Washington State Student Achievement Initiative: Achievement Points Analysis for Academic Years 2007–2011

CCRC-IHELP Student Achievement Initiative Policy Study

Clive Belfield

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Preface

Washington State has implemented an innovative policy that uses intermediate performance measures and incentive funding to encourage the state's community and technical colleges to adopt practices that increase rates of student progression and completion. Under this policy, called the Student Achievement Initiative (SAI), colleges earn points when students achieve one or more educational milestones, or "achievement points," which are organized along a continuum from remedial programs (which include adult basic education and pre-college "developmental" education) through the completion of credentials and training programs.

In this report, Clive Belfield, an economist at Queens College–CUNY and a research affiliate at CCRC, examines the recent performance of Washington State two-year colleges under this policy. Belfield analyzes the patterns and determinants of achievement points earned by colleges since the policy was enacted in 2007. This report extends two similar analyses Belfield conducted in 2009 and 2011. The current analysis takes advantage of data from a longer period to address the following questions, which were formulated in consultation with staff of the Washington State Board for Community and Technical Colleges and with input from the Education Committee of the Washington Association of Community and Technical Colleges.

1. Do patterns observed in the initial quantitative analysis (e.g., the importance of college size and the growing dominance of basic skills and pre-college measures) persist into 2011? Have new patterns emerged? How do these patterns affect the allocation of funding? Are these patterns consistent with the SAI measurement and funding principles?

2. Do alternative performance measures yield different funding allocations? For example, what would happen if colleges were rewarded based on changes in points per student rather than changes in total points?

3. Is there evidence that student momentum has increased since the SAI was established—that is, are there more students that are progressing further toward completion of postsecondary credentials?

Belfield's findings on these questions are intended to inform an ongoing review of the SAI policy being conducted by the Washington Association of Community and Technical Colleges. His analysis is also part of a larger three-year evaluation of the SAI being conducted by CCRC and the Institute for Higher Education Leadership and Policy (IHELP) with funding from the Bill & Melinda Gates Foundation. The larger study examines the effects of the SAI on efforts by Washington two-year colleges to implement policies and practices intended to improve student outcomes; it also seeks to capture lessons for other states seeking to improve student outcomes and college performance through state policy.[1] This spring, CCRC and IHELP researchers will conduct site visits and interviews at more than half of the colleges in the Washington State system to observe the effects of the SAI and examine how the practices of colleges influence the numbers Belfield presents here.

Davis Jenkins
CCRC

[1] Early lessons for other states were presented in a policy paper by Shulock and Jenkins (2011).

Executive Summary

This paper extends an earlier analysis of Washington State's Student Achievement Initiative (SAI). The goal of the initiative is to increase academic achievement at the state's 34 community and technical colleges. Under the SAI, since 2009, the state has awarded some funds based on how well colleges have increased student achievement relative to their own prior performance. Earlier analyses (Belfield 2009, 2011) indicated that the SAI was operating as intended. This paper examines how college performance has changed over the period from the baseline in 2007 to 2011, using an additional two years of data beyond what was used for the earlier analyses.

The SAI measures students' academic achievement in points, using six metrics: improvement in performance on assessment of basic skills; advancement across levels of developmental education toward college readiness; accumulation of 15 college credits; accumulation of 30 credits; completion of quantitative reasoning courses; and degree (or certificate or apprenticeship) completion. The measures used in the current analysis include total points, the change in total points, points generated for each individual metric, and points per student generated by each college. The following are the main findings of the study.

Patterns and Determinants of Changes in Achievement Points

Change in total points and points per student:

- In the baseline year, the average point total per college was 8,684. By 2009, the average rose to 10,365; by 2010, it rose to 11,598; and by 2011, it dropped slightly to 11,465.
- Over the period from baseline to 2011, the average college increased its point total by 31 percent.
- During this period, points per student increased by 29 percent. Enrollment was flat, but more students enrolled more intensively; full-time equivalent enrollment grew by 41 percent. Therefore, points per full-time equivalent fell by 4 percent.

Influence of college size:

- College enrollment size and total points were correlated. Enrollment size became modestly more influential over time. A college with 1,000 more students gained on average 60 more points per year. This is consistent with the original design of the SAI; larger colleges were expected to be able to obtain bigger awards on the premise that they would require more resources to make changes.

Influence of basic skills and college readiness points:

- The relative importance of the six metrics balanced out over time. The early trend—in which basic skills and college readiness points grew disproportionately—was not sustained into 2011.

- Consistent with the SAI's aim to encourage colleges to serve all students, including those from disadvantaged backgrounds, the basic skills metric appears to have encouraged enrollment from traditionally underserved groups.

Effects of student characteristics:

- There is no simple way to predict points accumulation for a given college or type of student. The characteristics of a college's students—such as age, full-time enrollment status, race, or prior education—do not strongly influence total points or the change in points. Although there were some significant influences on points across each of the six metrics, they do not result in large effects when the data are viewed in aggregate, and they depend on whether the student is full-time or part-time.

- There is little evidence that colleges serving more at-risk, low-income students are penalized by the SAI awards method. This is consistent with one of the key SAI design principles—points accumulation is not supposed to be driven by the types of students enrolled.

Comparison with Alternative Performance Measures

- The SAI formula for points results in little volatility in performance by individual colleges over time. Colleges that gained a lot of points from the 2007 baseline to 2009 also gained a lot of points from baseline to 2011.

- Alternative funding methods—such as ranking colleges based on changes in points for FTE—would yield different results in terms of which colleges would receive the most funds.

Evidence of Increase in Student Momentum

- Rates of progression or momentum were similar for students in college-level transfer and workforce programs. Interestingly, the momentum of students in either transfer or workforce programs did not seem to be dependent on whether they first took pre-college remedial courses or entered directly into college-level programs.
- Few students who earned basic skills points accumulated additional college-level points over the following three years.
- Some modest evidence suggests that momentum improved since baseline, primarily among students in college-level courses who were accumulating credits and making progress toward completion.
- About half of students did not accumulate any points. These students and basic skills students comprise a large proportion of all students. Improvements in momentum by the smaller number of students who did make progress had a small effect on points accumulation overall.
- Colleges may be more likely to improve student momentum if they focus on the gains that can be made among students when they first enter the institution.

1. Introduction

The Student Achievement Initiative (SAI) is a performance funding system for all public two-year colleges in Washington State.[2] It awards funding based on how well colleges increase academic achievement with the goal of helping students progress further in their college careers. Achievement is measured in points, using six metrics: improvement in performance on assessment of basic skills; advancement across levels of developmental education toward college readiness; accumulation of 15 college credits; accumulation of 30 college credits; completion of quantitative reasoning courses; and degree (or certificate or apprenticeship) completion.[3] A college is deemed to be raising achievement levels if its point total increases relative to its own past performance.

Successful performance funding systems have clear performance goals and tie funding directly to performance (Dougherty & Natow, 2010). By focusing on achievement and by explicitly articulating how points are awarded, the SAI does both of these things. Performance funding systems must also be robust, in the sense that awards are not sensitive to trivial differences in how they are calculated. However, they must allow for flexibility so that colleges can change their practices to accumulate more points. Earlier analyses found evidence that the SAI was broadly satisfying these two criteria as well (Belfield, 2009, 2011). Colleges were accumulating points at a rate faster than their enrollment growth, mostly with more basic skills and college readiness points. There was no evidence that colleges were disadvantaged by the composition of their student body. It was not possible to identify student characteristics that allowed colleges to earn points more easily than others, and there was no evidence that serving at-risk, low-income students prevented colleges from accumulating points.

This report updates and extends these earlier analyses using data collected from 2007 to 2011. Following the earlier studies, this paper presents a detailed empirical analysis of how many points colleges accumulated (both in total and by metric), as well

[2] For details on the SAI, see: www.sbctc.ctc.edu/college/e_studentachievement.aspx. See also Jenkins, Ellwein, and Boswell (2009).

[3] These metrics encompass the full range of Washington State community and technical college mission areas, including adult basic skills and developmental education as well as baccalaureate transfer and career-technical education. That said, the State Board for Community and Technical Colleges made an explicit policy decision to award points for student achievement in basic skills and developmental programs in order to encourage colleges to serve more academically unprepared students and thus help address the growth in population of educationally disadvantaged adults in the state.

as which college-level and student characteristics were associated with points accumulation. Updating the earlier analyses allows for the validation of the initial findings and an investigation of whether initial trends were sustained over time. The current paper also re-examines the question of whether different measures of institutional performance might yield different funding allocations. New to this report is an analysis of student momentum—i.e., whether students began making further progress after the SAI was introduced. The system was set up so that colleges could generate points by serving more students or improving the rates at which students as progress through college. Earning points in the latter way suggests that colleges are serving students more effectively. In previous analyses, progress toward this goal could not be adequately examined because only one round of data was available. With new data from 2007 to 2011, it is possible to map the pathways of individual students over time (Leinbach & Jenkins, 2008). These pathways are described in terms of points, with progression defined as reaching a higher level of points.

This analysis, in conjunction with information on how colleges have implemented the SAI (see Shulock & Jenkins, 2011), provides additional evidence on the validity of the SAI as a performance funding system. This analysis should not be interpreted as a full evaluation of the SAI. It is focused on patterns of achievement points accumulation by colleges and their students. The results should be understood in light of the intended goals of the SAI and in conjunction with field research at individual colleges being conducted by the Community College Research Center and the Institute for Higher Education Leadership and Policy.

The dataset used in this study includes all students enrolled in Washington State's 34 community and technical colleges, with information on students' demographic characteristics, prior education levels, and SAI points achieved by term. Data for individuals are combined to allow for analysis at the college level.[4] Additional college-

[4] Seattle Vocational Institute data are subsumed into data for Seattle Central. Results are reported for individual colleges even though some colleges are directly linked to each other. For example, Spokane Falls and Spokane Community College are part of the same district and share resources. Spokane Falls data include the Institute for Extended Learning basic skills center, with Spokane Community College serving students further along in their college path. Allocations and rewards are awarded to the district. Hence, the resource implications of their respective point totals are not independent for these two colleges.

specific data from the Integrated Postsecondary Education Data System (IPEDS) is integrated into the analysis.

The baseline year for the SAI is the academic year (AY) of 2007; this study uses data that were collected from 2007 through 2011. Since establishing the baseline, the SAI has begun rewarding colleges for increases in their total points. AY 2009 was the first full year of the SAI; 2008 was a preparatory/learning year, in which funding was not contingent on points. Performance funding in this first round was awarded based on points accumulated over the first two years, i.e., with 2007 as the baseline until 2009; in subsequent rounds, it depended on annual points accumulation. Therefore, the current analysis looks at trends in two dimensions. One is the annualized trend, to see how colleges perform year-on-year.[5] The second is the longer-term changes from baseline to 2011, to see if the system has created performance gaps among colleges. Identifying these trends is helpful for policymakers looking at the short-term impacts of the SAI and how colleges have adjusted since the baseline year.[6]

2. Absolute Points Per College

2.1 Total Points Per College

The SAI funding formula rewards colleges as their absolute total achievement points increase year-on-year. The change in total points from all six metrics determines the incremental funding awarded to each college. This formula was designed such that colleges would get more points if they enrolled more students who satisfied a metric. In part, this design decision was based on the principle that efforts to improve student success would require more resources at larger colleges.

Total points per college per year are shown in Table 1. In the baseline year, the average point total was 8,684 points. In 2009, the average rose to 10,365; in 2010, it rose to 11,598 points; and in 2011, it dropped slightly to 11,465. On average, across all

[5] This study uses four "years" of data (2007–08, 2009, 2010, and 2011), which are treated as consecutive. The final year (2011) is based on data as of April 17 2012. Revisions in the data are such that there are discrepancies of a few points per college.

[6] It is not possible to fully isolate those changes resulting from the SAI from any changes are due to broader economic conditions (e.g., the Great Recession).

colleges, annual point gains were +19 percent (2007–09), +12 percent in 2010, and -1 percent in 2011. The gain in points from baseline to 2011 was +31 percent. Since baseline, the college with the biggest change in points was College 007 (+7,556); the college that gained the least was College 027 (+287 points). So, although several colleges lost points in any given year, no college has lost points in total since the baseline year.

