Transfer: An Indispensable Part of the Community College Mission

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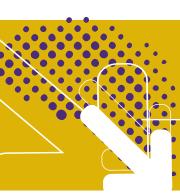
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EXECUTIVE SUMMARY

In policy conversations related to human capital development and not-so-veiled notions of institutional effectiveness, the current focus is squarely on graduation. While graduation is important to community colleges and their students, there is a concern among some that as colleges are becoming increasingly responsible for one outcome, other functions, among them the transfer function, are becoming less visible.

This brief examines transfer as a core function of community colleges. I examine multiple facets of transfer, including its role as a pathway to the bachelor's degree, the mobility of credits between institutions, and current and future challenges associated with transfer.

Community colleges play a substantial role in bachelor's degree attainment. Consider these facts: 28% of bachelor's degree earners started at a community college and 47% took at least one course at a community college. While the community college student body is frequently depicted as needing large amounts of remediation, it is worth noting that these colleges also serve as a starting point for academically advanced students aspiring to transfer. It is therefore no surprise to learn that students who start at a community college and transfer are as successful as are native students (i.e., students who start at the receiving institution).

However, community college transfer students are even more successful when the receiving institutions focus on transfer student success. Research has shown that 82% earned a bachelor's degree in the period observed when a 4-year receiving institution accepted all of a community college student's credits, and 42% earned that degree when the institution accepted only some of their credits. Research has demonstrated the importance of seven elements of articulation and transfer policies needed to promote credit retention upon transfer. Over the past decade, the number of states who have included these elements in their policies has increased. While these policies can establish and reinforce practices to ease the transfer of credit, institutional activity related to transfer students is an area where research has noted the need for more work to increase graduation.

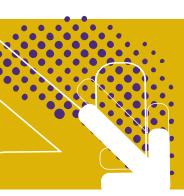
Credit mobility is not unique to community college students. Institutions from other sectors of higher education also report transfer rates. In some instances, their transfer rates are higher than those of community colleges. Whereas not all of the costs to the student—and to the public through related student aid programs—associated with transfer can be determined, it is possible to estimate the savings accrued to those students who start at a community college. For the nine cohorts examined in this brief, an estimated \$22 billion was saved by students who started at a community college and transferred to a 4-year institution.

There are enduring challenges with transfer. The nonlinear paths students take to traditional credential attainment—through activities such as swirling, free courses, massive open online courses, and prior learning credit—suggest that a traditional model of student progression may no longer be appropriate. From an institutional accountability perspective, the primary concern that remains is who to count in the numerator and denominator of transfer rate calculations.

As we move increasingly to postcompletion measures of institutional and program effectiveness, institutional leaders and the community being served face some tough questions, including but not limited to these three:

- 1. Should an institution that provides just the last few credits before earning a degree be considered the institution of record for the student's ultimate "success"?
- 2. What data are needed from a partner institution that wishes to provide baccalaureate options to community college students?
- 3. Do institutions offering only sub-baccalaureate credentials make the decision to offer bachelor's degrees to alleviate the barriers associated with transfer?

As the student success conversation moves forward, it is worth remembering that transfer is just one of the many necessary functions of the community college.



Transfer: An Indispensable Part of the Community College Mission

Introduction

In policy conversations and advocacy rhetoric related to human capital development and not-so-veiled notions of institutional effectiveness, the focus is squarely on graduation. While graduation is important to community colleges and their students, there is a concern among some that as colleges are becoming increasingly responsible for one outcome, the other functions, among them the transfer function, are becoming less visible.

Take, for example, the case of Austin Community College, which has been criticized because only 3% of their students graduate in 150% of "normal time." What critics fail to note in their analyses—out of a lack of knowledge, an engrained bias, or a desire for sensationalism—is a transfer rate. At Austin Community College, that rate is 39% (a 42% completion rate). While this is not a great rate, it is more accurate, though it omits students still enrolled. In fact, transfer rates can be as high as 79% at community colleges. This success is needlessly lost in the completion dialogue.

