WORKING PAPER

EXPLORING RELATIONSHIPS BETWEEN STUDENT ENGAGEMENT AND STUDENT OUTCOMES IN COMMUNITY COLLEGES:

REPORT ON VALIDATION RESEARCH

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EXECUTIVE SUMMARY

In 2004, the Lumina Foundation for Education approved a generous grant to support validation research to explore and document the validity of the Community College Student Report (CCSR), add to the higher education field's understanding of student engagement, and help to identify research or institutional practices that require further attention. The study was conducted in three strands that linked Community College Survey of Student Engagement (*CCSSE)* respondents with external data sources: (1) data from the Florida Department of Education; (2) data from the Achieving the Dream project; and (3) student record databases maintained at community colleges that have participated in the *CCSSE* survey and are either Hispanic-Serving Institutions or members of the Hispanic Association of Colleges and Universities (HSI/HACU). All participating students had participated in the 2002, 2003, or 2004 administrations of the Community College Student Report, *CCSSE's* survey instrument.

The Florida data set contained complete records of students' demographics, placement tests, course taking, and completion points. This data source was analyzed by a team at the National Center for Higher Education Management Systems (NCHEMS), directed by Peter Ewell. The Achieving the Dream data source consisted of extensive demographic data and term-level records from colleges participating in the national Achieving the Dream initiative. This data source was analyzed by Derek Price of Praxis Associates. The HSI/HACU data source was compiled by obtaining transcript data from participants in a *CCSSE* HSI/HACU consortium and other HSI and HACU colleges. This data source was analyzed by Greg Smith, an independent consultant.

Florida Study Results

The pattern of results obtained from the Florida study broadly confirms positive relationships between the construct of student engagement as measured by *CCSSE* and community college outcomes. *CCSSE* benchmarks and item clusters show a consistent pattern of significant association with academic outcomes like GPA, degree completion, and attainment of important academic milestones, after controlling for student characteristics and entering ability. The strongest of these net effects emerged where they should most be expected—for "academic"

areas of engagement such as Academic Challenge, Active and Collaborative Learning, Student-Faculty Interaction, and Mental Activities. Self-reported academic Gains on *CCSSE* also are significantly related to actual academic achievement measures, both directly (confirmed through bivariate correlation analysis) and after controlling for student ability and background. This finding helps validate *CCSSE*'s use as a "proxy" measure for student academic achievement. While pervasive significant net effects are less typical of behavioral measures of student success, such as persistence to a second term or persistence to second year, they do occur repeatedly across both longitudinal cohort datasets. Moreover, the *CCSSE* benchmarks and item clusters that emerge as significant in these cases are those that the retention literature says should do so: Support for Learners, Student Services, and occasionally, Collaborative Learning.

Achieving the Dream Study Results

This Achieving the Dream study yielded mixed results. The most promising results were for academic achievement (cumulative GPA) and persistence (credit completion ratios and fall-to-fall retention). Less promising were the results when predicting course completions across developmental math, writing and reading, as well as college-level algebra and English. The Achieving the Dream study also examined engagement levels for low-income students, minority students, and students exhibiting known risk factors, and found that in each case these students were more engaged than a comparison group. Overall, Active and Collaborative Learning is the most powerful and versatile of the five *CCSSE* benchmarks when predicting student success for Achieving the Dream colleges using several different outcome measures.

Results of the HSI/HACU Study

In the HSI/HACU study, the student engagement scales were predictors of both *CCSSE* self-reported outcomes and transcript-derived student outcomes. Overall, two student engagement scales – Academic Challenge and Support for Learners – were the most consistent predictors of student outcomes. After considering the effects of student engagement, when self-reported academic Gains and satisfaction were added as either independent variables or moderator variables, self-reported Gains tended to add little to our ability to predict outcomes, whereas satisfaction makes an independent contribution. Immigrant status should definitely be

accounted for in any future *CCSSE* research. Immigrant students reported much higher levels of Student Effort, Academic Challenge, Support for Learners, and Academic, Personal Development, and Vocational Goals Gains than did non-immigrants.

Overall, results clearly demonstrate that in assessing the validity of the *CCSSE,* the choice of student outcomes variables is very important. The analyses accounted for larger proportions of variance in cumulative GPA, total credit hours completed, and average credit hours than in first to second term persistence, first to third term persistence, and number of terms enrolled. Further, depending on the student outcome of interest, some *CCSSE* self-reported outcomes seemed to be good proxies for transcript-derived outcomes, specifically cumulative GPA and total credit hours earned. Overall, many of the *CCSSE* variables, as well as corresponding derived scales and factors, demonstrated solid relationships with both self-reported and transcript-derived student outcomes.

Overall Results

The results of these studies point to the following overall conclusions:

- There is strong support for the validity of the use of the CCSR as a measure of institutional processes and student behaviors that impact student outcomes. The strength of the results is derived from strong consistency across three studies using virtually independent samples and analyzed by three different analysts.
- The studies confirm a long tradition of research findings linking engagement to positive academic outcomes. The significance of this research is that it was conducted on community college students who have been markedly understudied relative to students in baccalaureate-granting institutions.
- There is strong consistency in the relationship between engagement factors and outcome measures across the three studies; however, some outcomes have stronger relationships to engagement than others.
- The Support for Learners benchmark was consistently correlated with measures of persistence. While the majority of the *CCSSE* items were acquired from the National

Survey of Student Engagement, several items in the Support for Learners benchmarks are unique to the CCSR and were intended to assess issues related to persistence.

INTRODUCTION

The central purpose of this research was to explore and document the validity of the Community College Student Report (CCSR), which is the instrument used by the Community College Survey of Student Engagement (*CCSSE*). In addition to providing important validation of the CCSR and its use as a measure of institutional effectiveness, the studies make a significant contribution to the literature on student engagement. Despite the voluminous empirical literature on the positive impact of quality and effort of work on academic success (Pascarella & Terenzini, 2005), there has been minimal investigation of the impact of student engagement in samples of community college students. Attempts to quantify the proportion of higher education literature that utilize community college samples consistently estimate the proportion of literature on community college samples at 10% or less. Pascarella (1997) acknowledges that at most 5% of approximately 2600 studies reviewed in the seminal text that he co-authored with Terenzini (*How College Affects Students*, 1991) focused on community college students. Cofers and Somers (2000) report that in their search of the Education Resources Information Center (ERIC) database, 10% of the nearly 2000 publications on college persistence included two-year students. A systematic examination of five major higher education journals found that only 8% of articles mentioned community colleges (Townsend, Donaldson, & Wilson, 2004). A meta-analysis examining support for Tinto's (1993) theory of retention, using only studies conducted with community college students, found only six studies that qualified for inclusion in the analysis after a literature search of three major databases (Wortman & Napoli, 1996). These findings strongly indicate that student engagement is one of the more poorly studied areas within the community college literature. Thus, the empirical higher education literature, particularly the literature on student engagement, have overwhelming focused on students at baccalaureate-granting institutions, leaving a gap in the literature on community college students.

This paucity of empirical literature has resulted in some recent high-profile statements noting the lack of empirical evidence for student integration or engagement models in research utilizing community college students. A review of community college research (Bailey & Alfonso, 2005) found that the quantity and quality of research on community college institutional practice

inadequate. A review of the empirical evidence for Tinto's (1993) theory of student departure found that there are notable differences in the theory's support between the two- and four-year sectors (Braxton, Hirschy, & McClendon, 2004). These statements reflect the lack of empirical work done using community college samples, not empirical work demonstrating a lack of applicability of student integration or engagement models. Thus, the research conducted in support of this grant directly fills a gap in higher education literature.

The purpose of the inquiry was to establish links between results obtained on the Community College Student Report (CCSR) and a variety of education outcomes. The CCSR is fundamentally designed to measure the processes—institutional practices and student behaviors—that lead to higher levels of learning and educational attainment. As such, there is an implicit assumption that engagement in effective educational practices has a positive impact on outcomes. To establish that the CCSR measures processes that matter, survey responses were linked to a variety of short- and long-term outcomes. The strategy of conducting three parallel studies enhances the power of this research by allowing us to examine results across studies and identify areas of convergence and divergence. Furthermore, because three different consultants conducted three separate strands of the research, the variety of analytic approaches used by the consultants provides multiple perspectives for examining and understanding the data.

Each of the analysts was supplied with derived constructs for data analysis. These variables are described in detail in Appendix D. The constructs consisted of *CCSSE* benchmarks, engagement item clusters, and gain item clusters. The development of the benchmarks and the engagement item clusters are described in detail elsewhere (Marti, in press). It should be noted that the benchmarks and engagement item clusters are non-orthogonal; engagement item clusters use largely the same items that comprise the benchmarks but contain a larger number of item clusters, or factors, that represent a finer grained examination of engagement items. The gain item clusters represent three groups of self-perceived gain items in academics, personal development, and vocational goals.

VALIDATION STUDIES

Study 1: Florida Community College System Validation Study

Study Description

Sample Overview

Students enrolled in the Florida Community College System (FCCS) institutions who took the *CCSSE* in 2002, 2003, and 2004 were matched with all term enrollment records provided by FCCS for the period fall 1996 through summer 2005. There were a total of 4,823 students who completed the CCSR in a primary *CCSSE* sample and provided an ID that could be matched to a record in the Florida Department of Education's database. Students taking the *CCSSE* in 2002-2004 were more likely to have entered a Florida community college for the first time in recent years. More than half of those students (58.8%) included in Long cohort files, for example, began their study at FCCS in 2001 or 2002, with only 13.3% beginning in fall 1998 or earlier. This means that most of the students in these cohorts have not experienced more than ten to fifteen terms of potential enrollment. Students completing the *CCSSE*—and thus eligible for inclusion in the study—also tend to be fairly traditional when compared to others enrolled in FCCS colleges. To assess how representative this study sample was, comparative statistics on all entering freshman were obtained from the FCCS. Comparisons are presented in Table 1.

These differences reflect the kinds of response biases typical of student surveys and, more particularly, experienced by most colleges when they administer *CCSSE*. No attempt was made to correct for them in any of the analyses undertaken, and because the most important analyses were multivariate, the primary point of interest was the relationships among variables in any case. But it is important to point out that the universe of students within which validation was attempted differs in a few notable ways from the parent student population.

Data Construction

FCCS maintains comprehensive records for all students enrolled for credit in the 28 community colleges in the state. These records include descriptive data on student characteristics, data on basic skills and placement levels, and transcript-level detail on every

class taken by every student; furthermore, they have been collected under common definitions for a very long period of time.

Table 1

Comparison of CCSR Analysis Cohorts with FCCS Population

Variable	Actual FCCS Entering	Merged Cohorts	Short Cohorts	2003-2004 Yr.
Gender (%)				
Female	61.6	60.9	59.6	63.2
Male	38.4	39.1	40.2	36.8
Ethnicity (%)				
Asian	3.0	2.5	2.4	2.5
Black	17.8	13.3	12.6	13.7
Hispanic	20.0	13.6	12.8	10.7
Indian	0.4	0.4	0.5	0.5
White	56.7	68.5	69.9	65.9
Not Reported	2.1	1.6	1.8	2.0
Age (%)				
17 or less	6.4	25.0	21.3	17.9
18 to 21	39.7	53.3	55.6	43.0
22 to 25	17.6	6.5	7.3	9.2
26 to 35	19.4	6.7	8.7	10.9
36 to 45	10.7	5.2	4.8	6.0
46 to 55	4.8	1.4	2.0	2.4
Over 55	1.3	0.1	0.1	0.3
College Status (%)				
First Time	76.0	83.4	81.0	78.3
Transfer	24.0	14.1	16.9	18.4
Enrollment Status (%)				
Full-time	32.6	46.5	50.8	54.4
Part-time	67.4	53.5	49.2	46.6
Goal for Attendance (%)				
AA	42.6	58.9	59.3	54.6
AS/AAS	18.2	17.9	17.9	19.2
Certificate	2.2	1.8	1.2	2.3
Other	37.0	21.4	21.6	24,2

In addition to data availability and high quality data, the Florida Community College System has other advantages for a study that systematically examines patterns of student success. It has a common course numbering system that helps to ensure that basic skills and "gatekeeper" courses are of equivalent content across campuses. Perhaps most important, common placement standards and a common placement test (the Florida CPT) provide standard measures of entering student ability that can be used as a control variable for studies of net effects. This is an unusual and valuable property in a community college dataset.

Unit record data drawn from the records system of the FCCS were supplied to NCHEMS by *CCSSE* in the form of individual SAS files containing discrete bodies of related variables. These records contain individual entries for each student for each term of attendance at a Florida Community College for all students enrolled in the period fall 1996 through fall 2005 who had also completed the *CCSSE* instrument in 2002, 2003, or 2004. *CCSSE* data were supplied directly in the form of a single SAS file. All records were individually identifiable through a student identification number that was used to construct analytical files.

NCHEMS staff converted discrete data files obtained from the Florida Community College System to SPSS files and ran basic statistics to verify their contents, ranges, coding structures, and similar properties to help determine which data elements would be used. Many data elements were eliminated from consideration because they contained only fragmentary data or were irrelevant to the validation analysis. Usable and relevant data elements were then used to construct a set of analytical files, using the student identification number as the key link. Several analytical files were created to support the analysis.

Long cohort files. Long cohort files were constructed for each fall and spring term beginning with fall 1996 through fall 2002. Student's first term of academic history is first determined in these files, and the students are tracked from that start point through the summer of 2005. The purpose of these files is to support analyses of long-term patterns of student success including remediation success, persistence, and program completion. These files contain a "fixed" body of data on each student, including demographic and educational background data elements, together with multiple term records containing information about the

details of enrollment and academic performance. *CCSSE* benchmarks and scales were included in each file. Initial exploratory analyses indicated that there were few differences in student behavior across cohorts over time, so all cohorts were merged to maximize the number of cases available for analysis. This yielded a total of 1958 usable cases for analysis.

Short cohort files. Short cohort files were constructed for each fall and spring term beginning with fall 1996 through fall 2004. These files were constructed in the same manner as Long cohort files but containing only three terms of academic history. These files were created because many students for whom records were available could not be included in Long cohorts because they began their studies more recently than the fall of 2002.[1] These cohorts were used to examine more immediate student outcomes such as second term persistence, first-year GPA and course completion, and success in remedial and gatekeeper courses. Short cohort files contained a total of 2658 usable cases.

Cross-sectional performance file. This file contains all students, regardless of level, enrolled in the period fall 2003 through summer 2004 (Academic Year 2003-2004). This file was created to correspond to a substantial administration of *CCSSE* in the spring of 2004 and represents the largest pool of students available for these validation analyses (N = 5468). For most questions on the CCSR, students are specifically asked to report their perceptions and experiences during the "current year," and this period corresponds to that year. Because students contained in this file are at different stages in their academic careers, this file cannot be used to examine outcomes like persistence or program completion. But it is the largest and probably most appropriate universe within which to examine the link between *CCSSE* self-reports and immediate academic outcomes such as GPA and course completion.

Course-taking files. These files contained all courses taken by students and were aggregated into a longitudinal record to examine student success in "gatekeeper" courses, basic skills courses, fulfillment of general education requirements, and so on. Because of their size, these files were maintained separately and were merged into cohort files as needed for particular analyses.

[1] The largest of the three administrations of *CCSSE* in Florida occurred in the Spring of 2004.

CCSR files. Complete CCSR responses were maintained as a separate file containing data from both the 2002 and 2004 administrations. These were merged with the analytical files as needed to examine particular items and to provide additional control variables for student characteristics not included in the Florida Community College System records.

Following standard NCHEMS procedures for conducting longitudinal student flow analyses, Cohort Files consist of a single block of "fixed" data elements containing information on student demographics, educational background, and initial enrollment status, followed by multiple term records containing information on the specifics of enrollment for each student for each subsequent term. Figure 1 shows the basic structure of all cohort files created.

Study Variables

A list of all data elements in the cohort files is provided in Appendix E. These data elements were identical for Long and Short cohort files; the only difference between the two files was the number of terms for which data were provided. Most data elements in the cohort files were taken directly from student records, but some (e.g. age) were derived from existing data elements. Some additional control and student selection variables were obtained from *CCSSE* responses. Derived data elements are flagged with an asterisk in the list.

Dependent variables for the validation study consisted of a range of performance measures defined longitudinally by relating two or more "milestone events" in a given student's enrollment history within a given period of time. For example, the Three-year Degree Completion Rate relates a given student's achievement of an associate degree at a Florida community college with his or her first credit enrollment in a Florida community college within a three-year time period. As another example, the "transfer-ready" rate for skills-deficient students relates the point at which a given student is placed below college level in one or more basic skills with his or her achievement of "transfer-ready" status, regardless of whether or not he or she has earned a credential. An illustrative chart of "milestone events" of this kind is presented in Figure 2.

Figure 1

Cohort File Structure

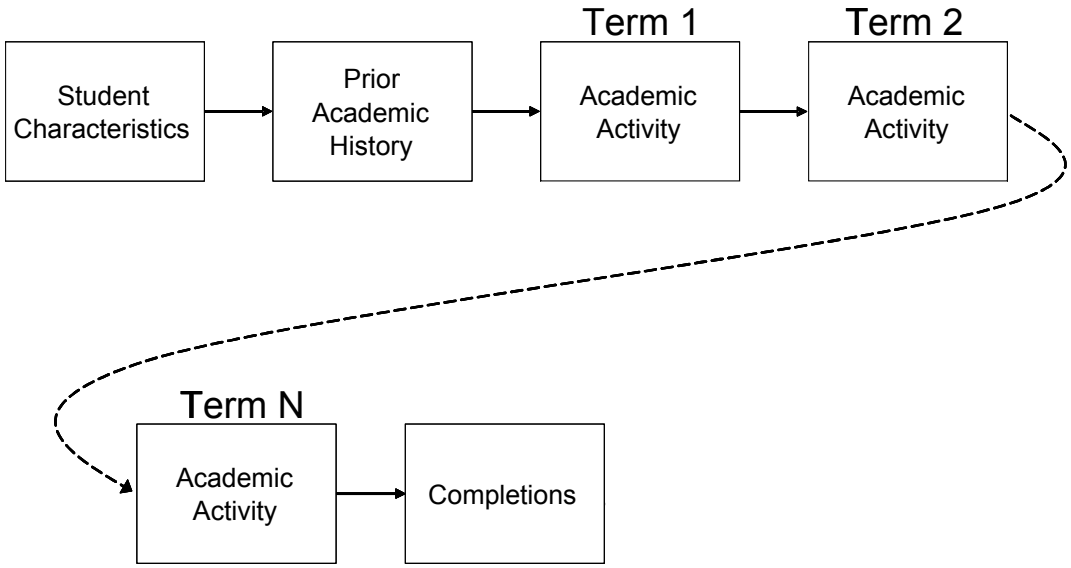
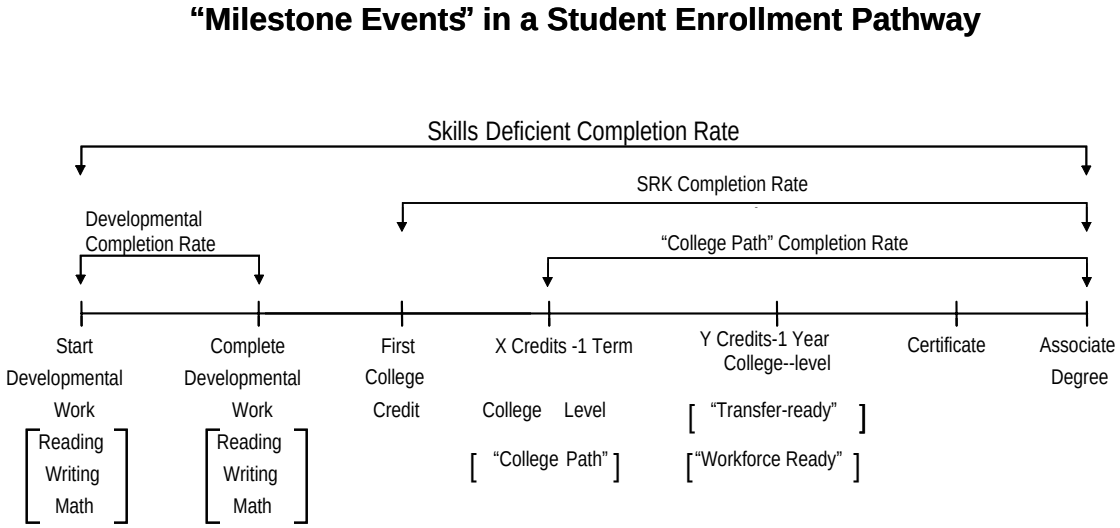


Figure 2

Milestone Events in a Student Enrollment Pathway



These performance measures recognize the fact that that such “milestone events” may occur in different orders for different students. For example, students may enroll for their first college-level credit at a point either before or after their enrollment in a developmental course. Similarly, students may transfer before or after they have earned a credential or achieved “transfer-ready” status. Each performance measure is calculated independently in this manner within a given analysis. The basic performance measures prepared for the validation study are as follows.

Completion rate. Students who earned an associate degree, tracked from the point at which they enroll for the first time for credit leading to a degree. Students placed in developmental work are considered to have reached this start point if they are enrolled in the appropriate course of study.

Second term persistence rate. Students in an entering cohort that remained enrolled in a program leading to a credential or a degree at any Florida Community College the following term, tracked from the point at which they enroll for the first time in instruction that leads to a credential.

Second year persistence rate. Students in an entering cohort that remained enrolled in a program leading to a credential or a degree at any Florida Community College the following year (fall for fall-term starters, spring for spring-term starters), tracked from the point at which they enroll for the first time in instruction that leads to a credential.

College pathway status. College pathway status is achieved when the student has completed 12 semester hours (or equivalent) of college credit, and can therefore be considered to be seriously on the path toward achieving a college credential.

Transfer-ready status. Transfer-ready status is achieved when the student has (a) completed 30 SCH of college credit; (b) has passed or placed out of all developmental work and; (c) has completed English Composition, a college-level math course, and one college-level course in each basic discipline cluster (science, social science, and humanities).

Cumulative grade point average. Cumulative grade-point average that was computed as earned in all completed courses.

Cumulative credit completion ratio. The total number of credit hours earned in all courses by students in an analysis divided by the total number of credit hours attempted in all courses. This measure accounts for course withdrawals and incompletes, as well as academic performance.

Percentage of courses completed with a grade of "C" or better. The total number of courses in which a grade of "C" or better was earned by students in an analysis was divided by the total number of courses these students attempted.

Grade performance in developmental courses. Average grade performance for students in an analysis for all developmental courses in which these students enrolled in reading, writing, or mathematics.

Grade performance in gatekeeper courses. The average grade for students in common English and Mathematics "gatekeeper" courses that are required of all students in order to complete their academic programs. Specific "gatekeeper" courses identified by the Florida Community College System include English 1101, Math 1033, and Math 1105.

Enrollment. The cumulative number of terms enrolled.

Cumulative credits completed. The cumulative number of credits completed per student.

Most of these performance measures were created for Long cohort files, with subsets calculated as appropriate for Short cohort files and the Cross-sectional performance file.

Analyses

Within each of the three analytical files (Long cohorts, Short cohorts, and the Cross-sectional performance file), three basic analytical methods were used to examine relationships between *CCSSE* benchmarks, item clusters, and the defined performance measures: bivariate correlations, regression analysis, and logistic regression analysis. For the cohort files, independent analyses were first performed for each starting cohort individually to determine if there were systematic differences in the relationships among variables over time or between students beginning their studies in the spring term as opposed to the fall term. No such differences were detected, so all individual cohort files were merged in order to assemble a large number of cases for analysis.

Bivariate correlations were calculated for each possible pair of *CCSSE* benchmarks and item clusters and performance measures. This analysis examines *CCSSE* as a direct predictor of academic outcomes and behavior—i.e. a "proxy" for academic performance itself. These analyses were not limited by missing data except any missing data that might be present in either of the two paired variables.

Regression analyses were performed to determine the net effect of each *CCSSE* benchmark or item cluster on each performance measure. Control variables in the regression included gender, a dummy variable representing black, Hispanic, or Native American status, age at entry, number of years since high school completion at entry, placement test (CPT) scores in reading, writing, and math, and credit hour load. For those performance measures typically taking more time to complete—for example, degree completion or achievement of transfer-ready status—the cohort was also used as a control. The cumulative effects of missing data (principally CPT placement test scores) meant that these analyses generally were based on about one third fewer students in each file than the correlation analyses.

Logistic regression models were constructed with controls identical to those used in the regression models and were used for binary performance measures (e.g., earning an associate degree or attaining "college path" status). Results for the OLS and logistic regressions were for the most part consistent, though a few differences were detected.

In all of the regressions, student ability (as measured by CPT scores), selected demographics such as race/ethnic status, and identified risk factors were powerfully related to outcomes, leaving little additional variance for *CCSSE* constructs to account for. Under these conditions, the emergence of any significant effects for *CCSSE* benchmarks and item clusters indicates the presence of a net effect. Except for whether or not the *CCSSE* benchmark or item cluster emerged as a significant predictor, the strength and direction of relationships between performance measures and control variables in these regressions differed little across analyses.

Results

Merged cohort results

Merged cohort files were constructed on the basis of students beginning their studies at a Florida community college in fall or spring terms from fall 1996 through fall 2002, with records updated through summer 2005. After all exclusions were applied, the working data file contained a total of 1958 cases. Because of the long period over which students were tracked, analyses of Long cohorts could examine a wide range of student outcomes, as indicated in Table 2. See Appendix Tables A1 – A10 for complete Merged Cohort results.

Table 2

Descriptive Statistics for Outcomes in Merged Cohorts

Performance Measure	Summary Results
Earned LT Associate (%)	2.9
Earned Associate (%)	37.1
Earned Associate in 3 Years (%)	21.7
Took Gatekeeper Course (%)	87.4
Passed Gatekeeper Course (%)	82.5
Failed Gatekeeper Course (%)	36.3
Took Developmental Course (%)	58.5
Passed Developmental Course (%)	53.0
Failed Developmental Course (%)	34.0
Transfer-ready (%)	23.9
Enrolled Next Term (%)	82.4
Enrolled Next Year (%)	76.9
College Path by Next Term (%)	64.1
Overall GPA	3.01
Credit Completion Ratio	80.7
Classes Completed with C or Better (%)	76.2

CCSSE benchmarks and item clusters are significant bivariate and net predictors of college-level GPA, but are somewhat less well associated with credit-completion ratios and the

completion of courses with a grade of "C" or better after controls are introduced. With regard to GPA, all of the "academic" *CCSSE* benchmarks and item clusters are significantly associated with performance. All three outcome measures show significant net effects with the *CCSSE* item on Academic Gains, providing useful validation for this self report.

CCSSE constructs are also significant bivariate and net predictors of overall associate degree completion, as well as degree completion within three years. Interestingly, Student-Faculty Interaction, along with Class Assignments and Exposure to Diversity item clusters, is not associated with degree completion.

CCSSE constructs exhibit positive net effects on achieving transfer-ready status. Transfer-ready, it should be emphasized, is the most "academic" of the performance measures used, with the exception of GPA, so it is particularly interesting that it emerges as one of the stronger sets of net relationships with the *CCSSE* "academic" benchmark Academic Challenge, and the Academic Preparation and Mental Activities item clusters. Support for the validity of *CCSSE*'s self-reported Gains in Academics item cluster is again provided by the emergence of this *CCSSE* item as a significant predictor.

In contrast, fewer *CCSSE* benchmarks and item clusters are significantly related to early persistence—either to the next term or to the next year—after controls are introduced. But those net effects that emerged as significant are for item clusters that the literature suggests should be related to persistence—that is, Collaborative Learning and Student Services item clusters.

CCSSE constructs have relatively weak relationships with taking and passing either developmental or gatekeeper courses—both direct and after controls.

Short cohort Results

Short cohort files were constructed on the basis of students beginning their studies at a Florida community college in fall or spring terms from fall 1996 through fall 2004, with records updated for their first three terms of potential enrollment. After all exclusions were applied, the working data file contained a total of 2,658 cases. Because of the limited period over which students were tracked, analyses of Short cohorts could examine only a subset of the outcomes possible using Merged Cohorts, but with a greater number of cases. Summary results for

performance outcomes are summarized in Table 3. See Appendix Tables A11 – A17 for complete Short cohort results.

Table 3

Descriptive Statistics for Outcomes in Short cohorts

Performance Measure	Summary Results
Enrolled Next Term (%)	76.7
College Path by Next Term (%)	69.4
Overall GPA	2.84
Credit Completion Ratio	78.1
Classes Completed with C or Better (%)	81.7
Took Gatekeeper Course (%)	63.3
Passed Gatekeeper Course (%)	54.5
Failed Gatekeeper Course (%)	19.3
Took Developmental Course (%)	51.4
Passed Developmental Course (%)	57.1
Failed Developmental Course (%)	24.0

Significant net effects on GPA within the first three terms of enrollment emerged only for Active and Collaborative Learning, Student Effort, and Class Assignments benchmarks while the validity of self-reported Academic Gains was again modestly confirmed. This suggests that the net effects of engagement on academic outcomes are more marked in later terms of enrollment—after a student has achieved "college path" status—than in the first three terms of enrollment.[2] For credit completion, moreover, the Support for Learners benchmarks and the Class Assignments and School Opinions item clusters emerged as a significant net predictor within the first three terms of engagement. For the proportion of courses completed with a grade of "C" or better in the first three terms of enrollment, Academic Challenge and Academic Preparation showed significant net effects. Finally, self-reported Gain in Academics was again validated aGainst a real measure of academic success.

[2] Short cohorts also had significantly lower GPA than Long cohorts (2.84 vs. 3.01) reflecting both the superior academic performance for "survivors" and the typical phenomenon at most institutions of increasing grades in later terms of enrollment for successful students.

Significant net effects on persistence to the next term emerged for a number of *CCSSE* constructs, including the Active and Collaborative Learning, Support for Learners, Student-Faculty Interaction benchmarks and the Collaborative Learning item cluster, while virtually all *CCSSE* constructs showed significant bivariate correlations. A somewhat stronger pattern of association—both bivariate and net—emerged for achieving "college path" status by the end of the first year of enrollment.

Only a few significant net effects emerged for course performance in the Short cohort group. For developmental coursework, only the Active and Collaborative Learning benchmark, and the Class Assignments and Academic Preparation item clusters showed significant net effects, while for gatekeeper course performance, only Class Assignments showed a significant net effect.

Cross-sectional performance file for Academic Year 2003-2004

This file was constructed to correspond as closely as possible to the "academic year" to which students would be expected to be referring when they reported experiences and behaviors on the *CCSSE* in the spring of 2004. It contains all students who completed the *CCSSE* at that time and enrolled at any point in the fall 2003, spring 2004, or summer 2004 terms and records all academic activity within that time period. After all exclusions were applied, the working data file contained a total of 3,544 cases. Because this file was cross-sectional, persistence could not be investigated. And again, the limited period over which students were tracked, analyses could examine only a subset of the outcomes possible using Long cohorts, but with a greater number of cases. Summary results for performance outcomes are summarized in Table 4.[3] See Appendix Tables A18 – A21 for complete Cross-sectional performance file results.

