Performance-Based Funding for Community Colleges in Texas: Are Colleges Disadvantaged by Serving the Most Disadvantaged Students?

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Introduction

Texas's goal to close the gaps in college participation and success (Texas Higher Education Coordinating Board, 2000) among racial/ethnic minorities and lower-income students will not be realized without significantly improving completion rates among community college students. Community college enrollments now comprise 55% of all students in Texas public higher education, and these open-access institutions serve the vast majority of residents from disadvantaged backgrounds (Texas Association of Community Colleges, 2012). Among Texas students earning their bachelor's degree in 2010-11, 78% had previously attended a two-year college at some point during their college careers, the highest percentage in the nation (National Student Clearinghouse, 2012). Community colleges are clearly vital to the future success of public higher education in the large, minority-majority state of Texas.

However, persistence and completion rates at most community colleges across the state remain disappointingly low. Approximately half of entering freshmen at many of these institutions do not return for a second year. Only one in every four students who begins at a Texas community college has earned any post-secondary credential six years after initial enrollment (Texas Higher Education Coordinating Board [THECB], 2011). The high rate of attrition at community colleges remains one of the leading cost inefficiencies for the Texas higher education system. Effective public policies and institutional practices that significantly increase completion rates among community college students would make major, long-term contributions towards closing the gaps in educational attainment in Texas.

In an effort to improve institutional performance and college completion rates, the 83rd Texas Legislature in 2013 adopted a performance-based funding (PBF) model for the state's 50 community colleges. This funding model is referred to as the Student Success Points Model, and beginning with the 2014-15 academic year, 10% of community college funding from the state is determined by student achievement of these identified success points. Similar to PBF models being applied to community colleges in other states (Altstadt, 2012), Texas' new PBF model awards funding based on student achievement of intermediate performance metrics (i.e., completing developmental coursework, passing college-level gatekeeper courses, completing 15 and 30 semester credit hours), as well as key educational milestones (i.e., earning a certificate or associate degree, four-year transfer), rather than heavily weighting a singular outcome measure like degree completion.

The allocation of PBF will use a percent change formula that compares the performance of a particular community college or college district (for multi-campus systems) to itself, rather than to other community colleges in the state. This approach has been recommended as one way to attempt to ensure that community colleges that serve a large number of disadvantaged students (e.g., minorities, lower-income, older adults, academically underprepared students) do not have their PBF dependent upon comparisons with colleges located in areas that serve a more advantaged student population (Dougherty & Hong, 2006; Shulock, 2011). But even with this measure in place, Texas' PBF model, as currently designed, remains susceptible to one of the most commonly cited concerns about these performance accountability policies: that is, resource-dependent colleges "will have an incentive to 'cream' the students more likely to succeed and counsel away or otherwise discourage marginal students from enrolling" (Shulock, 2011, p. 1). In difficult fiscal times, one of the most expeditious ways for a college to increase the total amount of PBF allocations is to enroll more students who successfully achieve the metrics built into the funding formula, while simultaneously curtailing enrollment among students who achieve few, if any, of these funding points.

If PBF models are poorly designed, there is a real threat that open-access community colleges, designed to welcome disadvantaged students less likely to persist and graduate, will be penalized for enrolling such students (Dougherty & Reddy, 2011). Clearly, such a scenario would have far-reaching negative effects on Texas' explicit policy goals of increasing college access and completion among less advantaged students. Unlike PBF models for community colleges in several other states (Altstadt, 2012), Texas' PBF model does not currently offer direct funding incentives for academic progress and completion/transfer among at-risk students. Consequently, it is important to more carefully examine the extent to which the new PBF model in Texas could disproportionately penalize colleges that predominately serve students from disadvantaged backgrounds.

The purpose of this study was to apply the metrics from Texas' new PBF model to examine academic progress and educational outcomes among a diverse cohort of students enrolled at a large, urban community college system in the state. We were particularly interested to learn the extent to which there were significant differences in PBF appropriations to the college based on students' background characteristics and academic behaviors. The research questions guiding this study were:

1. What are the rates of PBF 'success point' achievement across a large, urban community college system in Texas as a function of students' demographic characteristics, academic performance, and enrollment behaviors?

2. On average, which students will generate the most and least performance-based funding for the community college during their time of enrollment?

After a period of relative dormancy, PBF in higher education is currently experiencing a strong national resurgence (Hearn & McLendon, 2013). A growing number of states are now applying these accountability frameworks to community colleges (Altstadt, 2012; D'Amico et al., 2014), despite little evidence that PBF significantly increases institutional performance and graduation rates at these institutions (Altstadt, 2012; Dougherty & Hong, 2006; Dougherty & Reddy, 2011; Tandberg, Hillman, & Barakat, 2014). Initially, a relatively small proportion of state funding (i.e., 10%) for Texas community colleges will be performance-based. However, as evidenced by a 2013 proposal to the Texas legislature promoting that the performance-based funding share increase to 25% (Cortez-Neavel, 2013), clearly the stakes for PBF may be increasing. Trends in other states suggest that, over time, PBF models often begin to allocate a greater proportion of state funding based on institutional performance. In Ohio and Tennessee, for example, 50% and 100%, respectively, of state funding for community colleges is now allocated using performance-based outcomes. With the potential for a significant proportion of state funding for Texas higher education to become performance-based in the future, it is critical to ensure from the earliest stages of this new accountability policy that some community colleges are not at a disadvantage.

Performance-Based Funding for Texas Community Colleges

In recent years, Texas renewed discussions of PBF for higher education institutions as a reform strategy aimed at improving institutional performance and student outcomes. House Bill 9, known as the Higher Education Outcomes-Based Funding Act, was passed in 2011 during the 82nd legislative session and directed the Texas Higher Education Coordinating Board (THECB) to collaborate with institutional leaders to develop the performance metrics. Joined by staffers from the THECB and the Texas Association of Community Colleges (TACC), a metrics task force comprised of community college personnel (i.e., presidents, business officers, registrars, institutional researchers) worked to develop and fine-tune a PBF model for Texas community colleges, using Washington State's momentum points funding model for community and technical colleges (Shulock & Jenkins, 2011) as a guiding framework. The THECB and TACC jointly proposed a performance model for funding community colleges adopted in 2013 by the 83rd Texas Legislature (the legislature meets on a biennium basis).