In this brief, I quantify transfer to move a core community college function more directly into the mainstream conversation. I examine multiple facets of transfer, including its role as a pathway to the bachelor's degree, the mobility of credits between institutions, and current and future challenges associated with transfer.

Transfer as a Pathway to Bachelor's Degree Attainment

Community colleges play a substantial if not always appreciated role in bachelor's degree attainment. This has long been the case and in fact hails back to the beginnings of community colleges as "junior colleges." Consider that 28% of bachelor's degree earners started at a community college (Cataldi et al., 2011) and 47% took at least one course at a community college.1 Students who start at community colleges generally display relatively fewer characteristics that are associated with a high likelihood of completing a bachelor's degree than students who start at 4-year institutions (Calcagno, Bailey, Jenkins, Keinzl, & Leinbach, 2008; Mullin, 2012b). However, research has shown that students who start at a community college and subsequently transfer to a 4-year institution are as successful as are native students (Carlan & Byxbe, 2000; Montondon & Eikner, 1997). This might not be unexpected: students who show the drive to transfer institutions show an intention to complete that other students might lack.

A Point of Origin for Advanced Students

Many narratives about community college students focus on the academic deficiencies of the students. There is little attention given to the academically advanced students within the community college student body: 10% of students beginning

at community college in 2003–04 that took admissions tests earned scores between 1140 and 1600 (1600 was the highest score).² More than 160 community colleges have created honors programs to meet the demands of these students (National Collegiate Honors Council, 2012).

Many of these academically advanced students continue their education at highly selective institutions (Winerip, 2012). In recognition of their effort and accomplishment, scholarships have been developed to offset financial barriers for these highachieving students. The Jack Kent Cooke Foundation, for example, has developed an Undergraduate Transfer Scholarship awarding up to \$30,000 a year (Jack Kent Cooke Foundation, n.d.).

Reconsidering the Penalty

Some critics and colleagues assert that there is a "penalty" for students who start at a community college, in the form of a decreased likelihood of obtaining a bachelor's degree during the period observed, compared to similarly qualified students enrolling in 4-year colleges.3 (It is worth noting that the success of transfer students relative to native students may be similar, but may still be low if the receiving institution has a low rate of success.) They rarely examine the role that the 4-year colleges play in transfer in the first instance, and then to what extent their posttransfer success is due in part to the actions of the receiving institution.

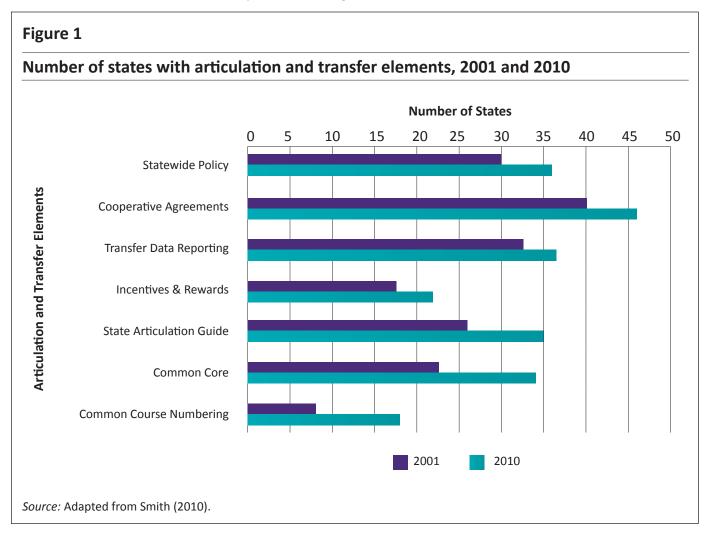
However, Doyle (2006) provides an example of the impact that the policies of 4-year colleges can have on community college transfers. He finds that 82% earned a bachelor's degree in the period observed when a 4-year receiving institution accepted all of a community college student's credits, and 42% earned that degree when the institution accepted only some of their credits.4 This factor, then, appears to be a critical dimension of transfer success. Additionally, Cheslock (2005) notes that 4-year institutions with high levels of former community college students are inclined to have, among other traits, high attrition rates and fewer financial resources, which almost by definition would lower the success rates of community college transfers. In one exploratory study, African American students starting at a community college and transferring to an institution with predominantly white students expressed that some of the challenges they experienced connecting to and feeling welcomed by their new institution had more to do with their transfer student identity than with their race (Younger, 2009).