CCSSE constructs are significant bivariate and net predictors of college-level GPA, three-term credit completion ratios, and the percent of courses in which a grade of A through C was earned. All the *CCSSE* "academic" item constructs are related to all three of these outcomes, with Collaborative Learning and Student Services item clusters also significant net predictors for

[3] Note: Too few of the students in this dataset enrolled in developmental classes to support meaningful analyses.

credit completion ratio. All three measures show significant net effects with the Academic Gain item cluster, providing useful validation for this self-report.

Table 4

Descriptive Statistics for Outcomes in Cross-sectional performance file for Academic Year 2003-2004

Performance Measure	Summary Results
Overall GPA	2.89
GPA in Gatekeeper Course	2.53
Credit Completion Ratio	82.2
Classes Completed with C or Better (%)	80.6

Only 27.2% of those included in the analysis took a gatekeeper course in the 2003-2004 academic years, but grade-point performance for those who did take such courses shows significant bivariate and net effects for most *CCSSE* "academic" constructs, including the Student Effort and Academic Challenge benchmarks and the Class Assignments and Academic Preparation item clusters.

Conditional Effects

Because conditional effects have appeared intermittently in previous studies examining the relationship between *CCSSE* and NSSE responses and outcomes, a particular effort was made in this study to look for such effects in two areas: student academic ability and minority status. At issue was whether engagement matters more or less for students who enter with differing levels of academic ability or for minority students vs. white students. To investigate these questions, two sets of interaction variables were computed for all *CCSSE* item clusters in each of the three analytical files by multiplying each *CCSSE* benchmark or item cluster by total CPT score and by each race/ethnicity category. Each of these interaction variables was then entered into the regression on academic performance measures, together with all previous controls and the *CCSSE* construct to which the interaction variable corresponded.

A number of significant interaction effects were revealed for entering ability in the analyses of all three datasets—Long cohorts, Short cohorts, and the 2003-2004 Cross-sectional performance file. Consistent with previous studies of four-year institutions (Kuh, Kinzie, Cruce, Shoup, & Gonyea 2006; Cruce, Wolniak, Seifert, & Pascarella 2006), these showed that higher levels of engagement boosted GPA for students with low CPT scores, but not for students with high CPT scores. A graphic illustration of two of these conditional effects detected in the cohort files is provided in Figure 3 and Figure 4.

Figure 3

Conditional Effects of Academic Preparation and College Placement Tests on GPA

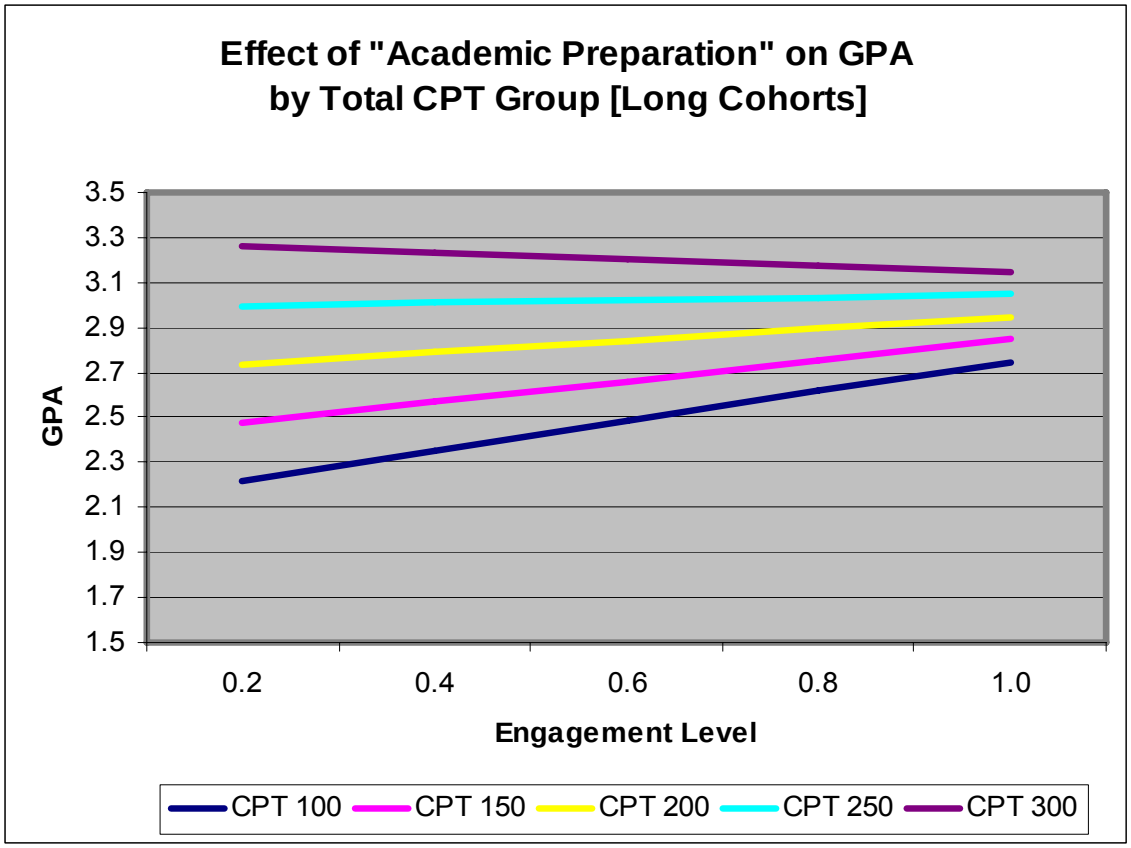
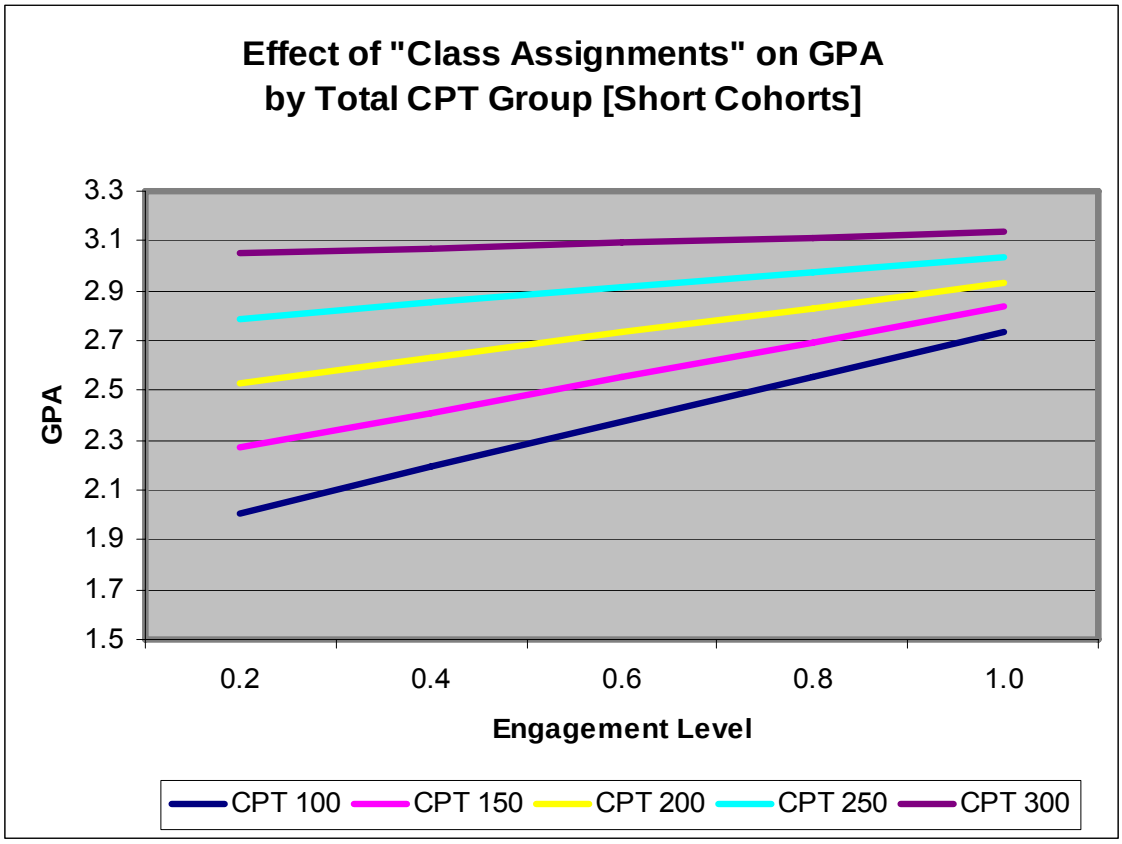


Figure 4

Conditional Effects of Class Assignments and College Placement Tests on GPA

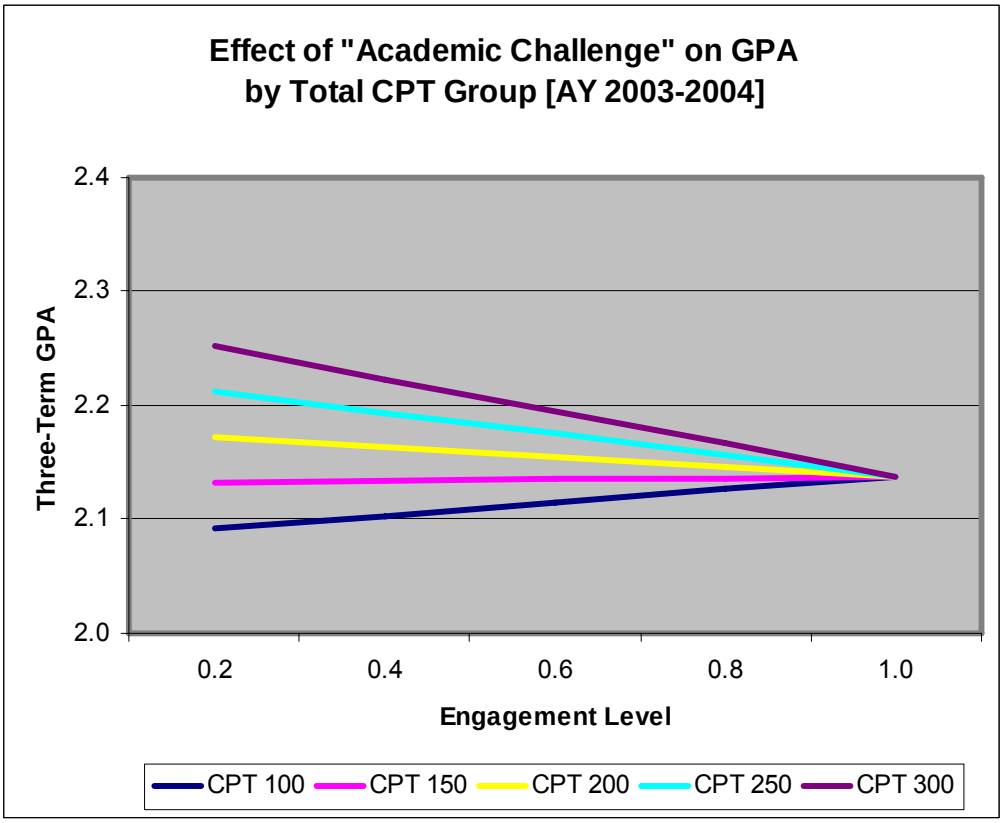


As is apparent, the regression model predicts that students in the lowest CPT ability groups in both cases gain markedly in GPA as their levels of engagement go up, while those in the highest ability group benefit less from engagement with respect to GPA, and their performance may even go down.

Similar effects can be striking for students in the Cross-sectional performance file for Academic Year 2003-2004—arguably, the dataset most suited to detecting the impact of engagement because academic outcomes were measured for the same year *CCSSE* responses were collected. The examples in Figure 5 and Figure 6 plot results for GPA and for the Credit Hour Completion Ratio.

Figure 5

Conditional Effects of Academic Challenge and College Placement Tests on Three-Term GPA



These cases are particularly interesting because students in the lowest ability group at the highest level of engagement rise to the performance levels attained by students in the highest ability group at the highest levels of engagement.

Interaction effects of this kind between *CCSSE* constructs and CPT scores were found frequently for course-level performance. The most prominent among these were for the Support for Learners benchmark and the Class Assignments and Academic Preparation item clusters on GPA and Credit Completion Ratio. For less immediately academic outcomes like persistence and the achievement of "college path" status, similar conditional effects were found for the Support for Learners benchmark and the Student Services item cluster. Table 5, Table 6, and Table 7 note all instances where ability-related conditional effects emerged as significant at or below the .05 confidence level.

Figure 6

Conditional Effects of Academic Challenge and College Placement Tests on Credit Completion Ratio

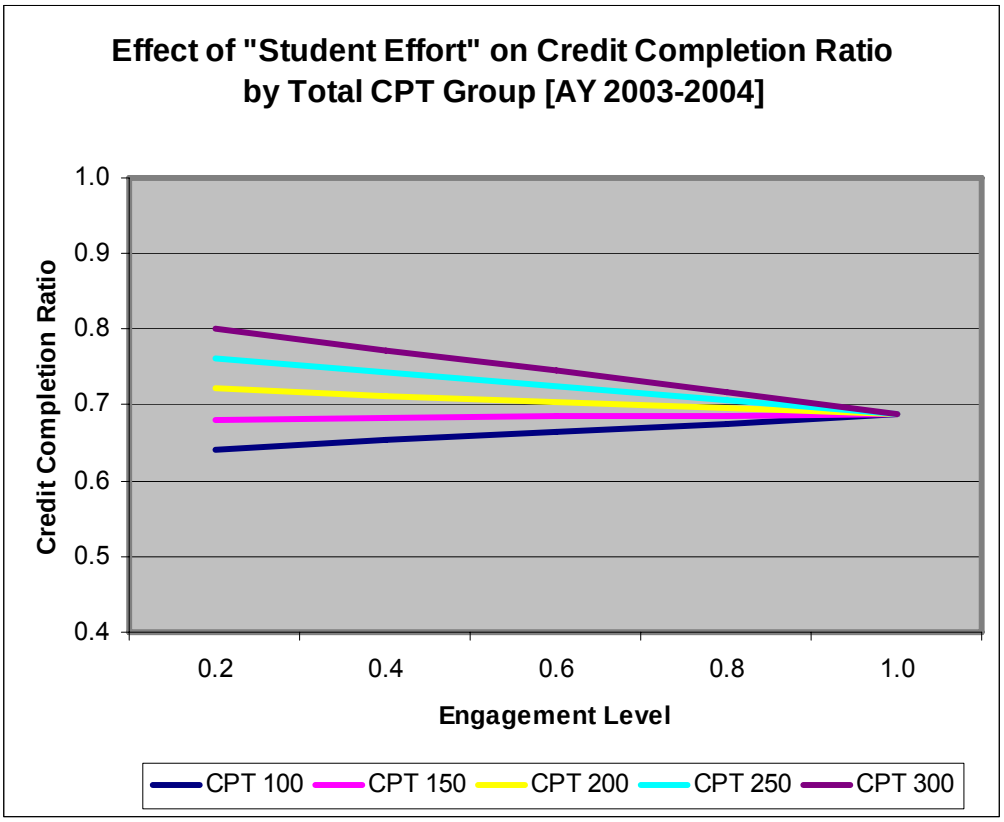


Table 5

Significant Ability-Related Conditional Effects for GPA

CCSSE Construct	Merged Cohorts	Short cohorts	2003-2004 Acad. Year
Active and Collaborative Learning	<.1 Level		
Student Effort	<.1 Level		<.1 Level
Academic Challenge			
Student-Faculty Interaction			
Support for Learners		Yes	
Faculty Interactions			
Class Assignments	Yes	Yes	
Exposure to Diversity			
Collaborative Learning	Yes		
Information Technology		<.1 Level	<.1 Level
Mental Activities			
School Opinions		<.1 Level	
Student Services			
Academic Preparation	Yes	<.1 Level	

Table 6

Significant Ability-Related Conditional Effects for Credit Completion Ratio

CCSSE Construct	Merged Cohorts	Short cohorts	2003-2004 Acad. Year
Active and Collaborative Learning	Yes		<.1 Level
Student Effort	Yes		Yes
Academic Challenge			Yes
Student-Faculty Interaction			Yes
Support for Learners		Yes	
Faculty Interactions			Yes
Class Assignments	Yes	<.1 Level	Yes
Exposure to Diversity			
Collaborative Learning	Yes		
Information Technology			
Mental Activities			Yes
School Opinions		Yes	
Student Services		<.1 Level	<.1 Level
Academic Preparation	Yes		<.1 Level

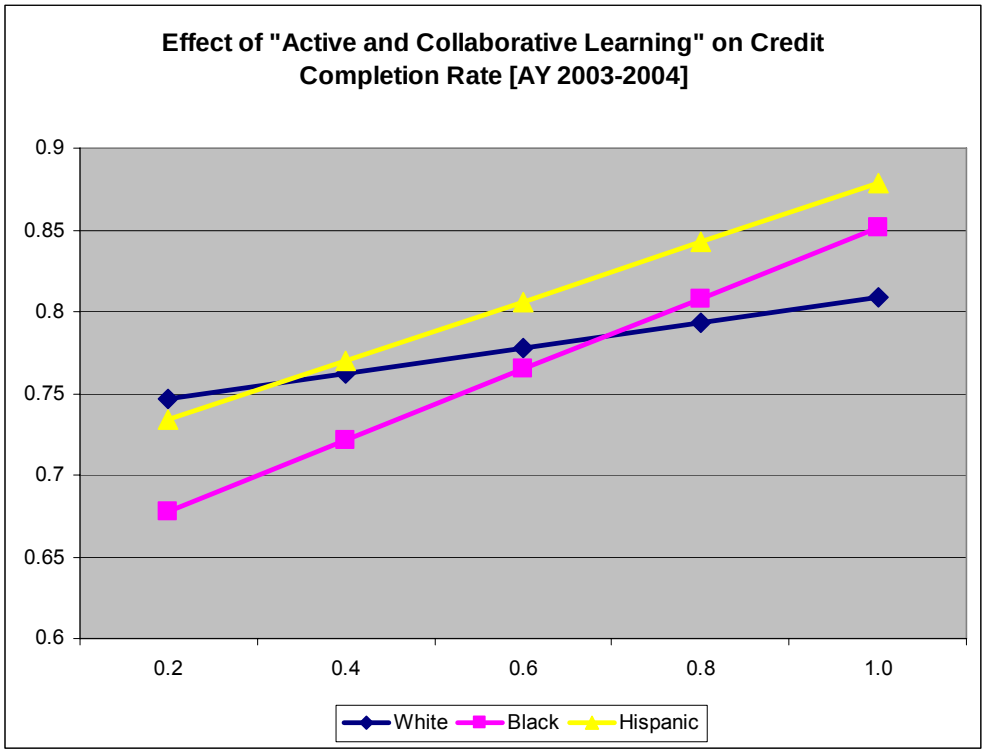
Table 7

Significant Ability-Related Conditional Effects for Courses with A-C Grades

CCSSE Construct	Merged Cohorts	Short cohorts	2003-2004 Acad. Year
Active and Collaborative Learning			
Student Effort	<.1 Level		<.1 Level
Academic Challenge			Yes
Student-Faculty Interaction			
Support for Learners			
Faculty Interactions		Yes	<.1 Level
Class Assignments	Yes		
Exposure to Diversity			
Collaborative Learning			
Information Technology			
Mental Activities			Yes
School Opinions			
Student Services		Yes	
Academic Preparation			

Figure 7

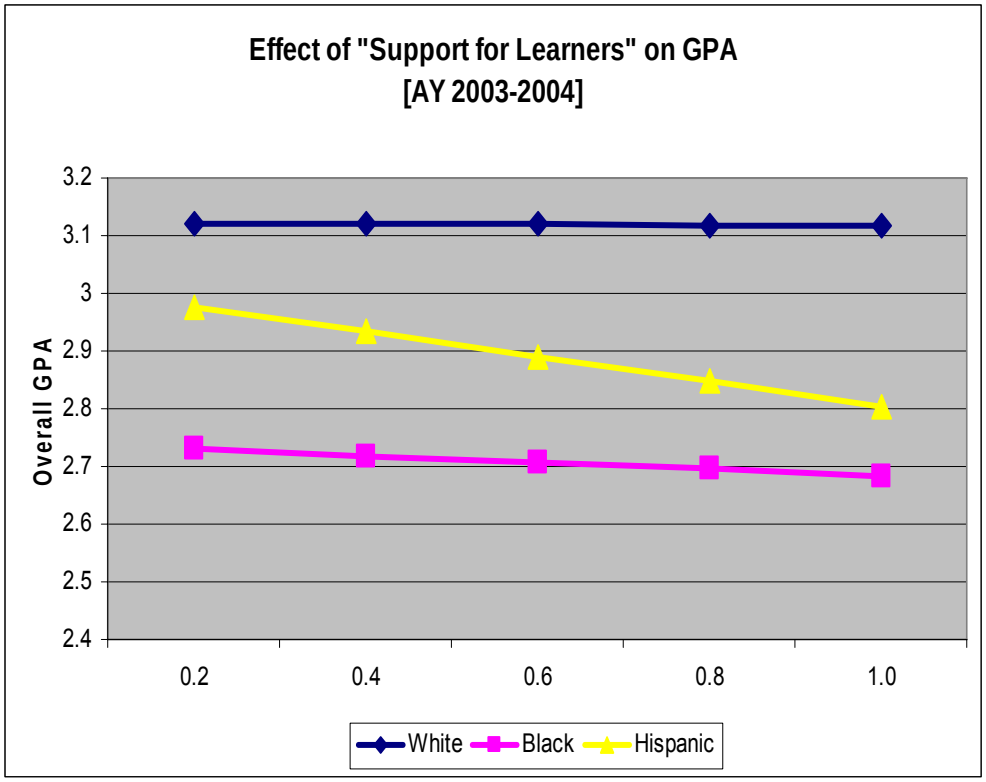
Conditional Effects of Active and Collaborative Learning and Race on Credit Completion Ratio



Far fewer conditional effects of this kind were found for race/ethnicity, and the few that were identified were not always compensatory. That is, in some cases, greater levels of engagement as reflected in *CCSSE* responses benefited blacks and Hispanics more than they did whites in terms of academic outcomes, while in some cases the reverse was true. No conditional effects on race/ethnicity were found for less immediately academic outcomes like persistence and degree completion. Graphic illustrations of two typical, but opposite, conditional effects of this kind are displayed in Figure 7 and Figure 8.

Figure 8

Conditional Effects of Support for Learners and Race on GPA



In the case in Figure 7, both blacks and Hispanics gain markedly in credit-completion rates as their reported participation in behaviors associated with Active and Collaborative Learning increases; white students gain as well, but not so markedly. In the case in Figure 8, however, GPA is essentially unchanged for whites and blacks as Support for Learners increases, but decreases somewhat for Hispanic students. Table 8, Table 9, and Table 10 note all instances

where interaction variables were significant at the .05 confidence level or beyond for African-American and Hispanic students and also indicate the direction of these conditional effects.

Table 8

Significant Race-Related Conditional Effects for GPA

	African-American			Hispanic		
CCSSE Construct	Merged Cohorts	Short Cohorts	AY 2003-04	Merged Cohorts	Short Cohorts	AY 2003-04
Active and Collaborative Learning						
Student Effort		Positive				
Academic Challenge						
Student-Faculty Interaction						
Support for Learners	Negative		Negative	Negative		Negative
Faculty Interactions			Negative			Positive
Class Assignments						
Exposure to Diversity						
Collaborative Learning						
Information Technology			Negative			Positive
Mental Activities						
School Opinions	Negative		Negative	Negative		Negative
Student Services						
Academic Preparation						

Table 9

Significant Race-Related Conditional Effects for Credit Completion Ratio

	African-American			Hispanic		
CCSSE Construct	Merged Cohorts	Short Cohorts	AY 2003-04	Merged Cohorts	Short Cohorts	AY 2003-04
Active and Collaborative Learning			Positive			Positive
Student Effort						
Academic Challenge						
Student-Faculty Interaction						
Support for Learners			Positive			
Faculty Interactions			Positive			
Class Assignments						
Exposure to Diversity						
Collaborative Learning						
Information Technology						
Mental Activities						
School Opinions	Positive					Negative
Student Services			Positive			
Academic Preparation						

Table 10

Significant Race-Related Conditional Effects for Courses with A-C Grades

	African-American			Hispanic		
CCSSE Construct	Merged Cohorts	Short Cohorts	AY 2003-04	Merged Cohorts	Short Cohorts	AY 2003-04
Active and Collaborative Learning						
Student Effort						
Academic Challenge						
Student-Faculty Interaction						
Support for Learners			Negative	Positive		Negative
Faculty Interactions			Negative			Positive
Class Assignments						
Exposure to Diversity						
Collaborative Learning						
Information Technology			Negative			
Mental Activities						
School Opinions	Positive		Negative	Positive		Negative
Student Services						
Academic Preparation						

While patterns of results here are mixed, positive effects for African-Americans and Hispanics appear more likely to emerge in credit-completion than in graded academic performance and tend to be more associated with less "academic" *CCSSE* constructs, such as the Support for Learners benchmark and the School Opinions and Student Services item clusters. With regard to pure academic performance as reflected in GPA and percentage of courses with grades of C or better, negative effects strongly outnumber positive compensatory effects for African-American and Hispanic students.

Discussion

Overall, this pattern of results broadly confirms the presence of positive relationships between the construct of student engagement as measured by *CCSSE* and community college student outcomes. *CCSSE* benchmarks and item clusters show a consistent pattern of significant association with academic outcomes like GPA, degree completion, and attaining important academic milestones like "college path" and "transfer-ready" status after controlling for student characteristics and entering ability. And the strongest of these net effects materialize where they are most expected—for "academic" areas of engagement such as Academic Challenge, Active and Collaborative Learning, Student-Faculty Interaction, and Mental Activities. At the same time,

self-reported Academic Gains on *CCSSE* are significantly related to actual academic achievement measures like GPA, achieving "transfer-ready" status, and degree completion, both directly (confirmed through bivariate correlation analysis) and after controlling for student ability and background.

While pervasive significant net effects of this kind are less typical of behavioral measures of student success like persistence to a second term or year, they do occur repeatedly across both longitudinal cohort datasets. Moreover, the *CCSSE* constructs that emerge as significant in these cases are those that the retention literature says should do so: Support for Learners and Student Services (and occasionally Collaborative Learning).

Two *CCSSE* item clusters do not appear to influence outcomes of either kind: Exposure to Diversity and Information Technology. This is consistent with much previous work on *CCSSE*.

The emergence of conditional effects, though less pervasive than direct effects, confirms the results of similar studies using NSSE and other four-year academic outcomes (Kuh et. al. 2006; Cruce et. al. 2006; Carini, Kuh, & Klein 2006) about the compensatory value of engagement for lower-ability students. And these interaction effects are also in expected directions—academic factors related to academic outcomes like GPA and more supportive factors related to behavioral outcomes like persistence. But the conditional effects uncovered for race/ethnicity are mixed, with some evidence of compensatory effects for African-Americans and Hispanics emerging for less "academic" forms of engagement on credit completion ratios, but generally negative outcomes for pure academic performance.

Finally, one caveat that must be placed on these results is the fact that the study sample is skewed toward "traditional" community college students. While exploratory analyses revealed no significant differences in these patterns of association between younger and older students, full-time enrollees vs. part-time enrollees, or AA-seekers versus students seeking credentials other than the AA, there were too few cases of non-traditional students in the core sample to allow such differences to be entirely ruled out.

Study 2: Achieving the Dream Validation Study

Study Description

Sample Overview

Data from 24 community colleges in the Achieving the Dream initiative were analyzed. These data were merged with *CCSSE* survey data to examine the relationship between student engagement and perceived Gains based on *CCSSE* responses and student outcome information from administrative data reported by colleges for Achieving the Dream. There were a total of 1,623 students who completed the CCSR in a primary *CCSSE* sample and provided an ID that could be matched to a record in the Achieving the Dream database.

Approximately 95% of the sample responded to *CCSSE* in either the 2004 or 2005 administrations. The sample was split among each of the three Achieving the Dream cohorts: 31% began in 2002, 44% began in 2003, and 24% began in 2004. Thus, almost 75 percent of the sample had at least four terms of data (excluding the summer terms which were sparsely populated in the Achieving the Dream database), and the entire sample had at least one academic term of data (fall and spring). All analyses were conducted on the complete sample across all cohorts unless otherwise stated. Table 11 illustrates frequency characteristics for key control variables used in the validation study: gender, race and ethnicity, part-time status, and age.

These data indicate that the merged sample is much younger than the overall Achieving the Dream universe, and more likely to be women. Students in the merged database are much less likely to enroll part-time (28% vs. 40%) in their first term. Although the merged sample has a slightly lower proportion of blacks (non-Hispanics) (14.0% vs. 16.6%) than the overall Achieving the Dream universe and a slightly higher proportion of Hispanics (34.8% vs. 30.8%), the race and ethnic distribution of the merged sample remains predominantly non-white (59%) – which reflects the college eligibility requirement of the Achieving the Dream initiative.

Table 11

Race, Ethnic, Gender, Age and Part-Time Status: Achieving the Dream Universe and Merged Analytic Sample

Variable	Achieving the Dream Universe	Merged Analytic Sample
Gender (%)		
Male	43.4	35.3
Female	55.2	64.7
Race and Ethnicity (%)		
Black, non-Hispanic	16.6	14.0
White, non-Hispanic	40.3	41.8
Hispanic	30.4	34.8
Other	12.7	9.4
Part-Time Status (Year 1, Term 1) (%)		
Yes	40.8	28.3
No	59.2	71.7
Age (%)		
25 or older	28.1	22.9
24 or younger	71.9	77.1
N	244,675	1,623

The merged analytic sample indicates the significant need for students at Achieving the Dream colleges to enroll in developmental education courses: almost two-thirds (63%) placed at least one-level below college math, about one-third (33%) placed at least one-level below college English, and 35 percent placed at least one-level below college reading.

Data Construction

The first step of the validation study involved merging a database of community college students at Achieving the Dream institutions who began in 2002, 2003 or 2004 – the final analysis used the Achieving the Dream database from July 6, 2006 – with a *CCSSE* database of students who took the *CCSSE* at one of the Achieving the Dream colleges between 2002 and 2005. There were 5,551 students who provided student IDs. Of these 5,551 students, 1,623 *CCSSE* respondents voluntarily provided a unique student identifier that allowed their responses to be matched with Achieving the Dream administrative records.