Texas' PBF model for community colleges, which is referred to as the Student Success Points Model, is presented in Figure 1. This figure identifies each of the funding points along the educational pathway, accompanied by their assigned weight in the PBF formula. The early and intermediate progress metrics are assigned smaller weights in model (0.5 points, 1 point), while educational milestones like earning a credential or four-year transfer are assigned larger weights (2 points). Similar to other PBF 2.0 models that utilize intermediate progress metrics, Texas' model is based on the premise that completion of an early success point (e.g., completing college-level math, earning 15 credit hours) will be positively associated with a major educational milestone (e.g., earning an associate degree, four-year transfer). These intermediate metrics are supported by empirical research on academic momentum (Adelman, 2005, 2006; Attewell, Heil, & Reisel, 2012) and enrollment outcomes among community college students (Bahr, 2013; Cofer & Somers, 2001; Crosta, 2013; Jenkins & Cho, 2012; Maxwell et al., 2003).

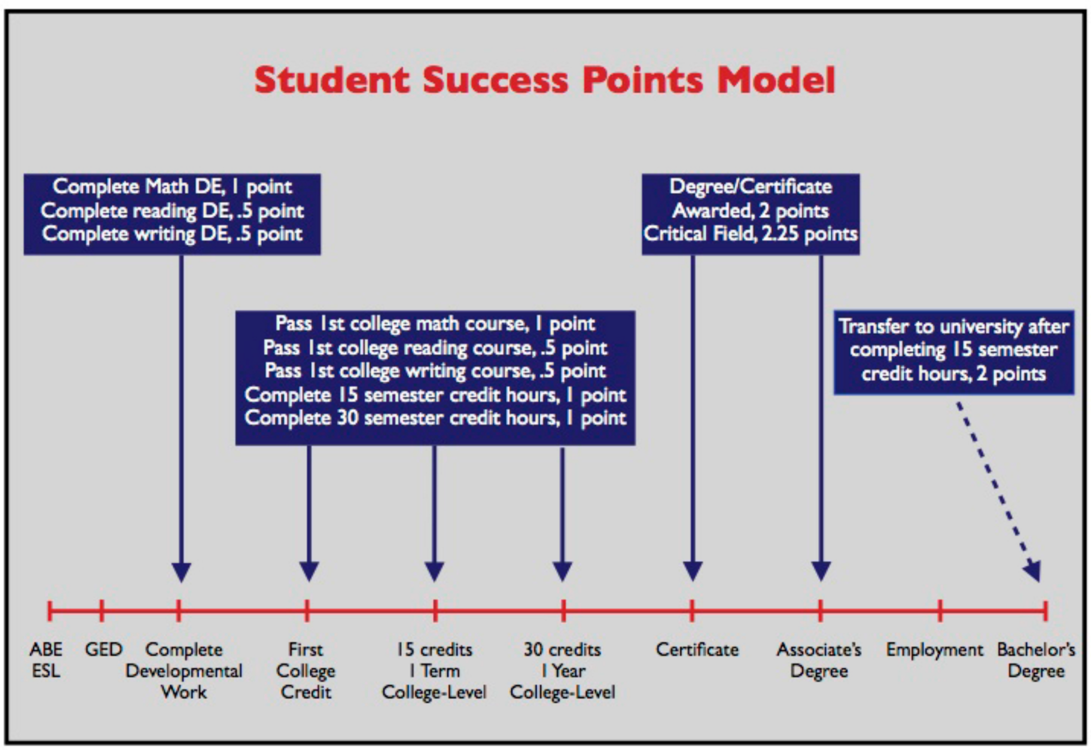

Figure 1: Texas' Performance-Based Funding Model for Community Colleges (2014-2015)

The 83rd Texas Legislature allocated $172 million to Student Success Points, and these funds were first appropriated during the 2014-15 academic year based on the three-year average (Fiscal Year 10-11-12) of Student Success Points for each community college district (TACC, 2013a). Each community college receives $185 per success point. The success points are calculated each fiscal year, but the three-year average is used to account for fluctuations in student enrollment from year to year. A student can earn multiple points for the community college each fiscal year. To provide context for the first PBF allocations under the new funding formula, Lone Star College System, the largest community college district in the state, earned 78,843 success points based on its three-year average and therefore received $14.59 million (i.e., 78,843 points x $185 per point) in PBF for the next two years.

Rider #23 of Texas' SB1-General Appropriations Act requires that, beginning with the 2016-17 biennium, PBF appropriations will use a distribution model that allocates funds based on improvements in student achievement for each community college district. Specifically, the percent change model will compare the college district to itself using the allocation of student success points from the 2014-15 biennium as the baseline for comparison (TACC, 2013a). To illustrate, a community college district that had earned 20,000 success points in 2014-15 (based on the three-year average from FY 11-12-13) would have been allocated $3.7 million in student success appropriations ($185 per success point x 20,000 points). If the total number of success points for 2016-17 (based on the three-year average from FY 12-13-14) for the district had decreased to 19,000, then the success point appropriation would be $3.515 million ($185 x 19,000 points), resulting in a 5% decrease in PBF appropriations to the college from the previous biennium (TACC, 2013b). Texas community colleges have a strong incentive to increase the total number of success points achieved by each student that enrolls, as more success points translate directly into more funding for the institution.

Unlike PBF 2.0 models for community colleges in some other states (e.g., Tennessee, Ohio), notably absent from Texas' PBF metrics are direct incentives for facilitating progress and completion among at-risk demographic groups. House Bill 9 defines an "at-risk" undergraduate student in Texas higher education as one who has been awarded a Pell Grant, is 20 years of age or older at enrollment, had an SAT or ACT score less than the national mean score, is enrolled part-time, and/or had received a GED rather than a high school diploma. Given the racial/ethnic diversity of Texas, including a metric in the PBF model for success among students of color is admittedly more complex than in less racially/ethnically diverse states. Many of the community colleges located along the southern and western borders of Texas, for example, serve student populations that are 90% Hispanic or higher.

Nonetheless, having direct funding incentives for colleges to increase success among populations a state identifies as “at-risk” is a best practice in the development of PBF 2.0 models (Altstadt, 2012; Jones, 2012; Shulock, 2011). Without this type of direct incentive in place, there is a chance that colleges could begin to limit their intake of these student groups, which are less likely to generate performance funding for the institution. Texas’ PBF model will be reviewed during upcoming legislative sessions and modified if necessary, so the results from the present study could be used to inform and guide policy decisions about the future of PBF for the state’s 50 community colleges.

Theoretical Framework

Resource dependency theory is grounded in the premise that an organization must routinely engage in transactions with other actors and organizations within its environment to procure resources and survive (Archibald, 2007; Pfeffer & Salancik, 1978). As it applies to PBF for higher education, resource dependency theory posits that because public colleges must be heavily dependent on state appropriations, college leaders will take steps necessary to retain or enhance their institutions’ funding (Harnish, 2011). Colleges are expected to respond to changes in the funding environment, as well as shifts in the state’s resource allocation methods, by adopting new strategies aimed at improving institutional performance and student outcomes (Rabovsky, 2012). In states where large proportions of state funding allocated to public higher education are performance-based, the ability of a college to effectively respond to these accountability demands has significant implications for the organization’s future.