Table 1
Total Points Per College

College	Baseline AY 2007	AY 2009	AY 2010	AY 2011	% Change 07–09	% Change 09–10	% Change 10–11	% Change 07–11
College 001	5,710	6,781	8,507	6,989	19	25	-18	22
College 002	16,103	18,722	20,975	21,983	16	12	5	37
College 003	2,846	4,383	4,970	5,060	54	13	2	78
College 004	4,164	5,303	5,513	5,231	27	4	-5	26
College 005	4,065	4,898	5,566	5,488	20	14	-1	35
College 006	5,754	6,005	6,370	6,565	4	6	3	14
College 007	15,874	19,344	24,385	23,430	22	26	-4	48
College 008	5,652	7,470	9,256	8,974	32	24	-3	59
College 009	11,060	13,849	12,228	12,605	25	-12	3	14
College 010	13,650	17,312	18,666	18,819	27	8	1	38
College 011	13,267	16,246	19,135	18,134	22	18	-5	37
College 012	4,251	4,531	5,073	4,627	7	12	-9	9
College 013	12,244	14,595	15,986	16,159	19	10	1	32
College 014	11,996	15,648	19,369	18,121	30	24	-6	51
College 015	6,950	8,130	9,108	8,944	17	12	-2	29
College 016	5,021	6,675	8,856	8,350	33	33	-6	66
College 017	10,073	11,879	13,818	14,216	18	16	6	46
College 018	4,384	6,020	5,781	5,948	37	-4	3	36
College 019	5,376	6,860	7,241	7,372	28	6	2	37
College 020	11,445	12,057	13,130	13,785	5	9	5	20
College 021	8,498	9,542	10,551	10,611	12	11	1	25
College 022	12,153	13,619	16,358	15,847	12	20	-3	30
College 023	8,355	9,329	9,690	10,004	12	4	3	20
College 024	8,133	10,437	11,805	10,257	28	13	-13	26
College 025	8,547	9,792	10,527	9,630	15	8	-9	13
College 026	7,631	8,558	9,557	10,707	12	12	12	40
College 027	9,845	11,158	11,197	10,132	13	0	-10	3
College 028	14,794	18,959	19,024	17,926	28	0	-6	21
College 029	8,049	9,453	10,665	10,709	17	13	0	33
College 030	9,801	11,967	13,498	15,121	22	13	12	54
College 031	6,018	6,657	7,682	7,778	11	15	1	29
College 032	6,315	6,473	6,529	6,722	3	1	3	6
College 033	8,017	8,825	10,552	10,876	10	20	3	36
College 034	9,218	10,942	12,777	12,684	19	17	-1	38
Average per college	**8,684**	**10,365**	**11,598**	**11,465**	**19**	**12**	**-1**	**31**

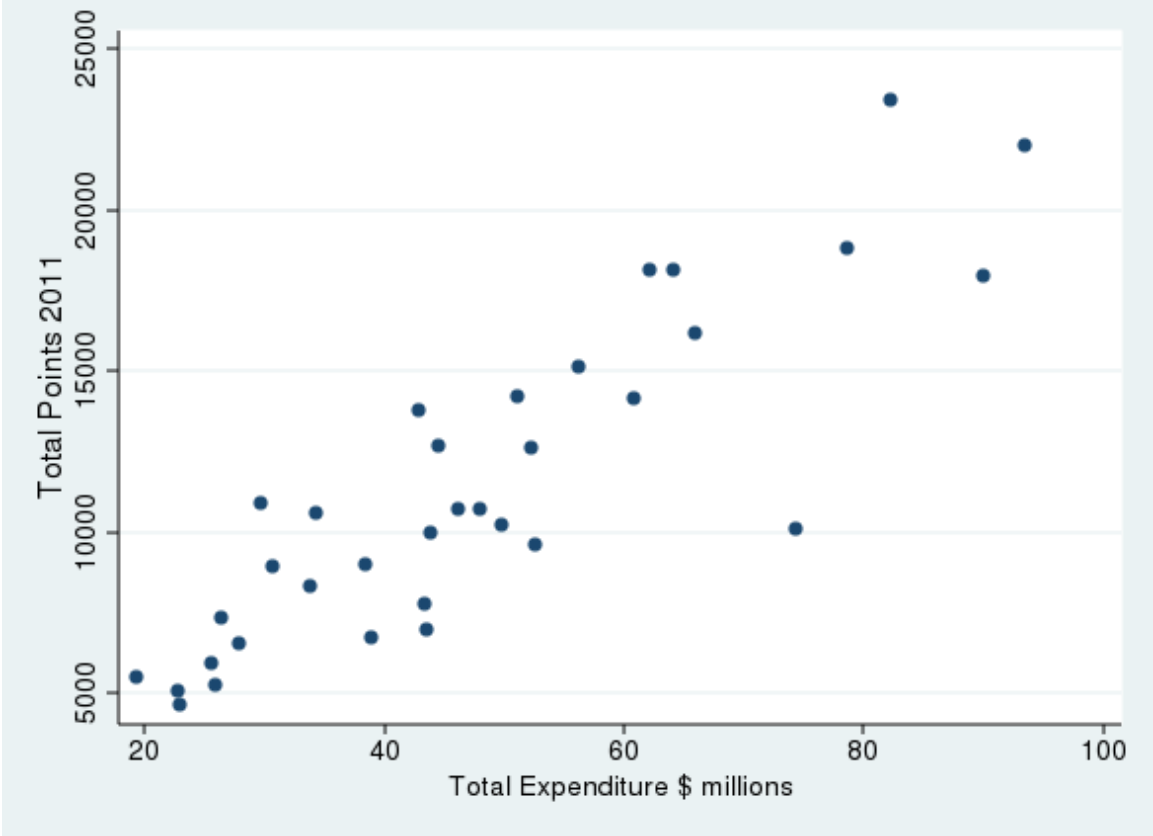
Table 1 also shows the percentage change in points per college by year.[7] Within any given year, there was significant variation in growth rates. For example, in 2007–09, the total points generated by College 003 grew by considerably more than the point totals for any other college (+54 percent versus the next highest of +37 percent); four colleges grew by less than 10 percent. Over time, the gaps in point growth between colleges widened. From baseline to 2011, the point total for College 003, which had the highest growth rate, increased by 78 percent; all colleges gained points, but three gained fewer than 10 percent. The relative positions of the colleges remained stable. Colleges with high totals in the baseline year also had high totals in 2011; this was a strong relationship, with a Pearson correlation coefficient of 0.96.

Earlier studies (Belfield 2009, 2011) suggested that the spread of total points was narrowing. This trend was not sustained through the period for the current study. In 2007, College 002, which had the most points, had 5.7 times as many total points as College 003, which had the fewest; by 2009, the ratio of most to least points fell to 4.4. By 2011, this ratio rose again to 5.1. Yet, there was no general compression in the spread of total points per college; the coefficient of variation (standard deviation divided by the mean) was almost identical in all three years (at 0.41–0.44). Any divergence in points and points growth took place primarily at the extremes, involving a few colleges. Even this interpretation is tentative in light of the 2011 data: Annual growth in points in 2011 was -1 percent, down sharply from the year before (+12 percent). This negative growth slightly compressed the point differences across colleges.

Unsurprisingly, larger colleges consistently earned more total points. A similar relationship exists between total college expenditures and total points in 2011, as shown in Figure 1. Broadly, total points increased in a linear fashion with expenditures, although the association weakens as college expenditures grow.

[7] The calculations are based on averages per college, not the overall total of points across all 34 state colleges.

Figure 1
Total Expenditures and Total Points Per College in 2011



2.2 Points in Each Metric Per College

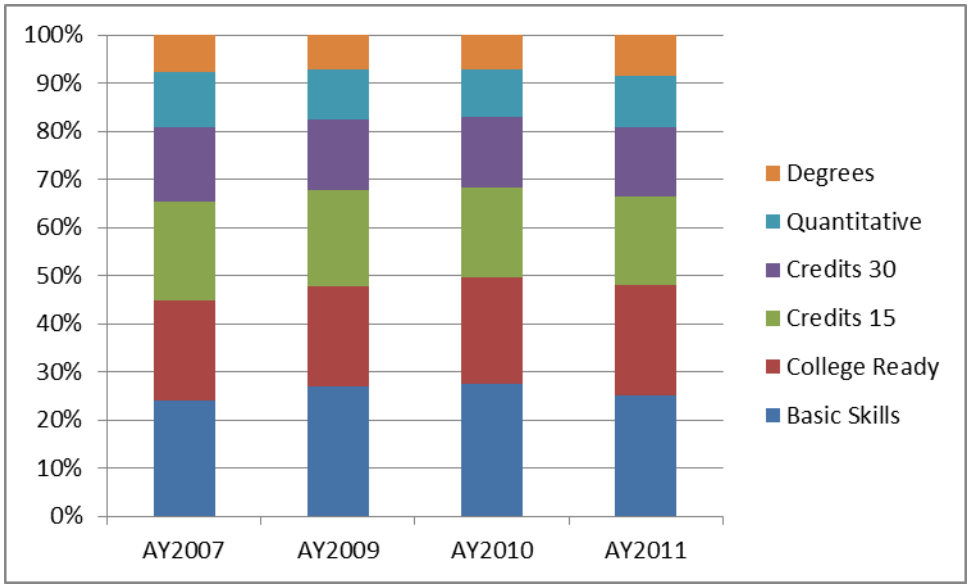
Total points are the sum of points accumulated across each of the six metrics. This section examines which metrics yield the most points. This examination also reveals whether the relative points between metrics differ across colleges (e.g., some colleges may have mostly basic skills points, others may have mostly college readiness points).

Figure 2 shows how SAI points are distributed across each metric. At baseline, colleges were accumulating approximately two thirds of their points evenly across three metrics: basic skills, college readiness, and 15 credits. The remaining points were accumulated via the other three metrics: 30 credits, quantitative reasoning, and degree completion. These proportions have not changed; by 2011, the proportion of points from each metric was almost exactly the same as in 2007. Until 2010, there appeared to be a trend toward increases in basic skills and college readiness points, but this was not

sustained into 2011.[8] Table 2 reports the points by metric as averages per college. In the baseline year, the average college had 2,087 points from basic skills; by 2011, the average rose 38 percent to 2,872. At the same time, points from all other metrics increased. In fact, the average college saw college readiness and degree completion points rise the fastest between baseline and 2011, at +46 percent and +42 percent respectively. This suggests that achievement has risen. The slight decrease in total points between 2010 and 2011 was almost entirely a result of a decrease in basic skills points.

However, this broad analysis masks within-college variations. For each metric, some colleges lost points and others experienced significant growth (e.g., of 50 percent per year). In any given year, one third of colleges lost points in basic skills, 15 credits, and quantitative reasoning; for the other metrics, one in five colleges lost points in any given year. Thus, colleges could easily lose points in each category in a particular year.

Figure 2
Points by Metric Over Time



[8] It is possible that this initial increase in basic skills points reflected improved accounting methods.

Table 2
Points by Metric: Average Per College

Metric	Baseline AY 2007	AY 2009	AY 2010	AY 2011	% Change 07–09	% Change 09–10	% Change 10–11	% Change 07–11
Basic skills	2,087	2,788	3,183	2,872	34	14	-10	38
College readiness	1,811	2,166	2,580	2,641	20	19	2	46
15 credits	1,777	2,063	2,172	2,100	16	5	-3	18
30 credits	1,335	1,538	1,680	1,662	15	9	-1	24
Quantitative reasoning	1,000	1,059	1,161	1,229	6	10	6	23
Degree completion	674	751	822	961	11	9	17	43
Average per college	**8,684**	**10,365**	**11,598**	**11,465**	**19**	**12**	**-1**	**31**

Table 3 illustrates the college-level volatility across each metric from baseline to 2011. Overall, there appear to be more opportunities for colleges to earn basic skills and pre-college points. For basic skills, some colleges had significant growth in points (College 003, +128 percent; College 014, +100 percent), and one had significant losses (College 032, -55 percent). For college readiness, three colleges grew extremely quickly (College 003, +315 percent; College 021, +125 percent; and College 008, +117 percent). For quantitative reasoning, three colleges grew substantially (College 018, +137 percent; College 001, +125 percent; and College 016, + 106 percent). In contrast, the growth in points for the accumulation of 15 or 30 college credits was less dramatic, only changing by +50 percent at a few colleges. This disparity makes sense because the basic skills and college readiness metrics require students to improve their scores on a basic skills test or progress through a sequence of remedial courses rather than take and pass a college-level math course or accumulate college credits that count toward completion of a credential. A few colleges did increase their degree completion points substantially (College 008, +115 percent; College 024, +107 percent; and College 015, +106 percent). On this metric, only one college accumulated fewer points in 2011 than at baseline (College 020, -4 percent).

Overall, these trends have led to shifts in how some colleges accumulate points, though the ultimate effect is not dramatic, even at the tails of the distribution. Colleges that grew faster tended to start from a lower base, so they converged to the average.

Table 3
Points by Metric Per College: Percentage Change from Baseline to 2011

College	Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
College 001	76	26	-1	3	125	42
College 002	66	32	28	35	36	29
College 003	128	315	28	38	86	36
College 004	20	64	3	20	10	20
College 005	0	40	39	48	51	48
College 006	-5	39	4	18	28	46
College 007	45	55	49	54	12	64
College 008	44	117	38	23	53	115
College 009	3	29	12	15	0	33
College 010	45	52	24	32	7	69
College 011	22	45	43	43	52	24
College 012	-28	78	13	25	-14	46
College 013	27	59	13	15	17	99
College 014	100	34	13	14	61	20
College 015	20	38	5	18	56	106
College 016	65	83	28	49	106	99
College 017	29	53	26	30	57	65
College 018	40	74	-11	20	137	79
College 019	61	59	24	29	30	14
College 020	5	71	12	22	-2	-4
College 021	22	125	29	28	-6	46
College 022	95	38	-2	3	-15	14
College 023	10	50	6	32	5	59
College 024	60	40	-15	0	12	107
College 025	17	11	9	5	8	39
College 026	77	37	27	31	51	24
College 027		12	-2	7	-23	21
College 028	57	-13	10	12	0	22
College 029	17	49	17	35	47	48
College 030	38	84	33	39	65	35
College 031	10	49	24	23	32	59
College 032	-55	40	23	27	18	29
College 033	-6	41	54	53	31	21
College 034	87	28	21	15	-6	2
Average	**38**	**46**	**18**	**24**	**23**	**43**

2.3 Determinants of Points

This section investigates which characteristics of the colleges determined total points, controlling for the influences of other factors. Across the 34 colleges, total points, points by metric, and absolute changes in points are regressed against characteristics of the student body.[9] At the aggregate level, this investigation reveals whether there are systematic influences that may favor colleges that enroll certain types of students.