Study Variables

The Achieving the Dream database includes developmental education, college algebra, and college English course information, enrollment data for each term, and degree or certificate attainment information. The administrative records also include basic student demographics, including gender, race and ethnicity, and age. The *CCSSE* database provides information on *CCSSE* benchmarks, engagement item clusters, and perceived Gains item clusters. Additionally, an indicator of risk factors constructed from *CCSSE* response data was derived. Several outcome variables were created for the validation study and are described below.

Enrollment. For each term in the database, a variable measuring cumulative fall and spring terms enrolled was created.

College algebra course completions. For each term in the database, binary variables were constructed for students who completed College Algebra with a 'C' or better. Additionally, a binary variable was constructed for completion of College Algebra at any time up to the third year spring term.

College English course completions. For each term in the database, binary variables were constructed for students who completed College English with a 'C' or better. Additionally, a binary variable was constructed for completion of College English at any time up to the third year spring term.

Developmental math course completions. For each term in the database, binary variables were constructed for students who completed a developmental math course - by level - with a 'B' or better. Additionally, binary variables were constructed for completion of developmental math – by level – at any time up to the third year spring term.

Developmental English course completions. For each term in the database, binary variables were constructed for students who completed a developmental English course - by level - with a 'B' or better. Additionally, binary variables were constructed for completion of developmental English – by level – at any time up to the third year spring term.

Developmental reading course completions. For each term in the database, binary variables were constructed for students who completed a developmental reading course - by level

- with a 'B' or better. Additionally, binary variables were constructed for completion of developmental reading – by level – at any time up to the third year spring term.

Cumulative GPA. For each term in the database, cumulative grade point average is reported.

Cumulative credits completed. For each term in the database, a variable measuring cumulative credits completed from the first through the third year was created.

Credit-completion ratios. For each term in the database, credit completion ratios were constructed as a measure of the number of credits completed divided by the number of credits attempted. In addition, a cumulative ratio variable was constructed as a measure of the number of credits completed divided by the number of credits attempted for the first and second year, and for the first through third year.

Persistence. For each term in the database, an enrollment flag was created to account for students who attempted both credit and non-credit courses. An intermediate persistence variable was derived using these enrollment flags: year-to-year persistence from fall to fall, year 1 to year 2.

Attainment. Degree or certificate completion flags were created for all students in the merged analytic database.

Analyses

Three basic methods were used to examine these relationships. First, an equality of means test (*t* test) was used to examine differences in *CCSSE* benchmarks between different groups of students. Second, bivariate correlations were calculated for each possible pair of *CCSSE* constructs and Achieving the Dream outcome variables. Finally, each of these relationships was further examined through regression analyses to estimate the net effect of each *CCSSE* benchmark, engagement item cluster, and perceived Gains item cluster on each outcome measure (logistic regression was used for binary dependent variables, and linear regression was used for continuous dependent variables). Control variables in the regression included gender, race and ethnicity, age, developmental math placement levels, part-time status,

and a risk index created from *CCSSE* responses. In addition, the Achieving the Dream cohort was used as control. In all, 17 regressions were run for each outcome measure.

Results

Comparison of CCSSE Benchmark Means

Race and ethnicity. Table 12 illustrates the mean *CCSSE* benchmarks for different groups of students according to race and ethnic characteristics. *T* tests were conducted between black and white students, and between Hispanic and white students; results of this statistical test indicates that black students are more engaged than white students on the Student Effort, Academic Challenge, and Support for Learners benchmarks; however, there were no statistical differences in mean benchmark scores for Active and Collaborative Learning or Student-Faculty Interaction. Hispanic students are more engaged than white students on the Student Effort and Support for Learners benchmarks, but no statistical differences were found for Active and Collaborative Learning, Student-Faculty Interaction, and Academic Challenge.

Table 12

Comparison of CCSSE Benchmark Means by Race and Ethnicity

CCSSE Benchmark	Mean	t	Sig.	N
Active and Collaborative Learning				
Black, non-Hispanic	.4018	1.598	.110	227
Hispanic	.3789	-.283	.776	565
White, non-Hispanic	.3815			678
Student Effort				
Black, non-Hispanic	.5195	4.096	.000	227
Hispanic	.4978	3.224	.001	565
White, non-Hispanic	.4694			905
Academic Challenge				
Black, non-Hispanic	.6175	4.049	.000	227
Hispanic	.5706	.645	.519	565
White, non-Hispanic	.5646			905
Student-Faculty Interaction				
Black, non-Hispanic	.3875	.224	.823	227
Hispanic	.3662	-1.719	.086	565
White, non-Hispanic	.3843			677
Support for Learners				
Black, non-Hispanic	.5218	5.685	.000	224
Hispanic	.4924	5.199	.000	565
White, non-Hispanic	.4307			678

NOTE: *t* tests for black and Hispanic are based on comparison with white

Public assistance. Table 13 provides results for comparisons between students who reported that public assistance was a major source of support for college enrollment and those who reported that public assistance was not a source of support. This survey item was used as a proxy for low-income status; this statistical test suggests that low-income students are more engaged than higher income students on four of five *CCSSE* benchmarks: Active and Collaborative Learning, Student Effort, Student-Faculty Interaction, and Support for Learners. Although the Achieving the Dream database has administrative records for Pell grant receipt (a typical proxy for low-income), these data are considered unreliable due to reporting problems from participating colleges and were not used for this analysis.

Table 13

Comparison of CCSSE Benchmark Means, by Income Proxy (Public Assistance as Source of Support)

CCSSE Benchmark	Mean	*t*	Sig.	N
Active and Collaborative Learning				
Public Assistance Major Source	.4344	3.998	.000	152
Public Assistance Not a Source	.3783			1,309
Student Effort				
Public Assistance Major Source	.5219	2.667	.008	152
Public Assistance Not a Source	.4864			1,309
Academic Challenge				
Public Assistance Major Source	.5976	1.702	.089	152
Public Assistance Not a Source	.5731			1,309
Student-Faculty Interaction				
Public Assistance Major Source	.4203	3.009	.003	152
Public Assistance Not a Source	.3732			1,309
Support for Learners				
Public Assistance Major Source	.5587	5.835	.000	152
Public Assistance Not a Source	.4520			1,308

NOTE: Public Assistance Minor Source is not included in the table

Grants and scholarships. An alternative measure of students' economic background is *CCSSE* responses to reliance on grants and scholarships to pay for college. Table 14 provides the results of a statistical test comparing students who replied grants and scholarships were a major source of financial support with students who replied that gift aid was not a source at all. Based on this measure, students from lower income backgrounds are more engaged than higher income students on all *CCSSE* benchmarks.

Table 14

Comparison of CCSSE Benchmark Means, by Income Proxy (Grants and Scholarships as Source of Support)

CCSSE Benchmark	Mean	t	Sig.	N
Active and Collaborative Learning				
Grants & Scholarships Major Source	.3962	2.814	.005	697
Grants & Scholarships Not a Source	.3721			728
Student Effort				
Grants & Scholarships Major Source	.5145	6.184	.000	697
Grants & Scholarships Not a Source	.4646			728
Academic Challenge				
Grants & Scholarships Major Source	.5959	4.063	.000	697
Grants & Scholarships Not a Source	.5600			728
Student-Faculty Interaction				
Grants & Scholarships Major Source	.3931	3.019	.003	697
Grants & Scholarships Not a Source	.3637			728
Support for Learners				
Grants & Scholarships Major Source	.5157	8.079	.000	696
Grants & Scholarships Not a Source	.4247			728

NOTE: Grants & Scholarships Minor Source is not included in the table

Risk factors. Table 15 provides the results for a fourth comparison of means – between students with two or more risk factors and students with zero risk factors. Risk factors were defined by *CCSSE* staff and include part-time enrollment status, need for developmental education, single parents, students who work more than 30 hours weekly, first-generation students, and a financial flag indicating that financial issues are very likely to cause withdrawal from college. In the merged analytic file, less than 6 percent of students had zero risk factors and more than 70 percent had two or more. The statistical test indicates that students with two or more risk factors are more engaged than students with zero risk factors on only one *CCSSE* benchmark: Student Effort.

Table 15

Comparison of CCSSE Benchmark Means, by Student Risk Factors

CCSSE Benchmark	Mean	t	Sig.	N
Active and Collaborative Learning				
Two or more risk factors	.3840	-.185	.853	1171
Zero risk factors	.3871			103
Student Effort				
Two or more risk factors	.4994	3.412	.001	1171
Zero risk factors	.4458			103
Academic Challenge				
Two or more risk factors	.5803	1.120	.263	1171
Zero risk factors	.5608			103
Student-Faculty Interaction				
Two or more risk factors	.3784	.346	.730	1171
Zero risk factors	.3718			102
Support for Learners				
Two or more risk factors	.4764	.837	.403	1171
Zero risk factors	.4573			101

NOTE: Students with only one risk factor are not included in the table

Bivariate Correlations and Net Effects

Bivariate correlations were calculated for each possible pair of *CCSSE* constructs and Achieving the Dream outcome variables. Each of these relationships was further examined through regression analyses to estimate the net effect of each *CCSSE* construct. See Appendix Tables B1 – B17 for complete correlation and regression results

Gatekeeper courses. One *CCSSE* benchmark – Active and Collaborative Learning - is positively related to completion of College Algebra with a 'C' or better. In addition, three *CCSSE* item clusters and one gain measure had statistically significant bivariate correlations. Moreover, logistic regression results indicate positive net effects for the Active and Collaborative Learning benchmark, and for the Class Assignments and Collaborative Learning item clusters. Students' perception of Academic Gains also had positive net effects when predicting completion of College Algebra with a 'C' or better by the third year.

The results for completion of College English with a 'C' or better by the third year were less promising - none of the *CCSSE* benchmarks had statistically significant bivariate correlations, and only one item cluster – Information Technology – had a statistically significant

bivariate correlation. There were no net effects of *CCSSE* benchmarks, item clusters, or perceived Gains when predicting completion of College English by the third year.

Developmental education. Two *CCSSE* benchmarks – Student Effort and Academic Challenge – had statistically significant bivariate correlations with the completion of developmental mathematics – one level below college - with a 'B' or better; these correlations did not hold in the regression analyses. Two item clusters – Academic Preparation and Faculty Interactions – also had statistically significant bivariate correlations. Students' perceptions of Academic Gains had both a statistically significant correlation, and a positive "net effect" when predicting completion of developmental math level 1 by the third year.

For completion of developmental math – two levels below college – students' School Opinions and Academic Preparation had statistically significant bivariate correlations with completion of developmental math level 2 with a 'B' or better by the third year. Additionally, students' perceived Academic Gains were also statistically significant. The perceived Academic Gains measure and the Academic Preparation item cluster also had positive net effects when predicting completion of developmental math level 2. No *CCSSE* benchmarks had statistically significant relationships with the completion of developmental math level 2.

Only two measures – the Active and Collaborative Learning benchmark and the Academic Preparation item cluster had statistically significant bivariate correlations with completion of developmental math – three levels below college – with a 'B' or better by the third year. Two additional item clusters – Class Assignments and Collaborative Learning – had positive net effects when predicting developmental math level 3 course completions; the Active and Collaborative Learning benchmark also had positive net effects when predicting the completion of developmental math level 3 with a 'B' or better.

Results for developmental English were less promising – only the Academic Preparation item cluster had a statistically significant bivariate correlation with the completion of developmental English (writing) – one level below college - with a 'B' or better by the third year. This item cluster also had a statistically significant bivariate correlation with the completion of developmental English two or more levels below college. Students' perceived Academic Gains

were also statistically related to the completion of developmental English level 2 with a 'B' or better by the third year. There were no net effects for *CCSSE* benchmarks, item clusters and Gains when predicting the completion of developmental English two or more levels below college by the third year. In contrast, two measures – students' School Opinions and the Support for Learners benchmark - had negative net effects when predicting the completion of developmental English level 1 with a 'B' or better by the third year.

Results for developmental reading were more positive than those for developmental English. One *CCSSE* benchmark – Student Effort – had a statistically significant bivariate correlation with the completion of both developmental reading one and two levels below college. One item cluster – Class Assignments – also had a statistically significant bivariate correlation with developmental reading level 1 and level 2. An additional item cluster – Information Technology – had a statistically significant bivariate correlation with completing developmental reading level 2 with a 'B' or better by the third year. Each of the measures with statistically significant bivariate correlations also had positive net effects when predicting the completion of developmental reading level 2 with a 'B' or better by the third year: the Student Effort benchmark, and the Class Assignments and Information Technology item clusters. One item cluster – Class Assignments – also had a positive "net effect" when predicting completion of developmental reading level 1 with a 'B' or better by the third year.

Academic achievement. Bivariate correlations and positive net effects were present for *CCSSE* benchmarks, item clusters, and academic achievement; however, there were no statistical relationships between students' perceived Gains and academic achievement. Three *CCSSE* benchmarks – Active and Collaborative Learning, Academic Challenge, and Student - Faculty Interaction had both statistically significant bivariate correlations and positive net effects when predicting cumulative grade point average after two years of college. Moreover, six item clusters – Faculty Interactions, Class Assignments, Exposure to Diversity, Collaborative Learning, Mental Activities, and Academic Preparation – had both statistically significant bivariate correlations and positive net effects when predicting cumulative GPA.

Persistence. Two measures of persistence were used for the validation study: credit completion ratios (year 1 through year 2) and fall-to-fall retention, year 1 to year 2. Bivariate correlations and positive net effects were present for *CCSSE* benchmarks, engagement item clusters and perceived academic Gains item clusters, and credit completion ratios through year 2.

Four *CCSSE* benchmarks had statistically significant bivariate correlations and positive net effects when predicting cumulative credit completion ratios after two years: Active and Collaborative Learning, Student Effort, Academic Challenge and Student-Faculty Interaction. Five additional item clusters also had statistically significant bivariate correlations and positive net effects when predicting cumulative credit completion ratios: Faculty Interactions, Class Assignments, Information Technology, Mental Activities, and Academic Preparation. Students' perceived Academic Gains also had a statistically significant bivariate correlation and positive "net effect" when predicting cumulative credit completion ratios after two years.

Similar results - but with fewer measures - were found when using persistence from the fall of year 1 to the fall of year 2 as a persistence measure. One *CCSSE* benchmark – Active and Collaborative Learning - had a statistically significant bivariate correlation and positive "net effect" when predicting year-to-year persistence. Three item clusters – Collaborative Learning, Information Technology, and Student Services – also had statistically significant bivariate correlations and positive net effects when predicting fall to fall persistence. Students' perceived Academic Gains was the final measure with statistically significant bivariate correlations and positive net effects when predicting persistence.

Attainment. The results for degree or certificate attainment after three years were also positive. Three *CCSSE* benchmarks – Active and Collaborative Learning, Academic Challenge, and Student–Faculty Interaction had statistically significant bivariate correlations and positive net effects when predicting graduation. Additionally, three item clusters had statistically significant bivariate correlations and positive net effects when predicting degree or certificate attainment after three years: Faculty Interactions, Collaborative Learning, and Academic Preparation. Further, students' perceived Career Gains has a statistically significant bivariate correlation and positive "net effect" when predicting graduation.

Within-term effects for GPA and credit completion ratios. A more discrete validation analysis was conducted according to the academic year a student was administered the *CCSSE*; for Achieving the Dream colleges, 60 percent of students took the survey in the spring of their first year and 34 percent of students took the survey in the spring of their second year.

CCSSE benchmarks, engagement item clusters, and perceived academic Gains item clusters were correlated and had positive net effects when predicting same-term credit completion ratios and cumulative GPA for students who took the *CCSSE* in their first academic year. Four *CCSSE* benchmarks – Active and Collaborative Learning, Student Effort, Academic Challenge, and Student-Faculty Interaction—positively predicted credit completion ratios during the spring term of the respondents' first academic year. Three of these benchmarks also predicted cumulative GPA: Active and Collaborative Learning, Student Effort, and Academic Challenge. Four engagement item clusters also had positive net effects when predicting same-term credit completion ratios and cumulative GPA: Faculty Interactions, Class Assignments, Mental Activities, and Academic Preparation. One additional item cluster – Information Technology – was also a positive predictor of same-term credit completion ratios. Finally, students' perceived Academic Gains had a positive "net effect" when predicting credit completion ratios.

The bivariate correlations and net effects for *CCSSE* benchmarks when predicting cumulative GPA after two years for students who took the *CCSSE* in their second academic year were also present; however, there were no net effects and only one bivariate correlation (Academic Preparation) with same-term credit completion ratios for students who took the *CCSSE* in the spring of their second academic year. Three *CCSSE* benchmarks – Active and Collaborative Learning, Student Effort, and Academic Challenge – and six item clusters (Faculty Interactions, Class Assignments, Exposure to Diversity, Collaborative Learning, Mental Activities and Academic Preparation) had positive net effects when predicting cumulative GPA after two years. In contrast, one *CCSSE* benchmark – Support for Learners – had a negative "net effect" when predicting cumulative GPA for students who took the *CCSSE* in the spring of their second

academic year. Additionally, students perceived Career Gains were also a negative predictor of cumulative GPA.

Discussion

The study examined overall differences in the levels of engagement between low-income students and other students, students of color and other students, and "high-risk" students and "low-risk" students. When using two *CCSSE* items as proxies for low-income status – reliance on grants and scholarships, and reliance on public assistance – there are statistical differences in mean *CCSSE* benchmark scores between low-income students and other students. Specifically, low-income students were more engaged than other students on at least four (and possibly all) of the *CCSSE* benchmarks: Active and Collaborative Learning, Student Effort, Student-Faculty Interaction, and Support for Learners. When using Achieving the Dream colleges' administrative records, and identifying students by race and ethnic categories, there are statistical differences in mean *CCSSE* benchmark scores between students of color and other students. Black, non-Hispanic students were more engaged than white students on the Student Effort, Academic Challenge and Support for Learners benchmarks. Hispanic students were more engaged than white students on the Student Effort and Support for Learners benchmarks. A risk factor measure, the total number of risk factors a student possessed, revealed statistically significant differences in mean *CCSSE* benchmark scores between "high-risk" and "low-risk" students on only one benchmark: Student Effort. "High-risk" students were more engaged than "low-risk" students on this measure.

The study examined whether engagement factors predict within-term persistence and whether engagement factors predict long-term persistence. Using credit completion ratios as a measure of within-term persistence indicates positive net effects for *CCSSE* benchmarks and item clusters when predicting credit completion ratios within the same term *CCSSE* was administered – if students took the *CCSSE* in the spring of their first year. The same measure for students who took the *CCSSE* in the spring of their second year yielded no "net effects." Long-term persistence was measured two ways – cumulative credit completion ratios after two years,

and fall-to-fall persistence year 1 to year 2. Four of the five *CCSSE* benchmarks – Active and Collaborative Learning, Student Effort, Academic Challenge, and Student-Faculty Interaction – had positive net effects when predicting cumulative credit completion ratios; several item clusters and students' perceived Academic Gains were also positive predictors of credit completion ratios after two years. Using fall-to-fall persistence as the outcome measure yielded positive net effects for the Active and Collaborative Learning benchmark as well as three *CCSSE* item clusters (Collaborative Learning, Information Technology, and use of Student Services) and students' perceived Academic Gains.

Completion of developmental and gatekeeper courses was examined to determine the extent to which engagement factors predict these outcomes. Using completion of developmental math, writing, and reading with a 'B' or better within three years yielded mixed results. For developmental math, the most promising results were at three levels below college; the Active and Collaborative Learning benchmark had a positive "net effect" when predicting course completion with a 'B' or better. No other benchmarks were positive predictors of developmental math course completions at any level. At the same time, students' perceived Academic Gains had a positive "net effect" when predicting developmental math course completions–level 1 and level 2–with a 'B' or better within three years.

For developmental English (writing), engagement does not predict successful course completion with a 'B' or better two or more levels below college English; moreover, the Support for Learners benchmark is a negative predictor – that is, students with higher scores on this benchmark are less likely to complete developmental English one level below college with a 'B' or better within three years.

For developmental reading, the most promising results were at two levels below college; the Student Effort benchmark had positive net effects when predicting developmental reading course completions with a 'B' or better within three years. The Class Assignments and Information Technology item clusters were also positive predictors of completing developmental reading level 2 with a 'B' or better. There were no net effects for *CCSSE* benchmarks when predicting course completions of developmental reading one level below college; however, the

Class Assignments item cluster was a positive predictor of completing developmental reading level 1 with a 'B' or better within three years.

Using completion of college Algebra and college English with a 'C' or better within three years yielded mixed results. The most promising results were for college Algebra: the Active and Collaborative Learning benchmark had a positive "net effect" when predicting the completion of college Algebra within three years. Two item clusters (Class Assignments and Collaborative Learning) were also positive predictors of completing college Algebra with a 'C' or better, as was students' perceived Academic Gains. There were no net effects for *CCSSE* benchmarks when predicting the completion of college English with a 'C' or better within three years.

In addition to examining developmental course completion, the relationship between engagement and completion of developmental courses across all levels of developmental needs was examined. The relationship between engagement and completion of developmental courses varies across levels. In fact, *CCSSE* benchmarks tend to predict completion of developmental math and reading at the lowest levels measured in this report. For developmental math level 3, Active and Collaborative Learning is the key predictor of successful completion with a 'B' or better, while Student Effort is the key predictor of successful completion of developmental reading level 2 with a 'B' or better. Students' perceived Academic Gains is a positive predictor of completing developmental math, levels 1 and 2; and the item cluster, Class Assignments, is a positive predictor for completing developmental reading, levels 1 and 2.

The net effects for engagement when predicting degree or certificate attainment within three years were very positive. Three *CCSSE* benchmarks – Active and Collaborative Learning, Academic Challenge, and Student-Faculty Interaction – had positive net effects when predicting graduation. Three item clusters (Faculty Interactions, Collaborative Learning, and Academic Preparation) were also positive predictors of graduation, as were students' perceived Career Gains.

CCSSE benchmarks positively predict cumulative GPA after two years and cumulative GPA at the end of the term in which *CCSSE* was administered. Overall, Active and Collaborative Learning, Academic Challenge, and Student–Faculty Interaction had positive net effects when

predicting cumulative GPA. Using cumulative GPA at the end of the term in which students took the *CCSSE* also yielded promising results: three benchmarks (Active and Collaborative Learning, Student Effort, and Academic Challenge) were positive predictors of cumulative GPA. Several *CCSSE* item clusters were also positive predictors of cumulative GPA; in contrast – for students who took the *CCSSE* during spring of their second year, perceived Career Gains was a negative predictor of cumulative GPA. That is, students who believed they made larger career Gains had lower GPAs.

All regression models included controls for race and ethnicity (binary variables for black, Hispanic and white); however, we did not have reliable measures for low-income status. In most cases, the control variables were not statistically significant in the regression models. In those cases where race and ethnicity did impact the predictive power of engagement, the effects were as expected: black and/or Hispanic students were less likely to have a successful outcome and white students were more likely to have a successful outcome. This impact was not widespread in these analyses, which suggests that engagement measures can predict student outcomes regardless of students' race and ethnic characteristics.

Study 3: HSI/HACU Consortium Institutions Validation Study

Study Description

Sample Overview

The *CCSSE* HSI/HACU consortium consists of community colleges that are either members of the Hispanic Association of Colleges and Universities (HACU) or have student populations comprised of greater than 25% Hispanic students. Approximately 27 percent (n = 3,540) of the 16 reporting consortium college students in the *CCSSE* sample identified themselves as Hispanic and 23 percent of the sample indicated that English was not their first language (the vast majority of non-English fluency being Spanish). In fact, 48.9 percent of students who identified as Hispanic indicated that English was not their first language. Nine percent of the sample indicated they were born outside of the United States.

There were a total of 3,279 students who completed the CCSR in a primary *CCSSE* sample and provided an ID and were thus included in the *CCSSE* validation sample. Of these, approximately 33 percent identified themselves as Hispanic and 26 percent indicated that English was not their first language. Forty-eight percent of Hispanics indicated that English was not their first language. Nine percent of these students indicated they were born outside the United States. Descriptive analyses (Table 16) showed that the group of students for whom we have transcript data was representative of students at participating institutions and of all students who completed the *CCSSE* at the 16 reporting consortium colleges.

Data Construction

The data from this study derived from three sources: the Community College Survey of Student Engagement (*CCSSE)*, the National Center for Education Statistics (NCES) Integrated Postsecondary Data System (IPEDS), and the *CCSSE* HSI/HACU consortium participant institutions. Sixteen *CCSSE* HSI/HACU institutions provided data. The 16 institutions had 12,598 unweighted records with 3,509 "valid'" IDs, and we obtained matches and transcript data for 2,778 student records (a 79.2 percent match rate). The weighted records, which are reported in all further analyses, yielded a total sample of 12,962 cases with 4,109 valid IDs and 3,279 matches (79.8 percent match rate).

Table 16

Study Community Colleges' Demographic Comparison of IPEDS, *CCSSE* Sample, and *CCSSE* Validation Data

Variable	2004 Fall IPEDS	*CCSSE* Sample	*CCSSE* Validation
Gender %			
Female	60.1	60.8	62.1
Male	39.9	39.2	37.9
Attendance %			
Full-Time	29.3	38.4	44.0
Part-Time	70.7	61.6	56.0
Race/Ethnicity %			
White, NH	41.9	43.6	39.5
Black, NH	16.1	11.0	11.5
Hispanic	33.0	27.3	33.1
Asian/PI	4.2	4.6	5.3
American Indian	.5	1.5	1.4
Other/Unknown	4.2	12.0	9.3
N	265,689	12,962	3,279

CCSSE data included all data elements from the 2002, 2003, and 2004 administrations of the survey. Select IPEDS data were downloaded from the NCES website to assess sample representativeness and to include institution-level variables in the analysis. *CCSSE* HSI/HACU consortium participants provided *CCSSE* staff with records from students who had completed the *CCSSE* in 2002-2004 and had provided valid SSNs. *CCSSE* staff summarized this data into an HSI dataset containing term data through spring 2005 for each student. These files were merged with the *CCSSE* and IPEDS data.

Study Variables

Cumulative GPA. For each term in the database, cumulative GPA was obtained.

First to second term persistence. For each term in the database, an indicator of persistence from first to second term was created.

First to third term persistence. For each term in the database, an indicator of persistence from first to third term was created.

Total credit hours taken. For each term in the database, the total number of credit hours taken was obtained.

Enrollment. For each term in the database, a variable measuring cumulative enrollment terms was created.

Average credit hours completed. For each term in the database, a measure of average credit hours completed per term was created.

Table 17

Description of HSI/HACU Study Variables

Variables	Source/Description	Variable Type Per Question
Satisfaction Items:		
Overall satisfaction	*CCSSE* Item	Q1, 2, & 4DV Q3IV
Likelihood of recommendation	*CCSSE* Item	Q1, 2, & 4DV Q
Institution-level:		
Size	IPEDS Item	Q2M Q3IV
Urbanicity	IPEDS Item	Q2M Q3IV
Graduation rate	IPEDS Item	Q2M Q3IV
Proportion of part-time students	IPEDS Item	Q2M Q3IV
Student-level:		
Developmental status	*CCSSE* Item	Q2M Q3IV
Student goals	*CCSSE* Item	Q2M Q3IV
Peer and family support	*CCSSE* Item	Q2M Q3IV
Concurrent enrollment	*CCSSE* Item (derived)	Q2M Q3IV
First-generation status	*CCSSE* Item (derived)	Q2M Q3IV
Prior education	*CCSSE* Item	Q2M Q3IV
Ethnicity	*CCSSE* Item (derived)	Q1IV Q2IV Q5IV Q7IV
Immigrant status	*CCSSE* Item	Q4IV Q5IV Q7IV
Weighting Variable		
Part- & full-time status weights	*CCSSE* staff	Applied to all analyses

Analyses

Research questions were examined using a variety of statistical techniques, including analysis of variance (ANOVA); correlations (Pearson product moment, point biserial, and phi coefficient) for estimating the relationships between two continuous variables, one continuous and one dichotomous variable, and two dichotomous variables, respectively; and regression analyses. For complete regression analysis results see Appendix Tables C1 – C6.

Hierarchical regression models were used extensively in the analysis because they allow independent variables to be ordered according to their temporally or logically determined causal priority or according to their research relevance, when some independent variables are the primary focus of the study (i.e., ethnicity and benchmark variables), but when other independent variables are also available (institution- and student-level variables). This procedure allows one to analyze the R Square, an estimate of the variance explained, for all independent variables or sets of variables in cumulative increments and to compare the proportion of dependent variable variance that is accounted for by the addition of each independent variable or set of variables to those higher in the hierarchy. Variables or sets of variables can be entered in a stepwise or forced-entry mode. In general, the hierarchical regression models with stepwise entry accounted for almost as much variance in transcript-derived student outcomes as did the forced-entry models. The stepwise models are thus preferred and discussed in the Results section because they are more parsimonious, using fewer variables to account for similar amount of variance in student outcomes.

Results

Overall differences in the levels of benchmarks, gain item clusters, and satisfaction between Hispanic and other students. There were significant differences between Hispanic and Non-Hispanic respondents on three of the five *CCSSE* benchmarks (Table 18). Hispanics reported slightly greater levels of Student Effort and Support for Learners and slightly less Student-Faculty Interaction. The differences in Student Effort and Student-Faculty Interaction, while statistically significant, were not noteworthy. Hispanic students reported significantly higher Academic, Personal Development, and Vocational Goals Gains. Both groups evaluated their experience at the community college very positively, and 96 percent of students reported that they would recommend their community college to a friend or family member.

Table 18

Comparison of Hispanic vs. Non-Hispanic Students on Engagement, Gain, and Satisfaction Indices

	Hispanic Status								
	Non-Hispanic			Hispanic			Total		
CCSSE Construct	Mean	N	SD	Mean	N	SD	Mean	N	SD
Active and Collaborative Learning	.36	9421	.16	.36	3540	.16	.36	12961	.16
Student Effort Scale*	.45	9421	.16	.47	3540	.15	.46	12962	.16
Academic Challenge Scale	.55	9417	.17	.55	3540	.17	.55	12957	.17
Student-Faculty Interaction Scale*	.36	9416	.18	.34	3539	.18	.35	12955	.18
Support for Learners Scale*	.41	9395	.21	.45	3540	.22	.42	12935	.22
Gains in Academics Factor*	2.72	9287	.71	2.86	3509	.69	2.76	12796	.71
Gains in Personal Development *	2.26	9265	.83	2.50	3502	.83	2.33	12767	.84
Gains in Vocational Goals Factor*	2.46	9293	.87	2.61	3506	.85	2.50	12799	.86
Recommend this college?*	1.05	9093	.22	1.03	3527	.17	1.04	12620	.20
Evaluate experience at this college*	3.10	9117	.68	3.17	3535	.66	3.12	12652	.67

* = p , .001
Gain Indices: 1=Very Little, 2=Some, 3=Quite a Bit, 4=Very Much; Educational Experience: 1=Poor, 2=Fair; 3=Good, and 4=Excellent; Recommend: 1=Yes, 2=No.