Research examining the unintended consequences of PBF demonstrates that some of the strategies colleges may utilize to meet performance accountability demands are very undesirable. These strategies include restricting student admissions, narrowing of the institution’s mission, weakening of academic standards, and gaming of the PBF system (Dougherty & Hong, 2006; Dougherty & Reddy, 2011; Shulock, 2011). In our study, we were interested to understand the extent to which Texas’ new PBF model could potentially lead some community colleges to begin limiting the admission of disadvantaged students to boost the college’s graduation rate, a strategy that has been referred to as “creaming” (Dougherty & Reddy, 2011; Shulock, 2011). For the sake of resource acquisition and organizational survival, a Texas community college may (perhaps reluctantly) find it profitable to more aggressively recruit and enroll the students who achieve the most success points from the PBF formula. Even though Texas' PBF model compares an institution's current performance to its own past performance, curtailing enrollment among students with low rates of success point attainment, while enrolling more students who graduate and/or transfer, is one of the more expeditious ways a college could increase its PBF allocations. Dougherty and Reddy (2011) explain the forms this could take in practice:

> Becoming more selective in student intake is more difficult—practically and ideologically—for community colleges than it is for 4-year colleges, but it is by no means impossible. Community colleges can downplay outreach efforts to high schools that have higher numbers of disadvantaged students. They can cut back on their offerings of English as a Second Language or developmental education or adult basic education. And they can limit how often students can retake developmental education courses. (p. 75-76)

While restricting the admission of disadvantaged students might be more of an impending threat than a reality at the present time, this could quickly change if larger proportions than 10% of state funding in Texas are connected to performance measures in the future. Proposals to do just that are already being discussed and debated in the Texas legislature (Cortez-Neavel, 2013). Positive and negative organizational strategies community colleges use to respond to PBF will become increasingly important to evaluate as PBF takes a deeper hold within this sector.

Methodology

Data Source and Sample

This study utilized longitudinal student unit record data from a large community college district in Texas. The Urban Community College (UCC) district (a pseudonym) is one of the largest districts in the state, serving more than 60,000 credit students annually across multiple campuses situated within a large metropolitan area. Like many urban community college districts in Texas, UCC serves a large number of students who are non-White, lower-income, older, and academically underprepared for college-level coursework.

Student transcripts provided the bulk of information used to build our dataset. Transcripts contain detailed information about student enrollment patterns, courses dropped, grades, and credentials. By organizing these records longitudinally and incorporating demographic data, transcripts serve as a valuable, yet underutilized, resource for examining student progress and achievement across semesters (Hagedorn, 2005; Hagedorn & Kress, 2008; Leinbach & Jenkins, 2008). The level of detail provided by transcript data was necessary for the goals of this study to determine achievement of many of the intermediate progress metrics from Texas' PBF model (e.g., earning a grade of 'C' or higher in specific college-level gatekeeper courses, completing 15 and 30 semester credit hours). The transcript data was merged with institutional financial aid records, as well as with data from the National Student Clearinghouse to capture student transfer behaviors.

The dataset tracked a group of students who enrolled at any of the UCC campuses during the Fall 2007 semester, and followed their educational experiences through the Summer 2013 semester, yielding data from a total of six academic years. The full sample used in the present study included students in college for the first time (FTIC) upon entry into UCC in Fall 2007 and belonged to one of four racial/ethnic groups (i.e., African American, Hispanic, White, Asian) with large enough sample sizes for the purposes of our statistical analysis (n = 5,878). Prior research underscores the importance of examining community college student outcomes as a function of their academic preparedness and intended educational goals upon entry (Leinbach & Jenkins, 2008). Accordingly, our analysis focused on the following two sub-samples:

1.) *College-Ready Students* (n = 1,594). This sub-sample was comprised of students enrolled in academic programs of study (n = 505) and technical/workforce programs of study (n = 1,076) who, based upon their placement test scores, were not required to take developmental coursework in any subject area. While the first three success points from Texas' PBF model (i.e., completing developmental Math, English, and/or Reading) would not expectedly apply to this sub-sample, our analysis revealed that a relatively small proportion of this group did achieve each the developmental education success points. Analysis of the college-ready sample was beneficial for comparing the background characteristics, educational experiences, and success point achievements of students who were and were not referred to any remedial coursework.

2.) *Developmental Math Students* (n = 4,187). We used placement in developmental math coursework as the selection criteria for our second sub-sample. More than seven out of every 10 students (71.2%) in the full sample were placed in developmental math. Sizable proportions of developmental math students were also referred to developmental coursework in reading (34.7%) and writing (40.2%). Therefore, many of the students in the developmental math sub-sample had the possibility of completing all three of the developmental education success points, with the completion of the developmental math sequence (1 funding point) being more highly rewarded in the PBF model than completing developmental reading and writing (both 0.5 funding point). For the developmental math sample, we were also interested in examining differences in PBF attainment among students referred to coursework one (n = 997), two (n = 1,228), and three (n = 1,962) levels below college-level math.

For the purposes of our analyses, we focused on students referred to developmental math rather than students referred to developmental writing and/or reading, for several reasons. First, the majority of UCC students place into developmental math. Numerous studies have documented how developmental math remains a formidable barrier to completion at community colleges (Bahr, 2008; Complete College America, 2012), so it is valuable to better understand the factors that facilitate, and impede, progress for these students. Additionally, it can be a complex undertaking to examine all of the possible combinations of students' depth (e.g., one, two, three levels below college-level) and breadth (e.g., math, reading, writing) of academic deficiencies (Bahr, 2010). Selecting the developmental math students allowed us to examine the majority of UCC students placed in remedial education, and provided a sufficient number of cases to examine PBF attainment based on students' depth of math deficiency.

Variables

The independent variables in the study were organized into two categories: demographic characteristics (gender; race/ethnicity; age) and academic and college experiences (high school preparation, enrollment intensity; program of study; cumulative college GPA; Pell Grant status; developmental math placement). Table 1 shows the levels and coding for each of these variables. Students' gender, race/ethnicity, age, and enrollment intensity were measured at the time of initial enrollment at UCC (i.e., Fall 2007). While community college students often change their enrollment patterns across semesters (Crosta, 2013), we utilized their enrollment status in the first semester since HB 9 in Texas identifies an "at-risk" student as one who is part-time at any time of enrollment. As with most community colleges in Texas, 12 semester credit hours (SCH), as opposed to 15 SCH, is considered full-time enrollment at UCC. A student's program of study (academic or vocational), college GPA, and financial aid status were captured as of the student's last semester of enrollment at the college, or as of the last semester (Summer 2013) available in the dataset.