The estimates for 2009, 2010, and 2011 are given in Tables A.1–A.3 (located in the appendix). Total points per college was strongly related to size of enrollment, or headcount. This relationship holds when controlling for the composition of the student body as regards socioeconomic status, age, full-time/part-time enrollment, disability, race, and prior education. The points–headcount relationship was reasonably consistent across all three years. If an average-sized college increased its enrollment by 1,000, it would have increased its total points by 670–710. In a previous analysis (Belfield, 2011), I speculated that the influence of college size might be growing over time; the additional years of data demonstrate this to be the case, but the trend is not dramatic. Few other student body characteristics were positively associated with total points in a consistent way.[10] Thus, point totals were not driven by characteristics of the colleges, such as the composition of the student body. This conclusion holds generally for each of the six metrics.[11]

Table A.4 shows the change in points across each year and from baseline to 2011. Change in total points from each college's baseline was measured by which rewards are allocated under the SAI policy. Again, the only consistent association was with

[9] All variables are measured contemporaneously. Data for Table A.1 is based on the student composition in 2009. Data for Table A.3 is based on the student composition in 2011.

[10] For example, colleges with more students without a high school diploma or GED had more points in 2010, but this association is not found in 2009 or 2011. In earlier studies, no correlation was found between points and spending per full-time equivalent student (Belfield, 2011).

[11] Tables A.1, A.2, and A.3 also show patterns for each of the six metrics. Again, total points for each metric are influenced by the enrollment size of the college. For basic skills, higher point totals are associated with colleges with greater representations of Hispanic students and dropouts; this makes sense, given that basic skills programs are designed to serve students seeking to improve their facility in English and students seeking a high school equivalency credential. College readiness points are not associated with any student body characteristics. For the other four metrics, as for the total, there are no clear, strong patterns. The patterns that are evident appear plausible—credit accumulation and completion rates are higher where more students attend school full-time and where there are fewer students of color—although few associations are statistically significant.

enrollment size: Bigger colleges accumulated more points. A college with 1,000 more enrollments at baseline would have accumulated 165 points more than the average college by 2011. This finding reflects a design principle of the SAI: Bigger colleges were expected to obtain bigger points gains. Given that the average college accumulated approximately 2,500 more points over the period, this magnitude of this effect is not great. The only other variable associated with points gain from baseline to 2011 was the education levels of entering students. Where there were more high school dropouts, colleges found it easier to accumulate points. This is probably because serving more dropouts enhances a college's ability to generate basic skills points.

Figures 3 and 4 show how point totals changed over time. Figure 3 shows the point totals at each college in 2007 and in 2011. The association is strongly linear, and there are no outlier colleges. Figure 4 shows gains in points. Generally, colleges that gained a lot of points from baseline to 2009 also gained a lot of points from baseline to 2011. These colleges sustained their early gains and did not revert back to the average by 2011. Nevertheless, the divergence is not especially strong; the bulk of colleges are clustered together along a straight line, with gains of approximately 1,000 points from baseline to 2009 and 2,000 from baseline to 2011.

Overall, there appears to be no college-level evidence that the points system favors schools with particular student compositions either in the short term or the long term. This, too, was a principle of the SAI: Points accumulation should not be driven by the types of students enrolled.

Figure 3
Point Totals in 2007 and 2011 at Each College

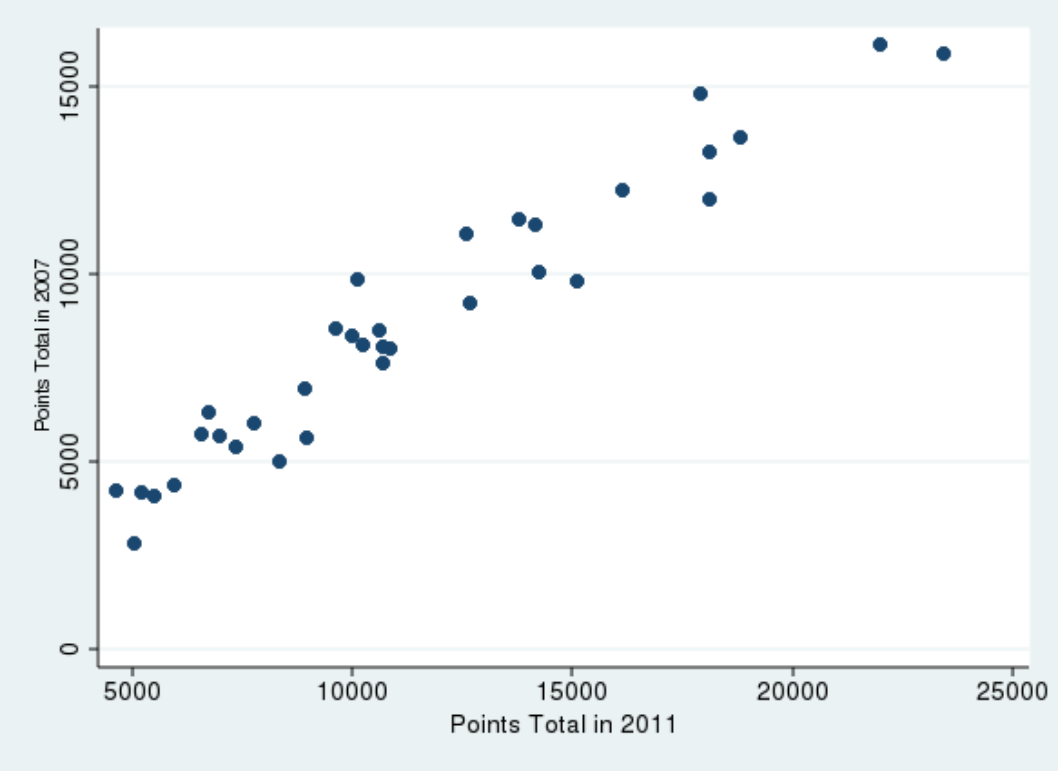
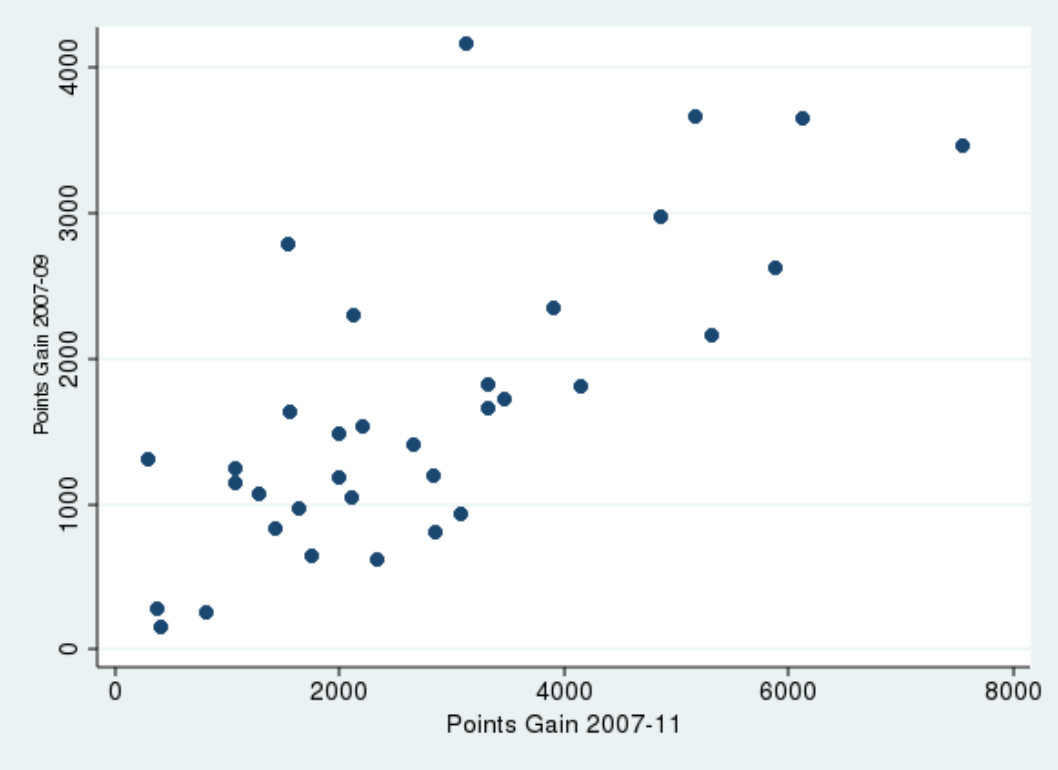


Figure 4
Points Gain 2007–09 and 2007–11 at Each College



3. Average Points Per College

3.1 Points Per Student Per College

From an economic perspective, it is useful to examine the determinants of points as a function of the resources available. More effective colleges might be defined as those that generate more points per individual student (even if enrollment falls); more efficient colleges may be defined as those that generate more points per dollar of expenditure.[12]

In this paper, headcounts serve as the primary measure of student enrollments, although FTEs are also considered.[13] Table 5 shows points per student (PPS) across the years 2007–2011. Colleges earned 0.66 points per student in 2007; this number rose to 0.74 by 2009 (+15 percent) and 0.83 by 2010 (+13 percent), stabilizing in 2011 (after rounding, the change is effectively zero percent). From baseline to 2011, points per student rose by 29 percent on average across the 34 colleges.

The colleges varied in their growth rates of PPS within any given year. From baseline to 2009 and from 2009 to 2010, only a few colleges experienced negative growth rates. Between 2010 and 2011, the majority of colleges saw negative growth rates. Over the long term, one college (College 021) doubled its PPS; two colleges (College 015 and College 027) saw effectively no change in PPS. However, the spread of PPS across the colleges has narrowed since baseline.[14] Although there was some volatility in PPS in any given year, this did not cause colleges' PPS to diverge over time.

The results for FTEs (see Table A.5) differ somewhat from those obtained using student headcounts. Points per FTE (PPFTE) fell in both 2010 and 2011. The baseline–2011 growth in PPFTE was -4 percent, compared to +29 percent for PPS. Thus, the number of FTEs rose faster than the total number of students. However, the rankings of colleges obtained using PPFTE and PPS are similar, although the latter measure shows greater stability across the years (Pearson correlation coefficient > 0.88).[15] Comparisons

[12] Under the SAI award scheme, a college whose enrollment decreases in a given year can still earn points by increasing points per student.
[13] The headcount measure weights part-time students equally with full-time students even though colleges vary in their proportions of part-time students enrolled. Empirically, these enrollment measures (headcounts and FTEs) are strongly correlated.
[14] The coefficient of variation has fallen from 0.24 to 0.17 and the high/low ratio from 2.8 to 2.0.
[15] Changes in enrollment and points were such that the PPFTE spread fell in the first year (2007–09) but rose subsequently. The coefficient of variation was 0.2 but rose to 0.26 by 2011; the high–low ratio rose

based on PPFTE show one college—College 020—to be much more effective than the rest, but this result is not found using PPS.

Table 5
Points Per Student

College	Baseline AY 2007	AY 2009	AY 2010	AY 2011	% Change 07–09	% Change 09–10	% Change 10–11	% Change 07–11
College 001	0.44	0.45	0.62	0.55	1	40	-12	24
College 002	0.48	0.58	0.58	0.61	21	0	5	27
College 003	0.32	0.49	0.57	0.56	53	15	-1	75
College 004	0.77	1.06	1.04	0.95	38	-2	-9	23
College 005	0.81	0.96	1.07	1.06	18	12	-1	30
College 006	0.72	0.77	0.82	0.86	7	6	6	20
College 007	0.68	0.85	0.84	0.83	24	-1	-1	21
College 008	0.32	0.48	0.51	0.56	50	6	11	76
College 009	0.88	0.96	0.95	0.93	9	-1	-2	6
College 010	0.84	0.95	0.99	0.97	13	4	-2	15
College 011	0.71	0.79	0.90	0.82	11	14	-8	16
College 012	0.77	0.78	0.91	0.91	1	16	0	18
College 013	0.77	0.82	0.87	0.81	7	6	-7	6
College 014	0.78	0.83	0.97	0.95	8	17	-3	22
College 015	0.87	0.82	0.91	0.87	-6	10	-4	-1
College 016	0.67	0.74	0.91	0.90	11	23	-2	34
College 017	0.70	0.79	0.86	0.87	13	10	1	25
College 018	0.52	0.67	0.77	0.77	30	15	0	50
College 019	0.86	1.06	1.07	1.07	23	1	0	24
College 020	0.59	0.59	0.63	0.69	0	8	8	17
College 021	0.41	0.63	0.79	0.85	52	27	7	106
College 022	0.63	0.68	0.76	0.75	9	11	-1	20
College 023	0.52	0.57	0.61	0.63	10	6	4	21
College 024	0.44	0.58	0.71	0.64	34	21	-9	48
College 025	0.73	0.77	0.86	0.84	6	11	-2	15
College 026	0.56	0.63	0.74	0.85	13	17	15	52
College 027	0.76	0.71	0.78	0.75	-6	9	-4	-1
College 028	0.60	0.74	0.78	0.74	25	5	-5	24
College 029	0.55	0.56	0.82	0.89	2	46	8	62
College 030	0.70	0.88	0.94	0.86	27	6	-8	24
College 031	0.70	0.65	0.90	0.85	-7	38	-6	21
College 032	0.79	0.80	0.86	0.85	1	7	-1	7
College 033	0.68	0.73	0.85	0.89	8	16	5	31
College 034	0.86	0.87	1.00	1.05	2	15	5	22
Average per college	**0.66**	**0.74**	**0.83**	**0.82**	**15**	**13**	**0**	**29**

from 2.9 to 4.1 by 2011. Therefore, the initial pattern—colleges converging slightly or stable in PPFTE—was not sustained.