Institutional intent and actions must be purposeful to foster transfer student success. Research (Education Commission of the States, 2009; Handel, 2011; Miller, Erisman, Bermeo, & Taylor-Smith, 2011) has identified practices that 4-year institutions can employ to encourage success posttransfer. They include, but are not limited to, developing a strategic enrollment plan, committing to serve transfer

students, developing close relationships with feeder colleges, increasing communication between college counselors, developing transparent transfer credit policies, providing scholarships for transfer students, monitoring and assessing the transfer student experience in a way similar to the first-year student experience, requiring transfer orientation, establishing a transfer center for students, and reserving housing for transfer students.

Legislative Support

Articulation and transfer policies have evolved from the early 20th century to today (Kintzer, 1996).⁵ Recent reviews of state legislation have classified various components of articulation and transfer (Education Commission of the States, 2001; Skinner & Loane, 2007;



Smith, 2010), noting the evolution of policy between 2001 and 2010. The findings indicate growth in all seven elements of statewide articulation and transfer policy (see Figure 1). That said, the movement to seamless articulation has been piecemeal and there is significantly more progress to be made. While some researchers (Anderson, Sun, & Alfonso, 2006; Banks, 1994; Higgins & Katsinas, 1999) use the existence of these policies to test whether more students transfer, others (Roska & Keith, 2008) suggest the intent of the policies is to preserve credits rather than to incent students to transfer.

What these policies and studies suggest is that while state policy can establish and reinforce practices to ease in the transfer of credit, in practice the acceptance of credits often remains subject to institutional discretion. Reasons include, but are not limited to, the need for academic programs to offer courses that make their program unique, the number of years that have passed since the credits were earned, and the alignment between the credits and the course of study.

There is a certainly a need to eliminate undue bias with respect to the acceptance of similar or identical credits with common learning objectives or competencies espoused in syllabi. But this issue is quite complex. A recent article in the Chronicle of Higher Education (Barrett, 2012) details how an economics class varied in how content was taught across and even within three institutions, even though there were common core elements embedded in each course.

Research indicates that, along with other types of support, community colleges would do well to provide more counseling for transfer students (Hagedorn,

Moon, Cypers, Maxwell, & Lester, 2006; Laanan, 2007). This, of course, requires additional resources that many acknowledge but are reluctant to fund. The emergence of student success plans and technologies that serve as guidance systems for students aspire to fill the void and make the process through and across institutions of higher education more direct. Some states have developed extremely user-friendly electronic means of communicating information about transfer options for students. Statewide articulation frameworks such as those in Virginia are broadly known.

Credit Mobility

Aside from sending students to other institutions, community colleges are the recipients of a substantial number of students who have previously attended college; a recent National Student Clearinghouse study finds that 43% of those who transfer do so to a community college (Hossler et al., 2012). Additionally, the authors note that 51.9% of all students who transfer from 4-year public institutions and 41.4% of all students who transfer from 4-year nonprofit colleges subsequently enroll at a community college. This is certainly contrary to academic conventional wisdom.

However, transfer is hardly exclusive to community colleges. In fact, cross-pollination between different types of institutions of higher education is quite common. Consider the facts presented in Table 1: 62% of public 4-year institutions report a transfer rate, with the highest reported rate being 64%. Private, nonprofit 4-year institutions are similar, with 30% of institutions reporting a transfer rate as high as 86.7%.

Analyses of student transfer behavior by the National Student Clearinghouse (Hossler et al., 2012) indicate that 34.5% of students starting at 4-year public institutions, 20.2% of students starting at 4-year private nonprofit institutions, and 24.2% of students starting at 4-year for-profit institutions who transfer do so to the same type of institution (i.e., 4-year public to 4-year public).⁶

One can see the extent to which a policy frame focused on the "traditional" college progression from 2-year institutions to 4-year institutions is not consistent with actual student behavior. This complicates transfer policies. Furthermore, the emergence of free course offerings by institutions such as MIT and many others, the movement in some fields toward "badges," and competency-based determinations of learning serve as only a few examples of fads that may become trends and exacerbate the preponderance of multiple institutional paths to a traditional or even untraditional credential.

