, with support from the William and Flora Hewlett Foundation, is implementing the Strengthening Pre-collegiate Education in Community Colleges (SPECC) initiative, working with eleven CCC campuses to improve classroom instruction in basic skills. The Hewlett Foundation also convened a Strengthening Community Colleges symposium from which emerged a group of researchers, practitioners, and advocates collaborating to encourage reforms in basic skills education. The Equity for All Project, sponsored by the Lumina Foundation, is working with some CCC campuses to close the gaps in outcomes among minority and low-income students

[5] See http://www.thecb.state.tx.us (listed under "participation and success")

[6] This method was originally presented and briefly explained in an earlier policy brief (Shulock and Moore, 2007).

[7] Non-credit students and high school students were not included. Students simultaneously enrolled in a four-year institution (e.g., students taking courses at a CCC while already enrolled at UC/CSU) were also excluded. A total of 520,407 students were included in the analyses.

[8] CCC students are asked to check a box on initial enrollment forms indicating their intent. The CCC refers to this as students' "uninformed goal" given that they have not yet met with a counselor. For some students who later meet with a counselor, the colleges add data on their "informed goal." But many students do not check a box on the initial form, and most student records have no "informed" goal information.

[9] Younger students are generally over-represented in the national survey samples used in this research compared to their representation among the CCC cohort. Also, many students in the CCC are not "first-time college students" (students in the cohort we studied were enrolled for the first time in the California Community College system, but some already had other college experience). So the 90% "degree intent" figure from the NCES study is not directly applicable to the CCC. However, the research is useful for demonstrating that younger students are very likely to enroll with degree intent, and are more likely than older students to be successful in meeting those goals.

[10] This would include students who were concurrently enrolled in a university while enrolling in a CCC course(s). It could also include students who recently attended a university but stopped attending and enrolled in a CCC (reverse transfers).

[11] If available, we used the goal student provided after receiving initial counseling, but used the initial (or "uninformed") goal when that was the only option.

[12] For information on the accountability program for the CCC, known as Accountability Reporting for the Community Colleges (ARCC), see http://www.cccco.edu/divisions/tris/rp/ab_1417/ab_1417.htm.

[13] Drummond and Perry (2007) report a Student Progress and Achievement Rate of 52 percent across the CCC system, indicating that just over half of "students who showed intent to complete" earned a certificate/degree, transferred to a university, or made some defined level of progress toward being ready for transfer within six years of enrollment. As discussed later in this report, 24 percent of "degree seekers," as defined by the Institute, completed a certificate/degree or transferred to a university within six years of enrollment. Due to the different method of calculation (for both the numerator and denominator of the rates), the two rates are not directly comparable.

[14] Looking at outcomes over six years is a common research practice. While there are sure to be some students who take longer than six years to complete a program, we believe that the six-year time frame is reasonable in that it captures most student outcomes accurately and it serves as an appropriate timeframe for considering policy reforms to improve success rates.

[15] The share of CCC students that complete a certificate or associate's degree may be somewhat understated. Some CCC students may transfer to a two-year proprietary institution and complete a certificate or associate's degree there.

[16] According to on-line data of the California Postsecondary Education Commission, nearly 70% of CCC transfers to universities in fall 2005 were to a CSU campus.

[17] Represents the rate for fall 1999 entering CCC transfers (sophomore and above) , as shown at http://www.asd.calstate.edu/csrde/ccct/2004htm/system.htm

[18] Examples include the Associate of Arts Oregon Transfer (AAOT) degree, Direct Transfer Agreement (DTA) Associate Degrees in Washington, and Florida's Associate of Arts Transfer Guarantee.

[19] Some CCC students are able to transfer to a university without completing 60 units in the CCC. To qualify for lower-division transfer, students have to have been eligible for admission at the time of high school graduation or have made up for any missing subject (A to G) requirements while enrolled at a CCC. However, many UC and CSU programs and/or campuses have been closed to lower-division transfers in recent years due to impaction. Students can still transfer to private universities without completing 60 CCC units.

[20] Some research on this topic is underway. Researchers from the University of Southern California, in collaboration with Long Beach City College, are examining the issue through analyses of enrollment data and interviews with students who completed transfer requirements but did not transfer. For more information, see http://www.usc.edu/dept/education/CUE/projects/missing/Executive_Summary_-_Missing_87_(2).pdf. In addition, researchers at MPR Associates are planning a research brief examining why some transfer-ready students do not transfer (Horn and Lew, 2007).

[21] For a summary of the theoretical frameworks commonly used in research on community college student success, see Bailey and Alfonso (2005).

[22] Hoachlander et al., (2003) also found that rates of certificate completion increase with age, related to the much greater likelihood of older students being enrolled in certificate programs.

[23] For example, in multivariate analyses like those by Adelman (2005), racial/ethnic differences in outcomes often disappear when other factors are added to a statistical model.

[24] Calculated from California Postsecondary Education Commission on-line data at www.cpec.ca.gov

[25] The index was developed based on all students enrolled in the CCC in fall 2000, matched to income by zip code from the 2000 Census. This time period is appropriate for a proxy measure of the average household income of the 1999-2000 cohort of students studied here. See http://www.cccco.edu/divisions/tris/rp/ab_1417/esai.pdf for a description of the development of the measure and results of analyses demonstrating its relationship to student outcomes.