3.2 Determinants of Average Points Per College

This section investigates the college-level characteristics that were associated with the average points per student and the change in points per student for each college. These associations indicate how the composition of a college influenced the average points accumulated on a per-student basis. Tables 6 and 7 show the determinants of points per student for each college in 2010 and 2011 respectively. There were few statistically significant and consistent determinants across the student body. Again, the SAI did not appear to favor any particular type of student.

Comparing colleges with larger and smaller enrollments, there is no evidence of economies of scale. Larger colleges had more points but not more points per student. Large and small colleges increased points per student at similar rates.[16] Average points per student for each of the six metrics are estimated in columns 3–8 of Tables 6 and 7. Points varied by college within each metric, and different metrics exhibited different patterns. The proportion of male students had no effect on average total points, although college readiness points and quantitative reasoning points fell with the proportion of male students (a result also found in Belfield [2011]). A younger student body was associated with more 15-credit and 30-credit points. This seems plausible because in general, younger students are more likely to be seeking a credential.

Given these null associations, it is no surprise that there were no clear drivers of changes in points. Table 8 shows the determinants of the absolute change in points per student across each of the years. Again, there were no strong influences of college characteristics (not even college size).

Overall, the composition of the student body did not appear to have a dramatic influence on the average points per student or change in points per student at each college in total, across any given metric, or over time. This finding reflects the intent of the SAI, which aimed to respect that individual colleges may have different missions and serve different populations and not to award points disproportionately for the achievements of any given student subgroup.

[16] In fact, Tables 6 and 7 show that larger colleges had fewer points per student (as was found for earlier years in Belfield [2011]).

Table 6
Average Points Per Student, 2010

Student Characteristics	Average Total Points	Average Per Student					
		Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
Financial aid	-0.286	-0.044	-0.011	-0.179	-0.089	-0.060	0.097
	(0.493)	(0.582)	(0.313)	(0.130)	(0.122)	(0.105)	(0.095)
SES bottom quintile	-0.271	-0.039	-0.113	-0.039	-0.014	-0.040	-0.027
	(0.198)	(0.233)	(0.126)	(0.052)	(0.049)	(0.042)	(0.038)
Age < 20	0.224	-0.378	0.080	0.206**	0.201**	0.166**	-0.051
	(0.285)	(0.337)	(0.181)	(0.075)	(0.070)	(0.061)	(0.055)
Age ≥ 65	0.426	1.383	-0.121	-0.506**	-0.290	0.083	-0.123
	(0.836)	(0.986)	(0.531)	(0.220)	(0.206)	(0.178)	(0.160)
Disability	0.434	0.759	-0.306	-0.007	0.028	0.008	-0.047
	(1.162)	(1.371)	(0.738)	(0.307)	(0.287)	(0.248)	(0.223)
Full-time	1.035***	0.373	0.334	0.121	0.111	-0.003	0.097
	(0.361)	(0.426)	(0.229)	(0.095)	(0.089)	(0.077)	(0.069)
Male	-0.345	0.663*	-0.775***	-0.126	-0.032	-0.148**	0.072
	(0.323)	(0.381)	(0.205)	(0.085)	(0.080)	(0.069)	(0.062)
Asian	1.019	1.299	-0.213	-0.287	-0.146	0.287*	0.078
	(0.655)	(0.773)	(0.416)	(0.173)	(0.162)	(0.140)	(0.126)
Black	-0.204	-0.059	-0.022	0.125	0.120	-0.181	-0.187
	(0.684)	(0.808)	(0.435)	(0.181)	(0.169)	(0.146)	(0.131)
Hispanic	0.417*	0.933***	-0.137	-0.166***	-0.138**	-0.075	-0.000
	(0.215)	(0.254)	(0.137)	(0.057)	(0.053)	(0.046)	(0.041)
Other race	1.538*	1.937*	-0.067	-0.145	-0.192	0.071	-0.065
	(0.880)	(1.038)	(0.559)	(0.232)	(0.217)	(0.188)	(0.169)
HS dropout	0.773**	0.591	0.282	-0.005	-0.003	-0.125*	0.034
	(0.333)	(0.392)	(0.211)	(0.088)	(0.082)	(0.071)	(0.064)
HS graduate	0.371	-0.684	0.446*	0.216**	0.140	0.281***	-0.028
	(0.360)	(0.424)	(0.228)	(0.095)	(0.089)	(0.077)	(0.069)
Enrollment	-0.008***	-0.001	-0.002	-0.001*	-0.001**	-0.002***	-0.000
	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
R-squared	0.864	0.715	0.780	0.781	0.732	0.845	0.639
N	34	34	34	34	34	34	34

Note. Enrollment is in thousands. *$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table 7
Average Points Per Student, 2011

Student Characteristics	Average Total Points	Average Per Student					
		Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
Financial aid	0.344	0.076	0.290	-0.118	-0.005	0.001	0.101
	(0.351)	(0.397)	(0.267)	(0.085)	(0.065)	(0.061)	(0.065)
Age < 20	0.735**	-0.466	0.312	0.308***	0.258***	0.376***	-0.053
	(0.296)	(0.335)	(0.225)	(0.071)	(0.055)	(0.051)	(0.055)
Age ≥ 65	0.468	1.272	-0.197	-0.319*	-0.087	0.127	-0.328**
	(0.765)	(0.867)	(0.583)	(0.184)	(0.142)	(0.133)	(0.142)
Disability	0.070	0.740	-0.158	-0.212	-0.241	-0.021	-0.039
	(0.997)	(1.129)	(0.759)	(0.240)	(0.185)	(0.173)	(0.185)
Full-time	0.155	0.124	0.017	0.002	-0.019	-0.081	0.112**
	(0.286)	(0.324)	(0.218)	(0.069)	(0.053)	(0.050)	(0.053)
Male	-0.165	0.566	-0.705***	-0.045	-0.018	-0.107*	0.143**
	(0.300)	(0.340)	(0.228)	(0.072)	(0.055)	(0.052)	(0.056)
Asian	1.631***	1.093*	0.132	-0.079	0.038	0.322***	0.124
	(0.492)	(0.557)	(0.374)	(0.118)	(0.091)	(0.085)	(0.091)
Black	-0.516	0.146	-0.063	-0.117	-0.112	-0.151	-0.220**
	(0.519)	(0.588)	(0.395)	(0.125)	(0.096)	(0.090)	(0.096)
Hispanic	0.384*	0.886***	-0.183	-0.112**	-0.098**	-0.073**	-0.037
	(0.199)	(0.225)	(0.151)	(0.048)	(0.037)	(0.034)	(0.037)
Other race	0.886	1.421	-0.474	0.057	0.025	-0.032	-0.111
	(0.847)	(0.959)	(0.645)	(0.204)	(0.157)	(0.147)	(0.157)
HS dropout	0.584*	0.731**	0.290	-0.137*	-0.140**	-0.206***	0.046
	(0.305)	(0.346)	(0.232)	(0.074)	(0.056)	(0.053)	(0.057)
HS graduate	0.114	-0.709*	0.275	0.230***	0.195***	0.194***	-0.071
	(0.320)	(0.363)	(0.244)	(0.077)	(0.059)	(0.055)	(0.060)
Enrollment	-0.007***	-0.000	-0.002	-0.001**	-0.001***	-0.002***	-0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)
R-squared	0.869	0.727	0.733	0.843	0.868	0.920	0.749
N	34	34	34	34	34	34	34

Note. Enrollment is in thousands. *$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table 8
Change in Points Per Student

Student Characteristics	Change in Points Per Student			
	(1) 2007–09	(2) 2009–10	(3) 2010-11	(4) 2007–11
Financial aid	1.073	0.174	0.223	0.930
	(0.758)	(0.459)	(0.319)	(0.696)
SES bottom quintile	-0.089	0.018	0.118	0.184
	(0.240)	(0.194)	(0.128)	(0.220)
Age under 20	0.821*	0.171	0.027	0.920**
	(0.414)	(0.291)	(0.185)	(0.380)
Age 65 over	-0.322	-0.121	1.007*	0.480
	(1.115)	(0.918)	(0.540)	(1.023)
Disability	1.586	-1.845	-1.123	-0.802
	(1.251)	(1.170)	(0.752)	(1.148)
Fulltime	-0.969**	-0.219	-0.650**	-1.246***
	(0.405)	(0.342)	(0.234)	(0.372)
Male	0.236	0.248	0.090	0.313
	(0.330)	(0.270)	(0.209)	(0.303)
Asian	-0.256	-0.401	0.572	0.307
	(0.761)	(0.612)	(0.424)	(0.698)
Black	1.109	0.049	-0.629	0.470
	(0.861)	(0.694)	(0.443)	(0.790)
Hispanic	-0.150	-0.121	-0.040	-0.144
	(0.302)	(0.206)	(0.139)	(0.277)
Other race	-1.583	0.894	0.248	-0.510
	(0.972)	(0.649)	(0.569)	(0.891)
HS dropout	0.526	0.110	-0.176	0.334
	(0.579)	(0.336)	(0.215)	(0.531)
HS graduate	-0.662	-0.471	0.286	-0.603
	(0.579)	(0.369)	(0.232)	(0.531)
Base enrollment	0.000	-0.002	-0.002	-0.006*
	(0.003)	(0.002)	(0.002)	(0.003)
R-squared	0.394	0.409	0.461	0.600
Observations	34	34	34	34

Note. Headcount measure of students. Results are unchanged if points per FTE is used. Standard errors in parentheses. Enrollment is in thousands.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

4. Student-Level Analysis

This section considers which individual student characteristics were associated with points. This disaggregated information may help to identify which students are most likely to accumulate points and, therefore, where colleges might channel resources to increase student success. In turn, this will reveal to policymakers which types of students are likely to be encouraged or discouraged by the new performance funding system and how the composition of the college might subsequently change. If the SAI is working as intended, student characteristics should have no influence or a very weak influence.

Student-level determinants of points for 2011 are estimated in Table 9 (results were similar for 2010). Table 9 uses total points per individual student as the dependent variable. (Table A.6 uses a binary variable denoting whether the student accumulated any points or not). These equations are estimated separately for full-time and part-time students, with and without college-level fixed effects.[17] Whereas two thirds of full-time students accumulated points, only one third of part-time students did. The total points per student variable is more salient (as it mathematically translates into total points per college) than whether individual students accumulated any points. The latter is included in the analysis because there may be some student groups for whom it is difficult to accumulate points, and policymakers may be interested in which groups those are. Overall, similar results are obtained from examining total points and whether or not an individual student gained any points. These results are largely unchanged when college-level fixed effects—controls for institutional characteristics—are included.

Students on financial aid tended to accumulate more points. This finding is plausible because financial aid is typically contingent on pursuing a credential. Student age was also influential, although not in a simple, linear way. Students over 65 were much less likely to accumulate points relative to all other age groups, and students under 20 were much more likely to accumulate points relative to all other age groups. The influence of other characteristics depended on whether the student was attending school full-time or part-time.

[17] College-level fixed effects are dummy variables added for each college to account for college-specific influences on student points.

Table 9
Total Points Per Individual Student, Academic Year 2011

	Full-Time Students		Part-Time Students	
Student Characteristics	**(1)**	**(2)**	**(3)**	**(4)**
Financial aid	0.105***	0.094***	0.576***	0.578***
	[0.009]	[0.009]	[0.007]	[0.007]
Age < 20	0.720***	0.695***	0.471***	0.458***
	[0.055]	[0.056]	[0.008]	[0.008]
Age 20–24	0.211***	0.186***	0.306***	0.298***
	[0.055]	[0.056]	[0.007]	[0.007]
Age 25–29	0.331***	0.305***	0.318***	0.312***
	[0.055]	[0.057]	[0.008]	[0.008]
Age 30–34	0.389***	0.359***	0.281***	0.275***
	[0.056]	[0.057]	[0.008]	[0.008]
Age 34–39	0.392***	0.355***	0.275***	0.270***
	[0.057]	[0.058]	[0.009]	[0.009]
Age 40–44	0.431***	0.390***	0.277***	0.274***
	[0.058]	[0.059]	[0.009]	[0.009]
Age 45–49	0.450***	0.413***	0.247***	0.247***
	[0.058]	[0.059]	[0.010]	[0.010]
Age 50–54	0.488***	0.440***	0.161***	0.164***
	[0.060]	[0.061]	[0.010]	[0.010]
Age 55–59	0.373***	0.326***	0.086***	0.092***
	[0.063]	[0.064]	[0.011]	[0.011]
Age 60–64	0.343***	0.285***	0.009	0.020
	[0.076]	[0.076]	[0.012]	[0.012]
Disability	-0.059***	-0.064***	0.052***	0.050***
	[0.019]	[0.019]	[0.011]	[0.011]
Male	-0.077***	-0.071***	0.019***	0.020***
	[0.009]	[0.009]	[0.004]	[0.004]
Asian	0.218***	0.262***	0.389***	0.359***
	[0.016]	[0.016]	[0.008]	[0.008]
Black	-0.099***	-0.063***	0.270***	0.241***
	[0.017]	[0.018]	[0.010]	[0.010]
Hispanic	0.200***	0.179***	0.318***	0.290***
	[0.014]	[0.014]	[0.007]	[0.007]
Other race	-0.024	-0.029*	0.170***	0.147***
	[0.017]	[0.017]	[0.010]	[0.010]
HS dropout	0.054***	0.034***	0.306***	0.298***
	[0.013]	[0.013]	[0.007]	[0.007]
HS graduate	0.142***	0.147***	0.186***	0.189***
	[0.010]	[0.010]	[0.005]	[0.005]
College fixed effects	No	Yes	No	Yes
R-squared	0.022	0.033	0.091	0.096
Observations	137,449	137,449	343,040	343,040

Note. OLS estimation. Unstandardized coefficients reported. Standard errors in parentheses.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Among full-time students, males, high school dropouts, and Black students were less likely to accumulate points. Both high school dropouts and high school graduates were more likely to gain points as part-time students. However, part-time and full-time students appear equally important to colleges' ability to raise points.