Regression analyses were conducted with gain item clusters as outcomes. Ethnicity accounted for little additional variance in self-reported academic, personal development, and vocational goals after the influence of benchmarks were considered (Table 19). The Support for Learners and Academic Challenge benchmarks had by far the best predictive ability.

Table 19

Engagement and Ethnicity Regressed on Gain Factors

Gain Index	Regression Model	R	R Square	R Square Change
Academics Factor	5 Engagement Scales Without Ethnicity	.631	.398	
	5 Engagement Scales With Ethnicity	.633	.401	.003
	With only Academic Challenge & Support for Learners Scales	.623	.388	
Personal Development Factor	5 Engagement Scales Without Ethnicity	.598	.358	
	5 Engagement Scales With Ethnicity	.605	.366	.008
	With only Academic Challenge & Support for Learners Scales	.595	.354	
Vocational Goals Factor	5 Engagement Scales Without Ethnicity	.596	.355	
	5 Engagement Scales With Ethnicity	.597	.356	.002
	Engagement Scales With only Academic Challenge & Support for Learners Scales	.590	.348	

Support levels from the institution and faculty as predictors of differences between Hispanic and Non-Hispanic students. From early analyses, we learned that there were negligible differences between Hispanic and Non-Hispanic students on the five *CCSSE* benchmark variables and the two satisfaction variables. Even the three self-reported gain item clusters have relatively low correlations with Hispanic status: Academic Gains factor r = .09, Personal Development Gains factor r = .13, and Gains in Vocational Goals factor r = .08. Further analyses to attempt to account for such small group differences did not seem fruitful.

Student-level and institution-level factors were used, in addition to *CCSSE* benchmarks, to help explain self-reported academic, personal development, and career-related Gains. Results indicate that there were similar patterns for academic, personal development, and career-related Gains (Table 20). The Academic Challenge and Support for Learners benchmarks had the best predictive ability, followed by student-level variables associated with educational goals (certificate, degree, or transfer) and quality of relationships with other students, instructors, and college personnel. Adding institution-level variables or ethnicity did not increase our ability to predict Gains.

Table 20

Model Summary – Academic, Personal Development, and Career-Related Gains

Model	Gains in Academics Adjusted R Square	Gains in Personal Development Adjusted R Square	Gains in Vocational Goals Adjusted R Square
1. *CCSSE* Benchmarks: Support for Learners Active and Collaborative Learning Student Effort Student-Faculty Interaction Academic Challenge	.411*	.364*	.368*
2. *CCSSE* Benchmarks and Institution Level Predictors: Graduation Rate Total cohort Location IPEDS % Part-Time Enrollment	.414*	.369*	.370*
3. *CCSSE* Benchmarks, Institution Level Predictors and Student Level Predictors: Concurrent Enrollment First Generation Status Highest Academic Credential Career Change Developmental Math Course Transfer to 4 Year College Family Support for College Began at Current College ESL Course Complete Certificate Program Study Skills Course Other Students Self Improvement Courses Obtain an Associate Degree Developmental Reading Course Administrative Personnel Friends Support for College Instructors Developmental Writing Course	.455*	.410*	.420*
4. *CCSSE* Benchmarks, Institution Level Predictors, Student Level Predictors and Ethnicity	.456	.409	.421

* $p < .001$

International vs. US Born Differences on CCSSE Benchmarks, Gain Item Clusters, and Satisfaction. International students reported being significantly more engaged than US-born students on four *CCSSE* benchmarks (Table 21). The group differences were greatest on Student Effort and Support for Learners. International students reported significantly higher Academic, Personal Development, and Vocational Goals Gains than did their US-born peers. Both groups evaluated their experience at the community college very positively, and 96 percent of students reported that they would recommend their community college to a friend or family member.

Table 21

Comparison of Means on Engagement, Gain, and Satisfaction Indices: International vs. US Born

	Are you an international student or foreign national?								
	Yes			No			Total		
CCSSE Construct	Mean	N	SD	Mean	N	SD	Mean	N	SD
Active and Collaborative Learning*	.38	1078	.17	.36	11480	.16	.36	12559	.16
Student Effort Scale*	.52	1079	.16	.45	11480	.16	.46	12559	.16
Academic Challenge Scale*	.59	1079	.17	.55	11480	.17	.55	12559	.17
Student-Faculty Interaction Scale	.36	1079	.19	.35	11479	.18	.35	12557	.18
Support for Learners Scale*	.47	1078	.23	.42	11474	.21	.42	12552	.22
Gains in Academics Factor*	2.96	1067	.70	2.73	11374	.70	2.75	12441	.71
Gains in Personal Development *	2.66	1064	.85	2.29	11354	.83	2.32	12418	.84
Gains in Vocational Goals Factor*	2.65	1068	.86	2.49	11381	.86	2.50	12449	.87
Recommend this college?	1.05	1071	.23	1.04	11403	.20	1.04	12473	.20
Evaluate your educational experience	3.13	1069	.67	3.12	11441	.67	3.12	12510	.67

* = $p < .001$
Gain Indices: 1=Very Little, 2=Some, 3=Quite a Bit, 4=Very Much; Educational Experience: 1=Poor, 2=Fair; 3=Good, and 4=Excellent; Recommend: 1=Yes, 2=No.

International vs. US Born Differences on CCSSE Benchmarks, Gain Item Clusters, and Satisfaction. When the Hispanic status and immigrant status variables were combined to yield four groups (Table 22), Non-Hispanic immigrants reported significantly higher levels of engagement on four of the five benchmarks: Active and Collaborative Learning, Student Effort, Academic Challenge, and Student-Faculty Interaction. Overall, Non-Hispanic non-immigrants reported the least Academic, Personal Development, and Vocational Goals Gains. Hispanic and Non-Hispanic international students reported the most (and almost identical) Academic, Personal

Development, and Vocational Goals Gains. Hispanic international students were more satisfied with their community college experience than were the other three groups, although all groups reported very positive community college experiences.

Table 22

Comparison of Means on Engagement, Gain, and Satisfaction Indices: International Status within Ethnicity

	International within Ethnicity									
	Hispanic, International		Non-Hispanic International		Hispanic, Not International		Non-Hispanic, Not International		Total	
CCSSE Variable	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Active and Collaborative Learning	.36	408	.39	670	.36	3101	.36	8380	.36	12559
Student Effort	.50	408	.53	671	.47	3101	.44	8380	.46	12559
Academic Challenge	.58	408	.60	671	.55	3101	.55	8380	.55	12559
Student-Faculty Interaction	.35	408	.37	671	.34	3099	.36	8380	.35	12557
Support for Learners	.48	408	.47	670	.45	3100	.41	8374	.42	12552
Gains in Academics	2.97	405	2.96	662	2.84	3072	2.69	8302	2.75	12441
Gains in Personal Development	2.70	402	2.63	662	2.47	3068	2.22	8286	2.32	12418
Gains in Vocational Goals	2.67	405	2.64	663	2.61	3069	2.44	8312	2.50	12449
Recommend this college?	1.04	405	1.06	666	1.03	3091	1.05	8312	1.04	12473
Evaluate your educational experience	3.21	407	3.09	662	3.16	3096	3.11	8345	3.12	12510

All variables $p < .001$ for F-Tests
Gain Indices: 1=Very Little, 2=Some, 3=Quite a Bit, 4=Very Much; Educational Experience: 1=Poor, 2=Fair; 3=Good, and 4=Excellent; Recommend: 1=Yes, 2=No.

Immigrant status accounted for little additional variability in self-reported academic, personal development, and vocational goals after the influence of student engagement factors was considered (Table 23). The Support for Learners and Academic Challenge benchmarks had by far the best predictive ability.

Table 23

Engagement and Immigrant Status (IS) Regressed on Gain Item Clusters

Gain Item Cluster	Regression Model	R	R Square	R Square Change
Academics Factor	5 Engagement Scales Without IS	.631	.398	
	5 Engagement Scales With IS	.631	.399	.000
	With only Academic Challenge & Support for Learners Scales	.622	.387	
Personal Development Factor	5 Engagement Scales Without IS	.598	.358	
	5 Engagement Scales With IS	.603	.364	.006
	With only Academic Challenge & Support for Learners Scales	.595	.354	
Vocational Goals Factor	5 Engagement Scales Without IS	.597	.357	
	5 Engagement Scales With IS	.598	.357	.000
	Engagement Scales With only Academic Challenge & Support for Learners Scales	.590	.348	

International Status and Ethnicity as Predictors of Transcript-Derived Student Outcomes. Differences between means for six transcript-derived student outcomes broken down by international status within ethnicity were analyzed (Table 24). For cumulative GPA, there was a main effect for international status where international students had higher cumulative GPAs than non-international students. For one-year persistence (first to third term), there was an interaction effect: Non-Hispanic, international students had higher persistence rates than Hispanic, international students while there were no significant differences between Hispanic and Non-Hispanic non-international students. For the outcome measure total credit hours taken, there were main effects for both ethnicity (Non-Hispanics had more total credit hours) and for international status (immigrants had more total credit hours). For the outcome measure average credit hours, there were main effects (international higher and Non-Hispanic higher) and an interaction effect, with the differences between Hispanic and Non-Hispanic students much greater for international students than for non-international students.

Table 24

Comparison of Means on Transcript-Derived Student Outcomes: International Status within Ethnicity

International within Ethnicity		Cum GPA	1st to 2nd Term Persistence	1st to 3rd Term Persistence	Total Credit Hours Taken	Number of Terms Enrolled	Average Credit Hours
Hispanic, International	Mean	2.90	.90	.78	45.07	4.93	9.18
	N	90	89	88	90	90	90
	S.D.	.82	.30	.42	26.99	2.67	2.78
Non-Hispanic International	Mean	2.90	.95	.88	55.84	5.09	10.85
	N	199	195	195	199	199	199
	S.D.	.72	.23	.32	30.34	2.61	3.44
Hispanic, Not International	Mean	2.73	.93	.79	41.61	4.64	9.09
	N	989	950	945	994	994	994
	S.D.	.74	.25	.41	24.20	2.58	3.24
Non-Hispanic, Not International	Mean	2.86	.93	.81	47.19	5.00	9.67
	N	1919	1893	1898	1928	1928	1928
	S.D.	.77	.25	.40	27.12	2.79	3.27
Total	Mean	2.82	.93	.80	45.94	4.89	9.55
	N	3197	3127	3125	3211	3211	3211
	S.D.	.76	.25	.40	26.69	2.72	3.28

Persistence and GPA models assessed the extent to which *CCSSE* benchmarks and item clusters predict these outcomes in addition to examining the impact of Hispanic and Non-Hispanic students and immigrant and US born students (Table 25).

Table 25

F Values for 2 x 2 ANOVA of Student Outcomes on Ethnicity by International Status

Source	Cumulative GPA	1st to 2nd Term Persistence	1st to 3rd Term Persistence	Total Credit Hours Taken	Number of Terms Enrolled	Average Credit Hours
Ethnicity	2.283	2.107	7.535**	25.339***	2.954	26.789***
International Status	5.002*	.448	1.290	11.481***	1.012	8.758**
Ethnicity * International Status	1.286	2.111	3.958*	2.710	.126	5.825*

*p < .05, **p < .01, ***p < .001

Based on results indicating that ethnicity, international status, and the interaction between the two variables proved significant, the ethnicity by international status interaction term, in addition to *CCSSE* benchmarks and satisfaction items, was used to help predict the six transcript-derived student outcomes.

For cumulative GPA, the Support for Learners and Academic Challenge benchmarks, willingness to recommend college to friends or family, and the Hispanic status by international status interaction variable contributed significantly to the prediction of cumulative GPA. Model results are presented in Table 26.

Table 26

Stepwise Entry within Blocks Model Summary for CCSSE Benchmarks, Perceived Gain Item Clusters, Satisfaction Variables, and Hispanic/International Status Regressed on Cumulative GPA

Model	R	R Square (R Square Change)	Adjusted R Square	Std. Error of the Estimate
1. Student Effort	.123	.015	.015	.757
2. Model 1 predictor and Support for Learners	.138	.019 (.004)	.018	.756
3. Model 2 predictors and Academic Challenge	.157	.025 (.006)	.024	.754
4. Model 3 predictors and Education Experience Evaluation	.257	.066 (.041)	.065	.738
5. Model 4 predictors and Recommend College Friend/Family	.263	.069 (.003)	.068	.737
6. Model 5 predictors and Ethnicity X International Status	.273	.074 (.005)	.073	.735

The Active and Collaborative Learning and Student-Faculty Interaction benchmarks were the strongest predictors of first to second term persistence. Overall, 93 percent of the students in the sample persisted from the first to second term. Thus, there was very little variance to predict in this outcome measure. Model results are presented in Table 27.

Table 27

Stepwise Entry within Blocks Model Summary for CCSSE Benchmarks, Gain Items, Satisfaction Variables, and Hispanic/International Status Regressed on First to Second Term Persistence

Model	R	R Square (R Square Change)	Adjusted R Square	Std. Error of the Estimate
1. Active and Collaborative Learning	.109	.012	.012	.248
2. Model 1 predictor and Student-Faculty Interaction	.115	.013 (.001)	.013	.248
3. Model 2 predictors and Gains in Academics	.127	.016 (.003)	.015	.247
4. Model 3 predictors and Education Experience Evaluation	.136	.019 (.003)	.017	.247

For first to third term (i.e., one year) persistence, Active and Collaborative Learning, Support for Learners, Gains in Academics, and Hispanic Status made significant contributions to the prediction of first to third term persistence. Model results are presented in Table 28.

Table 28

Stepwise Entry within Blocks Model Summary for CCSSE Benchmarks, Gain Items, Satisfaction Variables and Hispanic/International Status Regressed on First to Third Term Persistence

Model	R	R Square (R Square Change)	Adjusted R Square	Std. Error of the Estimate
1. Active and Collaborative Learning	.112	.013	.012	.394
2. Model 1 predictor and Support for Learners Scale	.119	.014 (.001)	.014	.394
3. Model 2 predictors and Gains in Academics	.140	.020 (.006)	.019	.393
4. Model 3 predictors and Ethnicity	.145	.021 (.001)	.020	.393

For total credit hours taken, student satisfaction contributed little to prediction after benchmarks and gain item clusters were taken into account. Seven predictors: Active and Collaborative Learning, Student-Faculty Interaction, Support for Learners, Gains in Academics,

Race by International Status Interaction, International Status, and Hispanic Status were significant predictors of total credit hours taken. Model results are presented in Table 29.

Table 29

Stepwise Entry within Blocks Model Summary for CCSSE Benchmarks, Gain Items, Satisfaction Variables, and Hispanic/International Status Regressed on Total Credit Hours Taken

Model	R	R Square (R Square Change)	Adjusted R Square	Std. Error of the Estimate
1. Active and Collaborative Learning	.177	.031	.031	26.30
2. Model 1 predictor and Student-Faculty Interaction	.198	.039 (.008)	.039	26.20
3. Model 2 predictors and Support for Learners	.205	.042 (.003)	.041	26.16
4. Model 3 predictors and Gains in Academics	.237	.056 (.014)	.055	25.98
5. Model 4 predictors and Ethnicity X International Status	.262	.069 (.013)	.067	25.81
6. Model 5 predictors and International Status	.267	.071 (.002)	.069	25.78
7. Model 6 predictors and Ethnicity	.270	.073 (.002)	.071	25.76

The number of terms enrolled was predicted by Active and Collaborative Learning, Student-Faculty Interaction, Gains in Academics, and Ethnicity by International Status Interaction. Model results are presented in Table 30.

Table 30

Stepwise Entry within Blocks Model Summary for CCSSE Benchmarks, Gain Items, Satisfaction Variables, and Hispanic/International Status Regressed on Numbers of Terms Enrolled

Model	R	R Square (R Square Change)	Adjusted R Square	Std. Error of the Estimate
1. Active and Collaborative Learning	.119	.014	.014	2.698
2. Model 1 predictor and Student-Faculty Interaction	.131	.017 (.003)	.016	2.694
3. Model 2 predictors and Gains in Academics	.167	.028 (.011)	.027	2.680
4. Model 3 predictors and Ethnicity X International Status	.179	.032 (.004)	.031	2.675

Average Credit Hours Taken was predicted by Student-Faculty Interaction, Support for Learners, Active and Collaborative Learning, Academic Challenge, Gains in Vocational Goals, Gains in Academics, both satisfaction items, Ethnicity, International Status, and Ethnicity by International Status Interaction. Model results are presented in Table 31.

Table 31

Stepwise Entry within Blocks Model Summary for CCSSE Benchmarks, Gain Items, Satisfaction Variables, and Hispanic/International Status Regressed on Average Credit Hours Taken

Model	R	R Square (R Square Change)	Adjusted R Square	Std. Error of the Estimate
1. Student-Faculty Interaction	.159	.025	.025	3.24
2. Model 1 predictor and Support for Learners	.178	.032 (.007)	.031	3.23
3. Model 2 predictors and Active and Collaborative Learning	.188	.035 (.003)	.034	3.22
4. Model 3 predictors and Academic Challenge	.191	.037 (.002)	.035	3.22
5. Model 4 predictors and Gains in Vocational Goals	.201	.040 (.003)	.039	3.22
6. Model 5 predictors and Gains in Academics	.211	.044 (.004)	.043	3.21
7. Model 6 predictors and Recommend College Friend/Family	.228	.052 (.008)	.050	3.20
8. Model 7 predictors and Education Experience Evaluation	.234	.055 (.003)	.052	3.19
9. Model 8 predictors and Ethnicity	.256	.065 (.01)	.063	3.18
10. Model 9 predictors and International Status	.264	.070 (.005)	.067	3.17
11. Model 10 predictors and Ethnicity X International Status	.267	.072 (.002)	.068	3.17

CCSSE-Reported Outcomes as Proxies for Transcript-Derived Outcomes. A number of *CCSSE* constructs were good proxies for transcript-derived student outcome variables (Table 32). The correlation between *CCSSE* self-reported Grade Average range and transcript-derived cumulative GPA was an impressive .55. And, the *CCSSE* variable, Total Credit Hours Earned, correlated highly with the transcript-derived variables Total Credit Hours Taken (r = .57) and Number of Terms Enrolled (r = .55).

Table 32

Transcript-Derived Outcomes Correlations with CCSSE-Reported Outcomes

Outcome Measure		Your overall college grade average?	TOTAL credit hours earned at this college?	Gains in Academics Factor	Gains in Personal Development Factor	Gains in Vocational Goals Factor
Cumulative GPA	Pearson *r*	.548(**)	.102(**)	.057(**)	-.002	.020
	N	3203	3215	3221	3218	3223
1st to 2nd Term Persistence	Pearson *r*	.101(**)	.281(**)	.092(**)	.083(**)	.068(**)
	N	3135	3147	3154	3151	3155
1st to 3rd Term Persistence	Pearson *r*	.115(**)	.392(**)	.114(**)	.097(**)	.074(**)
	N	3133	3145	3152	3149	3153
Total Credit Hours Taken	Pearson *r*	.100(**)	.566(**)	.191(**)	.159(**)	.116(**)
	N	3217	3230	3236	3232	3237
Number of Terms Enrolled	Pearson *r*	.103(**)	.548(**)	.140(**)	.124(**)	.092(**)
	N	3217	3230	3236	3232	3237
Average Credit Hours	Pearson *r*	.054(**)	.146(**)	.133(**)	.095(**)	.053(**)
	N	3217	3230	3236	3232	3237

**Correlation is significant at the 0.01 level (2-tailed).

Discussion

The *CCSSE* benchmarks were good predictors of both *CCSSE* self-reported outcomes and transcript-derived student outcomes. Overall, two benchmarks, Academic Challenge and Support for Learners, were the best and most consistent predictors of student outcomes. After considering the effects of student engagement, when self-reported academic Gains and satisfaction items were added as either predictors or moderator variables, self-reported Gains tended to add little to our ability to predict outcomes, whereas satisfaction makes an independent contribution. This is because Academic, Personal Development, and Vocational Goals Gain items were more highly correlated (i.e., share more common variance) with benchmarks than were the two satisfaction variables; thus, the satisfaction items make an independent contribution to the prediction of outcomes while gain items did not.

Immigrant status should definitely be accounted for in any future *CCSSE* research. Immigrant students reported much more Student Effort, Academic Challenge, Support for Learners, Academic Development, Personal Development, and Vocational Goals Gains than did non-immigrants. And, immigrant students were not a homogeneous group. There were many differences between Hispanic and Non-Hispanic immigrants. Further, in a number of the regression analyses, the Hispanic status by immigrant status interaction term was a significant (but not noteworthy) predictor of transcript-derived student outcomes. We suspect if other demographic variables were examined (e.g., gender, age, marital status) that other interactive effects would be found.

In the current study, student-level variables, such as those associated with educational goals, were better predictors of student outcomes than were institution-level factors. Only four IPEDS-derived institutional variables were included in this study. A future *CCSSE* study might incorporate a full range of IPEDS information. And, after four years of administration, the *CCSSE* database is large enough to employ institution as the unit of analysis rather than individual students. This method would allow for a more robust test of the influence of institution-level variables on student outcomes.

Upon reflection, the decision to select only HSI/HACU institutions may have muted our ability to study certain phenomena. Since the study institutions have a "critical Hispanic mass" (IPEDS average for 16 institutions is 28.2 percent Hispanic), it may be that student support services and curriculum are more geared and oriented toward Hispanic students in this sample than at community colleges with smaller proportions of Hispanic students. The research questions addressed in this study that involve only *CCSSE* variables could be better addressed employing the whole *CCSSE* database, resulting in greatly increased sample sizes and increased variation on some variables of interest.

The results clearly demonstrate that in assessing the "validity" of the *CCSSE,* the choice of student outcomes variables is very important. We were able to account for larger proportions of variance in cumulative GPA, Total Credit Hours Taken, and Average Credit Hours Earned than in First to Second Term Persistence, First to Third Term Persistence, and Number of Terms

Enrolled. Further, depending on the student outcome of interest, some *CCSSE* self-reported outcomes seemed to be good proxies for transcript-derived outcomes, specifically cumulative GPA and Total Credit Hours Earned.

Overall, many of the *CCSSE* variables and corresponding derived scales and factors, demonstrated solid relationships with both self-reported and transcript-derived student outcomes. And, although validity is often "in the eyes of the beholder," the evidence from this study, especially given its methodological limitations, suggests that the *CCSSE* has good validity.

SUMMARY ACROSS VALIDATION STUDIES

The results of the three studies broadly support the impact of engagement on students' academic outcomes. A wide variety of academic outcomes, including Cumulative GPA, Number of Terms Enrolled, Credit Completion Ratio, Total Credit Hours Completed, First to Second Term Persistence, and First to Second Year Persistence were examined and were consistently related to student engagement across all studies. While support for relationships between engagement and academic outcomes was broad, there were some measures that produced more consistent results than others. Cumulative measures of enrollment and credit hours accumulated exhibited the strongest relationships with engagement. Course performance measures, including GPA and Credit Completion Ratio, and measures of persistence were also consistently related to engagement measures in predicable ways. In addition, there were several study-specific measures, such as attainment of college pathway status and transfer readiness, that provide strong support for the proposition that student engagement matters in student success.

Bivariate Relationships between CCSSE Predictors and Performance Measures

There was considerable overlap in the outcome measures across the three studies. To evaluate consistencies across studies, we began by examining the bivariate correlations between *CCSSE* benchmarks, item clusters, and gain items to identify consistent patterns in relationships across studies. Results of bivariate correlations are presented in Table 33. For purposes of discussing correlation results from Table 33 the term "strong" refers to *CCSSE* constructs that were significant predictors of an outcome measure across all three studies, "good" refers to *CCSSE* constructs that were significant predictors of an outcome measure across two studies, and "adequate" refers to *CCSSE* constructs that were significant predictors of an outcome measure in one study.

Academic Measures

Cumulative GPA. Across all three studies, the relationships between Cumulative GPA and *CCSSE* constructs were examined. Student-Faculty Interaction was a good predictor; and Active and Collaborative Learning, Student Effort, and Academic Challenge were strong

predictors of Cumulative GPA. Four item clusters (Class Assignments, Collaborative Learning, Information Technology, and Student Services) were adequate predictors, while four other item clusters (Faculty Interactions, Exposure to Diversity, Mental Activities, and Academic Preparation) were strong predictors of Cumulative GPA. The perceived Gain in Academics item was a good predictor of Cumulative GPA.

Credit Completion Ratio. Correlations between Credit Completion Ratio and *CCSSE* constructs were analyzed for the Achieving the Dream and Florida studies. Active and Collaborative Learning and Academic Challenge benchmarks were both good predictors, while Student Effort and Student-Faculty Interaction benchmarks were adequate predictors of Credit Completion Ratio. Class Assignments, Collaborative Learning, Mental Activities, and Academic Preparation item clusters were good predictors of Credit Completion Ratio; Faculty Interactions and Information Technology item clusters were adequate predictors. The Academic Gain item cluster was a good predictor of Credit Completion Ratio.

Persistence Measures

First to Second Term Persistence. Across all three studies, the relationships between First to Second Term Persistence and *CCSSE* constructs were examined. All five benchmarks, Active and Collaborative Learning (strong predictor), Student Effort, Student-Faculty Interaction, and Support for Learners (good predictors), and Academic Challenge (adequate predictor), had a statistically significant relationship with First to Second Term Persistence in at least one study. Class Assignments, Exposure to Diversity, School Opinions, and Academic Preparation item clusters adequately predicted First to Second Term Persistence. Faculty Interactions, Collaborative Learning, and Information Technology item clusters were good predictors, and the Student Services item cluster was a strong predictor of First to Second Term Persistence. The Vocational Goal Gain item cluster was a good predictor, and the Academic Gain and Personal Development Gain item clusters were strong predictors of First to Second Term Persistence.

First to Second Year Persistence. The relationships between First to Second Year Persistence and *CCSSE* constructs were examined across studies. The Active and Collaborative Learning benchmark was a strong predictor; Student Effort and Support for Learners benchmarks

were good predictors, and Academic Challenge and Student-Faculty Interaction benchmarks were both adequate predictors of First to Second Year Persistence. Each of the engagement item clusters was at least an adequate predictor of First to Second Year Persistence. Perceived gain item clusters were adequate (Gains in Personal Development), good (Gains in Vocational Goals), and strong (Gains in Academics) predictors of First to Second Year Persistence.

Degree/Certificate Completion. Correlations between Degree/Certificate Completion and *CCSSE* constructs were analyzed for the Achieving the Dream and Florida studies. The Support for Learners benchmark was an adequate predictor, and Active and Collaborative Learning, Academic Challenge, and Student-Faculty Interaction benchmarks were good predictors of Degree/Certificate Completion. The Class Assignments item cluster was an adequate predictor, and Faculty Interactions, Collaborative Learning, Information Technology, Mental Activities, and Academic Preparation item clusters were good predictors of Degree/Certificate Completion. The perceived Gains in Academics item cluster was an adequate predictor of Degree/Certificate Completion.

Longevity Measures

Number of Terms Enrolled. All five benchmarks were strong predictors of Number of Terms Enrolled. The Academic Preparation item cluster was an adequate predictor, the Exposure to Diversity item cluster was a good predictor, and the remaining item clusters were strong predictors of Number of Terms Enrolled. All three perceived gain item clusters were also strong predictors of Number of Terms Enrolled.

Total Credit Hours Completed. All five benchmarks were strong predictors of Total Credit Hours Completed. Faculty Interactions and Student Services item clusters were good predictors, and the remaining item clusters were strong predictors of Total Credit Hours Completed. Perceived Personal Development and Vocational Goal Gain item clusters were both good predictors, and the Academic Gain item was a strong predictor of Total Credit Hours completed.

Table 33

Bivariate Correlations between Outcome Measures and CCSSE Constructs

CCSSE Predictor	Number of Terms Enrolled			Total Credit Hours Completed			Credit Completion Ratio	
	Achieving the Dream	HSI/HACU	Florida	Achieving the Dream	HSI/HACU	Florida	Achieving the Dream	Florida
Active and Collaborative Learning	.128***	.121***	.118***	.225***	.178***	.159***	.122***	0.070**
Student Effort	.093***	.065***	.117***	.155***	.114***	.113***	.106***	0.006
Academic Challenge	.099***	.066***	.123***	.197***	.131***	.137***	.121***	0.070**
Student-Faculty Interaction	.102***	.116***	.151***	.197***	.175***	.105***	.083***	-0.004
Support for Learners	.113***	.060***	.084***	.094***	.124***	.035*	-.045	0.031
Faculty Interactions	.087***	.104***	.101***	.188***	.136***	.017	.105***	0.009
Class Assignments	.108***	.092***	.126***	.186***	.153***	.146***	.114***	0.056*
Exposure to Diversity	.010	.079***	.048**	.077**	.130***	.100***	.031	0.008
Collaborative Learning	.125***	.092***	.077***	.197***	.166***	.102***	.063*	0.051*
Information Technology	.064*	.038*	.132***	.158***	.122***	.134***	.086***	0.012
Mental Activities	.096***	.066***	.084***	.169***	.104***	.073***	.106***	0.052*
School Opinions	.091***	.049**	.061***	.089***	.113***	.053**	-.040	0.034
Student Services	.142***	.079***	.093***	.125***	.134***	.011	-.001	-0.017
Academic Preparation	.040	.016	.153***	.194***	.121***	.248***	.128***	0.090***
Gains in Academics	.155***	.140***	.117***	.218***	.191***	.120***	.078**	0.082***
Gains in Personal Development	.121***	.124***	.076***	.117***	.159***	.011	-.030	-0.006
Gains in Vocational Goals	.088***	.092***	.109***	.126***	.116***	.033	-.019	0.040

Table 33 (continued)

CCSSE Predictor	First to Second Term Persistence			First to Second Year Persistence		
	Achieving the Dream	HSI/HACU	Florida	Achieving the Dream	HSI/HACU	Florida
Active and Collaborative Learning	-.052*	.110***	.063**	.059*	.112***	0.085***
Student Effort	.078**	.048**	.044	.058*	.038*	0.029
Academic Challenge	-.005	.038*	.025	.038	.054**	0.025
Student-Faculty Interaction	-.066**	.093***	.004	-.019	.094***	0.041
Support for Learners	.038	.052**	.052*	.047	.070***	0.053*
Faculty Interactions	-.088***	.081***	.015	-.042	.081***	0.040
Class Assignments	.023	.103***	.044	.064*	.084***	0.077***
Exposure to Diversity	-.027	.067***	.008	.031	.045**	-0.006
Collaborative Learning	-.040	.090***	.068**	.066*	.106***	0.085***
Information Technology	-.022	.047**	-.061**	.063*	.049**	0.031
Mental Activities	-.009	.019	.006	.042	.036*	0.005
School Opinions	.027	.041*	.028	.034	.058***	0.039
Student Services	.103***	.055**	.082***	.079**	.069***	0.043
Academic Preparation	.013	.044*	.038	.021	.050**	0.044*
Gains in Academics	.121***	.092***	.051*	.121***	.114***	0.057*
Gains in Personal Development	.055*	.083***	.048*	.040	.097***	0.033
Gains in Vocational Goals	-.005	.068***	.060**	.062*	.074***	0.024

Table 33 (continued)

CCSSE Predictor	Cumulative GPA			Degree/Certificate Completion	
	Achieving the Dream	HSI/HACU	Florida	Achieving the Dream	Florida
Active and Collaborative Learning	.141***	0.082***	0.115***	.101***	.107***
Student Effort	.059*	0.119***	0.044*	-.008	.013
Academic Challenge	.100***	0.103***	0.077***	.069**	.073**
Student-Faculty Interaction	.090**	0.077***	0.031	.110***	.071**
Support for Learners	-.028	-0.02	0.017	-.021	.054*
Faculty Interactions	.121***	0.117***	0.087***	.108***	.074**
Class Assignments	.055	0.05**	0.024	.030	.068**
Exposure to Diversity	.072*	0.045**	0.067**	.030	.032
Collaborative Learning	.098***	0.011	0.040	.088***	.104***
Information Technology	.058	0.046**	0.020	.064**	.057*
Mental Activities	.084**	0.095***	0.094***	.061*	.052*
School Opinions	-.012	-0.002	0.040	-.019	.040
Student Services	-.047	-0.02	-0.088***	-.022	.009
Academic Preparation	.127***	0.124***	0.075***	.080***	.095***
Gains in Academics	.055	.057***	0.066**	.009	.088***
Gains in Personal Development	-.016	-0.002	-0.043	.006	.013
Gains in Vocational Goals	-.012	0.02	0.009	.072**	.026

*p < .05, **p < .01, ***p < .001

Patterns across Studies

Academic Measures

The two outcomes that are most prototypically academic were Cumulative GPA and Credit Completion Ratio. GPA was analyzed by each of the three studies and considered in a number of different ways. Both the Florida and Achieving the Dream studies examined Credit Completion Ratio as an outcome measure.