The Role of Transfer in Affordability

Obviously, there are multiple reasons why students choose to enroll at a particular college. As decades of student price response research suggest (Heller, 1997; Hemelt & Marcotte, 2011; Jackson & Weathersby, 1975; Leslie & Brinkman, 1987), the price to the student is a primary driver. Given continued rising college tuitions and other economic factors, there is reason to believe that the consideration of price is growing in importance. However, student aid remains a strong countervailing force.

The low costs of community colleges are not lost on students across higher education. However, the precise amount of savings

accruing to students who attend a 2-year community college rather than a 4-year institution is difficult to quantify for a number of reasons. For one, students take courses at the community college for the purpose of up-skilling or retraining; one in four community college students has already earned a postsecondary credential (Baime & Mullin, 2011). Another reason associated with the difficulty in determining savings relates to the fact that students use community colleges as a resource to take courses not available at a student's home institution. Both these analytical problems are associated with credit acquisition as opposed to the common perception of transfer as educational progression.

However, for students who start at a community college and subsequently transfer to a 4-year institution we can arrive at a savings estimate. A conservative savings estimate for the 203,000 students who started at a community college in 2003-04 and transferred to a public 4-year institution was \$943 million in inflation-adjusted (2011) dollars. Assuming transfer behaviors of the entering class of 2003-04 did not change for ensuing cohorts, the amount of savings reaches \$1.9 billion for the 2011-12 cohort, as illustrated in Figure 2. These values reflect only those students who transferred to public institutions; an additional \$1.7 billion in savings were garnered by students starting at a community college in 2011 whose credits were accepted by private nonprofit institutions

after transfer. For methodological reasons, an estimate for forprofits was not determined. In total, students who started at a community college over the past 9 years and transferred to either a public or private nonprofit 4-year institution are estimated to have saved \$22.5 billion (\$24.3 billion in inflation-adjusted [2011] dollars).

While the price charged to college students is clear, the cost borne by the public is another matter. Large-scale national studies are not now possible without making substantial and somewhat arbitrary assumptions about the cost of delivering education. This is due in part to differences in accounting standards used by institutions of higher education. Contrary to numerous efforts to do so, these differences make it very difficult to

Table 1

Reported Student Right-to-Know Transfer-Out Rates at 150% of Normal Time, by Selected Sector

Sector		ns Reporting r-Out Rate	Transfer-Out	Rates	
	%	n	Rate	Minimum	Maximum
Public 4-year	62%	384	19.5%	0.5%	64.0%
Private nonprofit 4-year	30%	365	18.1%	0.2%	86.7%
Private for-profit 4-year	14%	54	6.4%	0.2%	40.0%
Public 2-year	84%	822	20.6%	0.1%	78.7%

Source: NCES (2012c).

Note: Data reflect bachelor's or equivalent or degree- or certificate-seeking cohorts ending August 2010. Institutions included in this analysis were Title IV participating, located in the United States, and degree granting. Data were also available for other sectors, such as private 2-year, but are not included in this table because it is intended to support the discussion in the text that transfer occurs at 4-year institutions as well. The sector was based on fall 2009; in a limited number of instances, a transfer rate for 2-year institutions was categorized as 4-year institution, and vice versa. In these instances, data were included in calculations for the sector reported for 2009.

^{a.} Transfer rates reflect only those institutions that reported a transfer rate. This can inflate the transfer rate because those institutions with a "0" are left out of the calculation for the sector. When included, transfer-out rates were 11.9%, 4.9%, 0.9%, and 18.9%, respectively. Rates reflect the mean, not the median.

conduct cross-sector comparisons of Integrated Postsecondary Education Data System (IPEDS) finance data (Goldstein & Menditto, 2005; NCES, n.d.). A concerted effort is under way to better understand comparable costs to the public, but this understanding is not sufficiently developed at this point. And none of this takes into account the obvious and essential point that not all courses are equal in substance, quality, and other respects.