Notably, all student characteristics examined here were statistically significant influences on points accumulation. However, these characteristics only explain 2–10 percent of the variation in points per student.

Moreover, there was considerable heterogeneity of effects across each individual metric. No particular college had an easier way to accumulate points. Tables A.7 and A.8 report estimates for earning any points in each of the six metrics by full-time and part-time student status for the 2011 academic year (including college fixed effects).

Consistent with the principles of the SAI, basic skills points appear to operate as a way to serve disadvantaged groups and counterbalance the accumulation of points by other, more advantaged student groups. Among full-time students (Table A.7), those on financial aid were likely to accumulate more total points but less likely to accumulate basic skills points. This result is reasonable because basic skills courses are not eligible for financial aid. Younger students were less likely to accumulate basic skills points, as were White students. There was a similar pattern for high school dropouts. Thus, unsurprisingly, the basic skills metric appears to be the most powerful in encouraging enrollment from traditionally underserved groups.

Other groups were also weighted toward particular metrics. Male students were more likely to accumulate 15-credit and 30-credit points as well as quantitative reasoning points; they were less likely to accumulate basic skills, college readiness, and degree completion points. Overall, it appears that five of the six metrics are determined by similar characteristics; the exception is basic skills, which is influenced by other countervailing student characteristics. Thus, basic skills points accumulation counterbalances the influences on the other metrics.

5. Alignment of Alternative Measures

One way to assess the SAI is to see how it implicitly orders the colleges in terms of performance. The SAI is explicitly intended not to rank colleges, and in general, ordinal ranking is often not the best way to understand differences between colleges (Jenkins & Cho, 2012). The SAI rewards colleges based on their improvement against their own baselines, not against the performances of other colleges; it is a funding system, not an ordering system.[18] Still, performance systems should be robust (i.e., insensitive to variations in how they are calculated), and the SAI does allocate funds based on colleges' relative performance. Some colleges receive more funds than others. Thus, the allocation system of the SAI will be more credible if it reflects a valid measure of relative performance, i.e., if colleges that receive more funds using the SAI formula would also receive more funds based on an alternative, equally plausible formula.

A prior analysis (Belfield, 2011) found that using alternative methods to identify relative performance yielded a different ordering for the colleges.[19] For example, under the SAI, the highest performing college was College 028. Using two alternative efficiency-related measures, College 028 ranked 20th or 28th, and using two effectiveness measures, it ranked 25th or 32nd.[20] The current analysis looks at rankings over time using the SAI allocation rule and at rankings across different allocation rules for the 2009 year (the one for which the most recent financial data were available).

Under the SAI, the highest performing college is the one that increased its absolute total of points the most between the baseline year and 2009 and then each subsequent year. Table 10 shows the ranks of the colleges based on the SAI formula. There is some stability in the rankings; those colleges that ranked highly from baseline–2009 also ranked highly from baseline–2011 (with a Pearson correlation coefficient of

[18] Crucially, colleges should not accumulate more points if the marginal revenue is below the marginal cost of claiming the points. For example, if a college has a quantitative reasoning class that is fully enrolled, it may be too costly to offer another section of that class if a few extra students turn up. The largest college need not be the most efficient (or even be balancing its budget) if the net cost of enrolling a student exceeds the marginal revenue.

[19] These methods included ranking colleges on the basis of total points change, baseline–2009; total points change, 2007–2008; percentage total points change, baseline–2009; total points per dollar; average points in 2007; residuals from an equation determining total points; and percentage change in average points, baseline–2009.

[20] Efficiency measures are based on the residuals from an equation determining total points and total points per dollar of expenditure. Effectiveness measures are based on total points per student and percentage change in average points.

0.64). Only one college had a top-ten ranking for all four years (College 002), and no single college had a bottom-ten ranking in all four years. Overall, there is no strong polarization over time into high-ranking and low-ranking colleges when the SAI is interpreted as a ranking system. Moreover, the funding implications are even less polarizing because the funding formula is not as strongly discriminating as a ranking system is. That is, a ranking system discriminates between every college. In 2011, the SAI funding formula allocated awards to only 21 colleges; the remaining 13 colleges were treated equally (i.e., they received no SAI funding).

There are multiple ways that colleges' relative performance within the Washington State system could be measured. Alongside the SAI formula, four ranking systems are examined here: three in "levels" (expenditure per point; points per student; and points per full-time equivalent student) and one in "changes" (changes in points per FTE 2007–09). The first three levels measures are based on what colleges do, rather than what they have done compared to their past performance. These comparisons are presented to illustrate the full range of possible alternatives. Note that levels and changes cannot be simply evaluated against each other.

Table 11 shows the ranks of the colleges using these alternative ranking systems for 2009. The correlations across the ranking systems are given in Table 12. The ranking system based on absolute change in points yields a different ordering than the other three methods. The other three methods yield ordering systems which are similar to one another, although this is in part because they are constructed using similar variables (e.g., student numbers and FTE numbers) and because they are based on levels. Thus, it appears that increasing points over time involves different practices than accumulating a great number of points each year.

A more direct comparison with the current ranking system is ranking based on change in points per FTE 2007–09; see Table 11. This system yields different rankings than measuring absolute change in total points. Some of the colleges that are ranked very low based on absolute change in total points—such as College 032 and College 033—are ranked very high when the ranks are based on changes in points per FTE. As shown in Table 12, the correlation between these two ranking systems is strongly negative (-0.56).

Table 10
College Rankings Based on the SAI Formula

College	Total Points Change			
	2007–09	2009–10	2010–11	2007–11
College 001	24	11	33	28
College 002	7	5	3	3
College 003	16	24	16	18
College 004	23	29	22	30
College 005	28	23	19	27
College 006	33	27	9	31
College 007	4	1	28	1
College 008	11	9	23	12
College 009	6	34	6	26
College 010	2	15	13	5
College 011	5	3	29	6
College 012	32	25	24	33
College 013	8	13	11	8
College 014	3	2	32	2
College 015	22	21	21	22
College 016	14	6	25	11
College 017	12	7	5	7
College 018	15	33	12	25
College 019	17	26	14	21
College 020	31	17	4	17
College 021	25	19	17	20
College 022	18	4	26	9
College 023	26	28	8	24
College 024	9	14	34	19
College 025	21	22	27	29
College 026	27	20	2	14
College 027	20	32	30	34
College 028	1	30	31	13
College 029	19	16	18	16
College 030	10	12	1	4
College 031	30	18	15	23
College 032	34	31	10	32
College 033	29	10	7	15
College 034	13	8	20	10

Table 11
College Ranks Based on Alternative Measures

College	Basis of Rank				
	Absolute Change in Total Points, 2007–09	Expenditure Per Point, 2009	Points Per Student, 2009	Points Per FTE, 2009	Change in Points Per FTE, 2007–09
College 001	24	32	34	34	18
College 002	7	24	29	24	11
College 003	16	28	32	30	32
College 004	23	22	1	5	33
College 005	28	8	4	7	6
College 006	33	16	17	13	1
College 007	4	11	8	16	14
College 008	11	27	33	33	21
College 009	6	5	3	12	22
College 010	2	15	5	6	25
College 011	5	6	13	4	30
College 012	32	25	15	13	12
College 013	8	14	10	9	29
College 014	3	10	9	19	31
College 015	22	4	11	10	20
College 016	14	26	18	25	15
College 017	12	13	14	22	13
College 018	15	12	23	2	34
College 019	17	7	2	7	22
College 020	31	2	27	1	19
College 021	25	3	26	17	24
College 022	21	21	22	27	17
College 023	26	18	30	23	9
College 024	9	20	28	26	28
College 025	20	29	16	31	16
College 026	27	30	25	28	2
College 027	19	34	21	32	10
College 028	1	19	19	20	27
College 029	18	23	31	18	5
College 030	10	17	6	21	7
College 031	30	33	24	29	8
College 032	34	31	12	15	3
College 033	29	1	20	3	3
College 034	13	9	7	11	26

Note. Higher ranks are associated with better performance. Rank 1 for expenditure per point is the college with the lowest expenditure per point.

Table 12
Correlations Between Ranking Systems

Basis of Rank	Absolute Change in Total Points, 2007–09	Expenditure Per Point	Points Per Student, 2009	Points Per FTE, 2009
Expenditure per point	0.17			
Points per student, 2009	0.23	0.42		
Points per FTE, 2009	-0.03	0.76	0.56	
Change in points per FTE, 2007–09	-0.56	-0.26	-0.14	-0.21

6. Momentum Analysis

This section focuses on momentum—getting students further along a college pathway.[21] In this analysis, it is critical to consider where students started in order to predict how many points they might earn. I relate the idea of momentum to points by depicting a pathway where students are defined in terms of their highest level of points. Students enter the path with no points. The first points they accumulate along the path are either basic skills points or college readiness points. They move on to accumulate points for reaching 15 and then 30 credits, or for passing a gatekeeper quantitative reasoning course. Finally, students at the end of the pathway receive credential or qualification points. *Momentum* refers to students' progress along this pathway of points. For simplicity, students are referred to in terms of their points; for example, a college-ready student is one who has passed pre-college remedial or developmental courses (rather than one who did not need to take a remedial course). It is important to account for dropouts; students who drop out obviously do not have momentum. Below, dropouts are included in the counts of those not progressing along a pathway.

The analysis above suggests that, in the aggregate, student momentum may not have changed much over the years. As shown in Figure 2, the proportion of points that are accumulated toward the beginning of the pathway—basic skills or college readiness points—remained stable. If colleges were increasing momentum, a greater proportion of their points would have been gained from the metrics that take place later in students'

[21] I also investigated the possibility that students are accumulating more points within a given year. However, no strong differences were evident.

academic pathways (e.g., 30 credits and degree completion). Interesting patterns result from examining the data at a more disaggregated level and from looking at a cohort of students over time.

In order to look at momentum for individual students tracked longitudinally, I analyze outcomes for a cohort of students in Washington community colleges in a given year. These students are categorized as basic skills, transfer, or workforce students, following the definitions used by the Washington State Board for Community and Technical Colleges. Basic skills (B) students can earn any category of points. Transfer (T) students and workforce (W) students typically do not earn basic skills points but can earn college readiness points if they enroll in and complete college remedial courses. Approximately 15 percent are B students, 34 percent are T students, and 51 percent are W students. On average, each student accumulates 0.7 points.[22] To identify momentum, student progress is tracked from a start year into the following year to see how many points were accumulated. (Results are only reported for one year to the next because few students persist for more than two years.) As noted above, the pathway of progression in points is: none, basic skills, college readiness, 15 credits, 30 credits, quantitative reasoning, and completion.[23] The tracks are based on the students' status in the start year; it is possible to see, for example, how many of the college-ready students in 2007 completed 15 credits in 2008. Rates of progress can then be compared across years to see if the sector is generating more momentum along a pathway for a given set of college-ready students.

Full tabulations of the progressions are given in Table A.9 for each of the student types across three start years: 2007, 2009, and 2010. Figures 5–7 illustrate patterns for the 2009 start year.

[22] In addition, there are students in the intent code category "other." This category covers approximately 20 percent of all students, but since they accumulate very few points, they are not part of this analysis. While the average B, T, or W student accumulates 0.7 points per year, students in the other category accumulate 0.1 points per year.

[23] A student who gained basic skills and college ready points in 2010 is designated as college ready.