Full Cohort and Cross-sectional performance file analyses results for the Florida validation study show that *CCSSE* constructs are significant bivariate and net predictors of college-level GPA. Each of the "academic" *CCSSE* item clusters (including all benchmarks) and the Academic Gain item were significantly associated with Cumulative GPA net effects in the full cohort model; these results were replicated in the Cross-Sectional file with the exception of Support for Learners. Support for Learners consistently failed to exhibit a significant bivariate relationship with GPA in the Florida sample, consistent with earlier studies (Marti, in press). For Short cohort analyses, significant net effects on GPA within the first three terms of enrollment emerged only for Active and Collaborative Learning, Student Effort, and Class Assignments, while the validity of self-reported Academic Gains was again modestly confirmed; in contrast, only Student Effort emerged as significant in analyses of first year GPA in Short cohorts. This suggests that the net effects of engagement on academic outcomes is more marked in later terms of enrollment—after a student has achieved "college path" status—than in the first three terms of enrollment.[4] Although the results were stronger for first three terms than first year, this affirms the importance of engagement in students' early experience.

Achieving the Dream results exhibited a high degree of similarity with GPA analyses in the Florida study. *CCSSE* benchmarks positively predict Cumulative GPA after two years and Cumulative GPA at the end of the term in which *CCSSE* was administered. Overall, Active and Collaborative Learning, Academic Challenge and Student-Faculty Interaction had positive net effects when predicting Cumulative GPA, and all benchmarks other than Support for Learners

[4] Short cohorts also had significantly lower GPA than Long cohorts (2.84 vs. 3.01) reflecting both the superior academic performance for "survivors" and the typical phenomenon at most institution of increasing grades in later terms of enrollment for successful students.

exhibited significant bivariate relationships with GPA. Several *CCSSE* item clusters were also positive predictors of Cumulative GPA.

The HSI/HACU study also shared similarity with GPA analyses in the Florida and Achieving the Dream studies in the bivariate relationships. For Cumulative GPA examined in the HSI/HACU study, three benchmarks (Student Effort, Support for Learners, Academic Challenge), and two item clusters contributed significantly to the prediction of Cumulative GPA. Other variables in these models included item clusters, gain items, and Hispanic and international status. Thus, use of this multivariate model decreased the strength of Active and Collaborative Learning and Student-Faculty Interaction while increasing the strength of the relationship between Support for Learners and GPA.

Full cohort analyses results for Florida's validation study show that *CCSSE* constructs (including the *CCSSE* Academic Gain item) are significant bivariate and net predictors of Credit Completion Ratio, but are somewhat less well associated after controls are introduced. For Credit Completion analyses using the Short cohort file, Class Assignments, Support for Learners, and School Opinions emerged as significant net predictors within the first three terms of enrollment. With regard to the Cross-sectional performance file analyses results, all of the *CCSSE* "academic" clusters and the Collaborative Learning and Student Services cluster items are related to three-term Credit Completion Ratios. Similar to the GPA analyses, the Support for Learners benchmark interacted with initial academic ability, meaning that students with lower initial levels of academic ability exhibited a positive relationship between the Student Effort benchmark and Credit Completion Ratios while students with higher initial levels of academic ability exhibited a negative relationship between Support for Learners and Credit Completion Ratio. In analyses examining the proportion of courses completed with a grade of C or better, full cohort and cross-sectional performance file analyses for the Florida validation study showed that *CCSSE* constructs (including the *CCSSE* Academic Gain item) are significant bivariate and net predictors of completion of courses with a grade of "C" or better, but are somewhat less well associated after controls are introduced. Academic Challenge, Academic Preparation and self-reported Gain in Academics showed significant net effects in predicting the proportion of courses

completed with a grade of “C” or better in the first three terms of enrollment. The Achieving the Dream validation study showed that four of the five *CCSSE* benchmarks – Active and Collaborative Learning, Student Effort, Academic Challenge, and Student-Faculty Interaction – had positive net effects when predicting cumulative Credit Completion Ratios; several item clusters and students’ perceived Academic Gains were also positive predictors of Credit Completion Ratios after two years.

Bivariate correlations demonstrated strong consistency across GPA analyses for the three studies. Four benchmarks, all but Support for Learners, were significantly correlated with GPA, though there were mixed results across the Florida analytic files for Student-Faculty Interaction. There were four item clusters that exhibited significant correlations with GPA across all three studies: Faculty Interactions, Exposure to Diversity, Mental Activities, and Academic Preparation. These patterns held up with only minor exceptions in net effects for these factors in regression models. Furthermore, the Academic Gains item cluster exhibited significant effects in several models and several bivariate relationships, indicating that the Academic Gains item cluster is related to GPA. It is notable that while the Support for Learners benchmark consistently fails to exhibit significant bivariate relationships with GPA, it does emerge as significant in interactions with initial academic ability in the Florida study and in a multivariate regression model in the HSI/HACU study, suggesting a suppressor effect. This pattern suggests that Support for Learners may be more important for some students than others.

Credit Completion Ratio wasn’t examined as thoroughly as GPA, but results were consistent with GPA, though not as strong. Each of the benchmarks, with the exception of Support for Learners, exhibited a bivariate relationship in at least one of the two studies examining Credit Completion Ratio and conditional effects for the Support for Learners benchmark. The strong consistency in the results across studies demonstrates that the academically related item clusters were consistent predictors of GPA and Credit Completion Ratio, and Student Effort may be conditionally related to these constructs as well.

Early Academic Measures

There were several measures that pertain specifically to early academic experiences in college. These include success in developmental education and gatekeeper courses as measured by either course completion or grades in those courses. The Florida and Achieving the Dream studies both had data on developmental and gatekeeper courses. In addition, the Florida study developed a composite measure termed College Pathway that assessed early course completion as a composite of several variables. The Achieving the Dream study had rich information about developmental course completion. Developmental needs in reading, writing, and mathematics were tracked at three levels below college level coursework. Results were modeled using completion of developmental math, writing, and reading with a 'B' or better within three years. The pattern of results was mixed across these analyses. The Florida study took a more granular approach to developmental education and modeled it as a binary outcome representing took and failed a developmental course.

For developmental math in the Achieving the Dream study, the Active and Collaborative Learning benchmark had a positive net effect when predicting course completion with a 'B' or better in coursework three levels below college level. No other benchmarks were positive predictors of developmental math course completions at any level, although students' perceived Academic Gains had a positive net effect when predicting level 1 and level 2 developmental math course completions with a 'B' or better within three years. The Academic Preparation item cluster was also a significant bivariate predictor in the level 1 and level 2 developmental math courses and was a net predictor in level 2 developmental math.

For developmental writing, engagement does not predict successful course completion with a 'B' or better two or more levels below college English; moreover, the Support for Learners benchmark and the related School Opinions item cluster were negative predictors of developmental English completion one level below college with a 'B' or better within three years. However, neither of these effects exhibited a significant bivariate relationship with the outcome, suggesting that one or more of the other variables in the model is producing a suppressor effect. Academic Preparation produced a significant bivariate relationship in both levels of

developmental writing, and self-reported Academic Gains were also related to the completion of developmental English level 2 with a 'B' or better. For both levels of developmental reading, the Student Effort benchmark had positive net and bivariate effects when predicting developmental reading course completions with a 'B' or better within three years. The Class Assignments and Technology Experiences item clusters were also positive predictors of completing developmental reading level 2 with a 'B' or better.

Consistent with the Achieving the Dream results, *CCSSE* factors have relatively weak relationships with taking and passing developmental courses—both direct and after controls— in the Florida study. Academic Gains exhibited a significant net effect in the long cohort and Active and Collaborative Learning, Academic Preparation, and Class Assignments exhibited significant net effects in the short cohort. Thus, the effects that did emerge in the Florida study were the same effects that emerged in the Achieving the Dream developmental math models.

Using completion of college algebra and college English with a 'C' or better within three years as outcome measures yielded mixed results for the Achieving the Dream study. The most promising results were for college algebra: the Active and Collaborative Learning benchmark had a positive "net effect" when predicting the completion of college algebra within three years. Two item clusters (Class Assignments and Collaborative Learning) were also positive predictors of completing college algebra with a 'C' or better, as was students' perceived Academic Gains. There were no net effects for *CCSSE* benchmarks when predicting the completion of college English with a 'C' or better within three years.

CCSSE constructs have weak relationships with taking and passing gatekeeper courses, both direct and after controls, according to the Florida validation study. Only Class Assignments showed significant net effects in predicting gatekeeper coursework performance for the short cohort group. In the cross-sectional file, grade-point performance for those who did take gatekeeper courses shows significant bivariate and net effects for most *CCSSE* "academic" item clusters including Student Effort, Academic Challenge, Class Assignments, and Academic Preparation.

College Pathway Status was an intermediate completion measure defined as completing 12 semester hours (or equivalent) of college credit. This measure showed bivariate and net effects on numerous factors. Significant bivariate and net effects on College Pathway Status emerged for Active and Collaborative Learning, Support for Learners, Class Assignments, Collaborative Learning, Student Services, Academic Preparation, perceived Academic Gains, and perceived Vocational Goal Gains; and all measures except Exposure to Diversity and Information Technology exhibited significant bivariate relationships with this measure.

Effects for developmental and gatekeeper course completion exhibited weaker relationships than most other outcome measures examined in the three studies. The Florida study examined the relationship between *CCSSE* factors and gatekeeper courses by modeling the outcome of "took and failed at least one gatekeeper course," finding only occasional bivariate and net effects in relationships between these variables. The strongest effects found for this outcome measure were in the cross-sectional cohort. The Achieving the Dream study examined gatekeeper math and English course completion with a C or better within the first three years. While there were virtually no significant bivariate or net effects for English gatekeeper courses, there were several factors that exhibited significant bivariate relationships with college algebra, and net effects emerged for the Active and Collaborative Learning benchmark as well as Class Assignments, Collaborative Learning, and Academic Gains item clusters. The approach taken in the Achieving the Dream study separates math and English courses and finds that the strength of the relationship differs notably between these two outcomes. It would be useful to pursue this distinction in the Florida sample, and if a similar effect were observed, this would account for weaker effects found in that study where the effects for math courses were potentially diluted by effects from English courses. While the overall effects for developmental and gatekeeper courses were weak, the effects that did emerge were consistent. Academic Preparation and Gains in Academic outcomes emerged in a number of analyses as having positive relationships with developmental and gatekeeper courses, particularly math courses. The Student Effort benchmark and Class Assignments item cluster also emerged more than once in these analyses as being positively associated with developmental and gatekeeper course completion. It is

notable that the composite variable, attainment of College Pathway Status, which should have a high overlap with developmental and gatekeeper courses, exhibited much stronger relationships than did the individual courses. It appears that among the detectable effects within developmental and gatekeeper course completion, measures of effort emerge as the strongest predictors of course completion and this in turn results in higher levels of perceived Academic Gain.

Persistence Measures

Each of the studies examined persistence measures. First to second term persistence and first year to second year persistence were the most common measures. The Florida and Achieving the Dream datasets contained degree/certificate completion data that are considered here as well, although this variable could be considered an academic measure.

The shortest term retention measure was within-term persistence, examined in the Achieving the Dream study by using Credit Completion Ratio as a measure of within-term persistence. Positive net effects for *CCSSE* benchmarks and item clusters were apparent when predicting Credit Completion Ratios within the same term *CCSSE* was administered – if students took the *CCSSE* in the spring of their first year. The same measure for students who took the *CCSSE* in the spring of their second year yielded no net effects.

First to second term persistence was examined thoroughly in the Florida and HSI/HACU studies. Few *CCSSE* constructs are significantly related to next term persistence after controls are introduced in Florida's long cohort validation study. Those net effects that emerged as significant are for item clusters that the literature suggests should be related to persistence—Collaborative Learning and Student Services. For the short cohort study, significant net effects on persistence to the next term emerged for a number of *CCSSE* constructs, including Active and Collaborative Learning and Support for Learners benchmarks and Faculty Interactions and Collaborative Learning item clusters, while virtually all *CCSSE* constructs exhibited significant bivariate correlations. Overall, 93 percent of the students in the HSI/HACU sample persisted from the first to second term. Thus, there was very little variance to predict in this outcome

measure. Overall, in the HSI/HACU study, the Active and Collaborative Learning and Student-Faculty Interaction scales were the strongest predictors of first to second term persistence.

First to second year persistence results were similar to those for first to second term persistence for the Florida long cohort validation study; Collaborative Learning and Student Services were significant net predictors of first to second year persistence. The Achieving the Dream study used fall-to-fall persistence as the outcome measure, yielding positive net effects for the Active and Collaborative Learning benchmark, as well as three *CCSSE* item clusters (Collaborative Learning, Information Technology, and Use of Services) and students' perceived Academic Gains. For the HSI/HACU study, the Active and Collaborative Learning benchmark, the Support for Learners benchmark, and Gains in Academics made significant contributions to the prediction of first to second year persistence.

The persistence measures results share a strong consistency with other academic measures, such as GPA, Credit Completion Ratios, and Degree/Certificate Completion. Active and Collaborative Learning and related item clusters (i.e., Class Assignments and Collaborative Learning), as well as Gains in Academics, consistently exhibited significant bivariate relationships with GPA, Credit Completion Ratio, and Degree/Certificate Completion, as well as First to Second Term Completion. However, there was relatively weak support for the relationship between Academic Challenge and the Mental Activities item cluster for persistence measures, in contrast to GPA, Credit Completion Ratio, and Degree/Certificate Completion. Moreover, Support for Learners and the Student Services item cluster, as well as the Gains in Vocational Goals, consistently exhibited significant bivariate relationships with persistence measures. However, persistence measures showed no relationship, even occasionally exhibited a negative relationship to GPA and Credit Completion Ratios, and exhibited only a minor relationship to Degree/Certificate Completion. Thus, among the engagement factors that exhibited clear trends in the persistence measures, it appears that Support for Learners and use of Student Services are more important for persistence, but that Academic Challenge and Mental Activities have little relationship to persistence— in contrast to the consistently strong relationship that these measures have with GPA, Credit Completion Ratios, and Degree/Certificate Completion.

Completion Measures

The Florida and Achieving the Dream studies examined degree/certificate completion in multiple regression models. In addition, the Florida study explored an alternative measure, attainment of Transfer-Ready Status, a variable that was derived from the completion of a cluster of courses. This alternative measure is an important consideration in community colleges, as it has often been argued that degree completion is not an adequate performance measure for community colleges where students often have goals that do not include degree attainment.

CCSSE constructs, analyzed in Florida's validation study, are significant bivariate and net predictors of overall associate degree completion, as well as degree completion within three years. Active and Collaborative Learning, Academic Challenge, and Support for Learners benchmarks consistently predicted degree/certificate completion at three years and at any point, and there was some support for Student-Faculty Interaction in the bivariate correlations.

The net effects for engagement when predicting degree or certificate attainment within three years were very positive for the Achieving the Dream study. Three *CCSSE* benchmarks – Active and Collaborative Learning, Academic Challenge, and Student-Faculty Interaction – had positive net effects when predicting graduation. Three item clusters (Faculty Interaction, Collaborative Learning and Academic Preparation) were also positive predictors of graduation, as was students' perceived Career Gains.

The Florida study also created a transfer-ready variable that provided a direct alternative to degree completion. Transfer-ready students had completed 30 credits, passed or placed out of all developmental work, completed English Composition, a college-level math course, and one college-level course in each basic discipline cluster (science, social science, and humanities). Transfer-ready status was significantly correlated with all benchmarks, engagement item clusters and gain item clusters, with three exceptions that were all marginally correlated. Net effects emerged for Academic Challenge, Support for Learners, and all gain items.

Comparing results across the Florida and Achieving the Dream studies produced consistent support for Active and Collaborative Learning and Academic Challenge in degree attainment. Additionally, Support for Learners consistently demonstrated significant effects for

measures of degree completion and transfer-ready status, though results often differed between bivariate and net effects, indicating that this measure is impacted by control variables. Student Effort and Student-Faculty Interaction exhibited some effects, though the inconsistency of the results for these factors suggests a weak relationship with completion.

Longevity Measures

Analyses for longevity variables—that is, Number of Terms enrolled and Total Credit Hours Completed—were primarily examined through bivariate correlations. These measures were considered hybrids of academics and persistence. There was overwhelming consistency across studies indicating that these measures were consistently correlated with engagement factors.

Outcomes Based on Student Characteristics

A number of student characteristics were investigated with regard to engagement. The purpose of such analyses was to determine if it is reasonable to expect that all students are equally engaged. Understanding the impact of student characteristics on engagement has important implications for institutional assessment: while it is reasonable to assume that institutions impact student engagement, it is also important to understand the extent to which students' backgrounds may impact the way in which they engage and their levels of engagement.

Race and Ethnicity. The HSI/HACU and Achieving the Dream studies conducted basic comparisons of race/ethnicity for engagement measures. In the Achieving the Dream study, black, non-Hispanic students were more engaged than white students on the Student Effort, Academic Challenge, and Support for Learners benchmarks, and Hispanic students were more engaged than white students on the Student Effort and Support for Learners benchmarks. The HSI/HACU study examined differences between Hispanic and non-Hispanic students on the five *CCSSE* benchmarks, item clusters, and gain items. Consistent with the benchmark analysis for the Achieving the Dream study, Hispanic students reported higher levels of Student Effort and Support for Learners. In addition, Hispanic students reported lower levels of Student-Faculty Interaction. Hispanic students reported significantly higher Academic, Personal Development, and Vocational Goals Gains.

Effects for race/ethnicity in multivariate regression models were consistently diminished in the HSI/HACU and Achieving the Dream studies. All regression models for the Achieving the Dream study included controls for race and ethnicity (binary variables for black, Hispanic and white). In Achieving the Dream models, race/ethnicity was not statistically significant in the regression models. In those cases where race and ethnicity did impact the predictive power of engagement, the effects were as expected, given existing literature: black and/or Hispanic students were less likely to have a successful outcome and white students were more likely to have a successful outcome. In HSI/HACU hierarchical regression models in which self-reported Academic, Personal Development, and Vocational Goals were treated as outcome measures, the influence of Hispanic status made small but statistically significant increases in total variance explained after considering the influence of student engagement items was considered.

Immigrant Status. The HSI/HACU study took an in-depth look at students' immigrant status. Differences in the levels of engagement, gain indices, and satisfaction between immigrant students and their non-immigrant peers were analyzed in the HSI/HACU study. International students reported being much more engaged than US-born students on four student engagement items. The group differences were greatest on Student Effort and Support for Learners. International students reported significantly higher Academic, Personal Development, and Vocational Goals Gains than did US-born peers. When the Hispanic status and immigrant status variables were combined to yield four groups, Non-Hispanic immigrants reported significantly higher levels of engagement on four of the five scales: Active and Collaborative Learning, Student Effort, Academic Challenge, and Student-Faculty Interaction. Overall, Non-Hispanic non-immigrants reported the least Academic, Personal Development, and Vocational Goals Gains. Hispanic and Non-Hispanic international students reported the most (and almost identical) Academic, Personal Development, and Vocational Goals Gains. Hispanic international students were more satisfied with their community college experience than were the other three groups, although all groups reported very positive community college experiences.

Income. There was little reliable financial information available for the three studies. The Achieving the Dream study used two *CCSSE* items as proxies for low-income status – reliance on

grants and scholarships and reliance on public assistance. Their analyses revealed that low-income students reported being more engaged than other students on four of the *CCSSE* benchmarks: Active and Collaborative Learning, Student Effort, Student-Faculty Interaction and Support for Learners.

The examination of student characteristics indicates that there are differences based on student characteristics. Generally, it appears that groups that are traditionally disadvantaged have higher levels of engagement; this pattern is true for racial minorities, immigrants, and low-income students. The conditional effects for race/ethnicity reported in the Florida study were consistently sparse, and the effects that emerged as significant were inconsistent. While each interaction effect would take individual consideration to understand, the more notable fact was that race/ethnicity did not appear to consistently interact with *CCSSE* measures. In combination with results demonstrating that minorities typically have higher levels of engagement, this pattern suggests that the strength of the relationship between engagement and putative outcome measures was not typically different to a large degree based on race/ethnicity.

A Look by Benchmark

Active and Collaborative Learning. Active and Collaborative Learning was perhaps the most consistent predictor of student success across studies and across measures. Active and Collaborative Learning consistently was correlated with the cumulative academic measures, Number of Terms Enrolled and Credit Hours Completed. However, it was not unique with regard to these measures, as all *CCSSE* benchmarks were correlated with these outcomes. The impact of Active and Collaborative Learning distinguishes itself in the academic and persistence outcome measures. Credit Completion Ratio and Degree Completion correlations were examined in the Achieving the Dream and Florida studies, and Active and Collaborative Learning was correlated with both measures in both studies. In addition, Credit Completion Ratio was correlated with GPA across all studies. The only other benchmark that exhibited this consistent pattern of positive correlations across all three studies was Academic Challenge. Active and Collaborative Learning was the only benchmark that was correlated with First to Second Term Persistence and First to Second Year Persistence across all three studies, though several other benchmarks

showed strong patterns of consistency across the three studies. Thus, the support for Active and Collaborative Learning suggests that this benchmark measures processes that are important for all of the outcomes measured in the studies described herein.

The pattern of results across the three studies is consistent with prior research. Educational practices, such as class discussions, cooperative learning, and student-generated questions and talking points used in classroom discussions have been linked with improved academic performance (Tsui, 2002; Connor-Greene, 2005). Specific practices, such as tutoring, have a positive impact on students' academic performance (Yonhong, Hartman, Uribe, & Mencke, 2001). In addition to positive academic outcomes, active and collaborative engagement activities, such as class discussions, examination preparation, and higher order thinking activities influence social integration, institutional commitment, and students' intent to return (Braxton, Milem, & Sullivan, 2000). The results presented herein are generally consistent with previous work linking Active and Collaborative Learning with both academic and persistence measures.

Student Effort. The results across models and studies suggest that the Student Effort benchmark is predictably related to retention measures and shows moderate predictability to academic measures. Number of Terms Enrolled and Credit Hours Completed were consistently correlated with Student Effort. The relationship between the Student Effort benchmark and academic measures was positive, though not completely consistent across studies. Student Effort exhibited the strongest consistency with GPA, where there were significant correlations across all three studies. The benchmark was correlated with Credit Completion Ratio in the Achieving the Dream study, but not in the Florida study, and was not correlated with Degree/Certificate Completion in either of these studies. Student Effort was correlated with First to Second Term Persistence and to First to Second Year Persistence in the Achieving the Dream and HSI/HACU studies, but not the Florida study.

In sum, the Student Effort benchmark is a consistent predictor of persistence and provides mixed results for academic measures. These findings are consistent with previous research that has examined activities related to Student Effort such as amount of reading of course materials, level of note-taking, frequency of class attendance, and preparing multiple

drafts of an assignment. Students participating in these activities have improved writing and revising skills (Carifio, Jackson, & Dagostino, 2001) and have increased exam performance (Williams & Clark, 2004).

Academic Challenge. Academic Challenge was consistently associated with academic outcomes, while showing little evidence of being correlated with persistence measures. Number of Terms Enrolled, Credit Hours Completed, GPA, Credit Completion Ratio, and Degree/Certificate Completion were consistently correlated with Academic Challenge across all studies. However, Academic Challenge exhibited a correlation with First to Second Term or First to Second Year Persistence in only the HSI/HACU study. The pattern of results indicates that the Academic Challenge benchmark is indeed measuring behaviors that relate to academic outcomes. The outcomes in which Academic Challenge distinguishes itself are all related to academic success.

Considerable research exploring how Academic Challenge relates to student outcomes was seen in the literature. Students learn more when they are asked to tackle complex and compelling problems that invite them to develop an array of workable and innovative solutions (Kezar, Hirsch, & Burack, 2001). Use of unconventional, challenging assignments has been demonstrated to develop critical thinking skills (Herman, 2005). Gains in cognitive and communication skills are associated with both academic and co-curricular involvement (Huang & Chang, 2004). Thus, the results presented herein are consistent with previous empirical work examining the impact of Academic Challenge.

Student-Faculty Interaction. The Student-Faculty Interaction benchmark results were positive, but the least consistent across the five benchmarks that were examined. Consistent with other benchmarks, it was correlated with Number of Terms Enrolled and Credit Hours Completed. However, results across academic and persistence measures were mixed. The Student-Faculty Interaction benchmark correlated with GPA in the Achieving the Dream and HSI/HACU studies, but not the Florida study; it correlated with credit completion ratio in the Achieving the Dream, but not the Florida study. In both the Achieving the Dream and the Florida studies, Student-Faculty Interactions correlated with Degree/Certificate Completion. Measures of

persistence were inconsistent: Student-Faculty Interaction exhibited a correlation with First to Second Term Persistence in the Achieving the Dream and HSI/HACU studies and First to Second Year Persistence in only the HSI/HACU study. The measures that exhibited consistent relationships with Student-Faculty Interaction were Number of Terms Enrolled, Credit Hours Completed, and Degree/Certificate Completion. These three measures are arguably measuring both academic performance and persistence, in contrast to other measures, such as GPA, that could reasonably be considered primarily academic and term to term persistence, which could reasonably be considered a measure of persistence. Thus, the results indicate that Student-Faculty Interactions are impacting both academic and persistence outcomes.

The link between Student-Faculty Interaction and positive academic achievement has support in the extant literature. Significant progress in improving student learning can be attained when students and faculty work collaboratively (Kezar et al., 2001). Frequent student interaction with faculty is a strong predictor of learning across all racial groups (Lundberg & Schreiner 2004). Students value response formats that allow them to be active participants on feedback on written papers (Edgington, 2004). Wilson and Taylor (2001) linked professor immediacy to student motivation, projected grades, and evaluations of the instructor. Thus, the existing literature suggests that students value Student-Faculty Interaction and faculty feedback and that frequent interactions with faculty translate into improved learning.

Support for Learners. The Support for Learners benchmark was consistently correlated with measures of persistence, but showed little evidence of being correlated with academic measures. Consistent with other benchmarks, the Support for Learners benchmark was correlated with Number of Terms Enrolled and Credit Hours Completed. There was not a single positive correlation between Support for Learners and GPA or Credit Completion Ratio across the three studies. The Florida study reported a correlation between Degree/Certificate Completion and the Support for Learners benchmark, while the Achieving the Dream study did not find this relationship. In contrast to the academic measures, there was good support for correlations between persistence measures and the Support for Learners benchmark. In both the HSI/HACU and the Florida study, the Support for Learners benchmark was correlated with First to Second

Term Persistence and First to Second Year Persistence. The results that emerge from the Support for Learners benchmark analyses suggest that this benchmark has its greatest impact on persistence. The absence of a relationship with academic measures may indicate that to a large degree, students who report higher levels of Support for Learners are academically unprepared. Examination of item clusters shows that the Student Services item cluster is a strong predictor of persistence and degree completion but is virtually unrelated to academic measures and even exhibits a negative effect in the one instance that there is a significant effect in the GPA results. Use of student services is an important component of the Support for Learners benchmark, and when student services are isolated in the examination of the Student Services item cluster, use of student services provides an amplified version of the Support for Learners benchmark. This suggests that the student services items in the Support for Learners benchmark may drive this effect observed between the Support for Learners benchmark and Number of Terms Enrolled and Credit Hours Completed. Thus, use of student services provides support to maintain persistence but does not necessarily translate into higher academic performance. However, to the extent to which use of services is compensatory for inadequate previous preparation, it is logically possible that there is an effect whereby student and academic support services raise performance to the level of better prepared students.

These results support previous work that focuses on institutional practices promoting Support for Learners. Learning occurs best when students are in an environment in which they feel connected, cared for, and trusted (Kezar et al., 2001). Group interaction and support offer students the structure to integrate and engage in the educational process and provide a support structure that encourages retention (Wild & Ebbers, 2002). College mentors introduce students to their college community and help students develop a self-awareness that leads to a sense of agency and responsibility (Vivian, 2005).

A Look by Gain Indicator

Gains in Academics. The Gains in Academics item cluster was the item cluster that most consistently predicted student outcomes across studies and outcome measures. This gain item was consistently correlated with Number of Terms Enrolled, Total Credit Hours Completed, First

to Second Term Persistence, and First to Second Year Persistence measures across all three studies. The Gains in Academics item cluster was also related to Credit Completion Ratio and Degree/Certificate Completion in the AtD and Florida studies. The pattern of results across the three studies is consistent with prior research. Academic integration has previously been demonstrated to be an important predictor of subsequent institutional commitment (Berger & Milem, 1999) and persistence (Blecher, 2006), and high perceptions of academic ability have a positive impact on student persistence (Miller, Greene, Montalvo, Ravindran, & Nichols, 1996). A study conducted by Taniguchi & Kaufman (2005) found that academic preparedness increases completion among nontraditional students, which highlights the significance of results from the HSI/HACU study that demonstrate that Hispanic and Non-Hispanic international students reported the most Academic Development, Personal Development, and Vocational Goals Gains. The reported associations between the Academic Gains item cluster supports existing reports that academic integration and academic ability facilitate student retention.