Challenges with Transfer

Universal Challenges

A leading challenge in the transfer

conversation is providing a precise, data-driven definition. In 2001, the National Center for Education Statistics (Bradburn & Hurst, 2001) presented eight different ways to quantify transfer, from most to least inclusive (see Table 2). A decade earlier, investigations of transfer rate calculations were undertaken by a group of community college researchers (Berman, Curry, Nelson & Weiler, 1990), the National Transfer Assembly Project (Jones, 1991), and Adelman (1988), to mention a few.

As with many rate calculations used in higher education, determining just who should be counted in the

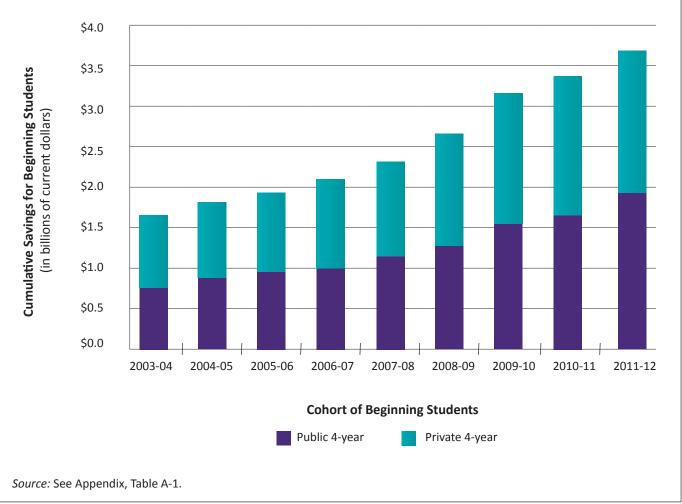
numerator and denominator of the transfer equation turns out to be much more complicated than it might seem at first. Hom (2009) has examined the denominator debate, and concludes that the difficulty arises in part because transfer is a joint action that involves both the student and the institution.

One transfer rate issue lies in determining the value difference, if any, between vertical (2-year to 4-year) and lateral (withinsector transfer such as 4-year to 4-year) transfer. Bailey, Jenkins, and Leinbach (2005) suggest that lateral transfer does not constitute student success. However, the

Figure 2

Cumulative tuition and fee savings for students who began at a community college and transferred to a public or private nonprofit 4-year institution, multiple cohorts

\$4.0



growing awareness of the economic returns of sub-baccalaureate credentials vis-à-vis a bachelor's degree is challenging this long-held perspective (Carnevale, Rose, & Hansen, 2012). Additionally, due to the way institutions are classified in the IPEDS, a community college can be classified as a 4-year institution. For example, a student who starts at Bunker Hill Community College and transfers to Indian River State College in the same program pursuing the same credential will be counted as a vertical transfer because the latter is categorized as a 4-year institution. Similarly, there are questions pertaining to who should be included in the denominator, with the implications clearly depicted in Table 2. The debate often centers on questions of student intent, which may be

either self-reported or based on student behavior (Mullin, 2012a). For purposes of its Voluntary Framework of Accountability (VFA), the American Association of Community Colleges (AACC; 2012b) settled on a student attempting 12 credit hours within 2 years as the threshold to define a credential-seeking student. (The VFA also has a cohort that includes every student.)

Underreporting of transfer students is also a concern. As it relates to rates reported in Student-Right-to-Know completion (graduation plus transfer) rates, the hierarchal reporting structure underreports the extent of transfers (Student Right-to-Know and Campus Security Act of 1990). This is because students who graduate and subsequently transfer are counted as graduates only,

thereby confusing the lay reader who might believe transfer-out rates are lower than they actually are.