Figure 5
Distribution of Points in 2010 for Cohort of Students with Zero Points in 2009

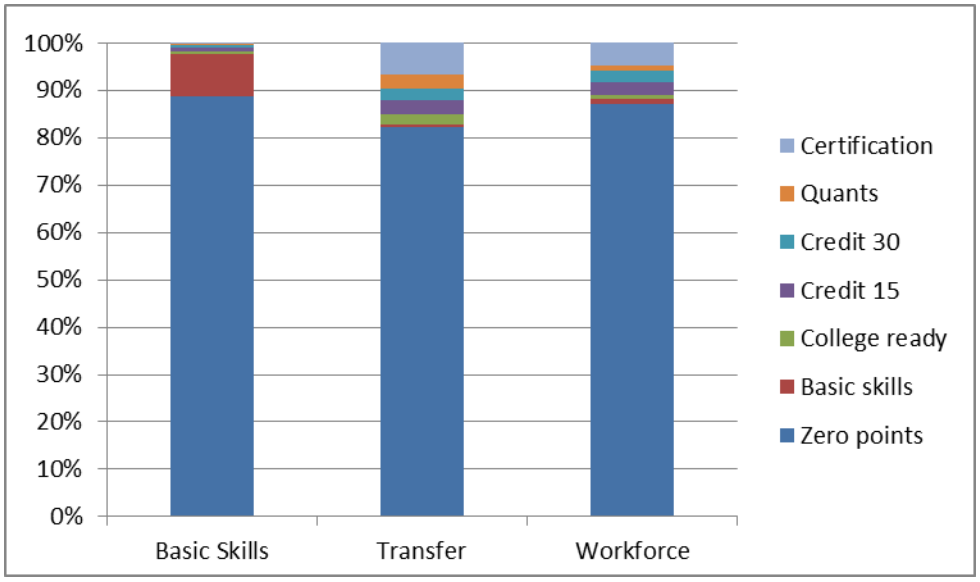


Figure 6
Distribution of Points in 2010 for Cohort of Students with College Readiness Points in 2009

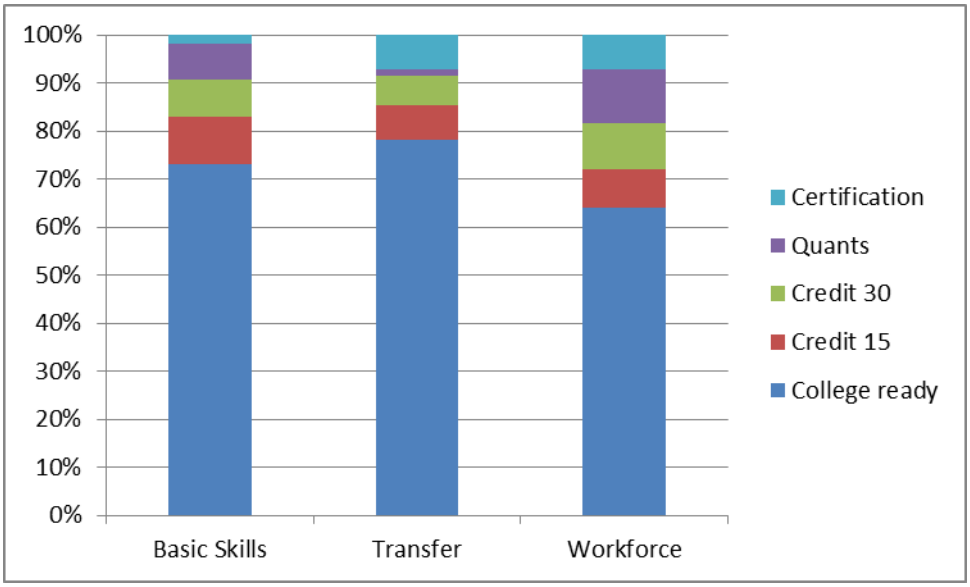
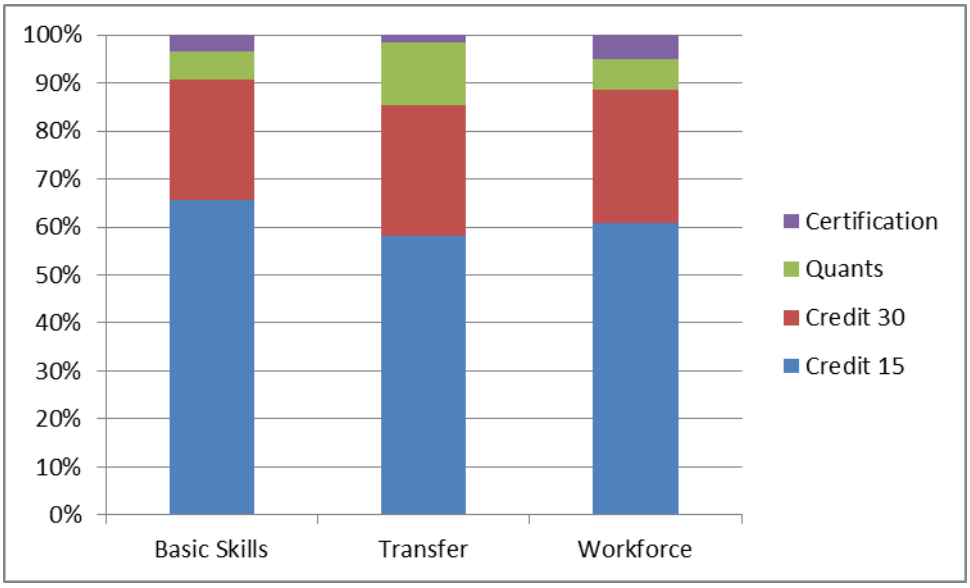


Figure 7
Distribution of Points in 2010 for Cohort of Students with 15 Credit Points in 2009



Results for the more than 50 percent of students who did not have any points in a given year are displayed in column 1 of Table A.9. Figure 5 shows the points accumulations in 2010 for the 2009 cohort of students who had zero points. Of those with zero points in 2009, over 80 percent did not have any points in 2010. Most of these students who did not earn points in either year were not enrolled in 2010; this is one way that students can lack momentum. For the remaining students, pathways varied by category. For B students with no points in 2009, 9 percent had basic skills points, with tiny percentages progressing further. For T students, 18 percent subsequently accumulated points, which were spread across all metrics except basic skills; 7 percent of these students completed some type of credential by 2010. For W students, 13 percent accumulated points in 2010; the points were gained from all six metrics, with 5 percent gaining a degree or certificate by 2010. Therefore, if a student accumulates no points in the first year—as is the case for more than 50 percent of all students—it is very unlikely that the student will accumulate any points, at least over a two-year period.

In each year, 9 percent of all students had basic skills points. In the following year, very few of these students accumulated any additional points; in 2010, less than 3

percent became college ready, and an even smaller fraction reached 15 credits or beyond. The progression rates were similar across B, T, and W students (See Table A.9). Therefore, almost all the students who get basic skills points in a given year subsequently accumulate no more points.

Students with college readiness points exhibited more progression each year; these students did have some momentum. Figure 6 shows the paths of those students who were college ready in 2009. For B students, over one quarter gained additional points in 2010: 10 percent reached 15 credits; 8 percent reached 30 credits; and 2 percent completed their program. For T students, almost one quarter gained additional points in 2010, with respective progression rates of 7 percent, 6 percent, and 7 percent. W students progressed the furthest: one third gained points in 2010, with 8 percent reaching 15 credits, 10 percent reaching 30 credits, and 7 percent gaining a credential.

Students with 15 credits also progressed. *Generally, momentum increases as students progress along a pathway*. Figure 7 shows the paths of those students who had 15 credits in 2009. For B students, one quarter of those with 15 credits in 2009 accumulated 30 credits in 2010 (with 4 percent completing a credential). Similar progression was made by T students; one quarter reached 30 credits, and 2 percent completed a credential. The progression rate for W students was slightly higher: 28 percent obtained 30 credits, and 5 percent obtained a credential. Unsurprisingly, attrition rates were much lower for students who already had points. Since these students represent less than 40 percent of the student body, it is difficult for an improvement in their momentum (e.g., more 15-credit students getting to 30-credits) to significantly increase the total points a college can obtain or the average number of points per student.

Looking across the three start years—2007, 2009, and 2010—some differences are apparent, but there are no strong trends. The inertia of students with zero points and basic skills points appears constant. However, there are two exceptions. First, more transfer students with basic skills points in 2010 made progress—14 percent by 2011, compared with 7 percent from 2007 to 2008. Considered in terms of absolute numbers of students, though, these figures are very small. Second, students of all types with 15 credit points progressed at higher rates in 2010 than equivalent students did in 2007. These exceptions indicate that, modestly, colleges are increasing momentum over time.

The findings for transfer and workforce students are not sensitive to their pre-college pathways. Those students who were in pre-college courses progressed in a similar fashion to those who entered directly into college-level classes. Table A.10 replicates the pathways of only those T and W students who attempted at least one pre-college English or math course. The rates of progression are similar to those for all T and W students.

7. Conclusion

This paper has examined, from a variety of empirical perspectives, total points and changes in points across the state's colleges during the initial phase of the SAI between 2007 and 2011. The findings from this analysis accord closely with the conclusions from prior analyses (Belfield, 2009, 2011).

Colleges increased their total points each year through 2010, although this trend stalled in 2011. From baseline to 2011, the average college increased its total points by 31 percent. It also increased its points per student at nearly the same rate (29 percent). At the same time, colleges increased enrollment; the number of FTEs grew by 41 percent, indicating that students were enrolling more intensively. The net result is that colleges' points per FTE fell by 4 percent since baseline. In the first three years of the SAI, colleges were becoming more effective—getting more points from each student—but this trend halted in 2011.

As with prior analyses, there is no strong evidence that the method of allocating awards based on change in total points significantly favors particular colleges. No college had fewer points in 2011 than at baseline. Some colleges had bigger changes in points, but this did not result in drastic changes in their rankings based on total points. Because there was some volatility in each year, colleges neither converged nor diverged in terms of gains in points. In terms of points per student, colleges converged over time. This may indicate the presence of a plateau beyond which colleges may find it difficult to continue increasing points. Over time, it will be possible to investigate this.

Enrollment size and total points were positively correlated for every year of data. Size influences total points, and while there are indications that size is becoming slightly

more influential over time, the effect is not dramatic. Although larger colleges had more points, they did not have more points per student.

The six metrics appear to be stable in their importance. In the first few years, colleges trended toward accumulating more of their points from gains in basic skills and college readiness. After the first few years, though, there was not much overall change in the proportions of students accumulating points across each metric. Insofar as the SAI is intended to increase incentives for serving disadvantaged groups, the basic skills point demonstrates the importance of this mission area to following the principle. However, the above analysis of momentum suggests that this point accumulation in and of itself has little or no connection to the goal of raising postsecondary achievement.

The characteristics of the student body at the colleges did not strongly influence total points and the change in points. Indeed, none of the characteristics of the student body—such as age, full-time enrollment status, race, or prior education—were associated with total points or with change in points. Although there were some significant influences on points across each of the six metrics, these differences do not result in large effects when the data are viewed in aggregate. In addition, the analysis of points per student suggests that the points system does not favor particular types of student. The influence of other characteristics depends on whether the student is classified as full-time or part-time. All of these conclusions echo those found in Belfield (2011).

Similarly, no simple model predicts points accumulation for any given student; it is not obvious which students yield the most points. Thus, colleges are unlikely to be able to target particular groups for enrollment. This was a key principle of the SAI. By default, this finding implies that the best way to accumulate points is to increase momentum—i.e., ensure that students who are college ready persist to 15 credits, 30 credits, and then to graduation. This, too, corresponds to the intent of the SAI.

The findings on the SAI as a ranking system are less clear-cut. The SAI is not intended as a ranking system, but colleges that rank higher do receive more funding. The use of alternative methods for evaluating the performance of each college—based either on levels of points or changes in points from one year to the next—would lead to different orderings. In turn, this would lead to somewhat different funding allocations.

In spite of the observed trend toward increases in points, colleges may have difficulty in substantially improving their point totals by generating extra momentum. This difficulty reflects the structure of the points-based award system rather than the institutional capacity of the colleges. Approximately 50 percent of students did not accumulate any points in a given year, and these students were unlikely to accumulate points in any subsequent year (in large part because they tended not to enroll). It may be difficult to get these students to progress far in college. Moreover, among students who accumulated basic skills points in any given year, few accumulated points in the following year. Only a small proportion of each student cohort progressed along a pathway of points—moving from 15 to 30 credits, for example. Consequently, colleges that retain more students may actually find it harder to accumulate points for these students beyond their first year. Colleges may be more likely to improve student momentum if they focus on the gains that can be made among new students during their first year in college.

References

Belfield, C. R. (2009). *The Student Achievement Initiative in Washington State: Identifying college effectiveness*. Unpublished manuscript.

Belfield, C. R. (2011). *The Student Achievement Initiative in Washington State: Evidence from baseline to 2009*. Unpublished manuscript.

Dougherty, K. J., & Natow, R. S. (2010). *Continuity and change in long-lasting state performance systems for higher education: The cases of Tennessee and Florida* (CCRC Working Paper 18). New York, NY: Columbia University, Teachers College, Community College Research Center.

Jenkins, D., & Cho, S. W. (2012). *Get with the program: Accelerating community college students' entry into and completion of programs of study* (CCRC Working Paper No. 32). New York, NY: Columbia University, Teachers College, Community College Research Center.

Jenkins, D., Ellwein, T., & Boswell, K. (2009). *Formative evaluation of the Student Achievement Initiative "learning year."* New York, NY: Columbia University, Teachers College, Community College Research Center.

Leinbach, D. T., & D. Jenkins. (2008). *Using longitudinal data to increase community college student success: A guide to measuring milestone and momentum point attainment* (CCRC Research Tools No. 2). New York, NY: Columbia University, Teachers College, Community College Research Center.

Shulock, N., & Jenkins, D. (2011). *Performance incentives to improve community college completion: Learning from Washington State's Student Achievement Initiative* (CCRC Policy Brief). New York, NY: Columbia University, Teachers College, Community College Research Center.