Gains in Personal Development. Results across studies and outcome measures indicate that the Gains in Personal Development item cluster is most consistently related to longevity and persistence measures. Across all three studies, the Personal Development Gains item was consistently correlated with Number or Terms Enrolled and First to Second Term Persistence, and exhibited more modest support for First to Second Year Persistence. This item cluster also showed patterns of consistent correlations with Total Credit Hours completed. The extant literature supports a positive association between Personal Development Gains relate to student outcomes. For example, an ethically principled campus climate has a positive effect on students' academic achievement and willingness to remain in college (Gardiner, 1998). A study conducted by Attinasi (1989) found that the extent and nature of socialization while in college has an influence on freshmen Mexican American student persistence, which is a finding supported by the HSI/HACU study's report that Hispanic and Non-Hispanic international students reported the largest Gains in personal development. Gains in personal development are likely tied to positive outcomes because students who are confident about regulating their own activities are more confident about mastering academic subjects and are more likely to attain higher academic

performance (Zimmerman, Bandura, & Martinez-Pons, 1992; Joo, Bong, & Choi, 2000). Thus, the reported associations between the Personal Gains and persistence item cluster supports existing findings that ethically principled campuses and socialization facilitate persistence.

Gains in Vocational Goals. When compared to other gain items, the Gains in Vocational Goals was the least consistent predictor of student outcomes across studies. Nevertheless, this gain item was consistently correlated with the cumulative academic measure, Number of Terms Enrolled across all three studies. Total Credit Hours Completed and both First to Second Term and First to Second Year Persistence showed consistent patterns of association with Gains in Vocational Goals and a less consistent, yet positive relationship between the Vocational Goal Gains indicator and Degree/Certificate Completion was observed. The link between perceived Vocational Goal Gains and student outcomes has been studied in the literature. Vocational training has a positive effect on educational attainment (Roksa, 2006). A recent study conducted on first semester freshmen found that students with defined job-related career goals made more positive persistence decisions than their peers without an identified career goal (Hull-Blanks, Kurpius, Befort, Sollenberger, Nicpon, & Huser, 2005). Research conducted by Sandler (2000) indicates that adult students' decision to re-enroll is affected by their perceived vocational futures and career expectations. Students' perceived school-employer linkages and job placement significantly predict confidence in degree completion (Person & Rosenbaum, 2006). Thus, the reported associations between the Vocational Goals item cluster supports existing reports that career goals and perceptions about linkages between education and careers have positive impact on student persistence.

CONCLUSIONS AND IMPLICATIONS

Results Confirm a Long Tradition of Research on Student Engagement

The studies presented herein confirm a vast body of research on student engagement (Pascarella & Terenzini, 2005). Results support major theoretical perspectives such as Astin's (1985) theory of involvement, in which student learning occurs as a function of a student's level of academic and social involvement with the institutional environment. Quality of Student Effort is a

function of the opportunities that an institution offers and the extent to which students make use of those opportunities in their academic, intellectual, personal, and interpersonal experiences in Pace's (1984) theory. Tinto's (1993) model of student departure emphasizes the role of academic and social integration as processes that promote persistence. In spite of the voluminous work supporting these theoretical perspectives, the present studies fill a critical gap in the literature: validation of student integration and engagement models using community college students. Higher education research overwhelmingly under represents empirical work conducted using community college students (Cofers & Somers, 2000; Pascarella, 1997; Townsend et al., 2004), and this gap is particularly salient in the engagement literature (Wortman & Napoli, 1996).

The paucity of empirical evidence linking student engagement to retention in community colleges is highlighted in a recent review of empirical literature (Braxton, Hirschy, & McClendon, 2004). They examine thirteen testable propositions of Tinto's (1975) model of student persistence and found that only student entry characteristics garner strong empirical support, although they do find modest empirical support for the relationship between academic integration and departure. They describe Tinto's theory of student departure as undetermined and open to empirical treatment in two-year colleges. Of the propositions, only student entering characteristics has robust empirical support. The testable propositions in Tinto's model that are most relevant to CCSR measures, social and academic integration, were not deemed to be well supported in the extant literature that examined community college samples.

The broad conclusion that can be reached from the present studies is that the current lack of support for student integration and engagement models is due to a lack of data rather than a lack of applicability of student integration and engagement models. These studies demonstrate that the broad measures of student engagement on the CCSR are predictive of outcomes measuring academic success and persistence in community colleges.

The Outcome Measure Matters

The breadth of the studies presented herein provides insight into the outcome measures that are most influenced by student engagement as well as providing new knowledge about

specific relationships between engagement constructs and various outcome measures. In reviewing results across the three studies, we broadly classified outcomes as academic or persistence outcomes, in addition to a fair number of outcomes classified as hybrids.

The academic outcomes were predictably impacted by the Academic Challenge and Active and Collaborative Learning benchmarks and had reasonable support from the Student Effort and Student-Faculty Interaction benchmarks. GPA was consistently related to higher levels of engagement in Active and Collaborative Learning, Student Effort, and Academic Challenge in addition to garnering strong support from Student-Faculty Interaction. Active and Collaborative Learning and Academic Challenge were the strongest predictors of Credit Completion Ratio. Thus, academic outcomes are most predictably related to the benchmarks that focus on activities directly related to coursework.

Completion of individual courses and course grades appear to have relatively weak relationships to measures of student engagement, in contrast to broader measures. The item clusters that did emerge as having impact on individual course completions were academically oriented. While measures from individual courses appear to have the greatest paucity of relationships between engagement measures and outcomes, other analyses suggest that course completion and grades are related to engagement behaviors. Therefore, we speculate that individual courses are not sensitive to the impact of engagement as measured by the CCSR, rather than concluding that there is not an impact of student engagement on developmental and gatekeeper courses. The analysis of College Path in the Florida study, an outcome measure that represents the completion of 12 credit hours, provides the most direct support for this assertion, as this composite variable was broadly related to engagement measures. The College Path variable approximates the cumulative achievement of completing developmental and gatekeeper courses, suggesting that broad measures better capture than do course-specific measures. Because the CCSR is about experiences at the college in general (across courses and experiences during an entire academic year), this result is not surprising and suggests that single course outcomes should not be tied to CCSR measures. Further investigations of single course outcomes should limit engagement data to engagement in the courses being examined.

There were two direct persistence measures examined by all studies: First to Second Term Persistence and First to Second Year Persistence. In addition to the ubiquitous effects of Active and Collaborative Learning, Student Effort and Support for Learners were the most consistent predictors of persistence. These benchmarks include items regarding use of student services, and the consistent relationship between the Student Services item cluster and persistence supports the importance of student services in persistence. The Class Assignments item cluster is largely comprised of Student Effort items and supports the importance of effort as an engagement measure that predicts persistence.

There were at least two measures that we considered hybrid measures of academics and persistence: Number of Terms Enrolled and Credits Hours Completed. These measures represent longevity as a persistence dimension and require accumulation of credits, an academic measure. These two measures were the most ubiquitously related to engagement items and Gains in Academics, Vocational Goals, and Personal Development. Given their breadth, they provide important validation for the CCSR as the CCSR is broadly construed to measure students' overall experience at that college.

It is clear that the choice of outcome is important in investigating the impact of student engagement behaviors. Aside from the nearly ubiquitous impact of Active and Collaborative Learning, *CCSSE* benchmarks appear to differentially impact outcomes. Academic Challenge predictably has the strongest impact on academic measures. Support for Learners has the greatest impact on persistence measures. The Student-Faculty Interaction and Student Effort benchmarks are not as easily classified as predicting academic or persistence measures, but did show good consistency within measures across studies. The general consistency within measures across studies exhibited by all benchmarks indicates that there are specific effects for specific domains of engagement practices and behaviors. Furthermore, null results between engagement practices/behaviors and outcomes that are not necessarily related to these practices/behaviors reduce the possibility of a positive response bias among academically successful students were there global positive relationships between engagement and outcome measures.

Context of Current Research

While the studies presented herein make significant contributions to the literature on student engagement in community college settings, there are some important contextual considerations. First, administration of the CCSR to students in spring semesters undoubtedly has an impact on the sample that completes the CCSR. Second, the survey asks students to evaluate their entire experience at the college during the academic year in which the CCSR is administered. Both of these considerations have implications for the effect sizes observed in the present studies. Specifically, the spring administration produces a restriction of range, and students' evaluation of their entire experience that year increases the signal-to-noise ratio. The reported effect sizes are generally small; however, when we consider the impact of the spring administration and of the fact that students are reporting on their entire college experience that year, we recognize that the effect size is undoubtedly reduced by these factors. However, the true power of the current studies is in the pervasiveness and consistency of effects across multiple studies. Further, these effects hold in spite of restriction of range and large signal-to-noise ratios.

Spring administration of the CCSR undoubtedly limits the range of the variables that were examined in the studies presented herein, due to the fact that many students who begin college in the fall semester do not return. The impact on the range of student engagement factors is unknowable, as these students are not in classrooms where the survey is administered. However, the impact on the range of outcome measures is apparent: students who do not complete or persist past their first semester do not graduate, do not accumulate credit hours, and by definition, do not persist. Furthermore, students who persist for longer periods of time are more likely to attend during a semester that the class is sampled for *CCSSE* administration. Thus, the range of outcomes and likely the range of engagement measures are limited to students who have, for the most part, survived to at least their second semester.

The vast majority of survey questions ask students to evaluate their entire experience that year at the college where they took the survey. This essentially requires them to average

their experiences across a number of courses that could potentially represent a wide range of experiences, thus increasing the signal-to-noise ratio. This strategy captures a snapshot of the typical student experience of students attending college during spring semesters. However, the cost of such breadth is that it does not capture heterogeneity within students and is essentially the average of a given student's experience for each survey item. Outcomes, such as grades and course completions, are also heterogeneous within individuals. A more precise signal would capture the heterogeneity of levels of engagement in a putative behavior or putative cluster of behaviors as they relate to the heterogeneity of an outcome. While this is logistically overwhelming, we believe that the effect sizes obtained within would only be enhanced by reducing the signal-to-noise ratio, and purer measures of effect sizes would thus be enhanced. The value of detecting small effects between the average experience of students at an institution and their average outcomes is the promise that there is a more powerful signal in the combined distributions of those experiences and outcomes that underlie the detected effects presented herein.

The general conclusion of the considerations presented herein is that the reported effect sizes are conservative measures of the true effect size of student engagement. While these considerations undoubtedly impact the effect sizes reported in these studies, both the spring administration and questions about students' entire experiences at a college are by design. Spring administrations are an attempt to capture the experiences of students who have had time to experience the college. Questions about the entire experience at a college are intended to understand those experiences with the maximum breadth possible. Developing precise measures of effect size is the work of targeted experimental or quasi-experimental research. For purposes of the current investigation, small effect sizes are sufficient to demonstrate that effects hold despite factors that should only diminish them. The validation of the CCSR is derived from the pervasiveness of effects that present themselves even under inauspicious circumstances.

Validation of the CCSR as a Measure of Institutional Effectiveness

Validating the CCSR as a measure of institutional effectiveness was the primary purpose of the studies presented herein, and the results broadly confirm that the behaviors and experiences measured by the instrument are positively related to student outcomes. The role of *CCSSE* measures in institutional effectiveness is the evaluation of processes. In an input, process, output framework (Ewell, 1998), processes are the most difficult components to measure. Inputs, such as test scores, demographics, and income are easily obtainable, as are output measures, such as graduation rates, course completion rates, and grades.

The strategy of the present studies was to link engagement measures as process indicators to input and output measures, with primary emphasis on output measures. This link is critical to validating the use of the CCSR as an instrument for assessment and improvement of institutional effectiveness, as it illustrates the processes in terms of student behaviors and experiences that impact outcomes. While process indicators are the most difficult to measure, they also represent the student experiences that colleges have the greatest opportunity to impact. And while outcome measures typically are given primacy as evaluation measures, they are the product of inputs and processes; clearly, then, impacts on these measures occur as a function of inputs and processes. In community colleges, where open admissions are the norm, institutions have little impact on inputs; therefore, the greatest area of potential institutional influence is through institutional practices that comprise processes.

While the focus of the present studies was on linking processes to output, there was considerable attention given to inputs. The studies repeatedly demonstrate that input characteristics, such as race, income, and academic ability impact process measures. While there is considerable validity that can be derived from bivariate relationships between processes and outcomes, it is important to understand the extent to which these relationships are affected by student characteristics. To a large extent, bivariate correlations held up in multivariate regression models; this suggests that the relationship between engagement and outcomes is above and beyond that which is explained by inputs. While many effects were diminished after controlling for inputs, the consistent persistence of engagement as a predictor of outcomes is a

reminder that while there may be input characteristics that predict engagement, engagement is fundamentally independent of input characteristics and malleable to institutional influence.

REFERENCES

Ansburg, P.I. (2001). *Students' expectations of workload and grade distribution by class difficulty*. (ERIC Document Reproduction Service No. ED 460328)

Attinasi, L.C. (1989). *Getting In: Mexican Americans' Perceptions of University Attendance and the Implications for Freshman Year Persistence.* The Journal of Higher Education, 60 (3), 247-277.

Bailey, T. R & Alfonso, M. (2005). *Paths to persistence: an analysis of research on program effectiveness at community colleges*. Lumina Foundation for Education: New Agenda Series, 6 (1).

Berger, J.B. & Milem, J.F. (1999). *The role of student involvement and perceptions of integration in a causal model of student persistence.* Research in Higher Education, 40 (6).

Blecher, L. (2006). *Persistence toward bachelor degree completion of students in family and consumer sciences*. College Student Journal. 40 (3). 469-484.

Braxton, J. M., Hirschy, A. S., & McClendon, S. A. (2004). *Understanding and reducing college student departure*. AHSE-ERIC Higher Education Report, 30 (3).

Braxton, J.M., Milem, J.F., & Sullivan, A.S. (2000). *The influence of active learning on the college student departure process: Student integration and persistence*. The Journal of Higher Education, 71 (5), 569-590.

Carifio, J., Jackson, I., & Dagostino, L. (2001). *Effects of diagnostic and prescriptive comments on the revising behaviors of community college students*. Community College Journal of Research & Practice, 25 (2), 109-123.

Carini, R.M., Kuh, G.D., & Klein, S.P. (2006). *Student Engagement and Student Learning: Testing the Linkages*. Research in Higher Education, 47, 1-32.

Chen, X. (2005). *First generation students in postsecondary education: a look at their college transcripts* (NCES 2005-171). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Cheng, D.X. (2001). *Assessing student collegiate experience: Where do we begin?* Assessment & Evaluation in Higher Education, 26(6), 525-538.

Cofer, J. & Somers, P. (2000). *Within-year persistence of students at two-year colleges*. Community College Journal of Research and Practice*, 24,* 785-807.

Connor-Greene, P.A. (2005). *Fostering meaningful classroom discussion: Student-generated questions, quotations, and talking points*. Teaching Psychology, 32(3), 173-175.

Cruce, T.M. Wolniak, G.C., Seifert, T.A., & Pascarella, E.T. (2006). *Impacts of Good Practices on Cognitive Development, Learning Orientations, and Graduate Degree Plans During the First Year of College*. Journal of College Student Development, 47 (6), 365-381.

Edgington, A. (2004). *Encouraging collaboration with students on teacher response*. Teaching English in the Two-Year College, 31(3), 287-296.

Gardiner, L.F. (1998). *Why we must change: the research evidence*. Thought and Actioin 14. 71-88.

Herman, J. (2005). *Thwarting expectations: Assignments from a critical thinking class*. New Directions for Community Colleges, 130, 69-77.

Huang, Y., & Chang, S. (2004). *Academic and cocurricular involvement. Their relationship and the best combinations for student growth*. Journal of College Student Development, 45(4), 391-406.

Hull-Blanks, E., Kurpius S.E.B., Befort, C., Sollenberger, S., Nicpon, M.F., & Huser, L. (2005). *Career goals and retention-related factors among college freshmen*. Journal of Career Development, 32 (1), 16-30.

Hynd, C., Holschuh, J., & Nist, S. (2000). *Learning complex scientific information: Motivation theory and its relation to student perceptions*. Reading and Writing Quarterly, 16, 23-57.

Joo, Y., Bong, M. & Choi H. (2000). *Self-efficacy for self-regulated learning, academic self-efficacy, and internet self-efficacy in web-based instruction*. Educational Technology Research and Development, 48 (2), 5-17.

Kezar, A., Hirsch, D.J., & Burack, C. (2001). *Powerful partnerships: A shared responsibility for learning: A joint report. Understanding the Role of Academic and Student Collaboration in*

Creating a Successful Learning Environment. New Directions for Higher Education, 116, 18-38. San Francisco: Jossey-Bass.

Kouyoumdjian, H. (2004). *Influence of unannounced quizzes and cumulative exam on attendance and study behavior*. Teaching of Psychology, 31(2), 110-111.

Kuh, G.D., Kinzie, J., Cruce, T., Shoup, R., & Gonyea, R.M. (2006). *Connecting the Dots: Multi-Faceted Analyses of the Relationships Between Student Engagement Results from the NSSE, and the Institutional Practices and Conditions that Foster Student Success, Final Report prepared for the Lumina Foundation for Education*. Bloomington, IN: Center for Postsecondary Research, Indiana University Bloomington.

Lundberg, C.A. & Schreiner, L.A. (2004). *Quality and frequency of faculty-student interaction as predictors of learning: An analysis by student race/ethnicity*. Journal of College Student Development, 45(5), 549-565.

Miller, R.B., Greene, B.A., Montalvo, G.P., Ravindran, B., & Nichols J.D. (1996). *Engagement in academic work: the role of learning goals, future consequences, pleasing others and perceived ability*. Contemporary Educational Psychology, 21 (28), 388-422.

Pascarella, E. T. (January/February 1997). *It's time we started paying attention to community college students*. About Campus, 14-17.

Pascarella, E. T. & Terenzini, P. (2005). *How college affects students: A third decade of research*. San Francisco: Jossey-Bass.

Person, A.E. & Rosenbaum, J.E. (2006). *Educational outcomes of labor-market linking and job placement for students at public and private 2-year colleges*. Economics of Education Review, 25(4), 412-429.

Roksa, J. (2006). *Does the vocational focus of community colleges hinder students' educational attainment?* The Review of Higher Education, 29(4), 499-526.

Sanler, M.E. (2000). *Career decision-making self-efficacy, perceived stress, and an integrated model of student persistence: a structural model of finances, attitudes, behavior, and career development*. Research in Higher Educatiion, 41(5), 537-580.

Schulte, L.E., Fluckiger, J., & Squires, S. (2005). *Student and agency personnel perceptions of the impact of community service learning*. Essays in Education, 14, 1-13.

Taniguchi, H. & Kaufman, G. (2005). *Degree completion among nontraditional college students*. Social Science Quarterly, 86(4), 912-927.

Tinto, V. (1993). Leaving college: Rethinking the causes and cures of student attrition, 2nd Ed. Chicago: University of Chicago Press.

Townsend, B. K., Donaldson, J., & Wilson, T. (2004). *Marginal or monumental? Visibility of community colleges in selective higher education journals*. Community College Journal of Research & Practice, *29*, 123-135.

Tsui, L. (2002). *Fostering critical thinking through effective pedagogy: Evidence from four institutional case studies*. The Journal of Higher Education, 73 (6), 740-763.

Vivian, C. (2005). *Advising the at-risk college student*. The Educational Forum, 69(4), 336-351.

Wild, L., & Ebbers, L. (2002). *Rethinking student retention in community colleges*. Community College Journal of Research and Practice, 26(6), 503-519.

Williams, R.L., & Clark, L. (2004). *College students' ratings of student effort, student ability and teacher input as correlates of student performance on multiple choice exams*. Educational Research, 46(3), 229-239.

Wilson, J.H., & Taylor, K.W. (2001). *Professor Immediacy as Behaviors Associated with Liking Students*. Teaching of Psychology, 28(2), 136-138.

Wortman, P. M., Napoli, A. R. (1996). *A meta-analysis of the impact of academic and social integration of persistence of community college students*. Journal of Applied Research in the Community College, *4*, 5-21.

Yonhong, X., Hartman, S. Uribe, G., & Mencke, R. (2001). *The effects of peer tutoring on undergraduate students' final examination scores in mathematics*. Journal of College Reading and Learning, 32(1), 22-31.

Zimmerman, B.J., Bandura, A., Martinez-Pons, M. (1992). *Self-motivation for academic attainment: the role of self-efficacy beliefs and personal goal setting*. American Educational Research Journal, 29(3), 663-676.

APPENDICES

Appendix A: Florida Community College System Validation Study Results

Full Cohort Results

Table A1

Outcome: Cumulative GPA

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.095	.000	.322	1120	.115	.000	1956
Student Effort	0.079	.002	.319	1120	.044	.050	1956
Academic Challenge	0.076	.003	.317	1120	.077	.001	1956
Student-Faculty Interaction	0.050	.049	.315	1120	.031	.175	1956
Support for Learners	0.053	.039	.313	1117	.017	.460	1953
Faculty Interactions	0.092	.000	.320	1120	.087	.000	1956
Class Assignments	0.282	.010	.316	1120	.024	.282	1955
Exposure to Diversity	0.027	.385	.313	1117	.067	.003	1951
Collaborative Learning	0.219	.040	.315	1120	.040	.080	1955
Information Technology	0.007	.791	.313	1118	.020	.387	1954
Mental Activities	0.085	.001	.319	1120	.094	.000	1956
School Opinions	0.063	.013	.317	1110	.040	.075	1943
Student Services	0.011	.676	.308	1099	-.088	.000	1923
Academic Preparation	0.064	.013	.320	1113	.075	.001	1946
Gains in Academics	0.112	.000	.326	1111	.066	.003	1943
Gains in Personal Development	0.060	.022	.317	1108	-.043	.057	1939
Gains in Vocational Goals	0.039	.128	.315	1110	.009	.667	1942

Table A2

Outcome: Credit Completion Ratio

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.054	.050	.166	1120	.070	.002	1956
Student Effort	0.047	.097	.166	1120	.006	.780	1956
Academic Challenge	0.051	.067	.166	1120	.070	.002	1956
Student-Faculty Interaction	-0.007	.810	.163	1120	-.004	.846	1956
Support for Learners	0.048	.091	.167	1117	.031	.173	1953
Faculty Interactions	0.004	.899	.163	1120	.009	.677	1956
Class Assignments	0.061	.028	.168	1120	.056	.013	1955
Exposure to Diversity	-0.023	.401	.156	1117	.008	.709	1951
Collaborative Learning	0.050	.072	.166	1120	.051	.025	1955
Information Technology	-0.018	.524	.163	1118	.012	.597	1954
Mental Activities	0.034	.221	.165	1120	.052	.022	1956
School Opinions	0.041	.142	.168	1110	.034	.138	1943
Student Services	0.053	.071	.162	1099	-.017	.469	1923
Academic Preparation	0.075	.008	.170	1113	.090	.000	1946
Gains in Academics	0.083	.003	.173	1111	.082	.000	1943
Gains in Personal Development	0.046	.113	.166	1108	-.006	.799	1939
Gains in Vocational Goals	0.046	.107	.169	1110	.040	.079	1942

Table A3

Outcome: Percent Courses Completed with Grade of "C" or Better

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.064	.019	.197	1121	.087	.000	1958
Student Effort	0.055	.047	.197	1121	.008	.736	1958
Academic Challenge	0.065	.018	.197	1121	.076	.001	1958
Student-Faculty Interaction	-0.004	.871	.193	1121	-.004	.870	1958
Support for Learners	0.036	.200	.194	1118	.013	.570	1955
Faculty Interactions	0.018	.525	.193	1121	.022	.321	1958
Class Assignments	0.043	.111	.197	1121	.040	.077	1957
Exposure to Diversity	-0.018	.515	.192	1118	.017	.462	1953
Collaborative Learning	0.052	.056	.195	1121	.061	.007	1957
Information Technology	-0.025	.363	.193	1119	.003	.907	1956
Mental Activities	0.056	.039	.197	1121	.068	.003	1958
School Opinions	0.034	.213	.196	1111	.019	.403	1945
Student Services	0.051	.075	.193	1100	-.033	.145	1925
Academic Preparation	0.078	.005	.201	1114	.095	.000	1948
Gains in Academics	0.103	.000	.205	1112	.085	.000	1945
Gains in Personal Development	0.050	.077	.196	1109	-.022	.337	1941
Gains in Vocational Goals	0.044	.111	.198	1111	.019	.393	1944

Table A4

Outcome: Completed Associates Degree

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.091	.001	.143	1120	.116	.000	1956
Student Effort	0.135	.031	.282	1120	-.018	.417	1956
Academic Challenge	0.142	.087	.002	1120	.076	.001	1956
Student-Faculty Interaction	0.138	.054	.057	1120	.088	.000	1956
Support for Learners	0.083	.004	.142	1117	.029	.201	1953
Faculty Interactions	0.055	.056	.139	1120	.079	.000	1956
Class Assignments	0.045	.112	.138	1120	.050	.028	1955
Exposure to Diversity	-0.013	.653	.134	1117	.033	.144	1951
Collaborative Learning	0.092	.001	.142	1120	.116	.000	1955
Information Technology	0.089	.002	.142	1118	.107	.000	1954
Mental Activities	0.077	.006	.141	1120	.071	.002	1956
School Opinions	0.057	.047	.139	1110	.010	.659	1943
Student Services	0.073	.014	.139	1099	.000	.999	1923
Academic Preparation	0.053	.056	.139	1113	.079	.001	1946
Gains in Academics	0.112	.000	.153	1111	.082	.000	1943
Gains in Personal Development	0.070	.017	.140	1108	.014	.531	1939
Gains in Vocational Goals	0.047	.105	.143	1110	.013	.567	1942

Table A5

Outcome: Completed Associates Degree within Three Years

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.064	.028	.085	1120	.095	.000	1956
Student Effort	-0.002	.958	.079	1120	-.008	.710	1956
Academic Challenge	0.068	.020	.084	1120	.068	.003	1956
Student-Faculty Interaction	0.042	.152	.082	1120	.073	.001	1956
Support for Learners	0.077	.009	.086	1117	.050	.026	1953
Faculty Interactions	0.054	.067	.084	1120	.071	.002	1956
Class Assignments	0.017	.553	.080	1120	.054	.018	1955
Exposure to Diversity	0.003	.913	.080	1117	.022	.333	1951
Collaborative Learning	0.059	.044	.083	1120	.090	.000	1955
Information Technology	0.047	.110	.075	1118	.061	.007	1954
Mental Activities	0.053	.069	.082	1120	.050	.026	1956
School Opinions	0.058	.048	.083	1110	.033	.140	1943
Student Services	0.039	.207	.082	1099	.010	.649	1923
Academic Preparation	0.060	.045	.084	1113	.083	.000	1946
Gains in Academics	0.112	.000	.096	1111	.079	.001	1943
Gains in Personal Development	0.057	.059	.082	1108	.015	.515	1939
Gains in Vocational Goals	0.064	.032	.088	1110	.321	.000	1942

Table A6

Outcome: Transfer-ready

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.039	0.187	0.028	1120	0.054	0.017	1956
Student Effort	0.034	0.262	0.030	1120	0.046	0.044	1956
Academic Challenge	0.082	0.007	0.032	1120	0.082	0.000	1956
Student-Faculty Interaction	0.052	0.084	0.029	1120	0.056	0.013	1956
Support for Learners	0.066	0.032	0.032	1117	0.060	0.008	1953
Faculty Interactions	0.042	0.170	0.028	1120	0.042	0.060	1956
Class Assignments	0.034	0.254	0.027	1120	0.057	0.011	1955
Exposure to Diversity	0.030	0.313	0.027	1117	0.041	0.068	1951
Collaborative Learning	0.029	0.328	0.027	1120	0.045	0.046	1955
Information Technology	0.036	0.230	0.027	1118	0.044	0.050	1954
Mental Activities	0.073	0.014	0.031	1120	0.069	0.002	1956
School Opinions	0.040	0.191	0.028	1110	0.044	0.053	1943
Student Services	0.057	0.071	0.036	1099	0.049	0.033	1923
Academic Preparation	0.072	0.018	0.031	1113	0.073	0.001	1946
Gains in Academics	0.143	0.000	0.046	1111	0.139	0.000	1943
Gains in Personal Development	0.087	0.005	0.033	1108	0.086	0.000	1939
Gains in Vocational Goals	0.069	0.024	0.032	1110	0.083	0.000	1942

Table A7

Outcome: Persist Next Term

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.066	.022	.094	1120	.063	.005	1956
Student Effort	0.031	.294	.092	1120	.044	.054	1956
Academic Challenge	-0.005	.875	.089	1120	.025	.279	1956
Student-Faculty Interaction	-0.010	.734	.089	1120	.004	.844	1956
Support for Learners	0.037	.208	.091	1117	.052	.022	1953
Faculty Interactions	0.012	.681	.089	1120	.015	.500	1956
Class Assignments	0.352	.005	.096	1120	.044	.051	1955
Exposure to Diversity	0.019	.503	.090	1117	.008	.710	1951
Collaborative Learning	0.057	.048	.093	1120	.068	.003	1955
Information Technology	-0.067	.020	.094	1118	-.061	.007	1954
Mental Activities	-0.013	.642	.089	1120	.006	.799	1956
School Opinions	0.012	.679	.090	1110	.028	.214	1943
Student Services	0.079	.009	.094	1099	.082	.000	1923
Academic Preparation	0.227	.062	.092	1113	.038	.092	1946
Gains in Academics	0.001	.971	.090	1111	.051	.025	1943
Gains in Personal Development	0.001	.969	.088	1108	.048	.036	1939
Gains in Vocational Goals	0.035	.242	.091	1110	.060	.008	1942