Another challenge in the transfer arena is the capacity of 4-year colleges to accommodate such students. Many private nonprofit 4-year institutions have little space or capacity for additional students; for example, of 1,365 private nonprofit 4-year colleges, nearly two-thirds (855 colleges) have fewer than 2,000 undergraduate students in their 12-month unduplicated counts for 2009–10.7 Furthermore, many of these colleges are not designed to accept transfer students. At some public institutions that are organized to accept transfer students, and where policy has been developed to enhance transfer opportunities, capacity

Table 2

Eight Criteria to Define a Transfer Cohort for Students Starting at a Community College with Percent of All Students Meeting the Criteria and Transfer Rates

Criteria to be Included in Cohort	Starting at a Commu	inity College
	Percent of All Students Meeting the Criteria	Percent of All Students who Transferred
All Students	100	25
1. Expected to complete bachelor's degree or higher	71	36
2. Enrolled in an academic program	68	36
3. Enrolled continuously in [first] year	63	37
4. Enrolled any time in [second] academic year	62	38
5. Enrolled for 12 or more credit hours	43	40
6. Taking courses toward a bachelor's degree in [first] year	36	45
7. Pursuing academic major or taking courses toward a bachelor's degree or both	25	43
8. Pursuing academic major and taking courses toward a bachelor's degree	11	52

Source: Bradburn & Hurst (2001).

Note: These data reflect students beginning in 1989–90 and transfer outcomes by spring 2004. Transfer is defined as from a 2-year to a 4-year college. Rates may have changed over time.

is again a problem, and in many cases an acute problem. However, the slowing of enrollment in fall 2011 and expected enrollment for fall 2012 should ameliorate these capacity problems.

Finally, as mentioned above, actually identifying who transfers becomes a problem. Reasons for this were provided in an earlier AACC policy brief titled "The Road Ahead" (Mullin, 2011). Some of the difficulty is being addressed by the expansion of the National Student Clearinghouse, whose data cover 89% of all higher education enrollments (Hossler et al., 2012). Yet, since 62% of students who leave the community college after the first year return to higher education within 5 years (NCES, 2012b), institutions may need to continually check for transfer students to accurately capture this behavior. It is unclear how often or for how long institutions track the subsequent enrollment of their students.

Challenges on the Horizon

Transfer issues present a variety of lingering policy challenges. As we move increasingly to postcompletion measures of institutional and program effectiveness, institutional leaders and the community being served face some tough questions, including but not limited to these three:

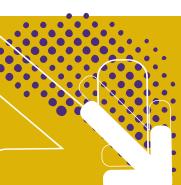
1. Should an institution that provides just the last few credits before earning a degree be considered the institution of record for the student's ultimate "success"? Policy, institutional or otherwise, needs to determine a threshold of credits earned for institutional "ownership" of a completer.

- 2. What data are needed from a partner institution that wishes to provide baccalaureate options to community college students? To help students at community colleges better understand their likelihood of future success, and to aid community colleges in forming the most efficient partnerships with 4-year institutions, it would be helpful if 4-year institutions provided regular feedback on the graduation rates of students who transferin. This also would tighten the linkage between sectors and assist in the likelihood of success for community college transfer students, much as high school feedback reports inform the improvement of secondary schools.
- 3. Do institutions offering only sub-baccalaureate credentials make the decision to offer bachelor's degrees to alleviate the barriers associated with transfer? In some communities, effective 2 + 2 partnerships have been developed to facilitate student success. In others, community colleges offer transfer pathways important to place-bound students and local workforce needs associated with advancements in workplace technology. In 2009-10, community colleges awarded nearly 8,500 bachelor's degrees, primarily in business and management (Mullin, 2011); in some cases, students are required to first earn an associate degree before being admitted to a bachelor's degree program.8

Moving Forward

Transfer is just one of the many necessary functions of the community college. In this brief, I have provided an overview of some aspects of the transfer function in higher education generally and as it relates to community colleges specifically.

AACC's recent Listening Tour, development of the VFA (AACC, 2012b), and 21st-Century Commission on the Future of Community Colleges (AACC, 2012a), in concert with innumerable college, system, and state initiatives focused on innovative ways to help their community, serve as examples of the thought, passion, and potential embodied in the community college movement. As the student success conversation moves forward, it is worth remembering that transfer is just one of the many necessary functions of the community college.