The outcome variable of interest was the cumulative amount of PBF a student would procure for UCC throughout their entire duration of enrollment at the institution. To derive this measure, we summed the total number of success points from the PBF model that the student earned, and then multiplied that number by the dollar amount the state awarded per success point (i.e., $185). This variable allowed us to compare the average rates of PBF procurement for different student groups within our sample. In a sense, this measure allowed us to better understand what a student is "worth" to the community college in terms of the PBF dollars they procure during their time of enrollment. For our predictive models, this variable was examined in continuous form and dichotomized to examine the likelihood a student would earn zero PBF over the duration of their enrollment.

There are a total of 11 intermediate and outcome "success points" from the PBF model that a student can achieve while at UCC (see Figure 1). In applying the relative weights for each success point, the range extends from zero (student completed none of the success points) to a total of 10.25 success points (student completed all 11 the success points). Success points for developmental education are awarded when the student completes the highest level of remedial coursework (i.e., the class one-level below college-level) in a particular subject area. A student who earns a grade of 'D' or higher in these courses is considered to have achieved this success point as a result of earning a passing grade in the class. However, for the first college-level math, reading, and writing courses, a student must earn a grade of 'C' or higher to achieve these success points. Here it is also important to note that colleges are allowed to count the first-college level English course as achievement of both the first college reading *and* writing success point from the model. A student earning a grade of 'C' or higher in the first college-level English class earns a total of 1 success point (0.5 each from reading and writing).

Completing 15 and 30 SCH are each worth 1 success point. The most heavily weighted (2 points) performance metrics are having earned an associate degree or certificate from UCC, and/or transferring to a four-year institution only *after* having completed 15 SCH. An additional 0.25 success points are awarded to students who complete credentials in "critical fields" as identified by the Texas legislature, which include credentials earned in the fields of engineering, computer science, mathematics, physical science, allied health, nursing, and teaching certification in the field of science or mathematics.

Data Analysis

The first phase of the analysis used descriptive statistics to identify and compare the characteristics of the full and restricted samples, as well as to examine the proportions of each sub-sample that completed each of the success points from the PBF model. The frequencies and percentages for each variable are presented in Table 1. Next, we wanted to better understand the total amount of PBF funding the college would receive, based upon the different types of students who enrolled at UCC. While Texas' PBF model calculates success points on a fiscal year basis, our goal was to illustrate the cumulative dollar amount of PBF a student would procure for UCC over their entire duration of enrollment. Therefore, we purposefully chose not to examine success point attainment on fiscal year basis and instead to track each student's completion of these funding metrics (or lack thereof) across all six years of the dataset.

In the next phase of data analysis, we created two linear multiple regression equations that used the predicted total PBF each student earned for their college as the dependent variable for the college ready and developmental students. The range for this continuous dependent variable was $0 to $1,896.25. Using demographic and other variables as the dependent measures provided a way to understand the contributions provided by various student descriptors in a statistically controlled equation. The next phase of analyses involved the dichotomous outcome of the likelihood that a student would earn no PBF for the college (0 = any PBF, 1 = no PBF). The nature of this dependent variable supported the use of logistic regression (Meyers, Gamst, Guarino, 2006). We modeled both outcome variables for the college-level and developmental math sub-samples. The independent variables were entered into each model simultaneously. Diagnostic tests did not reveal any problems with the regression analyses.

Limitations

The goal of our study was to better understand the average cumulative rates of PBF attainment for different student groups across their entire duration of enrollment at UCC. In practice, the Student Success Points Model calculates student completion of these funding points on a fiscal year basis. This "snapshot" view of attainment, however, would not have allowed us to determine which types of students, on average, procure the most, and least, PBF for the college. Therefore, we applied the central components of the PBF model (i.e., all 11 success points and their relative weights) and the level of funding per success point at the time of our study (i.e., $185 in 2014-15) to derive a general measure of a student's "worth" to the college in terms of PBF accrued over a six-year time period. But it is important for the reader to remain mindful that our longitudinal calculations of PBF procurement are intended for illustrative and comparative purposes, and are not identical to the way funding is calculated by the state.

Our data were derived from a large, diverse community college system located within an urban environment in Texas. Therefore, the results from this study may not be generalizable to community colleges in other parts of the state. We only examined a particular cohort of first-time-in-college students belonging to one of four racial/ethnic groups; hence our study does not capture success point completion among all of the students at the institution. While our dataset included information on all of the success points from the PBF model, it is important to remember that our study tracks momentum and enrollment outcomes among a cohort of students who entered UCC in Fall 2007. The rates of success point attainment for more recently entering cohorts at UCC may not be identical to those reported for the students in our sample.

CIP codes are used to identify associate degrees and certificates earned in areas considered "critical fields" by the Texas legislature. Identifying the students in our sample who earned credentials in these critical fields (worth .25 success points) was straightforward for most CIP codes. However, while the state identifies particular programs within the Health Professions and Related Clinical Sciences CIP code as critical fields, our dataset did not disaggregate the 231 credentials awarded within this CIP code. We chose a liberal approach and awarded .25 success points for all of the students earning credentials under this CIP code, but a limitation of this decision is that a proportion of these students may have earned health-related credentials in fields not classified as critical by the state.

Results

Table 1 provides descriptive statistics for the full sample and sub-samples. The final rows in this table examine the percentage of students across the full and restricted samples who achieved each of the PBF model's success points within six years of initial enrollment at UCC. With regard to the developmental education success points, 29% of the full sample had completed developmental math, 17.8% developmental writing, and 19.2% developmental reading. Only 26.9% of the sample ever completed the first college-level math course, compared to 45.8% who had completed the first college-level reading and writing course. Approximately six out of every 10 students (60.8%) earned 15 SCH, while a markedly lower percentage (42%) ever completed 30 SCH. Twenty-two percent of the full sample transferred to a four-year college or university within six years of enrolling at UCC. With regards to earning an associate degree or certificate, 15.6% of the full sample achieved this success point, and 2.3% of the sample earned a credential in an area identified as a critical field by the state of Texas.