Table A8

Outcome: Persist Next Year

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.100	.001	.094	1120	.085	.000	1956
Student Effort	0.034	.249	.084	1120	.029	.202	1956
Academic Challenge	0.008	.776	.083	1120	.025	.278	1956
Student-Faculty Interaction	0.030	.304	.084	1120	.041	.072	1956
Support for Learners	0.042	.159	.084	1117	.053	.019	1953
Faculty Interactions	0.031	.298	.084	1120	.040	.074	1956
Class Assignments	0.086	.003	.097	1120	.077	.001	1955
Exposure to Diversity	0.019	.513	.083	1117	-.006	.788	1951
Collaborative Learning	0.090	.002	.092	1120	.085	.000	1955
Information Technology	0.036	.222	.085	1118	.031	.169	1954
Mental Activities	-0.004	.897	.082	1120	.005	.817	1956
School Opinions	0.018	.542	.082	1110	.039	.086	1943
Student Services	0.063	.038	.084	1099	.043	.057	1923
Academic Preparation	0.254	.037	.085	1113	.044	.050	1946
Gains in Academics	0.021	.465	.082	1111	.057	.012	1943
Gains in Personal Development	0.039	.192	.084	1108	.033	.150	1939
Gains in Vocational Goals	-0.004	.887	.082	1110	.024	.296	1942

Table A9

Outcome: Took and Failed at Least One Developmental Course

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.025	.455	.093	856	.003	.916	1150
Student Effort	-0.037	.279	.094	856	-.009	.750	1150
Academic Challenge	-0.047	.162	.094	856	-.015	.610	1150
Student-Faculty Interaction	0.031	.360	.093	856	.043	.143	1150
Support for Learners	-0.047	.170	.094	854	-.010	.729	1148
Faculty Interactions	0.015	.661	.093	856	.023	.435	1150
Class Assignments	-0.049	.140	.096	856	-.020	.503	1149
Exposure to Diversity	-0.016	.630	.093	853	-.022	.460	1145
Collaborative Learning	0.000	.998	.093	856	.036	.224	1150
Information Technology	0.281	.074	.095	855	-.011	.718	1149
Mental Activities	-0.028	.406	.093	856	.002	.956	1150
School Opinions	-0.064	.057	.098	847	-.028	.338	1139
Student Services	0.025	.465	.093	841	.056	.062	1131
Academic Preparation	-0.047	.164	.097	849	-.035	.235	1141
Gains in Academics	-0.070	.036	.099	848	-.062	.037	1140
Gains in Personal Development	-0.021	.540	.093	845	.038	.201	1137
Gains in Vocational Goals	0.013	.710	.094	847	.017	.572	1139

Table A10

Outcome: Took and Failed at Least One Gatekeeper Course

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.003	.929	.076	1036	.000	.998	1731
Student Effort	-0.038	.215	.077	1036	-.002	.940	1731
Academic Challenge	-0.012	.685	.077	1036	-.042	.083	1731
Student-Faculty Interaction	0.000	1.000	.076	1036	.035	.142	1731
Support for Learners	0.002	.938	.079	1034	.000	.994	1729
Faculty Interactions	-0.008	.785	.076	1036	.019	.441	1731
Class Assignments	-0.039	.194	.078	1036	-.007	.760	1731
Exposure to Diversity	0.043	.152	.080	1033	.016	.516	1727
Collaborative Learning	0.007	.810	.076	1036	.013	.586	1731
Information Technology	0.008	.799	.076	1034	.016	.505	1729
Mental Activities	-0.017	.580	.077	1036	-.036	.139	1731
School Opinions	0.004	.900	.077	1027	-.006	.808	1720
Student Services	-0.033	.291	.080	1018	.018	.447	1707
Academic Preparation	-0.035	.266	.077	1029	-.066	.006	1722
Gains in Academics	-0.013	.661	.075	1028	-.028	.241	1720
Gains in Personal Development	0.036	.256	.076	1025	.032	.190	1716
Gains in Vocational Goals	-0.061	.048	.079	1027	-.030	0.218	1719

Table A11

Outcome: First Year GPA

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.063	.010	.136	1476	.065	.001	2656
Student Effort	0.051	.042	.134	1476	.047	.016	2656
Academic Challenge	0.037	.138	.133	1476	.065	.001	2656
Student-Faculty Interaction	-0.016	.511	.132	1476	-.013	.503	2656
Support for Learners	0.031	.220	.135	1473	.018	.360	2653
Faculty Interactions	-0.011	.660	.131	1476	.015	.429	2656
Class Assignments	0.080	.001	.141	1476	.067	.001	2655
Exposure to Diversity	-0.011	.669	.131	1472	.015	.432	2650
Collaborative Learning	0.042	.089	.134	1476	.021	.289	2655
Information Technology	0.000	.993	.133	1474	-.002	.938	2654
Mental Activities	0.039	.108	.133	1476	.067	.001	2656
School Opinions	0.036	.150	.134	1465	.029	.131	2638
Student Services	0.010	.705	.132	1442	-.270	.175	2594
Academic Preparation	0.012	.643	.133	1465	.040	.041	2641
Gains in Academics	0.052	.035	.134	1465	.027	.163	2637
Gains in Personal Development	0.008	.746	.132	1462	-.019	.327	2633
Gains in Vocational Goals	0.020	.434	.133	1464	.011	.556	2636

Table A12

Outcome: First Year Credit Completion Ratio

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.017	.497	.084	1476	.041	.035	2656
Student Effort	0.016	.530	.084	1476	.009	.645	2656
Academic Challenge	0.002	.942	.083	1476	.048	.014	2656
Student-Faculty Interaction	-0.026	.307	.085	1476	-.018	.364	2656
Support for Learners	0.060	.010	.091	1473	.016	.400	2653
Faculty Interactions	-0.035	.170	.085	1476	-.012	.553	2656
Class Assignments	0.058	.020	.088	1476	.066	.001	2655
Exposure to Diversity	-0.024	.374	.085	1472	-.011	.584	2650
Collaborative Learning	0.016	.528	.083	1476	.020	.307	2655
Information Technology	-0.020	.438	.084	1474	.003	.875	2654
Mental Activities	-0.013	.594	.084	1476	.034	.083	2656
School Opinions	0.056	.001	.090	1465	.015	.445	2638
Student Services	0.032	.224	.083	1442	-.004	.852	2584
Academic Preparation	0.027	.290	.084	1468	.047	.016	2641
Gains in Academics	-0.002	.940	.084	1465	.007	.705	2637
Gains in Personal Development	-0.017	.523	.085	1462	-.008	.674	2633
Gains in Vocational Goals	0.004	.885	.084	1464	.023	.243	2636

Table A13

Outcome: First Year Percent Courses Completed with Grade of "C" or Better

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.035	.130	.218	1477	.020	.308	2658
Student Effort	0.035	.140	.218	1477	.019	.317	2658
Academic Challenge	0.046	.051	.219	1477	.038	.048	2658
Student-Faculty Interaction	-0.012	.603	.212	1477	-.034	.083	2658
Support for Learners	0.028	.238	.216	1474	-.001	.944	2655
Faculty Interactions	0.006	.799	.217	1477	-.005	.793	2658
Class Assignments	0.019	.407	.217	1477	.017	.371	2657
Exposure to Diversity	-0.016	.491	.217	1473	-.015	.451	2652
Collaborative Learning	0.025	.295	.217	1477	-.007	.708	2657
Information Technology	-0.024	.313	.215	1475	.004	.826	2656
Mental Activities	0.036	.123	.218	1477	.030	.120	2658
School Opinions	0.033	.164	.212	1466	.003	.874	2640
Student Services	0.029	.240	.219	1433	-.021	.374	2596
Academic Preparation	0.057	.017	.215	1469	.062	.001	2643
Gains in Academics	0.055	.020	.219	1466	.014	.458	2639
Gains in Personal Development	0.006	.808	.211	1463	-.048	.014	2635
Gains in Vocational Goals	0.019	.431	.211	1465	-.015	.449	2638

Table A14

Outcome: Persist Next Term

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.070	.050	.104	1476	.068	.000	2656
Student Effort	0.005	.841	.099	1476	.060	.002	2656
Academic Challenge	0.033	.188	.100	1476	.065	.001	2656
Student-Faculty Interaction	0.037	.138	.101	1476	.048	.013	2656
Support for Learners	0.061	.017	.105	1473	.081	.000	2653
Faculty Interactions	0.049	.052	.102	1476	.052	.007	2656
Class Assignments	0.045	.072	.103	1476	.083	.000	2655
Exposure to Diversity	0.040	.115	.100	1472	.030	.118	2650
Collaborative Learning	0.072	.004	.105	1476	.061	.002	2655
Information Technology	-0.036	.151	.101	1474	-.025	.197	2654
Mental Activities	0.033	.191	.101	1476	.048	.014	2656
School Opinions	0.062	.016	.104	1465	.062	.001	2638
Student Services	0.028	.285	.100	1442	.069	.000	2594
Academic Preparation	0.002	.941	.099	1468	.057	.004	2641
Gains in Academics	0.062	.011	.107	1465	.084	.000	2637
Gains in Personal Development	0.038	.142	.101	1462	.082	.000	2633
Gains in Vocational Goals	0.063	.014	.107	1464	.086	.000	2636

Table A15

Outcome: College Path by End of First Year

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.078	.000	.307	1476	.100	.000	2656
Student Effort	0.040	.078	.303	1476	.095	.000	2656
Academic Challenge	0.029	.193	.302	1476	.083	.000	2656
Student-Faculty Interaction	0.030	.181	.302	1476	.070	.000	2656
Support for Learners	0.052	.022	.305	1473	.095	.000	2653
Faculty Interactions	0.036	.105	.302	1476	.072	.000	2656
Class Assignments	0.092	.000	.309	1476	.141	.000	2655
Exposure to Diversity	0.032	.148	.301	1472	.034	.084	2650
Collaborative Learning	0.059	.007	.304	1476	.085	.000	2655
Information Technology	-0.012	.581	.301	1474	-.009	.639	2654
Mental Activities	0.016	.482	.301	1476	.051	.008	2656
School Opinions	0.035	.119	.301	1465	.800	.000	2638
Student Services	0.303	.039	.090	1442	.095	.000	2594
Academic Preparation	0.052	.022	.303	1468	.107	.000	2641
Gains in Academics	0.065	.004	.305	1465	.101	.000	2637
Gains in Personal Development	0.025	.285	.303	1462	.069	.000	2633
Gains in Vocational Goals	0.060	.008	.304	1464	.085	.000	2636

Table A16

Outcome: Took and Failed at Least One Developmental Class

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.068	.024	.116	996	-.043	.121	1291
Student Effort	-0.050	.110	.114	996	-.025	.367	1291
Academic Challenge	-0.051	.098	.115	996	-.056	.044	1291
Student-Faculty Interaction	-0.010	.747	.112	996	.003	.901	1291
Support for Learners	-0.009	.776	.103	994	.011	.705	1289
Faculty Interactions	-0.019	.528	.112	996	-.013	.630	1291
Class Assignments	-0.089	.003	.120	996	-.059	.034	1290
Exposure to Diversity	-0.001	.974	.111	992	-.025	.379	1285
Collaborative Learning	-0.043	.162	.114	996	.001	.974	1291
Information Technology	-0.020	.507	.113	995	-.041	.138	1290
Mental Activities	-0.031	.308	.114	996	-.037	.190	1291
School Opinions	-0.011	.722	.112	987	-.001	.962	1281
Student Services	-0.004	.896	.109	979	.034	.228	1267
Academic Preparation	-0.071	.023	.116	989	-.074	.008	1283
Gains in Academics	-0.042	.169	.114	988	-.036	.198	1282
Gains in Personal Development	-0.008	.800	.113	985	.033	.243	1279
Gains in Vocational Goals	0.027	.381	.113	987	.041	.146	1281

Table A17

Outcome: Took and Failed at Least One Gatekeeper Class

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.021	.520	.050	918	-.026	.281	1682
Student Effort	-0.049	.141	.051	918	-.039	.114	1682
Academic Challenge	0.015	.645	.050	918	-.053	.029	1682
Student-Faculty Interaction	-0.009	.787	.050	918	.004	.878	1682
Support for Learners	-0.004	.903	.052	916	-.025	.303	1680
Faculty Interactions	-0.010	.757	.050	918	-.001	.956	1682
Class Assignments	-0.080	.014	.056	918	-.064	.009	1682
Exposure to Diversity	-0.037	.260	.053	914	.008	.737	1677
Collaborative Learning	0.009	.780	.050	918	-.002	.933	1682
Information Technology	-0.061	.018	.055	916	-.022	.365	1680
Mental Activities	0.025	.445	.050	918	-.038	.115	1682
School Opinions	0.009	.783	.050	910	-.022	.378	1671
Student Services	-0.024	.474	.051	898	-.001	.968	1649
Academic Preparation	-0.048	.158	.053	912	-.080	.001	1673
Gains in Academics	-0.038	.251	.050	910	-.034	.159	1670
Gains in Personal Development	0.002	.961	.050	907	-.007	.784	1666
Gains in Vocational Goals	-0.028	.401	.051	909	-.027	.272	1669

Cross Sectional Performance File Results

Table A18

Outcome: Three-Term GPA

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.095	.000	.121	2051	.104	.000	3176
Student Effort	0.094	.000	.121	2054	.072	.000	3180
Academic Challenge	0.080	.000	.120	2053	.069	.000	3179
Student-Faculty Interaction	0.052	.014	.116	2045	.048	.007	3160
Support for Learners	-0.002	.940	.113	2034	-.025	.162	3146
Faculty Interactions	0.075	.000	.118	2052	.097	.000	3175
Class Assignments	0.067	.002	.122	1982	.053	.004	3051
Exposure to Diversity	0.002	.935	.113	1995	.005	.803	3085
Collaborative Learning	0.036	.096	.116	1890	.023	.216	2929
Information Technology	0.036	.101	.112	1941	.015	.398	2992
Mental Activities	0.094	.000	.123	2047	.095	.000	3167
School Opinions	0.012	.571	.113	2030	-.017	.331	3146
Student Services	-0.007	.753	.115	1801	-.036	.062	2754
Academic Preparation	0.069	.002	.120	2037	.052	.003	3156
Gains in Academics	0.069	.001	.119	2035	.028	.113	3155
Gains in Personal Development	-0.030	.164	.114	2034	-.059	.001	3154
Gains in Vocational Goals	0.015	.495	.114	2035	.002	.918	3156

Table A19

Outcome: Three-Term Credit Completion Ratio

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.087	.000	.034	2163	.056	.001	3504
Student Effort	0.094	.000	.037	2166	.033	.051	3505
Academic Challenge	0.067	.002	.037	2163	.050	.030	3506
Student-Faculty Interaction	0.134	.029	.028	2155	.002	.914	3485
Support for Learners	0.019	.276	.026	2146	-.012	.467	3467
Faculty Interactions	0.173	.006	.030	2163	.005	.758	3502
Class Assignments	0.081	.000	.035	2085	.054	.002	3359
Exposure to Diversity	0.025	.250	.026	2102	.039	.002	3401
Collaborative Learning	0.056	.012	.030	1992	.018	.315	3235
Information Technology	0.051	.022	.025	2043	.032	.068	3291
Mental Activities	0.053	.013	.036	2158	.041	.016	3493
School Opinions	0.024	.262	.027	2139	.006	.716	3467
Student Services	0.048	.040	.027	1898	-.017	.348	3018
Academic Preparation	0.083	.000	.032	2148	.070	.000	3482
Gains in Academics	0.089	.000	.037	2146	.055	.001	3481
Gains in Personal Development	0.021	.337	.028	2145	-.008	.637	3480
Gains in Vocational Goals	0.022	.305	.030	2146	.007	.660	3482

Table A20

Outcome: Percent Courses with A-C Grades

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.098	.000	.072	2128	.094	.000	3291
Student Effort	0.104	.000	.073	2131	.066	.000	3295
Academic Challenge	0.091	.000	.075	2130	.062	.000	3294
Student-Faculty Interaction	0.038	.075	.063	2120	.023	.192	3273
Support for Learners	-0.007	.734	.060	2112	-.046	.090	3261
Faculty Interactions	0.051	.016	.066	2128	.055	.002	3289
Class Assignments	0.097	.000	.072	2053	.083	.000	3155
Exposure to Diversity	0.034	.118	.063	2067	.007	.676	3192
Collaborative Learning	0.033	.132	.061	1962	.024	.178	3037
Information Technology	0.061	.005	.058	2011	.033	.063	3097
Mental Activities	0.081	.000	.074	2124	.065	.000	3282
School Opinions	0.010	.654	.061	2104	-.026	.141	3257
Student Services	0.026	.268	.062	1868	-.017	.360	2849
Academic Preparation	0.102	.000	.073	2113	.071	.000	3270
Gains in Academics	0.093	.000	.072	2111	.053	.002	3269
Gains in Personal Development	0.000	.986	.062	2110	-.041	.089	3268
Gains in Vocational Goals	0.033	.121	.064	2111	.009	.598	3270

Table A21

Outcome: Grade Points in Gatekeeper Course

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.074	.051	.037	641	.800	.014	641
Student Effort	0.155	.000	.055	642	.138	.000	642
Academic Challenge	0.092	.020	.049	642	.100	.002	642
Student-Faculty Interaction	0.049	.214	.034	640	.033	.302	640
Support for Learners	0.005	.906	.032	637	.006	.858	637
Faculty Interactions	0.062	.115	.035	642	.062	.056	642
Class Assignments	0.207	.000	.074	624	.205	.000	624
Exposure to Diversity	0.003	.933	.037	623	.008	.816	623
Collaborative Learning	0.023	.578	.034	586	.023	.488	586
Information Technology	0.059	.161	.035	599	.022	.515	599
Mental Activities	0.077	.053	.042	638	.078	.016	638
School Opinions	0.021	.602	.032	634	.010	.761	634
Student Services	0.077	.078	.036	551	.036	.297	551
Academic Preparation	0.092	.026	.045	638	.120	.000	638
Gains in Academics	0.115	.004	.046	637	.073	.025	637
Gains in Personal Development	0.011	.790	.039	637	.035	.286	637
Gains in Vocational Goals	0.005	.910	.036	637	.035	.280	637

Appendix B: Achieving the Dream Validation Study Results

Table B1

Outcome: College Algebra Completion (C or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	1.674	.001	.067	660	.128	.001	660
Student Effort	0.976	.086	.052	660	.065	.094	660
Academic Challenge	0.546	.292	.049	660	.047	.233	660
Student-Faculty Interaction	0.482	.293	.049	660	.047	.230	660
Support for Learners	0.498	.213	.049	658	.039	.316	658
Faculty Interactions	0.772	.111	.051	660	.067	.086	660
Class Assignments	0.909	.016	.058	660	.084	.031	660
Exposure to Diversity	0.374	.230	.049	660	.049	.206	660
Collaborative Learning	1.265	.008	.061	660	.101	.009	660
Information Technology	0.234	.431	.048	660	.037	.345	660
Mental Activities	0.352	.384	.048	660	.036	.361	660
School Opinions	0.419	.274	.047	654	.036	.362	654
Student Services	0.120	.744	.046	647	-.001	.972	647
Academic Preparation	1.036	.069	.052	655	.090	.022	655
Gains in Academics	0.386	.004	.062	654	.097	.013	654
Gains in Personal Development	0.096	.368	.047	654	.020	.614	654
Gains in Vocational Goals	0.095	.349	.047	654	.028	.482	654

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Developmental Math Placement Level, Sum of Risk Factors

Table B2

Outcome: College English Completion (C or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.698	.080	.040	1097	-.049	.103	1097
Student Effort	-0.580	.168	.038	1097	-.037	.218	1097
Academic Challenge	-0.369	.342	.037	1097	-.028	.361	1097
Student-Faculty Interaction	-0.421	.231	.037	1096	-.030	.323	1096
Support for Learners	-0.095	.753	.036	1097	.005	.862	1097
Faculty Interactions	-0.493	.176	.038	1097	-.032	.290	1097
Class Assignments	0.013	.962	.036	1097	-.004	.905	1097
Exposure to Diversity	-0.231	.332	.037	1097	-.028	.356	1097
Collaborative Learning	-0.497	.169	.038	1096	-.036	.233	1096
Information Technology	-0.413	.069	.039	1096	-.064	.034	1096
Mental Activities	-0.404	.178	.038	1096	-.038	.203	1096
School Opinions	-0.047	.870	.037	1088	.016	.589	1088
Student Services	0.006	.983	.036	1075	.005	.867	1075
Academic Preparation	-0.529	.214	.039	1088	-.045	.140	1088
Gains in Academics	-0.063	.522	.037	1088	-.005	.864	1088
Gains in Personal Development	-0.013	.868	.037	1088	.019	.531	1088
Gains in Vocational Goals	-0.098	.199	.037	1088	-.015	.617	1088

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Developmental Reading Placement Level, Developmental Writing Placement Level, Sum of Risk Factors

Table B3

Outcome: Developmental Math Completion, Level 1 (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.616	.274	.063	491	.058	.155	606
Student Effort	0.791	.217	.064	491	.096	.019	606
Academic Challenge	0.740	.190	.064	491	.079	.051	606
Student-Faculty Interaction	0.651	.207	.064	490	.075	.067	605
Support for Learners	-0.112	.797	.060	489	-.014	.731	604
Faculty Interactions	0.721	.189	.064	491	.081	.045	606
Class Assignments	0.217	.591	.060	491	.042	.296	606
Exposure to Diversity	0.296	.393	.062	491	.050	.218	606
Collaborative Learning	0.447	.386	.061	490	.034	.398	605
Information Technology	0.307	.351	.062	490	.062	.130	605
Mental Activities	0.598	.177	.064	490	.074	.070	605
School Opinions	-0.225	.595	.061	486	-.016	.691	601
Student Services	0.181	.648	.065	477	.017	.680	591
Academic Preparation	1.075	.088	.069	487	.094	.021	602
Gains in Academics	0.297	.049	.071	486	.113	.006	601
Gains in Personal Development	-0.054	.652	.061	486	-.041	.318	601
Gains in Vocational Goals	-0.021	.854	.060	486	-.024	.560	601

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B4

Outcome: Developmental Math Completion, Level 2 (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	1.060	.059	.073	523	.036	.386	582
Student Effort	0.574	.344	.067	523	.048	.248	582
Academic Challenge	0.949	.080	.072	523	.075	.071	582
Student-Faculty Interaction	0.022	.964	.066	522	-.022	.593	581
Support for Learners	0.555	.179	.069	522	.059	.158	581
Faculty Interactions	0.230	.654	.065	523	-.011	.787	582
Class Assignments	0.595	.131	.070	523	.017	.685	582
Exposure to Diversity	0.181	.590	.065	523	.003	.943	582
Collaborative Learning	0.716	.161	.071	522	.035	.394	581
Information Technology	0.185	.573	.067	522	.018	.668	581
Mental Activities	0.424	.305	.069	522	.044	.284	581
School Opinions	0.766	.061	.072	516	.083	.046	575
Student Services	0.263	.490	.068	509	.030	.472	566
Academic Preparation	1.346	.038	.074	517	.087	.038	576
Gains in Academics	0.559	.000	.099	516	.149	.000	575
Gains in Personal Development	0.048	.681	.064	516	-.003	.937	575
Gains in Vocational Goals	0.106	.334	.066	516	.024	.561	575

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B5

Outcome: Developmental Math Completion, Level 3 (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	2.392	.000	.162	418	.121	.011	446
Student Effort	0.114	.868	.126	418	.002	.970	446
Academic Challenge	0.551	.386	.128	418	.026	.591	446
Student-Faculty Interaction	0.195	.733	.125	418	.005	.920	446
Support for Learners	-0.368	.449	.128	417	-.047	.324	445
Faculty Interactions	0.621	.300	.129	418	.046	.334	446
Class Assignments	1.220	.009	.146	418	.073	.123	446
Exposure to Diversity	0.202	.599	.127	418	.024	.617	446
Collaborative Learning	1.651	.006	.147	417	.072	.131	445
Information Technology	0.729	.054	.135	417	.071	.135	445
Mental Activities	0.316	.509	.126	417	.007	.890	445
School Opinions	-0.371	.440	.129	414	-.047	.327	442
Student Services	-0.418	.348	.133	405	-.063	.191	433
Academic Preparation	1.168	.121	.134	414	.096	.044	442
Gains in Academics	0.220	.174	.133	414	.066	.168	442
Gains in Personal Development	-0.141	.300	.130	414	-.064	.180	442
Gains in Vocational Goals	-0.163	.214	.132	414	-.061	.202	442

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B6

Outcome: Developmental English Completion, Level 1 (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.137	.843	.146	387	-.003	.952	457
Student Effort	0.241	.751	.146	387	.045	.336	457
Academic Challenge	0.258	.715	.146	387	.037	.424	457
Student-Faculty Interaction	-0.652	.239	.151	386	-.043	.363	456
Support for Learners	-1.484	.005	.170	385	-.087	.062	455
Faculty Interactions	-0.646	.271	.149	387	-.035	.454	457
Class Assignments	1.004	.062	.157	387	.073	.117	457
Exposure to Diversity	-0.425	.315	.149	387	-.036	.443	457
Collaborative Learning	-0.075	.899	.147	386	-.019	.690	456
Information Technology	0.228	.548	.148	386	.059	.210	456
Mental Activities	0.033	.951	.147	386	.014	.763	456
School Opinions	-1.150	.021	.164	381	-.066	.162	451
Student Services	-0.557	.274	.155	376	-.043	.365	445
Academic Preparation	1.136	.161	.152	382	.113	.016	452
Gains in Academics	0.130	.460	.148	381	.047	.322	451
Gains in Personal Development	-0.221	.152	.153	381	-.038	.419	451
Gains in Vocational Goals	-0.074	.603	.147	381	-.023	.621	451

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B7

Outcome: Developmental English Completion, Level 2 or Lower (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	-0.854	.388	.139	172	-.005	.944	199
Student Effort	-0.020	.986	.133	172	.044	.539	199
Academic Challenge	0.690	.510	.137	172	.087	.222	199
Student-Faculty Interaction	-0.716	.414	.138	171	.006	.932	198
Support for Learners	-0.614	.421	.139	171	-.075	.290	198
Faculty Interactions	-1.109	.226	.144	172	-.007	.920	199
Class Assignments	0.473	.544	.136	172	.061	.394	199
Exposure to Diversity	0.670	.323	.141	172	.078	.272	199
Collaborative Learning	-0.329	.687	.134	171	-.002	.979	198
Information Technology	0.409	.512	.136	171	.087	.223	198
Mental Activities	0.093	.908	.133	171	.032	.658	198
School Opinions	-0.353	.628	.156	170	-.061	.396	197
Student Services	0.384	.648	.129	160	.037	.619	186
Academic Preparation	1.259	.260	.163	170	.152	.033	197
Gains in Academics	0.349	.219	.165	170	.156	.028	197
Gains in Personal Development	0.125	.615	.156	170	.066	.354	197
Gains in Vocational Goals	0.156	.480	.158	170	.081	.260	197

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B8

Outcome: Developmental Reading Completion, Level 1 (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.176	.807	.059	347	.008	.872	399
Student Effort	1.297	.124	.068	347	.105	.036	399
Academic Challenge	1.144	.134	.068	347	.095	.058	399
Student-Faculty Interaction	-0.202	.749	.059	347	-.007	.891	399
Support for Learners	-0.699	.207	.066	346	-.066	.191	398
Faculty Interactions	-0.141	.831	.059	347	.002	.971	399
Class Assignments	1.550	.004	.093	347	.139	.005	399
Exposure to Diversity	-0.233	.622	.060	347	-.022	.656	399
Collaborative Learning	-0.302	.633	.060	347	-.044	.382	399
Information Technology	0.574	.176	.066	347	.086	.085	399
Mental Activities	0.786	.164	.067	347	.082	.102	399
School Opinions	-0.625	.241	.066	343	-.058	.250	395
Student Services	-0.079	.880	.062	339	.005	.927	391
Academic Preparation	0.722	.402	.063	343	.087	.085	395
Gains in Academics	-0.070	.723	.061	343	.025	.623	395
Gains in Personal Development	-0.200	.217	.067	343	-.072	.154	395
Gains in Vocational Goals	-0.097	.523	.062	343	-.041	.412	395

Data Sources: Achieving the Dream Database (July 6, 2006) and *CCSSE* (2003, 2004, 2005)
NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B9

Outcome: Developmental Reading Completion, Level 2 (B or better) by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.446	.687	.100	154	.077	.302	182
Student Effort	2.708	.041	.134	154	.163	.028	182
Academic Challenge	-0.069	.947	.099	154	.056	.454	182
Student-Faculty Interaction	0.677	.520	.102	154	.089	.233	182
Support for Learners	-0.935	.261	.109	154	-.115	.122	181
Faculty Interactions	0.227	.837	.099	154	.053	.473	182
Class Assignments	1.867	.031	.138	154	.154	.038	182
Exposure to Diversity	0.463	.565	.101	154	.053	.477	182
Collaborative Learning	0.073	.937	.099	154	.029	.694	182
Information Technology	1.806	.007	.161	154	.249	.001	182
Mental Activities	0.456	.555	.102	154	.086	.250	182
School Opinions	-0.881	.271	.109	154	-.116	.120	181
Student Services	1.394	.101	.130	145	.102	.183	172
Academic Preparation	-1.304	.271	.109	154	-.020	.786	182
Gains in Academics	0.096	.731	.100	154	.032	.673	181
Gains in Personal Development	0.188	.467	.103	154	.006	.940	181
Gains in Vocational Goals	0.017	.943	.099	154	-.056	.452	181

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Sum of Risk Factors

Table B10

Outcome: Cumulative GPA (after two years)

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.820	.000	.100	1091	.141	.000	1091
Student Effort	0.451	.075	.092	1091	.059	.050	1091
Academic Challenge	0.571	.012	.094	1091	.100	.001	1091
Student-Faculty Interaction	0.433	.037	.093	1090	.090	.003	1090
Support for Learners	-0.168	.347	.090	1089	-.028	.362	1089
Faculty Interactions	0.619	.004	.096	1091	.121	.000	1091
Class Assignments	0.316	.053	.092	1091	.055	.069	1091
Exposure to Diversity	0.301	.035	.093	1091	.072	.017	1091
Collaborative Learning	0.524	.010	.095	1090	.098	.001	1090
Information Technology	0.195	.142	.091	1090	.058	.056	1090
Mental Activities	0.357	.041	.093	1090	.084	.005	1090
School Opinions	-0.081	.638	.089	1082	-.012	.694	1082
Student Services	-0.204	.224	.090	1061	-.047	.126	1061
Academic Preparation	0.873	.001	.089	1083	.127	.000	1083
Gains in Academics	0.106	.064	.092	1082	.055	.072	1082
Gains in Personal Development	-0.040	.412	.089	1082	-.016	.602	1082
Gains in Vocational Goals	-0.050	.270	.090	1082	-.012	.697	1082

NOTE: Linear regression model (unstandardized betas)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, Developmental Math Placement Level, Sum of Risk Factors

Table B11

Outcome: Credit Completion Ratio – Cumulative Y1Y2

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.112	.000	.106	1623	.122	.000	1623
Student Effort	0.124	.000	.107	1623	.106	.000	1623
Academic Challenge	0.105	.000	.106	1623	.121	.000	1623
Student-Faculty Interaction	0.061	.020	.101	1622	.083	.001	1622
Support for Learners	-0.035	.121	.100	1620	-.045	.068	1620
Faculty Interactions	0.086	.002	.104	1623	.105	.000	1623
Class Assignments	0.094	.000	.110	1623	.114	.000	1623
Exposure to Diversity	0.018	.987	.099	1623	.031	.210	1623
Collaborative Learning	0.047	.081	.100	1622	.063	.011	1622
Information Technology	0.037	.027	.101	1622	.086	.001	1622
Mental Activities	0.074	.001	.104	1622	.106	.000	1622
School Opinions	-0.033	.125	.100	1610	-.040	.111	1610
Student Services	0.020	.345	.105	1574	-.001	.985	1574
Academic Preparation	0.103	.001	.104	1611	.128	.000	1611
Gains in Academics	0.024	.001	.105	1610	.078	.002	1610
Gains in Personal Development	-0.004	.490	.099	1610	-.030	.233	1610
Gains in Vocational Goals	-0.004	.256	.099	1610	-.019	.455	1610

NOTE: Regression model (unstandardized betas)
Controls: cohort, gender, race/ethnicity, age, part-time status Y1T1, developmental math placement level, sum of risk factors, cumulative credits attempted Y1Y2.