Notes and References

Notes

- ¹These data come from my analysis of "Baccalaureate and Beyond" data retrieved using the PowerStats web tool (NCES, 2012a).
- ²These data come from my analysis of Beginning Postsecondary Student Longitudinal Study (BPS) data retrieved using the PowerStats web tool (NCES, 2012b). Fifty percent of the sample who started at 2-year institutions did not have an admission test score. This may have been due to not taking the test, or age, because data for those aged 25 and older were not included.
- ³ I differentiate here between critics and colleagues. The former align with the definition provided in the text, whereas the latter ask important question to help themselves and advance the collective understanding of the issue being studied. Colleagues are critical to the advancement of educational practice and students' success.
- ⁴I attempted to replicate this analysis with a more recent BPS cohort, but alterations to variables did not allow for an exact replication. The new, slightly different analysis did show a comparatively higher completion rate when some credits were accepted (47.8%) and a comparatively lower 6-year completion rate when all credits were accepted (60.7%). What was also interesting to note was that the percent of students earning an associate degree increased from 2.4% in Doyle's analysis to 15.9%.
- ⁵ Kintzer (1996) defines articulation as "the development of a variety of procedures designed to provide a continuous smooth flow of students," and transfer as "the mathematics of the interchange of credits" (p. 1).
- ⁶ For a more robust conversation of lateral transfer, see Mullin (2011) and Mullin (2012a).
- ⁷ These data come from my analysis of IPEDS data (NCES, 2010c).
- 8 Because workers continually need education to advance their skill sets and career opportunities, students from what were once terminal programs are benefitting from educational pathways that allow for greater career opportunities. Townsend, Bragg, and Ruud (2008) build on the work of Ignash and Kotun (2005) to identify differing models of applied bachelor's degrees that rely on transfer pathways. The first is the career ladder, where a substantial number of upper-division courses are required for a technically oriented degree. Great Basin College's (n.d.) bachelor of applied science in geomatics serves as an example. The second is the management capstone, which allows for students with technical skills to prepare for management positions. The third is the upsidedown or completion model, in which students take general education courses after they specialize in their first 2 years, in effect reversing the traditional sequence of taking general studies courses first. Recently this model has been divided into two models in order to clarify distinct degree-completion strategies (Makela, Ruud, Bennett & Bragg, 2012): The upside-down model represents a frontloading of technical coursework that is complemented with general education coursework at the upper-division level; a bachelor of applied arts and sciences, awarded by Southeastern Oklahoma State University (n.d.) provides one example. The completion model has a wide-ranging and flexible structure that often maximizes opportunities to complete a bachelor's degree with awards of credit for prior learning; Murray State University's (n.d.) bachelor of integrated studies provides one example. Last, there is the hybrid model that combines different aspects of the other models. Applied bachelor's degrees are also awarded by 4-year colleges and universities (see, for example, Townsend et al., 2008), but the design of current national data systems makes it difficult to extract the number of applied bachelor's degrees awarded because the data include traditional bachelor's degrees awarded.

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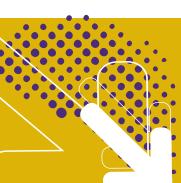
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Appendix



Following is a discussion of Table A-1.

The first realization of studying the savings associated with transfer is to acknowledge that, as the number of credits students transfer varies, the amount saved also varies. Using the "Beginning Postsecondary Student Longitudinal Study" (NCES, 2012b), I estimated the number of credits students transferred from community colleges to 4-year institutions. BPS data allowed me to estimate the distribution of credits accepted to arrive at a range of credits transferred as illustrated in Panel A. When I created estimates for a distribution where three credits defined each range category, the estimates did not result in stable estimates. As such, I set the categories for the range at six credits, or two classes.

The number of students was determined by multiplying the percent per range category by the total weighted sample size. The result is an estimate of the number of students for each range category as depicted in Panel B.