Table 1: Descriptive Statistics for Full and Restricted Samples of Community College Students

	Developmental Math (n = 4,187)		College-Level (n = 1,594)		Full Sample (n = 5,878)	
	N	%	N	%	N	%
Gender						
Female	2469	59.0	792	49.7	3303	56.2
Male	1712	40.9	801	50.3	2568	43.7
Race/Ethnicity						
African American	1412	33.7	444	27.9	1889	32.1
Hispanic	1675	40.0	500	31.4	2189	37.2
White	689	16.5	391	24.5	1094	18.6
Asian	411	9.8	259	16.2	706	12.0
Age in 2007						
19 or younger	2456	58.7	671	42.1	3173	54.0
20-24	990	23.6	424	26.6	1443	24.6
25 or older	740	17.7	497	31.2	1259	21.4
Pre-College Credential						
High School Diploma	3751	89.6	1423	89.3	5260	89.5
GED or None	436	10.4	171	10.7	618	10.5
Program of Study						
Academic/Transfer	1580	37.7	505	31.7	2127	36.2
Vocational/Technical	2574	61.5	1076	67.5	3704	63.0
Enrollment First Semester						
Part-Time	2412	57.6	871	54.6	3345	56.9
Full-Time	1775	42.4	723	45.4	2533	43.1
Cumulative College GPA						
Less than 2.0	1410	33.7	371	23.3	1802	30.7
2.0 – 3.0	1666	39.8	548	34.4	2255	38.4
3.0 – 4.0	1111	26.5	675	42.3	1821	31.0
Financial Aid Ever Received						
Pell Grant	2048	48.9	601	37.7	2707	46.1
Grant Aid (non-Pell)	1088	26.0	329	20.6	1140	24.5
Loans	797	19.0	242	15.2	1059	18.0
Level of Math Deficiency						
1 level below CL	997	23.8	--	--		
2 levels below CL	1228	29.3	--	--		
3 levels below CL	1962	46.9	--	--		
Required Remediation in						
Mathematics	4187	100.0	--	--	4187	71.2
Writing	1683	40.2	--	--	1761	30.0
Reading	1454	34.7	--	--	1516	25.8
*Success Point Attainment through Summer 2013**						
Complete Dev Math	1537	36.7	163	10.2	1705	29.0
Complete Dev Writing	906	21.6	114	7.2	1045	17.8
Complete Dev Reading	945	22.6	142	8.9	1129	19.2
Complete CL Math	1143	27.3	393	24.7	1582	26.9
Complete CL Read/Write	2097	50.1	543	34.1	2694	45.8
Completed 15 SCH	2549	60.9	951	59.7	3571	60.8
Completed 30 SCH	1781	42.5	634	39.8	2469	42.0
4-yr Transfer w 15 SCH	909	21.7	384	24.1	1331	22.6
Earned Credential	589	14.1	303	19.0	915	15.6
Earned Credential in Critical Field	90	2.1	40	2.5	133	2.3

*Note: Frequencies and percentages reported for these measures included duplicated counts, as a student can complete multiple success points. The percentages reflect the proportion of the respective sample that ever achieved that particular success point.

What Is a Student "Worth" (in Terms of PBF)?

By multiplying the total number of success points a student earns by the current level of state appropriation per success point (i.e., $185 at the time our study was conducted), we were able to calculate the procurement of PBF dollars by student groups, focused particularly on differences in PBF procurement between at-risk students and their peers. Table 2 presents the results from this analysis. This specific sample of students accumulated 17,663 success points for the college during the six-year time frame captured by the dataset, which translated into a total of $3.26 million in performance funding. The range of success points achievement was zero (28% of the sample never completed any success point) to 10.25 (only one student in the sample achieved all 11 success points). The average number of success points earned per student was 2.99, which translated into an average of $554.98 in PBF per student.

Table 2: Cumulative Performance-Based Funding Procurement by Student Characteristics

	Total Success Points	Mean Success Pt.	SD	Total PBF	Mean Student PBF	Mean Differences
Full Sample (5,878)	17,663.25	2.99	2.82	$3,262,151.25	$554.98	
Gender						
Female+	10,670.50	3.23	2.87	1,974,042.50	597.65	
Male	6,933.25	2.70	2.73	1,282,651.25	499.47	-98.18***
Race/Ethnicity						
Asian+	2,921.50	4.14	2.90	540,477.50	765.55	
African American	4,915.00	2.60	2.73	909,275.00	481.35	-284.20***
Hispanic	6,767.75	3.09	2.83	1,252,033.75	571.97	-193.58***
White	3,029.00	2.77	2.70	560,365.00	512.22	-253.33***
Age at Entry						
19 or younger+	11,202.50	3.53	2.85	2,072,462.50	653.15	
20-24	3,423.25	2.37	2.62	633,301.25	438.88	-214.28***
25 or older	3,000.50	2.38	2.69	555,092.50	440.90	-212.26***
Pre-College Credential						
High School Diploma+	16,331.25	3.10	2.83	3,021,281.20	574.38	
GED	885.50	2.02	2.47	163,817.50	389.76	-184.63***
Program of Study						
Academic/Transfer+	6,803.00	3.20	2.89	1,258,555.00	591.70	
Vocational/Technical	10,709.50	2.89	2.77	1,981,257.50	534.90	-56.81***
Enrollment First Semester						
Part-Time+	8,209.50	2.45	2.72	1,518,757.50	454.04	
Full-Time	9,423.75	3.72	2.79	1,743,393.70	688.27	234.23***
Cumulative College GPA						
3.0 – 4.0+	7,618.50	4.18	2.96	1,409,422.50	773.98	
2.0 – 2.99	8,338.50	3.72	2.63	1,542,622.50	688.17	-85.81***
Less than 2.0	1,626.50	0.90	1.42	300,902.50	166.98	-607.00***
Pell Grant Recipient						
No+	8,151.25	2.57	2.68	1,507,981.20	475.55	
Yes	9,482.00	3.50	2.90	1,754,170.00	648.01	172.46***
Developmental Education						
Yes+	13,437.25	3.14	2.89	2,485,891.20	580.27	
No (College-Ready)	4,196.00	2.63	2.59	776,260.00	486.99	-93.28***
Level of Math Deficiency						
1 level below CL+	3,883.75	3.90	2.91	718,493.75	720.66	
2 levels below CL	4,052.25	3.30	2.93	749,666.25	610.48	-110.18***
3 levels below CL	5,115.00	2.61	2.75	946,275.00	482.30	-238.35***

*p ≤ .05, ** p ≤ .01, *** p ≤ .001; + indicates reference group for results of t-test or ANOVA comparing group differences in mean PBF;

As the far-right column in Table 2 demonstrates, there are significant differences in the average PBF earned for the college as a function of different student characteristics. On average, Asian students in our sample earned $766 in PBF for the college, compared to only $481 for African American students. PBF rates per student were markedly lower for students 20-24 ($439) and 25 or older ($441), relative to students 19 or younger ($653). Students who earned a GED, rather than a high school diploma, had the lowest rates of average PBF attainment ($390) across all students in the sample. On average, full-time students ($688) procured much more PBF than part-time students ($454). There was a notable difference in the average amount of PBF earned as a function of students Pell Grant recipients ($648) had much higher average than students who did not receive a Pell ($476).