Table B12

Outcome: Persistence, Fall-to-Fall Y1Y2 (Cohorts 2002, 2003 only)

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.758	.052	.118	1229	.059	.037	1229
Student Effort	0.738	.081	.117	1229	.058	.041	1229
Academic Challenge	0.576	.130	.117	1229	.038	.183	1229
Student-Faculty Interaction	-0.268	.436	.115	1228	-.019	.498	1228
Support for Learners	0.346	.248	.115	1227	.047	.098	1227
Faculty Interactions	-0.501	.159	.116	1229	-.042	.145	1229
Class Assignments	0.427	.115	.117	1229	.064	.024	1229
Exposure to Diversity	0.280	.241	.116	1229	.031	.272	1229
Collaborative Learning	0.685	.053	.118	1228	.066	.021	1228
Information Technology	0.527	.019	.120	1228	.063	.027	1228
Mental Activities	0.490	.095	.117	1228	.042	.139	1228
School Opinions	0.272	.350	.112	1219	.034	.235	1219
Student Services	0.577	.041	.120	1195	.079	.006	1195
Academic Preparation	0.271	.518	.112	1220	.021	.456	1220
Gains in Academics	0.294	.002	.121	1219	.121	.000	1219
Gains in Personal Development	0.048	.553	.111	1219	.040	.158	1219
Gains in Vocational Goals	0.136	.075	.114	1219	.062	.031	1219

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, placed in developmental math, placed in developmental English, sum of risk factors

Table B13

Outcome: Attainment – Degree or Certificate by Year 3

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	1.192	.017	.203	1623	.101	.000	1623
Student Effort	-0.198	.727	.197	1623	-.008	.759	1623
Academic Challenge	1.009	.050	.201	1623	.069	.005	1623
Student-Faculty Interaction	1.232	.006	.205	1622	.110	.000	1622
Support for Learners	-0.522	.210	.198	1620	-.021	.394	1620
Faculty Interactions	1.331	.004	.206	1623	.108	.000	1623
Class Assignments	0.190	.600	.197	1623	.030	.225	1623
Exposure to Diversity	0.237	.463	.198	1623	.030	.220	1623
Collaborative Learning	0.909	.040	.202	1622	.088	.000	1622
Information Technology	0.355	.231	.199	1622	.064	.010	1622
Mental Activities	0.654	.101	.200	1622	.061	.014	1622
School Opinions	-0.395	.325	.199	1610	-.019	.419	1610
Student Services	-0.377	.323	.196	1574	-.022	.383	1574
Academic Preparation	1.306	.019	.204	1611	.080	.001	1611
Gains in Academics	0.013	.919	.198	1610	.009	.718	1610
Gains in Personal Development	-0.026	.811	.198	1610	.006	.820	1610
Gains in Vocational Goals	0.209	.048	.202	1610	.072	.004	1610

NOTE: Logistic regression model (R^2 is Nagelkerke)
Control Variables: Cohort, Gender, Race/Ethnicity, Age, Part-Time Y1T1, placed in developmental math, placed in developmental English, sum of risk factors

Table B14

Outcome: Credit Completion Ratios in Term CCSSE Administered if Spring of First Academic Year

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.160	.006	.052	975	.103	.001	975
Student Effort	0.198	.001	.056	975	.105	.001	975
Academic Challenge	0.220	.000	.049	975	.139	.000	975
Student-Faculty Interaction	0.113	.022	.050	974	.082	.010	974
Support for Learners	0.019	.647	.045	973	-.006	.855	973
Faculty Interactions	0.153	.003	.053	975	.105	.001	975
Class Assignments	0.143	.000	.047	975	.117	.000	975
Exposure to Diversity	-0.005	.875	.045	975	.003	.936	975
Collaborative Learning	0.081	.134	.047	974	.049	.123	974
Information Technology	0.086	.006	.052	974	.106	.001	974
Mental Activities	0.142	.001	.056	974	.116	.000	974
School Opinions	0.022	.580	.045	968	.005	.874	968
Student Services	0.021	.570	.054	939	-.018	.575	939
Academic Preparation	0.244	.000	.061	969	.147	.000	969
Gains in Academics	0.038	.004	.053	968	.064	.045	968
Gains in Personal Development	0.009	.427	.045	968	.001	.966	968
Gains in Vocational Goals	0.008	.477	.045	968	.018	.585	968

NOTE: Regression model (unstandardized betas)
Controls: cohort, gender, race/ethnicity, age, part-time status when *CCSSE* administered, developmental math placement level, sum of risk factors

Table B15

Outcome: Cumulative GPA in year CCSSE Administered (if Year 1)

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.432	.013	.108	975	.095	.003	975
Student Effort	0.573	.001	.113	975	.098	.002	975
Academic Challenge	0.523	.001	.112	975	.108	.001	975
Student-Faculty Interaction	0.244	.101	.105	974	.056	.079	974
Support for Learners	-0.044	.720	.103	973	-.049	.128	973
Faculty Interactions	0.398	.010	.109	975	.093	.004	975
Class Assignments	0.405	.000	.114	975	.098	.002	975
Exposure to Diversity	0.057	.566	.103	975	.018	.581	975
Collaborative Learning	0.187	.252	.104	974	.034	.288	974
Information Technology	0.165	.079	.105	974	.073	.023	974
Mental Activities	0.336	.008	.109	974	.089	.005	974
School Opinions	-0.004	.975	.102	968	-.030	.356	968
Student Services	0.032	.777	.112	939	-.039	.229	939
Academic Preparation	0.647	.000	.114	969	.139	.000	969
Gains in Academics	0.057	.148	.104	968	.004	.899	968
Gains in Personal Development	-0.043	.201	.104	968	-.078	.015	968
Gains in Vocational Goals	-0.049	.132	.104	968	-.060	.062	968

NOTE: Regression model (unstandardized betas)
Controls: cohort, gender, race/ethnicity, age, part-time status when *CCSSE* administered, developmental math placement level, sum of risk factors

Table B16

Outcome: Credit Completion Ratios in Term CCSSE Administered if Spring of Second Academic Year

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.047	.403	.104	547	.062	.148	547
Student Effort	0.051	.444	.103	547	.023	.585	547
Academic Challenge	0.042	.471	.103	547	.066	.125	547
Student-Faculty Interaction	-0.024	.645	.103	547	.024	.580	547
Support for Learners	-0.067	.151	.106	546	-.038	.378	546
Faculty Interactions	0.021	.689	.103	547	.060	.162	547
Class Assignments	0.009	.841	.102	547	.005	.898	547
Exposure to Diversity	0.025	.505	.103	547	.025	.558	547
Collaborative Learning	-0.020	.689	.103	547	.008	.850	547
Information Technology	-0.038	.285	.104	547	-.013	.766	547
Mental Activities	0.039	.373	.104	547	.068	.112	547
School Opinions	-0.082	.064	.106	541	-.046	.290	541
Student Services	0.012	.793	.094	534	-.026	.546	534
Academic Preparation	0.099	.128	.104	541	.099	.021	541
Gains in Academics	0.009	.568	.100	541	.052	.231	541
Gains in Personal Development	0.004	.762	.100	541	.029	.497	541
Gains in Vocational Goals	-0.008	.510	.100	541	.016	.711	541

NOTE: Regression model (unstandardized betas)
Controls: cohort, gender, race/ethnicity, age, part-time status when *CCSSE* administered, developmental math placement level, sum of risk factors

Table B17

Outcome: Cumulative GPA in year CCSSE Administered (if Year 2)

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.645	.000	.191	548	.208	.000	548
Student Effort	0.400	.035	.173	548	.114	.008	548
Academic Challenge	0.391	.018	.175	548	.151	.000	548
Student-Faculty Interaction	0.181	.222	.168	548	.104	.105	548
Support for Learners	-0.235	.081	.171	547	-.039	.367	547
Faculty Interactions	0.346	.021	.174	548	.153	.000	548
Class Assignments	0.258	.033	.173	548	.077	.070	548
Exposure to Diversity	0.314	.003	.180	548	.121	.005	548
Collaborative Learning	0.329	.019	.174	548	.131	.002	548
Information Technology	0.089	.387	.167	548	.073	.088	548
Mental Activities	0.344	.007	.177	548	.149	.000	548
School Opinions	-0.165	.196	.170	542	-.022	.605	542
Student Services	-0.074	.564	.170	535	-.019	.653	535
Academic Preparation	0.413	.027	.175	542	.179	.000	542
Gains in Academics	0.065	.127	.171	542	.098	.023	542
Gains in Personal Development	-0.053	.133	.171	542	-.030	.480	542
Gains in Vocational Goals	-0.070	.037	.174	542	-.029	.495	542

NOTE: Regression model (unstandardized betas)
Controls: cohort, gender, race/ethnicity, age, part-time status when *CCSSE* administered, developmental math placement level, sum of risk factors

Appendix C: HSI/HACU Consortium Institutions Validation Study Results

Table C1

Outcome: Cumulative GPA

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.064	.000	.074	3198	.082	.000	3265
Student Effort	0.081	.000	.077	3198	.119	.000	3265
Academic Challenge	0.082	.000	.077	3198	.103	.000	3265
Student-Faculty Interaction	0.066	.000	.075	3198	.077	.000	3265
Support for Learners	-0.019	.261	.071	3194	-.020	.249	3260
Faculty Interactions	0.092	.000	.079	3198	.117	.000	3265
Class Assignments	0.043	.012	.072	3197	.050	.004	3264
Exposure to Diversity	0.039	.024	.072	3197	.045	.010	3263
Collaborative Learning	0.017	.309	.071	3197	.011	.582	3264
Information Technology	0.044	.011	.072	3195	.046	.009	3262
Mental Activities	0.082	.000	.077	3197	.095	.000	3264
School Opinions	0.000	.991	.071	3161	-.002	.888	3227
Student Services	-0.038	.029	.069	3117	-.020	.253	3174
Academic Preparation	0.093	.000	.079	3164	.124	.000	3231
Gains in Academics	0.041	.019	.072	3159	..057	.001	3221
Gains in Personal Development	-0.010	.553	.071	3155	-.002	.911	3218
Gains in Vocational Goals	-0.010	.553	.071	3155	.020	.256	3223

Table C2

Outcome: First to Second Term Persistence

	Regression				Correlation		
CCSSE Predictor	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.110	.000	.012	3127	.110	.000	3194
Student Effort	0.046	.011	.003	3127	.048	.006	3194
Academic Challenge	0.038	.034	.002	3127	.038	.030	3194
Student-Faculty Interaction	0.095	.000	.009	3127	.093	.000	3194
Support for Learners	0.056	.002	.004	3122	.052	.003	3189
Faculty Interactions	0.082	.000	.007	3127	.081	.000	3194
Class Assignments	0.104	.000	.011	3126	.103	.000	3193
Exposure to Diversity	0.070	.000	.005	3125	.067	.000	3193
Collaborative Learning	0.090	.000	.009	3127	.090	.000	3194
Information Technology	0.050	.005	.003	3125	.047	.008	3193
Mental Activities	0.019	.290	.001	3127	.019	.288	3194
School Opinions	0.043	.016	.002	3092	.041	.020	3159
Student Services	0.054	.003	.004	3053	.055	.002	3110
Academic Preparation	0.042	.019	.002	3095	.044	.013	3162
Gains in Academics	0.094	.000	.009	3091	.092	.000	3154
Gains in Personal Development	0.056	.000	.008	3087	.083	.000	3151
Gains in Vocational Goals	0.071	.000	.005	3092	.068	.000	3155

Table C3

Outcome: First to Third Term Persistence

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.113	.000	.014	3125	.112	.000	3193
Student Effort	0.038	.037	.003	3125	.038	.034	3193
Academic Challenge	0.053	.003	004	3125	.054	.002	3193
Student-Faculty Interaction	0.093	.000	.010	3125	.094	.000	3193
Support for Learners	0.076	.000	.007	3121	.070	.000	3188
Faculty Interactions	0.079	.000	.007	3125	.081	.000	3193
Class Assignments	0.087	.000	.009	3124	.084	.000	3192
Exposure to Diversity	0.042	.020	.003	3124	.045	.010	3191
Collaborative Learning	0.108	.000	.013	3125	.106	.000	3193
Information Technology	0.050	.005	.004	3123	.049	.005	3191
Mental Activities	0.036	.044	.002	3125	.036	.041	3193
School Opinions	0.063	.001	.005	3090	.058	.001	3157
Student Services	0.069	.010	.006	3050	.069	.000	3107
Academic Preparation	0.047	.000	.003	3093	.050	.005	3160
Gains in Academics	0.121	.000	.015	3082	.114	.000	3152
Gains in Personal Development	0.104	.000	.012	3086	.097	.000	3149
Gains in Vocational Goals	0.075	.000	.007	3090	.074	.000	3153

Table C4

Outcome: Total Credit Hours Taken

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.181	.000	.045	3211	.178	.000	3279
Student Effort	0.123	.000	.028	3211	.114	.000	3279
Academic Challenge	0.132	.000	.030	3211	.131	.000	3279
Student-Faculty Interaction	0.167	.000	.041	3211	.175	.000	3279
Support for Learners	0.140	.000	.032	3207	.124	.000	3274
Faculty Interactions	0.131	.000	.030	3211	.136	.000	3279
Class Assignments	0.160	.000	.038	3210	.153	.000	3278
Exposure to Diversity	0.115	.000	.026	3210	.130	.000	3278
Collaborative Learning	0.170	.000	.042	3210	.166	.000	3278
Information Technology	0.117	.000	.026	3209	.122	.000	3277
Mental Activities	0.103	.000	.024	3210	.104	.000	3278
School Opinions	0.127	.000	.028	3174	.113	.000	3241
Student Services	0.141	.000	.033	3131	.134	.000	3188
Academic Preparation	0.120	.000	.027	3178	.121	.000	3245
Gains in Academics	0.207	.000	.055	3172	.191	.000	3236
Gains in Personal Development	0.179	.000	.044	3169	.159	.000	3232
Gains in Vocational Goals	0.131	.000	.029	3175	.116	.000	3237

Table C5

Outcome: Number of Terms Enrolled

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.118	.000	.037	3211	.121	.000	3279
Student Effort	0.050	.004	.025	3211	.065	.000	3279
Academic Challenge	0.059	.001	.026	3211	.066	.000	3279
Student-Faculty Interaction	0.112	.000	.035	3211	.116	.000	3279
Support for Learners	0.074	.000	.028	3207	.060	.001	3274
Faculty Interactions	0.092	.000	.031	3211	.104	.000	3279
Class Assignments	0.098	.000	.032	3210	.092	.000	3278
Exposure to Diversity	0.076	.000	.028	3210	.079	.000	3278
Collaborative Learning	0.101	.000	.033	3210	.092	.000	3278
Information Technology	0.041	.019	.025	3209	.038	.029	3277
Mental Activities	0.061	.000	.026	3210	.066	.000	3278
School Opinions	0.060	.001	.027	3174	.049	.006	3241
Student Services	0.075	.000	.030	3131	.079	.000	3188
Academic Preparation	0.002	.907	.023	3178	.016	.355	3245
Gains in Academics	0.142	.000	.043	3172	.140	.000	3236
Gains in Personal Development	0.134	.000	.041	3169	.124	.000	3232
Gains in Vocational Goals	0.096	.000	.033	3175	.092	.000	3237

Table C6

Outcome: Average Credit Hours Taken

CCSSE Predictor	Regression				Correlation		
	Beta	Sig.	R^2	N	Coeff.	Sig.	N
Active and Collaborative Learning	0.158	.000	.102	3211	.149	.000	3279
Student Effort	0.152	.000	.099	3211	.113	.000	3279
Academic Challenge	0.154	.000	.100	3211	.141	.000	3279
Student-Faculty Interaction	0.142	.000	.097	3211	.150	.000	3279
Support for Learners	0.138	.000	.096	3207	.131	.000	3274
Faculty Interactions	0.115	.000	.090	3211	.106	.000	3279
Class Assignments	0.161	.000	.103	3210	.157	.000	3278
Exposure to Diversity	0.091	.000	.085	3210	.114	.000	3278
Collaborative Learning	0.165	.000	.104	3210	.170	.000	3278
Information Technology	0.155	.000	.101	3209	.167	.000	3277
Mental Activities	0.094	.000	.080	3210	.087	.000	3278
School Opinions	0.130	.000	.094	3174	.124	.000	3241
Student Services	0.139	.000	.095	3131	.120	.000	3188
Academic Preparation	0.235	.000	.131	3178	.214	.000	3245
Gains in Academics	0.158	.000	.102	3172	.133	.000	3236
Gains in Personal Development	0.117	.000	.091	3169	.095	.000	3232
Gains in Vocational Goals	0.072	.000	.082	3175	.053	.003	3237

Appendix D: *CCSSE* Constructs

Benchmark Descriptions for the Community College Survey of Student Engagement Data	
Active and Collaborative Learning	Benchmark composed of seven survey items. A four-item response scale (*Never, Sometimes, Often, Very often*) corresponds to the following Active and Collaborative Learning college activities: • Asked questions in class or contributed to class discussions • Made a class presentation • Worked with other students on projects during class • Worked with classmates outside of class to prepare class assignments • Tutored or taught other students (paid or voluntary) • Participated in a community-based project as a part of a regular course • Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)
Student Effort	Benchmark composed of eight survey items. A four-item response scale (*Never, Sometimes, Often, Very often*) corresponds to the following Student Effort related college activities: • Prepared two or more drafts of a paper or assignment before turning it in • Worked on a paper or project that required integrating ideas or information from various sources • Come to class without completing readings or assignments A five-item response scale (*None, Between 1 and 4, Between 5 and 10, Between 11 and 20, More than 20*) is used for the following academic preparation item: • Number of books read on your own (not assigned) for personal enjoyment or academic enrichment A six-item response scale (*None, 1-5 hours, 6-10 hours, 11-20 hours, 21-30 hours, More than 30 hours*) is used for the following time allotment item: • Preparing for class (studying, reading, writing, rehearsing, doing homework, or other activities related to your program)

A four-item response scale (*Don't Know/N.A., Rarely/never, Sometimes, Often*) is used for the following student services items:

- Frequency: peer or other tutoring
- Frequency: skill labs (writing, math, etc.)
- Frequency: computer lab

Academic Challenge

Benchmark composed of ten survey items. A four-item response scale (*Never, Sometimes, Often, Very often)* is used for the following Academic Challenge related college activity:

- Worked harder than you thought you could to meet an instructor's standards or expectations

A four-item response scale (*Very little, Some, Quite a bit, Very much)* is used for the following mental activity items:

- Analyzing the basic elements of an idea, experience, or theory
- Synthesizing and organizing ideas, information, or experiences in new ways
- Making judgments about the value or soundness of information, arguments, or methods
- Applying theories or concepts to practical problems or in new situations
- Using information you have read or heard to perform a new skill

A five-item response scale (*None, Between 1 and 4, Between 5 and 10, Between 11 and 20, More than 20)* is used for the following academic preparation items:

- Number of assigned textbooks, manuals, books, or book-length packs of course readings
- Number of written papers or reports of any length

A seven-item response scale (*Ranging from 1 to 7, with scale anchors described: (1) Extremely easy (7) Extremely challenging)* is used for the following exam item:

- Mark the box that best represents the extent to which your examinations during the current school year have challenged you to do your best work <u>at this college</u>

A four-item response scale (*Very little, Some, Quite a bit, Very much)* is used for the following college opinion item:

- Encouraging you to spend significant amounts of

	time studying
Student-Faculty Interaction	Benchmark composed of six survey items. A four-item response scale (*Never, Sometimes, Often, Very often)* is used for the following Student-Faculty Interaction related college activities: • Used email to communicate with an instructor • Discussed grades or assignments with an instructor • Talked about career plans with an instructor or advisor • Discussed ideas from your readings or classes with instructors outside of class • Received prompt feedback (written or oral) from instructors on your performance • Worked with instructors on activities other than coursework
Support for Learners	Benchmark composed of seven survey items. A four-item response scale (*Very little, Some, Quite a bit, Very much)* is used for the following college opinion items: • Providing the support you need to help you succeed at this college • Encouraging contact among students from different economic, social, and racial or ethnic backgrounds • Helping you cope with your non-academic responsibilities (work, family, etc.) • Providing the support you need to thrive socially • Providing the financial support you need to afford your education A four-item response scale (*Don't know/N.A., Rarely/never, Sometimes, Often)* is used for the following student services items: • Frequency: Academic advising/planning • Frequency: Career counseling

Definitions of Item Clusters for
the Community College Survey of Student Engagement Data

Faculty Interactions	Indicator composed of six survey items. A four-item response scale (*Never, Sometimes, Often, Very Often)* is used for the following college activities: • Asked questions in class or contributed to class discussions • Discussed grades or assignments with an instructor • Talked about career plans with an instructor or advisor

	• Discussed ideas from your readings or classes with instructors outside of class • Received prompt feedback (written or oral) from instructors on your performance • Worked with instructors on activities other than coursework
Class Assignments	Indicator composed of three survey items. A four-item response scale (*Never, Sometimes, Often, Very Often)* is used for the following college activities: • Made a class presentation • Prepared two or more drafts of a paper or assignment before turning it in • Worked on a paper or project that required integrating ideas or information from various sources
Exposure to Diversity	Indicator composed of three survey items. A four-item response scale (*Never, Sometimes, Often, Very Often)* is used for the following college activities: • Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.) • Had serious conversations with students of a different race or ethnicity other than your own • Had serious conversations with students who differ from you in terms of their religious beliefs, political opinions, or personal values
Collaborative Learning	Indicator composed of four survey items. A four-item response scale (*Never, Sometimes, Often, Very Often)* is used for the following college activities: • Worked with other students on projects during class • Worked with classmates outside of class to prepare class assignments • Tutored or taught other students (paid or voluntary) • Participated in a community-based project as a part of a regular course
Information Technology	Indicator composed of two survey items. A four-item response scale (*Never, Sometimes, Often, Very Often)* is used for the following college activities: • Used the internet or instant messaging to work on an assignment • Used email to communicate with an instructor
Mental Activities	Indicator composed of six survey items. A four-item response scale (*Never, Sometimes, Often, Very Often)* is used for the following college activity: • Worked harder than you thought you could to meet

	an instructor's standards or expectations A four-item response scale (*Very little, Some, Quite a bit, Very much)* is used for the following mental activity items: • Analyzing the basic elements of an idea, experience, or theory • Synthesizing and organizing ideas, information, or experiences in new ways • Making judgments about the value or soundness of information, arguments, or methods • Applying theories or concepts to practical problems or in new situations • Using information you have read or heard to perform a new skill
School Opinions	Indicator composed of six survey items. A four-item response scale (*Very little, Some, Quite a bit, Very Much)* is used for the following college opinion items: • Encouraging you to spend significant amounts of time studying • Providing the support you need to help you succeed at this college • Encouraging contact among students from different economic, social, and racial or ethnic backgrounds • Helping you cope with your non-academic responsibilities (work, family, etc.) • Providing the support you need to thrive socially • Providing the financial support you need to afford your education
Student Services	Indicator composed of five survey items. A four-item response scale (*Don't Know/N.A., Rarely/never, Sometimes, Often)* is used for the following student services items: • Frequency: Academic advising/planning • Frequency: Career counseling • Frequency: Peer or other tutoring • Frequency: Skill labs (writing, math, etc.) • Frequency: Computer lab
Academic Preparation	Indicator composed of four survey items. A five-item response scale (*None, Between 1 and 4, Between 5 and 10, Between 11 and 20, More than 20)* is used for the following academic preparation items: • Number of assigned textbooks, manuals, books, or book-length packs of course readings • Number of written papers or reports of any length A seven-item response scale (*Ranging from 1 to 7, with scale anchors described: (1) Extremely easy (7)*

	Extremely challenging) is used for the following exam item: • Mark the box that best represents the extent to which your examinations during the current school year have challenged you to do your best work at this college A six-item response scale (*None, 1-5 hours, 6-10 hours, 11-20 hours, 21-30 hours, More than 30 hours*) is used for the following time allotment item: • Preparing for class (studying, reading, writing, rehearsing, doing homework, or other activities related to your program)

Definitions of Perceived Gain Items for the Community College Survey of Student Engagement Data	
Gains in Academics	Gain index based on five survey items. A four-item response scale (*Very little, Some, Quite a bit, Very much)* is used for the following academic gain items: • Acquiring a broad general education • Writing clearly and effectively • Speaking clearly and effectively • Thinking critically and analytically • Solving numerical problems
Gains in Personal Development	Gain index based on four survey items. A four-item response scale (*Very little, Some, Quite a bit, Very much)* is used for the following personal development gain items: • Understanding yourself • Understanding people of other racial and ethnic backgrounds • Developing a personal code of values and ethics • Contributing to the welfare of your community
Gains in Vocational Goals	Gain index based on three survey items. A four-item response scale) *Very little, Some, Quite a bit, Very much)* is used for the following vocational goal gain items: • Acquiring job or work-related knowledge and skills • Developing clearer career goals • Gaining information about career opportunities

Appendix E: Study Variables

Florida Community College System Variables

Identifiers:

- Student Identification Number
- Community College Attended
- Year
- Term

Student Characteristics:

- Gender
- Race
- Age at Entry*
- Residence
- Citizenship
- Nationality
- Disability Flag
- Limited English Flag
- Incarceration Flag

Descriptors from *CCSSE* Responses:

- Highest Degree Attained
- Goal for Attendance (Taking Courses for Personal Interest)
- Number of Risk Factors (Standard *CCSSE* Calculation for Students "At Risk)*

Educational Background:

- High School Name
- High School Type
- High School Location
- High School Graduation Type
- Time from High School Graduation*
- Transfer Institution

Test Scores:

- CPT (Reading, Sentence Skills, Elementary Algebra)
- CPT Testing Dates
- SAT (Verbal, Math)
- SAT Testing Dates
- ACT (Reading, English, Math)
- ACT Testing Dates
- CLAST First Testing (Reading, Language Arts, Math, Essay)*
- CLAST First Testing Dates*
- CLAST Latest Testing (Reading, Language Arts, Math, Essay)*
- CLAST Latest Testing Dates*
- Remedial Reading Flag (Indicates Placement Level)*
- Remedial Writing Flag (Indicates Placement Level)*
- Remedial Math Flag (Indicates Placement Level)*
- Total CPT Score*

Enrollment Status:

- First Time in College Flag
- Transfer Status
- Admit Status
- Entry Date
- Class Level

Term Variables (Repeated as Needed):

- Term Clock Hour Load
- Term Clock Hours Earned
- Term Credit Hour Load
- Term Credit Hours Earned
- Term Credit Equivalent Hour Load (Combines Clock and Credit Hours)*
- Term Credit Equivalent Hours Earned (Combines Clock and Credit Hours)*
- Term Grade Points
- Term GPA Hours
- Total Grade Points
- Part-time Indicator
- Dual Enrollment Flag (from Course File)
- Program CIP Cluster (up to three)*
- Program CIP Code (up to three)*
- Award or Certification Sought (up to three)*
- Pell Grant Award*
- Federal Need-Based Aid*
- Federal Loans*
- State Need-Based Aid*
- State Merit-Based Aid*
- Other Loan*
- Other Scholarship*
- Total All Aid Sources*
- Term GPA*
- Cumulative GPA*
- Term Credit Completion Ratio*
- Cumulative Credit Completion Ratio*
- Term Percent Courses Completed with Grade of “C” or Better*
- Cumulative Percent Courses Competed with Grade of “C” or Better*
- Enrolled (Persistence) Flag*
- Award Flag*
- Award CIP Cluster (up to three)*
- Award CIP Code*

Course Enrollment Data

- Student Identification Number
- Community College ID
- Year
- Term
- Course Number
- Section Number
- Grade
- Hours Type
- Credits
- Credit Equivalent Hours (Combined Clock and Credit Hours)*

Dual Enrollment Flag
Gatekeeper Course Flag*
Developmental Course Flag*

Appendix F: Participating Institutions

Participating Florida Community College System Institutions

Brevard Community College
Broward Community College
Central Florida Community College
Chipola College
Daytona Beach Community College
Edison College
Florida Community College at Jacksonville
Florida Keys Community College
Gulf Coast Community College
Hillsborough Community College
Indian River Community College
Lake City Community College
Lake-Sumter Community College
Manatee Community College
Miami Dade College
North Florida Community College
Okaloosa-Walton Community College
Palm Beach Community College
Pasco-Hernando Community College
Pensacola Junior College
Polk Community College
St. Petersburg College
Santa Fe Community College
Seminole Community College
St. Johns River Community College
South Florida Community College
Tallahassee Community College
Valencia Community College

Participating Achieving the Dream Colleges

Albuquerque TVI
Brookhaven College
Broward Community College
Capital Community College
Dona Ana Branch Community College – NMSU
Durham Technical Community College
El Paso Community College
Guilford Technical Community College
Housatonic Community College
Houston Community College System
Northwest Vista College
Norwalk Community College
Palo Alto College
Patrick Henry Community College
Paul D. Camp Community College
San Antonio College
San Juan College
Santa Fe Community College
Southwest Texas Junior College
St. Philip's College
Tidewater Community College
University of New Mexico - Gallup
Valencia Community College
Wayne Community College
Zane State College

Participating HSI/HACU Consortium Institutions

Austin Community College
Brazosport College
Broward Community College
Central Arizona College
Coastal Bend College
College of the Mainland
Community College of Denver
Estrella Mountain Community College
Galveston College
Howard College
Miami Dade College
New Mexico Junior College
New Mexico State University at Alamogordo
North Harris Montgomery Community College District
North Lake College
Pasco-Hernando Community College
Phoenix College
Richland College
Southwest Texas Junior College
Valencia Community College