[26] For students who attended more than one college, we used the initial college of enrollment or, where students enrolled in more than one college in their first term, the college where they enrolled in the most units.

[27] The SAAP was developed by matching first-time freshmen enrolled in the CCC in the fall 2000 term with their high school standardized test scores using data from the California Department of Education (only younger students who recently attended high school were matched). The SAAP for each college represents the average standardized test scores for all (younger) first-time freshmen attending that college. The time period of the match is appropriate for approximating the average academic preparation levels of the 1999-2000 cohort of students studied here.

[28] For students who attended more than one college, we used the initial college of enrollment or, where students enrolled in more than one college in their first term, the college where they enrolled in the most units.

[29] "More committed" is defined as in Horn, Nevill & Griffith (2006) - students attended at least half time throughout their enrollment (excluding summer) and stated a goal of transfer/degree/certificate. The "less committed" and "not committed" definitions used by Horn, et al. could not be replicated due to lack of data on program enrollment. Instead, "less committed" was defined as students who attended at least half time throughout their enrollment, but did not state a goal of completion. The remaining students were defined as "not committed" (i.e., they did not attend at least half time throughout their enrollment, regardless of stated goal).

[30] Tinto's (1993) influential theory of social integration guides much of the research on college student attrition, and suggests that students who are more involved in the academic, social and cultural life of the college will be more likely to persist and complete a degree.

[31] Among students we defined as part time, about one in seven of those who did not complete were enrolled at the end of the six-year period, while the rest did not complete a program and were no longer enrolled.

[32] We used calendar files from the CCC Chancellor's Office for each term to identify start dates for each college. We then calculated the difference (number of days) between the date students registered for each course and the start date of the term. Adjustments were made, based on advice from researchers with the Center for Student Success, to account for "late start" courses.

[33] We are not referring here to the orientation services provided to some students as part of the matriculation process, but to an actual credit-bearing class intended to assist students in adjusting to college and being more successful (usually the courses carry one credit).

[34] The Opening Doors project is working with community colleges in several states to design and implement new types of financial aid, enhanced student services, and curricular and instructional innovations, with the goal of helping low-income students earn college credentials. For more information see the project website at http://www.mdrc.org/project_31_2.html.

[35] She was referring to research underway as part of the Strengthening Pre-Collegiate Education in Community Colleges (SPECC) project, involving efforts to improve classroom instruction in basic skills in eleven CCC campuses.

[36] Several different terms are used to describe pre-collegiate coursework provided at colleges and universities, including remedial education and developmental education. We use those terms interchangeably in this discussion. For a comprehensive review of research literature on developmental education, see Center for Student Success (2007) at http://css.rpgroup.org.

[37] Achieving the Dream is a national initiative to increase the success of under-served groups in community colleges (see http://www.achievingthedream.org/default.tp).

[38] Non-native speakers of English may choose whether to take an English as a Second Language (ESL) assessment or the regular English assessment offered by the college. According to the Academic Senate's 2004 report on assessment and placement, most colleges offer ESL assessments. The issue of how well assessment instruments measure proficiency levels of non-native English speakers is an issue of great importance to the CCC but is beyond the scope of this study.

[39] The MALDEF concerns and the revised regulations are well described in a personal communication from Assistant General Counsel Ralph Black, December 13, 2006, accompanied by a May 28, 1991 letter to MALDEF regional counsel from then-CCC Chancellor David Mertes.

[40] For more information, see http://collegenow.cuny.edu/

[41] CCC Assessment Association, "Assessment Q &A" March 2005, p.10.

[42] See the chart at http://www.scc.losrios.edu/~scounsel/intra/scc/assesment_information/assesment_index.html

[43] Mr. Mapeso cited a statement prepared by district counselors citing these and other problematic aspects of the current process with respect to students.

[44] Letter to Chancellor Drummond from Harriet Robles, then president of the RP Group, May 21, 2004.

[45] Matriculation Assessment/Placement Task Force Recommendations, Consultation Digest, February 15, 2007.

[46] Minutes, Special Meeting to Discuss the Feasibility of a CCC-Owned Assessment Instrument, Friday, March 30, 2007, Community College Chancellor's Office, p. 5.

[47] Academic Senate Resolution 18.03, Fall 2006.

[48] See Resolutions 9.05 and 9.03 at http://www.asccc.org/Events/sessions/spring2007/Presentations-Documents/FinalS07SessionResolutions.pdf

[49] The UC and CSU could certainly do better in making clear to students the actual competencies required for admission and success at UC and CSU, but they do clearly communicate the course, GPA and testing requirements.

[50] The CSU program allows high school juniors to voluntarily take an extra set of assessments during the regular administration of the California Standards Test, and receive notification from the CSU about their readiness for college English and math (see http://www.calstate.edu/EAP/).

[51] Letter addressed to Community College Partners and Friends from Chancellor Drummond, dated March 8, 2007.

[52] For descriptions of these variables, see the subsections on Wealth and Academic Preparation in the section titled Many Factors Affect Student Success and Degree Completion.