Interestingly, students assigned to developmental coursework in any subject area ($580) earned more PBF, on average, than students who were not placed into developmental education ($487). While this finding might at first seem counterintuitive, Texas' PBF model rewards student completion of developmental coursework in math, reading, and writing. Therefore, students who are assigned to developmental education have the opportunity to earn more success points than the college-level students. An important caveat within this finding, however, is demonstrated upon examination of the average rates of PBF procurement by students' level of math deficiency. While students referred to developmental math coursework one level below college-level were, on average, among the most valuable ($721) for the college, students placed in the lowest level of developmental math were among the least valuable ($482) in terms of PBF.

Table 3 provides the findings from the set of independent variables regressed on the PBF procured by the student. The multivariate statistics indicated that the equations for the college ready and developmental students were significant ($F=32.6$, $p<.001$; $F=53.0$, $p<.001$) and explained 15.6% and 13.2% of the variance respectively. For both sub-samples, the two strongest predictors of PBF procurement was full-time status and Pell Grant status, respectively. For the developmental sub-sample, the third strongest and most negative predictor was being placed at the lowest developmental math level (three levels beneath college-level). Controlling for all other variables, the total predicted PBF procured by a student at three levels beneath college-level math was $113.27. Although male students on average procured less PBF than their female counterparts, interestingly for this sample of college-level males it was $59.30 less, but for male students in the developmental sub-sample, it was almost double: $110.00 less. While Asian students on average brought higher levels of PBF than their White counterparts, the amounts differed between the two sub-samples. Controlling for other variables, Asian college-level students brought $84.10 more, but developmental students brought more than two and half times as much: $221.20. The Hispanic students at college-level brought $25.00 less than White students, but for Hispanic students in the developmental sub-sample, the PBF procured was $42.20 more than White students.

Table 3: Multiple Regression Predicting PBF Procurement by Student Characteristics

	College-Level Students		Developmental Math Students	
Variable	b (sd)	B Beta (Sig)	b (sd)	B Beta (Sig)
Student Characteristics				
Male (female)	-59.3 (22.4)	-.062 (**)	-110.0 (16.0)	-.101 (***)
Asian (White)	84.1 (36.0)	.065 (*)	221.2 (32.0)	.123 (***)
African American (White)	-61.0 (32.1)	-.057	-87.1 (25.0)	-.077 (***)
Hispanic (White)	-25.0 (30.1)	-.024	42.2 (23.3)	.039
20 or older (19 or younger)	-6.9 (1.2)	-.138 (***)	-3.0 (1.3)	-.034 (*)
GED/Other (HS Diploma)	-121.0 (37.0)	-.078 (**)	-136.0 (26.4)	-.077 (***)
Technical Major (Academic)	-31.0 (23.0)	-.032	-17.0 (15.4)	-.016
Full-time (Part-time)	220.0 (23.0)	.229 (***)	181.3 (16.2)	.168 (***)
Received Pell Grant (No)	173.2 (24.3)	.176 (***)	165.5 (16.5)	.155 (***)
Dev Math 2 Levels (1 Level)	--	--	55.1 (22.0)	.044 (*)
Dev Math 3 Levels (1 Level)	--	--	-113.3 (19.0)	-.106 (***)
Dev Write and/or Read (No)	--	--	15.0 (17.2)	.014
Model Summary Statistics				
	F (Sig) = 32.6 (***)		F (sig) = 53.0 (***)	
	R Square=.156		R Square .132	

*p ≤ .05, ** p ≤ .01, *** p ≤ .001

Finally, we ran two logistic regression models to predict the characteristics of students who procured zero PBF for the college (see Table 4). The overall model predicting the least valuable college-level students was statistically significant ($F = 185.59$, $p \leq .000$) and had a Cragg-Uhler pseudo r squared of .196 and correctly classified 71.7% of the cases. Gender and race/ethnicity were not statistically significant in this model. Older students (135% higher odds) and students who earned a GED (48% higher odds) had a greater likelihood of generating zero PBF for the college relative to their respective comparison groups. Full-time students (68% lower odds) and Pell Grant recipients (53% lower odds) were less likely to be among the students earning no PBF. The final regression model examined the predictors of procuring no PBF (a PBF non-performer) for the developmental math sample was statistically significant ($F = 877.62$, $p \leq .000$) and had a Cragg-Uhler pseudo r squared of .130 and correctly classified 74.4% of the cases. Consistent with results from the previous model, males, African Americans, students age 20 and older, GED holders, and those assigned to the lowest levels of developmental math had the highest probability of being a PBF non-performer. Students who were Asian, full-time, and Pell Grant recipients were the least likely to be a PBF non-performer.

Table 4: Logistic Regressions Predicting PBF Non-Performers (i.e., earning $0 PBF)

	College-Level Students			Developmental Math Students		
		95% C.I.			95% C.I.	
Variable	Odds Ratio	Lower	Upper	Odds Ratio	Lower	Upper
Student Characteristics						
Male (female)	1.22	.966	1.530	1.501***	1.295	1.741
Asian (White)	.812	.555	1.187	.568***	.408	.791
African American (White)	1.267	.920	1.746	1.434**	1.146	1.794
Hispanic (White)	.898	.661	1.219	.812	.655	1.006
20 or older (19 or younger)	2.350***	1.835	3.011	1.715***	1.468	2.003
GED/Other (HS Diploma)	1.475*	1.036	2.101	1.422**	1.135	1.781
Technical Major (Academic)	1.050	.830	1.329	.941	.815	1.087
Full-time (Part-time)	.323***	.253	.412	.493***	.420	.579
Received Pell Grant (No)	.469***	.362	.608	.507***	.432	.595
Dev Math 2 Levels (1 Level)	--	--	--	.837	.673	1.042
Dev Math 3 Levels (1 Level)	--	--	--	1.262**	1.061	1.501
Dev Write and/or Read (No)	--	--	--	.865	.736	1.016
Model Fit Statistics						
N			1,594			4,187
Percent Correctly Predicted			71.7			74.4
Cragg-Uhler(Nagelkerke) R2:			.196			.130
-2 Log likelihood (df)		1770.277	9	4413.244		12

$*p \leq .05$, $** p \leq .01$, $*** p \leq .001$

Discussion and Implications

When applying the funding metrics from Texas' new PBF model to a large cohort of community college students, our findings revealed stark differences in success point attainment, and PBF procurement, as a function of the type of students being served by the college. The most valuable students for UCC to recruit and serve, strictly in terms of the PBF they garnered for the institution during their entire time of enrollment, were Asian, 19 or younger, have completed a high school diploma, attend full-time, receive Pell Grants, and were assigned to developmental coursework just below college-level. Conversely, African American, older adults, GED holders, part-time students, and students assigned to the lowest levels of remedial coursework procured significantly less PBF for the college; these groups were also overrepresented among the 28% of students in our sample that procured no PBF for the institution.