Appendix: Tables

Table A.1
Points Per College, Year 2009

Student Characteristics	Total Points	Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
Financial aid	-862	-2,019	3,475	-2,829	-1,351	52	1,810
	(9,626)	(7,572)	(4,875)	(1,888)	(1,379)	(1,840)	(1,180)
SES bottom quintile	-4,243	-2,159	-2,235	286	94	-590	361
	(4,074)	(3,205)	(2,063)	(799)	(584)	(779)	(500)
Age < 20	1,260	-936	1,117	115	555	1,458	-1,049
	(6,094)	(4,793)	(3,086)	(1,195)	(873)	(1,165)	(747)
Age > 65	6,672	15,178	6,430	-6,723*	-3,985	445	-4,673*
	(19,231)	(15,127)	(9,740)	(3,771)	(2,755)	(3,676)	(2,358)
Disability	10,993	27,484	-7,232	-3,931	-2,871	-2,033	-424
	(24,526)	(19,292)	(12,421)	(4,809)	(3,514)	(4,688)	(3,007)
Full-time	18,308**	6,158	3,916	3,209**	2,698**	1,343	984
	(7,166)	(5,637)	(3,629)	(1,405)	(1,027)	(1,370)	(879)
Male	-226	7,316	-5,168*	-697	-448	-2,108*	879
	(5,658)	(4,451)	(2,866)	(1,110)	(811)	(1,082)	(694)
Asian	13,097	12,307	-3,035	-2,265	-586	4,680*	1,997
	(12,828)	(10,091)	(6,497)	(2,515)	(1,838)	(2,452)	(1,573)
Black	-7,153	3,640	818	-1,572	-2,016	-4,247	-3,776**
	(14,542)	(11,439)	(7,365)	(2,851)	(2,083)	(2,780)	(1,783)
Hispanic	2,919	9,505**	-1,594	-2,266**	-1,598**	-92	-1,036*
	(4,323)	(3,401)	(2,189)	(848)	(619)	(826)	(530)
Other race	10,027	11,147	-1,411	166	382	606	-863
	(13,600)	(10,698)	(6,888)	(2,667)	(1,948)	(2,600)	(1,668)
HS dropout	9,816	7,006	3,024	387	-116	-1,228	744
	(7,037)	(5,535)	(3,564)	(1,380)	(1,008)	(1,345)	(863)
HS graduate	4,244	-10,777*	5,806	3,739**	2,690**	2,863*	-77
	(7,732)	(6,082)	(3,916)	(1,516)	(1,108)	(1,478)	(948)
Enrollment	672***	168***	147***	138***	102***	74***	43***
	(51)	(40)	(26)	(10)	(7)	(10)	(6)
N	34	34	34	34	34	34	34
R-squared	0.939	0.788	0.785	0.943	0.947	0.889	0.817

Note. Enrollment is in thousands.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.2
Points Per College, Year 2010

Student Characteristics	Total Points	Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
Financial aid	3,446	2,079	3,251	-2,160	-715	-257	1,248
	(10,475)	(9,788)	(6,431)	(1,979)	(1,665)	(1,749)	(1,503)
SES bottom quintile	-11,249**	-5,726	-4,646*	-164	-121	-105	-486
	(4,198)	(3,923)	(2,577)	(793)	(667)	(701)	(603)
Age < 20	-4,188	-6,458	-1,530	1,650	1,623	1,426	-899
	(6,061)	(5,664)	(3,721)	(1,145)	(963)	(1,012)	(870)
Age > 65	-234	21,984	-2,985	-9,551**	-6,273**	-416	-2,993
	(17,752)	(16,589)	(10,898)	(3,355)	(2,821)	(2,965)	(2,548)
Disability	17,160	24,887	-5,554	-1,898	229	-391	-113
	(24,692)	(23,073)	(15,158)	(4,666)	(3,924)	(4,124)	(3,544)
Full-time	15,057*	6,402	3,893	1,679	1,588	-23	1,519
	(7,673)	(7,170)	(4,710)	(1,450)	(1,219)	(1,281)	(1,101)
Male	1,158	10,448	-7,747*	-1,092	-56	-1,360	965
	(6,868)	(6,417)	(4,216)	(1,298)	(1,091)	(1,147)	(986)
Asian	-11,600	2,753	-12,751	-4,558*	-2,898	5,101**	753
	(13,917)	(13,005)	(8,544)	(2,630)	(2,212)	(2,324)	(1,998)
Black	12,174	16,180	3,206	-605	641	-5,110**	-2,137
	(14,540)	(13,587)	(8,926)	(2,747)	(2,311)	(2,428)	(2,087)
Hispanic	7,085	13,562***	-2,095	-2,055**	-1,614**	-457	-257
	(4,569)	(4,270)	(2,805)	(863)	(726)	(763)	(656)
Other race	55,591***	46,743**	8,844	-313	-1,963	2,468	-188
	(18,696)	(17,471)	(11,478)	(3,533)	(2,971)	(3,122)	(2,684)
HS dropout	22,390***	15,772**	7,737*	-197	128	-2,021	971
	(7,064)	(6,601)	(4,337)	(1,335)	(1,123)	(1,180)	(1,014)
HS graduate	-6,317	-14,290*	3,701	1,780	784	2,273*	-565
	(7,637)	(7,136)	(4,688)	(1,443)	(1,214)	(1,275)	(1,096)
Enrollment	712***	189***	164***	145***	107***	63***	44***
	(47)	(44)	(29)	(9)	(7)	(8)	(7)
N	34	34	34	34	34	34	34
R-squared	0.949	0.795	0.762	0.956	0.941	0.905	0.763

Note. Enrollment is in thousands.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.3
Points Per College, Year 2011

Student Characteristics	Total Points	Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
Financial aid	10,938	2,310	7,404	-1,055	357	239	1,685
	(8,379)	(6,340)	(5,516)	(1,297)	(915)	(1,239)	(1,124)
Age < 20	5,186	-4,717	3,355	2,308**	1,844**	3,195***	-798
	(7,059)	(5,341)	(4,647)	(1,093)	(771)	(1,044)	(947)
Age > 65	-6,755	16,715	-7,449	-6,654**	-2,891	-235	-6,236**
	(18,270)	(13,824)	(12,027)	(2,828)	(1,995)	(2,702)	(2,451)
Disability	4,553	21,249	-9,865	-3,301	-3,265	508	-777
	(23,810)	(18,016)	(15,674)	(3,686)	(2,600)	(3,521)	(3,195)
Full-time	-718	2,177	-2,381	-340	-444	-1,047	1,316
	(6,830)	(5,167)	(4,496)	(1,057)	(746)	(1,010)	(916)
Male	5,330	10,347*	-5,581	-179	115	-1,712	2,341**
	(7,158)	(5,416)	(4,712)	(1,108)	(782)	(1,059)	(960)
Asian	10,664	11,391	-2,859	-2,315	-447	3,876**	1,019
	(11,739)	(8,882)	(7,728)	(1,817)	(1,282)	(1,736)	(1,575)
Black	-1,167	9,164	518	-2,880	-2,455*	-3,042	-2,472
	(12,389)	(9,374)	(8,155)	(1,918)	(1,353)	(1,832)	(1,662)
Hispanic	4,564	12,606***	-4,240	-1,447*	-1,102**	-459	-793
	(4,744)	(3,590)	(3,123)	(735)	(518)	(702)	(637)
Other race	33,091	29,239*	-920	2,652	1,591	1,580	-1,055
	(20,219)	(15,298)	(13,310)	(3,130)	(2,208)	(2,990)	(2,713)
HS dropout	14,707*	11,839**	6,582	-1,108	-1,389*	-2,500**	1,282
	(7,285)	(5,512)	(4,795)	(1,128)	(796)	(1,077)	(977)
HS graduate	-8,808	-14,034**	1,129	2,147*	1,836**	1,618	-1,505
	(7,648)	(5,786)	(5,034)	(1,184)	(835)	(1,131)	(1,026)
Enrollment	718***	179***	164***	141***	110***	69***	55***
	(49)	(37)	(32)	(8)	(5)	(7)	(7)
N	34	34	34	34	34	34	34
R-squared	0.943	0.804	0.715	0.966	0.972	0.926	0.832

Note. Enrollment is in thousands. *$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.4
Change in Total Points Per College

Student Characteristics	Change in Points 07–09	Change in Points 09–10	Change in Points 10–11	Change in Points 07–11
Financial aid	5,621	3,766	-2,564	256
	(7,267)	(7,250)	(5,405)	(13,348)
SES bottom quintile	-4,872**	540	45	-3,265
	(2,296)	(3,068)	(2,166)	(4,218)
Age < 20	1,815	-3,306	909	-1,153
	(3,966)	(4,589)	(3,128)	(7,285)
Age > 65	-1,865	-11,623	7,601	1,355
	(10,688)	(14,483)	(9,161)	(19,632)
Disability	21,188*	-25,234	130	-1,028
	(11,984)	(18,470)	(12,742)	(22,012)
Full-time	1,776	-2,092	-3,936	336
	(3,882)	(5,397)	(3,960)	(7,131)
Male	699	-2,782	-3,986	-8,855
	(3,164)	(4,261)	(3,544)	(5,811)
Asian	-8,413	-1,039	3,375	-4,633
	(7,292)	(9,661)	(7,182)	(13,394)
Black	10,712	-3	-5,136	8,588
	(8,250)	(10,952)	(7,503)	(15,153)
Hispanic	-1,826	-5,439	1,307	-3,956
	(2,894)	(3,256)	(2,358)	(5,316)
Other race	-2,295	19,616*	-3,610	6,664
	(9,310)	(10,242)	(9,648)	(17,101)
HS dropout	11,177*	9,699*	-4,987	13,345
	(5,549)	(5,300)	(3,645)	(10,192)
HS graduate	-5,931	-1,371	6,592	1,281
	(5,545)	(5,823)	(3,941)	(10,185)
Base enrollment	107***	82**	-50**	165***
	(27)	(38)	(23)	(39)
N	34	34	34	34
R-squared	0.656	0.536	0.447	0.689

Note. Enrollment is in thousands.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.5
Points Per Full-Time Equivalent

College	Baseline AY 2007	AY 2009	AY 2010	AY 2011	% Change 07–09	% Change 09–10	% Change 10–11	% Change 07–11
College 001	1.21	1.35	1.53	1.47	12	13	-4	22
College 002	2.21	2.25	1.75	1.82	2	-22	4	-18
College 003	1.54	2.01	1.94	1.91	31	-3	-1	24
College 004	2.61	3.12	2.61	2.44	20	-16	-6	-6
College 005	2.96	2.91	2.43	2.27	-2	-17	-6	-23
College 006	2.72	2.52	2.24	2.22	-7	-11	-1	-18
College 007	2.36	2.46	2.19	2.07	4	-11	-5	-12
College 008	1.38	1.56	1.58	1.54	13	2	-3	12
College 009	2.35	2.54	2.06	2.14	8	-19	4	-9
College 010	2.79	3.07	2.52	2.44	10	-18	-3	-13
College 011	2.83	3.18	2.54	2.33	12	-20	-9	-18
College 012	2.46	2.52	2.29	2.12	2	-9	-7	-14
College 013	2.37	2.69	2.15	2.08	14	-20	-4	-12
College 014	1.98	2.38	2.34	2.28	20	-2	-3	15
College 015	2.46	2.63	2.24	2.17	7	-15	-3	-12
College 016	2.11	2.22	2.06	2.00	5	-7	-3	-5
College 017	2.22	2.32	2.18	2.14	5	-6	-2	-4
College 018	2.71	3.40	2.23	2.33	25	-34	5	-14
College 019	2.72	2.91	1.16	1.13	7	-60	-2	-58
College 020	3.33	3.47	4.45	4.63	4	28	4	39
College 021	2.19	2.42	2.40	2.39	11	-1	-1	9
College 022	2.08	2.20	2.26	2.23	6	3	-1	7
College 023	2.24	2.27	2.05	2.12	1	-10	4	-5
College 024	1.89	2.21	2.14	1.93	17	-3	-10	2
College 025	1.77	1.89	2.05	1.90	7	8	-7	7
College 026	2.22	2.08	2.04	2.28	-6	-2	11	3
College 027	1.67	1.70	2.23	2.03	2	31	-9	22
College 028	2.04	2.36	2.58	2.59	16	9	0	27
College 029	2.49	2.41	1.18	1.18	-3	-51	0	-53
College 030	2.37	2.33	2.21	2.27	-2	-5	3	-4
College 031	2.05	2.07	1.98	2.01	1	-4	2	-2
College 032	2.63	2.50	2.00	1.89	-5	-20	-6	-28
College 033	3.48	3.35	2.61	2.50	-4	-22	-4	-28
College 034	2.28	2.58	2.58	2.65	13	0	3	16
Average	**2.32**	**2.47**	**2.20**	**2.16**	**7**	**-9**	**-2**	**-4**

Note. Points per student rounded to two decimal places.