In order to make the range categories inclusive of six credit hours, there were two ways to proceed with the next step. For analytical purposes, I used the conservative option—that is, rather than count the number of credits for the one-to-six category as six credits, I used the midpoint of one course (three credits). I provide both these data points, the credit midpoint and the number of courses it reflects, in Panel C. Before determining estimate savings, I had to determine the difference in average tuition and fees per three-credit course. I was able to do this using data reported annually by the College Board (2012). I enrollment-weighted these data and provide them in Panel C.

To arrive at a savings estimate for each range category (Panel D), I multiplied the estimated sample size estimate for the range category by the number of courses that each category represented. I then multiplied the product by the savings difference to arrive at a savings estimate. For example, for the 13-to-18-credit range

category, I multiplied 5,497 by 5 to arrive at 27,485 (an estimate of the total number of courses taken). I then multiplied 27,485 by \$274 to arrive at \$7.5 million. For those students who transferred-in more than 30 credits, I followed the steps previously described and then, on the basis that it takes more than 1 academic year to accumulate 30 credits, substituted the tuition and fee difference for the next year. So, for example, for students who started college in 2003–04 and transferred-in between 37 and 42 credits I multiplied 6,515*(10*\$274) and then added 6,515*(3*\$305), where 10 reflects the ten courses that constitute the 30-credit level in Year 1, and 3 reflects the three courses (nine credits) over and above the initial 10 courses.

For private nonprofit institutions, stable estimates were not available for categories of six credits. As such, I created three range categories: zero credits, 1 to 30 credits, and more than 30 credits. I used the midpoint of 15 credits, or five courses for the 1- to 30-credit range category. In cases where more than 30 credits were accepted, I used the methodology described for public institutions.

I did not conduct for-profits calculations because the tuition and fees were not reported by the College Board until the 2010–11 year and the population estimates in BPS were too unstable.

I checked this methodology with colleagues in academic and policy positions; it is meant to most closely reflect the savings. I acknowledge the methodology may be improved and readers are encouraged to contact me with any improvements. In all cases where I am aware, I used conservative options. I was not able to provide an estimate in cases where no credits were accepted at the first transfer, or for any range category; these costs are real and a topic for further inquiry.

Estimates of Tuition and Fee Savings to Students Associated with Transfer from Community Colleges to Public 4-year Institutions,

Table A-1

First				Ran	ge of credits t	ransferred to	destination fir	Range of credits transferred to destination first transfer (Range category)	nge category)				Total
Institution Sector	X <= 0	1 <= X <= 6	7 <= X <= 12	13 <= X <= 18	19 <= X <= 24 25 <= X <= 30		31 <= X <= 36 37 <= X <= 42		43 <= X <= 48 49 <= X <= 54	49 <= X <= 54	55 <= X <= 60	X >= 61	
Panel A: Estimates													
Public 2-year	16.7%	3.9%	7.6%	2.7%	4.6%	3.7%	4.1%	3.2%	%8	6.2%	10.3%	34.1%	100%
Panel B: Weighted sample size	nple size												
Public 2-year	ı	7,940	5,294	5,497	998'6	7,533	8,348	6,515	16,288	12,623	20,971	69,428	203,804
Panel C: Data for calculations	lations												
Credit midpoint	ı	3	6	15	21	27	33	39	45	51	57	63	-
Number of courses at the midpoint	I	1	3	2	7	6	11	13	15	17	19	21	1
Difference in average tuition and fees per 3-credit course	ı	\$274	\$274	\$274	\$274	\$274	\$305	\$305	\$305	\$305	\$305	\$305	ı
Panel D: Estimated savings	ings												
Savings	ı	\$2,172,493	\$2,172,493 \$4,344,987 \$7,520,170	\$7,520,170	17,936,997	\$18,549,752	\$25,382,547 \$23,781,132	-	\$69,378,736	\$69,378,736 \$61,461,098		\$114,884,334 \$422,654,401 \$768,066,646	\$768,066,646

Note: Sector at destination school for first transfer was public 4-year. The savings presented here reflect tuition and fees, the "sticker price." Student aid that reduces the sticker price constitute part of the savings. I was unable to estimate these savings at this point.



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