Resource dependency theory explains that an organization's effectiveness, and survival, is dependent upon its ability to procure resources (Pfeffer & Salancik, 1978). A common concern about applying PBF models to the community college sector is that in an effort to acquire a greater share of state appropriations, these already under-funded colleges could begin to "cream" the students more likely to achieve success, while limiting the admission of students from disadvantaged backgrounds (Altstadt, 2012; Community College Research Center, 2014; Dougherty & Hong, 2006). The results from our study suggested that efforts to proactively recruit students from several particular at-risk populations (e.g.,, African Americans, older adults, GED holders, students who are the most sorely underprepared for college-level coursework) may not be in UCC's best interest in terms of procuring PBF. Instead, UCC would be better positioned to secure additional funding by aggressively recruiting and enrolling the types of students our results indicate consistently generate more PBF (i.e., students who are Asian, 19 or younger at entry, enroll full-time, have earned a high school diploma) during their time of enrollment.

Resource-dependent institutions may take actions such as easing recruitment efforts at high schools in low-SES areas. On the other hand, resource-dependent colleges might more aggressively recruit college-ready recent high school graduates who express intent to enroll full-time in an A.A. or A.S. degree program designed to facilitate four-year transfer. Given the very low rates of PBF attainment among students assigned to the lowest levels of developmental math, another response could be to reduce the number of these course offerings and/or limit the number of times a student can retake this course (Dougherty & Reddy, 2011). Additionally, colleges such as UCC may find it financially advantageous under PBF to discontinue some short-term vocational certificate programs that predominately attract older adults, many of whom may only intend to take a course or two to upgrade their job skills, and consequently do not complete any of the success points. This is related to concerns that PBF models in some states could have the unintended (at least publicly) impact of narrowing the workforce training mission of community colleges (Dougherty & Hong, 2006; Dougherty & Reddy, 2011).

Performance-based accountability models can be very difficult to design and maintain (McLendon & Hearn, 2013; Zumeta & Kinne, 2011). The multiple missions carried out by community colleges make developing PBF policies for this sector additionally challenging. In designing and implementing the new Student Success Points Model, Texas did follow many of the recommended best practices for tying state funding to community college outcomes. Some of these practices were involving colleges in the planning process, using intermediate progress metrics in the funding formula, comparing colleges' current performance to their own past performance, publicizing the model, and instituting in a 'learning year' before the formal implementation of the policy (Altstadt, 2012; Community College Research Center, 2014; Dougherty & Reddy, 2011; Shulock &

Jenkins, 2011). While there is no perfect PBF model, we believe there are several modifications to Texas' PBF model for community colleges that could minimize the unintended impacts of this new policy.

Perhaps the most effective and efficient way Texas policymakers could reduce the temptation for community colleges to "cream" students is to add a metric in the PBF model that that introduces a funding incentive for success among one or more categories of "at-risk" students. This type of metric is currently being used by PBF 2.0 models in several other states. For example, Tennessee rewards additional performance funding for progress and completion among adult students and those eligible for Pell Grants (Altstadt, 2012). However, due to the racial diversity of Texas, using race/ethnicity may not be the most appropriate indicator of an "at-risk" student in the Student Success Points Model. In our sample, students age 20 and older were less likely than their younger peers to achieve nearly all of the success points. Even after controlling for other relevant predictors of success, older students were more likely to be among the students who procured no PBF for the college. We believe that policymakers should explore the possibility of rewarding community colleges for improving progress and/or completion among students who are age 20 or older (or perhaps 25 and older) at the time of initial enrollment at the college.

HB 9 in Texas already identifies older undergraduate students as at-risk, and older adults at the community college are more likely to be lower-income, attend part-time, and GED holders. Consequently, awarded success points for credential completion among adult students in the PBF model for community colleges would support existing state policy goals to increase college access and success among these disadvantaged groups. Including a direct incentive in the PBF model for completion and/or four-year transfer among older adults could incentive colleges to develop services and programs aimed at facilitating success among these at-risk students, as these practices could generate additional performance funding for the institution.

As Dougherty and Hong (2006) explain, if PBF models are not carefully designed and monitored, they can "create a vicious cycle where urban community colleges and small, rural community colleges with more disadvantaged students and fewer institutional resources will find it difficult to meet state standards, and, hence, will lose funding, further compounding their lack of resources and imperiling their future performance" (p. 82). Unaccompanied by sufficient financial resources to help build institutional capacity for change and improvement, PBF could further imperil the performance of community colleges like UCC that predominately serve at-risk student populations (Tandberg et al., 2014). Accordingly, as community colleges try new strategies in response to PBF, Texas policymakers should consider implementing a stop-loss prevention measure in the formula that limits the level of funding colleges can lose in a given year (Maio, 2012). We also recommend that the impacts, both intended and unintended, of the new PBF model for Texas community colleges be better understood before state policymakers attach a larger proportion of state funding to student outcomes.

Conclusion

When the portion of funds allocated to community colleges through PBF is low, allocated funds assume the form of a reward structure and a mechanism for behavior modifications. But when funding allocations increase, the PBF formula becomes a driver for survival. Only time will tell if PBF can provide the appropriate motivation and support to produce institutional actions that support increased student success for Texas' diverse students, or if it will result in a Matthew effect of accumulated advantage for those colleges serving more affluent students. If the stakes become sufficiently high, will colleges feel pressured to enact policies to attract PBF top performers while discouraging PBF non-performers? This study may be a cautionary tale of what could happen if colleges in Texas (or elsewhere) must adhere to a survival formula.

References

Adelman, C. (2005). *Moving into town – and moving on: The community college in the lives of traditional-age students*. Washington, DC: U.S. Department of Education.

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington, DC: U.S. Department of Education.

Altstadt, D. (Ed.). (2012). *Tying funding to community college outcomes: Models, tools, and recommendations for states.* Boston, MA: Jobs for the Future.

American Association of Community Colleges (2012). *Reclaiming the American dream: A report from the 21st-Century Commission on the future of community colleges.* Washington, DC: Author.

Archibald, M. (2007). Resource dependency theory. In M. Bevir (Ed.), *Encyclopedia of governance.* (pp. 836-837). Thousand Oaks, CA: SAGE Publications.