Table A.6
Any Non-Zero Points Per Individual Student, Academic Year 2011

	Full-Time Students		Part-Time Students	
Student Characteristics	**(1)**	**(2)**	**(3)**	**(4)**
Financial aid	0.207***	0.200***	0.762***	0.769***
	[0.008]	[0.008]	[0.008]	[0.008]
Age < 20	0.729***	0.758***	1.114***	1.094***
	[0.044]	[0.045]	[0.011]	[0.011]
Age 20–24	0.321***	0.351***	0.857***	0.841***
	[0.044]	[0.045]	[0.010]	[0.010]
Age 25–29	0.348***	0.379***	0.775***	0.758***
	[0.044]	[0.046]	[0.011]	[0.011]
Age 30–34	0.358***	0.389***	0.692***	0.675***
	[0.045]	[0.046]	[0.011]	[0.011]
Age 34–39	0.359***	0.389***	0.657***	0.642***
	[0.045]	[0.047]	[0.012]	[0.012]
Age 40–44	0.391***	0.416***	0.622***	0.611***
	[0.046]	[0.047]	[0.013]	[0.013]
Age 45–49	0.398***	0.423***	0.579***	0.575***
	[0.047]	[0.048]	[0.013]	[0.013]
Age 50–54	0.467***	0.486***	0.403***	0.405***
	[0.048]	[0.049]	[0.014]	[0.014]
Age 55–59	0.401***	0.423***	0.217***	0.224***
	[0.051]	[0.052]	[0.016]	[0.017]
Age 60–64	0.345***	0.364***	-0.075***	-0.052**
	[0.061]	[0.062]	[0.021]	[0.021]
Disability	-0.127***	-0.125***	0.144***	0.147***
	[0.016]	[0.016]	[0.013]	[0.013]
Male	-0.058***	-0.056***	0.036***	0.034***
	[0.007]	[0.007]	[0.005]	[0.005]
Asian	-0.001	0.023*	0.329***	0.303***
	[0.013]	[0.013]	[0.009]	[0.009]
Black	-0.178***	-0.161***	0.174***	0.153***
	[0.014]	[0.014]	[0.011]	[0.011]
Hispanic	-0.049***	-0.066***	0.149***	0.131***
	[0.012]	[0.012]	[0.008]	[0.008]
Other race	-0.102***	-0.103***	0.130***	0.110***
	[0.014]	[0.014]	[0.011]	[0.011]
HS dropout	-0.130***	-0.132***	0.204***	0.195***
	[0.010]	[0.011]	[0.007]	[0.008]
HS graduate	0.034***	0.036***	0.247***	0.240***
	[0.008]	[0.008]	[0.006]	[0.006]
College fixed effects	No	Yes	No	Yes
Observations	137,449	137,449	343,040	343,040

Note. Probit estimation. Unstandardized coefficients reported. Standard errors in parentheses.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.7
Any Non-Zero Points by Metric Per Individual Student: Full-Time Students, Academic Year 2011

Student Characteristics	Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Completion
Financial aid	-0.805***	0.534***	0.136***	0.191***	0.162***	0.122***
	[0.015]	[0.008]	[0.008]	[0.008]	[0.009]	[0.010]
Age < 20	-0.721***	0.960***	0.583***	0.613***	1.268***	0.674***
	[0.066]	[0.079]	[0.049]	[0.052]	[0.103]	[0.087]
Age 20–24	-0.291***	0.569***	-0.119**	0.074	0.825***	0.979***
	[0.065]	[0.079]	[0.049]	[0.052]	[0.103]	[0.087]
Age 25–29	-0.055	0.569***	-0.113**	0.073	0.768***	0.967***
	[0.066]	[0.080]	[0.049]	[0.053]	[0.103]	[0.087]
Age 30–34	0.100	0.544***	-0.166***	0.027	0.747***	0.992***
	[0.066]	[0.080]	[0.050]	[0.053]	[0.103]	[0.088]
Age 34–39	0.141**	0.524***	-0.170***	0.034	0.684***	1.004***
	[0.067]	[0.080]	[0.051]	[0.054]	[0.104]	[0.088]
Age 40–44	0.214***	0.537***	-0.178***	0.033	0.673***	0.977***
	[0.068]	[0.081]	[0.051]	[0.055]	[0.104]	[0.089]
Age 45–49	0.216***	0.508***	-0.113**	0.080	0.690***	0.996***
	[0.069]	[0.081]	[0.052]	[0.055]	[0.105]	[0.089]
Age 50–54	0.233***	0.499***	-0.041	0.089	0.652***	1.034***
	[0.070]	[0.083]	[0.053]	[0.057]	[0.106]	[0.090]
Age 55–59	0.122	0.424***	-0.073	0.099*	0.571***	1.029***
	[0.074]	[0.086]	[0.056]	[0.060]	[0.109]	[0.092]
Age 60–64	0.185**	0.318***	-0.064	0.039	0.465***	0.925***
	[0.085]	[0.098]	[0.067]	[0.071]	[0.121]	[0.101]
Disability	0.007	0.154***	-0.171***	-0.154***	-0.107***	-0.105***
	[0.027]	[0.017]	[0.018]	[0.018]	[0.020]	[0.021]
Male	-0.165***	-0.029***	0.061***	0.047***	0.070***	-0.104***
	[0.012]	[0.008]	[0.007]	[0.008]	[0.008]	[0.009]
Asian	0.654***	-0.065***	-0.163***	-0.168***	-0.009	-0.110***
	[0.019]	[0.016]	[0.014]	[0.015]	[0.016]	[0.017]
Black	0.441***	0.000	-0.160***	-0.240***	-0.345***	-0.367***
	[0.023]	[0.016]	[0.016]	[0.016]	[0.020]	[0.020]
Hispanic	0.643***	-0.009	-0.169***	-0.252***	-0.249***	-0.332***
	[0.017]	[0.013]	[0.013]	[0.013]	[0.015]	[0.017]
Other race	0.273***	-0.013	-0.088***	-0.135***	-0.127***	-0.251***
	[0.023]	[0.015]	[0.015]	[0.015]	[0.017]	[0.019]
HS dropout	0.642***	-0.209***	-0.319***	-0.169***	-0.138***	-0.140***
	[0.016]	[0.013]	[0.012]	[0.012]	[0.013]	[0.014]
HS graduate	0.044***	0.341***	-0.010	-0.062***	-0.098***	-0.186***
	[0.015]	[0.009]	[0.008]	[0.009]	[0.010]	[0.010]
Observations	137,449	137,449	137,449	137,449	137,449	137,449

Note. Probit estimation. Unstandardized coefficients reported. College fixed effects included in all equations. Standard errors in parentheses.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.8
Any Non-Zero Points by Metric Per Individual Student: Part-Time Students, Academic Year 2011

Student Characteristics	Basic Skills	College Readiness	15 Credits	30 Credits	Quantitative Reasoning	Degree Certification
Financial aid	-0.392***	0.853***	0.543***	0.633***	0.523***	0.521***
	[0.016]	[0.009]	[0.009]	[0.010]	[0.010]	[0.011]
Age < 20	0.277***	1.839***	0.889***	1.331***	1.226***	0.469***
	[0.027]	[0.044]	[0.013]	[0.022]	[0.020]	[0.020]
Age 20–24	0.565***	1.578***	0.298***	0.966***	0.931***	0.748***
	[0.026]	[0.043]	[0.013]	[0.021]	[0.020]	[0.018]
Age 25–29	0.695***	1.512***	0.234***	0.926***	0.830***	0.596***
	[0.026]	[0.044]	[0.014]	[0.022]	[0.021]	[0.019]
Age 30–34	0.748***	1.413***	0.149***	0.855***	0.712***	0.527***
	[0.026]	[0.044]	[0.015]	[0.023]	[0.022]	[0.020]
Age 34–39	0.810***	1.366***	0.150***	0.823***	0.582***	0.496***
	[0.027]	[0.045]	[0.016]	[0.023]	[0.023]	[0.021]
Age 40–44	0.849***	1.316***	0.131***	0.789***	0.564***	0.488***
	[0.027]	[0.045]	[0.017]	[0.024]	[0.024]	[0.022]
Age 45–49	0.852***	1.279***	0.078***	0.747***	0.492***	0.524***
	[0.028]	[0.046]	[0.018]	[0.025]	[0.026]	[0.023]
Age 50–54	0.803***	1.145***	-0.046**	0.614***	0.346***	0.391***
	[0.029]	[0.047]	[0.020]	[0.027]	[0.028]	[0.025]
Age 55–59	0.693***	0.893***	-0.191***	0.480***	0.147***	0.352***
	[0.032]	[0.051]	[0.024]	[0.031]	[0.034]	[0.028]
Age 60–64	0.578***	0.649***	-0.405***	0.284***	-0.105**	0.043
	[0.038]	[0.060]	[0.033]	[0.039]	[0.049]	[0.039]
Disability	-0.001	0.218***	-0.021	0.060***	0.060***	0.211***
	[0.024]	[0.017]	[0.018]	[0.018]	[0.020]	[0.019]
Male	0.006	0.042***	0.015**	0.045***	0.047***	0.015*
	[0.008]	[0.007]	[0.007]	[0.007]	[0.008]	[0.008]
Asian	0.790***	0.037***	-0.009	0.001	0.050***	-0.023
	[0.012]	[0.013]	[0.012]	[0.013]	[0.014]	[0.015]
Black	0.708***	0.072***	-0.076***	-0.090***	-0.126***	-0.226***
	[0.015]	[0.016]	[0.016]	[0.017]	[0.018]	[0.020]
Hispanic	0.804***	-0.069***	-0.221***	-0.211***	-0.247***	-0.270***
	[0.011]	[0.012]	[0.012]	[0.013]	[0.014]	[0.015]
Other race	0.466***	0.059***	-0.037**	-0.011	-0.041**	-0.067***
	[0.017]	[0.015]	[0.015]	[0.016]	[0.017]	[0.018]
HS dropout	0.830***	-0.117***	-0.082***	-0.083***	-0.210***	-0.044***
	[0.011]	[0.012]	[0.010]	[0.012]	[0.012]	[0.013]
HS graduate	0.180***	0.384***	0.042***	0.096***	-0.033***	0.124***
	[0.011]	[0.008]	[0.008]	[0.009]	[0.009]	[0.010]
Observations	343,040	343,040	343,040	343,040	343,040	343,040

Note. Probit estimation. Unstandardized coefficients reported. College fixed effects included in all equations. Standard errors in parentheses.
*$p < 0.1$. **$p < 0.05$. ***$p < 0.01$.

Table A.9
Percentage Distributions Across Start and Follow-up Years

	(1) Zero Points in Start Year			(2) Basic Skills Points in Start Year			(3) College Readiness Points in Start Year			(4) Credit 15 Points in Start Year		
Metric	**Basic Skills**	**Transfer**	**Workforce**	**Basic Skills**	**Transfer**	**Workforce**	**Basic Skills**	**Transfer**	**Workforce**	**Basic Skills**	**Transfer**	**Workforce**
Points in 2008 for 2007 Start Year												
Zero points	89	81	90									
Basic skills	9	1	1	96	93	94						
College readiness	1	2	1	1	3	2	69	63	66			
15 credits	1	3	2	1	2	2	12	7	9	67	57	61
30 credits	0	3	1	1	1	1	9	6	7	25	28	29
Quantitative reasoning	0	4	1	1	1	1	8	15	11	6	14	6
Degree completion	0	6	4	0	1	1	3	8	7	2	2	4
Points in 2010 for 2009 Start Year												
Zero points	89	82	87									
Basic skills	9	0	1	96	92	92						
College readiness	1	2	1	2	3	2	73	78	64			
15 credits	1	3	3	1	2	3	10	7	8	66	58	61
30 credits	0	2	2	1	1	2	8	6	10	25	27	28
Quantitative reasoning	0	3	1	0	1	1	8	1	11	6	13	6
Degree completion	0	7	5	0	0	1	2	7	7	4	2	5
Points in 2011 for 2010 Start Year												
Zero points	89	82	87									
Basic skills	8	0	1	96	86	93						
College readiness	1	2	1	1	4	2	66	65	64			
15 credits	1	3	2	1	4	2	9	8	9	64	54	59
30 credits	0	2	2	1	2	1	12	7	10	24	30	28
Quantitative reasoning	0	3	1	1	2	1	10	13	12	9	14	8
Degree completion	0	7	6	0	1	1	2	7	6	4	2	5

Note. Numbers rounded to nearest percentage.

Table A.10
Percentage Distributions Across Start and Follow-up Years:
Transfer and Workforce Students Who Attempted Either English or Math Remedial Courses

	(1) Zero Points in Start Year		(2) Basic Skills Points in Start Year		(3) College Readiness Points in Start Year		(4) Credit 15 Points in Start Year	
Metric	**Transfer**	**Workforce**	**Transfer**	**Workforce**	**Transfer**	**Workforce**	**Transfer**	**Workforce**
			Points in 2008 for 2007 Start Year					
Zero points	85	90						
Basic skills	0	0	67	74				
College readiness	5	1	19	7	63	66		
15 credits	3	3	3	4	7	9	47	48
30 credits	2	2	3	6	6	7	30	33
Quantitative reasoning	3	2	8	2	15	11	21	15
Degree completion	2	2	0	7	8	7	2	4
			Points in 2010 for 2009 Start Year					
Zero points	83	84						
Basic skills	0	0	55	85				
College readiness	6	5	7	6	67	64		
15 credits	3	3	17	7	7	8	47	46
30 credits	2	3	14	2	6	10	31	33
Quantitative reasoning	3	2	7	0	13	11	20	15
Degree completion	2	2	0	0	7	7	2	6
			Points in 2011 for 2010 Start Year					
Zero points	86	88						
Basic skills	0	0	77	74				
College readiness	6	4	8	11	65	74		
15 credits	3	3	12	6	8	9	45	44
30 credits	2	2	0	6	7	10	32	35
Quantitative reasoning	2	2	4	2	13	1	21	16
Degree completion	2	1	0	1	7	6	2	5

Note. Numbers rounded to nearest percentage. Sample sizes for college ready students < 100.