Attewell, P., Heil, S., & Reisel, L. (2012). What is academic momentum? And does it matter? *Educational Evaluation and Policy Analysis, 34*(1), 27-44.

Bahr, P. R. (2008). Does mathematics remediation work?: A comparative analysis of academic attainment among community college students. *Research in Higher Education, 49,* 420-450.

Bahr, P. R. (2010). Revisiting the efficacy of post-secondary remediation: The moderating effects of depth/breadth of deficiency. *Review of Higher Education, 33,* 177-205.

Bahr, P. R. (2013). The deconstructive approach to understanding community college students' pathways and outcomes. *Community College Review, 41*, 137-153.

Burke, J.C. (2002). *Funding public colleges and universities for performance*. Albany, NY: Rockefeller Institute Press.

Cofer, J. & Somers, P. (2001). What influences persistence at two-year colleges? *Community College Review, 29*(3), 56-76.

Cohen, A.M. & Brawer, F.B. (2008). *The American community college* (5th ed.). San Francisco, CA: Jossey-Bass.

Collins, M.L. (2014). *Texas student success council: Finding common ground to increase community college completion.* Washington, DC: Jobs for the Future.

Community College Research Center (2014, February). *Performance funding: Impacts, obstacles, and unintended outcomes.* New York: CCRC Policy Brief.

Complete College America (2012). *Remediation: Higher education's bridge to nowhere.* Washington, DC: Author.

Cortez-Neavel, B. (2013, March). Branch promotes big expansion of performance-based higher ed funding. The Texas Observer.

Crosta, P.M. (2013, June). *Intensity and attachment: How the chaotic enrollment patterns of community college students affect educational outcomes* (CCRC Working Paper No. 60). New York: Community College Research Center.

D'Amico, M. M., Friedel, J. N., Katsinas, S. G., & Thornton, Z. M. (2014). Current developments in community college performance funding. *Community College Journal of Research & Practice, 38(2/3),* 231-241

Dennis, R. (2013, June). Funding for colleges to be based on student academic, career success. The Waco Tribune.

Dougherty, K.J. & Hong, E. (2006). Performance accountability as imperfect panacea: The community college experience. In T. Bailey and V. Morest (Eds.), *Defending the community college equity agenda* (p. 51-86). Baltimore, MD: Johns Hopkins Press.

Dougherty, K.J., Nator, R.S., Bork, R.H., Jones, S.M., & Vega, B.E. (2013). Accounting for Higher Education Accountability: Political Origins of State Performance Funding for Higher Education. *Teachers College Record*, *115*(1), 1-50.

Dougherty, K. J., & Reddy, V. T. (2011). The impacts of state performance funding systems on higher education institutions: Research literature review and policy recommendations.

Hagedorn, L.S. (2005). Transcript analyses as a tool to understand community college student academic behaviors. *Journal of Applied Research in the Community College*, *13*(1), 45-57.

Hagedorn, L.S., & Kress, A. M. (2008). Using transcripts in analyses: Directions and opportunities. *New Directions for Community Colleges*, (143), 7-17.

Harnisch, T. L. (2011). *Performance-based funding: A re-emerging strategy in public higher education financing.* Washington, DC: AASCU.

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

Jones, D. (2013) Outcomes-Based Funding: The Wave of Implementation. Washington, DC: Complete College America.

Leinbach, D.T. & Jenkins, D. (2008). *Using longitudinal data to increase community college student success: A guide to measuring milestone and momentum point funding.* Community College Research Center, Columbia University. Working Paper No. 2.

Maxwell, W., Hagedorn, L., Cypers, S., Moon, H. S., Brocato, P., Wahl, K., & Prather, G. (2003). Community and diversity in urban community colleges: Coursetaking among entering students. *Community College Review, 30*(4), 21-46.

McLendon, M. & Hearn, J. (2013). The resurgent interest in performance-based funding for higher education. *Academe, 99*(6), 25-30.

McKeown-Moak, M. P. (2013). The" New" Performance Funding in Higher Education. *Educational Considerations, 40(2),* 3-12.

Miao, K. (2012). *Performance-based funding of higher education: A detailed look at best practices in 6 states.* Washington, DC: Center for American Progress.

National Student Clearinghouse (2012, Spring). *Percentage of students completing degrees at four-year institutions who previously enrolled at two-year institutions.* Snapshot Report Mobility Series. Retrieved online on September 15, 2012 from http://www.studentclearinghouse.info/snapshot/docs/SnapshotReport6-TwoYearContributions.pdf

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective.* New York, NY: Harper and Row.

Rabovsky, T. M. (2012). Accountability in higher education: Exploring impacts on state budgets and institutional spending patterns. *Journal of Public Administration Research and Theory, 22*(4), 675-700.

Rutherford, A. & Rabovsky, T. (2014). Evaluating impacts of performance funding policies on student outcomes in higher education. *The ANNALS of the American Academic of Political and Social Science, 655,* 185-208.

Sanford, T & Hunter, J. (2011). Impact of Performance-funding on Retention and Graduation Rates. *Education Policy Analysis Archives, 19*(33), 1-30.

Shulock, N. (2011). *Concerns about performance-based funding and ways that states are addressing the concerns* (IHELP Brief). Sacramento, CA: Institute for Higher Education Leadership & Policy.

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

Tandberg, D.A., Hillman, T.A., & Barakat, M. (2014). State higher education performance funding for community colleges: Diverse effects and policy implications. *Teachers College Record.*

Texas Association of Community Colleges (2012). *Higher education Fall 2011 enrollment*. Retrieved online on January 8, 2013 from http://www.tacc.org/documents/highereduc.pdf.

Texas Association of Community Colleges (2013a). *Student success points: An update.* Student Success Snapshot 1.2. Texas Success Center. Available at: http://www.tacc.org/uploads/tinymce/data%20and%20info/snapshot1_2%20v2.pdf

Texas Association of Community Colleges (2013b). Student success points: Report to TACC membership. Available at: http://www.tacc.org/uploads/tinymce/data%20and%20info/success%20points/ceo_102313.pdf

Texas Higher Education Coordinating Board (2000). Closing the gaps: The Texas higher education plan. Available at: http://www.thecb.state.tx.us/reports/PDF/0379.PDF?CFID=16588375&CFTOKEN=23956317.

Texas Higher Education Coordinating Board (2011). *Community and technical colleges: 6-year graduation rates of first-time entering undergraduates, fall 2004*, p. 77. Available at: http://www.thecb.state.tx.us/reports/PDF/2402.PDF?CFID=17184525&CFTOKEN=99601361.

Zarkesh, M., & Beas, A. M. (2004). UCLA community college review: Performance indicators and performance-based funding in community colleges. *Community College Review, 31*(4), 62–76.