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A Short Guide to "Tipping Point" Analyses of Community College Student Labor Market Outcomes

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This guide is designed for community colleges and community college state agencies that are interested in analyzing the labor market outcomes of their programs and identifying opportunities for improving employment outcomes of their students.

The Study

The "tipping point" refers to a study conducted by David Prince of the Washington State Board for Community and Technical Colleges (SBCTC) and Davis Jenkins of CCRC.[1] Using transcript data on individual students collected by the SBCTC, the study tracked the progress over five years of a cohort of Washington State community and technical college students 25 or older who entered the system with at most a high school diploma. This included students in adult basic skills programs (including Adult Basic Education and English-as-a-Second-Language, or ESL), which in Washington are provided by the community and technical colleges. The purpose of the study was to enrich understanding of the educational pathways and labor market outcomes of low-skill adult students, who make up about a third of the 300,000 students served annually by Washington community and technical colleges.

The Findings

One of the main findings of the study was that students in the cohort who took at least one year's worth of college credit courses (equivalent to two semesters of full-time study) and earned a certificate or other credential over the five years we tracked them earned substantially more than students who did not reach that threshold. Compared to students who earned fewer than 10 credits, those who reached this "tipping point" of at least two semesters of credits and a credential had a considerable average annual earnings advantage: $7,000 for students who started in ESL, $8,500 for those who started in ABE or GED, and $2,700 and $1,700 for those who entered with at most a GED or high school diploma.

The study found, however, that few students reach the tipping point, with many adult basic skills students earning no college credits at all. This finding motivated the SBCTC staff to explore with educators throughout the system ways to increase the rate at which adult basic skills students transition to college and reach the tipping point. One strategy developed in response, called Integrated Basic Education and Skills Training, or I-BEST, involves courses for basic skills students jointly taught by basic skills and college-level occupational faculty. The SBCTC evaluated pilots of the I-BEST programs and found that they substantially increase the rate at which basic skills students advance to college and reach the tipping point.[2]

Community college agencies in several states have since expressed interest in conducting tipping point studies using data on their own students. This document is intended to provide guidance on how to do that.

The Model

The model design table (see page 2) shows the specifications for an analysis that uses longitudinal data on cohorts of community college students and ordinary least squares regression to estimate the effect of reaching various levels of attainment or milestones on changes in students' pre- and post-program earnings. Note that the analysis is conducted separately for students grouped by the program level at which they started (ESL, ABE, developmental, or college-level) and by the degree-program type (academic transfer or occupational) in which they are enrolled (for degree-seeking students who started at the college level). The milestones examined include successfully completing college-level math and English courses, completing various amounts of college credits, and earning particular credentials or transferring to a baccalaureate institution. The model also examines the effect of completing ESL and ABE courses for basic skills students.

The model includes controls for student demographics, educational background, and educational pathways (e.g., full- vs. part-time enrollment), making it possible to examine the effects of milestone attainment on changes in earnings independent of other factors that have been shown to be correlated with student success. It also includes measures to assess the impact on changes in earnings of various supports that could be provided to students. For example, the Washington State tipping point study found that degree-seeking adult students who receive financial aid are more likely to reach the tipping point, although many such students do not receive aid. This led the Washington community and technical

(text continues on page 4)

TABLE 1: TIPPING POINT ANALYSIS MODEL DESIGN

Model purpose: Estimates the effect of achieving intermediate and "terminal" milestones on changes in earnings for community college students grouped by program level and degree program objectives at entry.
Outcome variable: Earnings gain (post-school earnings minus pre-school earnings).[1]
Sample: Cohort of first-time college students who started anytime in a given academic year and were tracked over at least 5 years.[2]
Analysis Method: Ordinary least squares (OLS) regression.

	Students Grouped by Program Level at Entry[3]				Students Grouped by Degree-Program Type or Objective[4]		
Explanatory Variables	ESL	ABE	Developmental	College Level	Transfer	Career-Tech	**Comments**
Achieved ≥ 2 grade level ESL gains							
Completed highest ESL level							
Achieved ≥ 2 grade level ABE gains							
Completed highest ABE level							
Earned GED							
Completed college-level math course							Course and credit completions defined as grade C or better.
Completed college-level English							
Completed 0 college credits [ref]							Credits refers to non-developmental degree credits, including electives.
Completed 1-6 credits							
Completed 7-12 credits							
Completed 13-18 credits							
Completed 19-24 credits							
Completed 25-36 credits							
Completed 37-48 credits							
Completed 49-60 credits							
Completed more than 60 credits							
Earned certificate of < 1 year							All these completion or transfer categories represent the highest attainment for each student and are thus mutually exclusive.
Earned certificate of ≥ 1 year							
Earned A.A.S. degree							
Earned A.A. or A.S. degree							
Transferred to 4-year institution							
Female [male ref]							
Age: under 20 to start [ref]							
Age: 20-24 to start							
Age: 25 or older to start							
Race/ethnicity: White [ref]							
Race/ethnicity: Black							
Race/ethnicity: Hispanic							
Race/ethnicity: Asian							
Race/ethnicity: Other							
Race/ethnicity: Unknown							
Pell Grant recipient							
Public Aid recipient							If available through match with TANF agency administrative records.
Highest education level: < HS [ref]							
Highest ed. level: < HS diploma							
Highest ed. level: GED							
Math test score							
Reading test score							
Took Any ESL							
Took Any ABE							
Took no developmental courses [ref]							
Took developmental math only							
Took developmental English only							Developmental English includes reading or writing.
Took both dev math and English							
Received financial aid in Term 1							
Full-time in Term 1							
Persisted Year 1 to Year 2							
Never employed while enrolled [ref]							A simpler measure would be Employed during Term 1.
Sometimes employed while enrolled							
Always employed while enrolled							

[1]Pre-school earnings equal the average quarterly earnings in the eighth through third quarters prior to first enrollment. Post-school earnings equal the average earnings in the third through eighth quarters after leaving postsecondary education. Using earnings averages during those periods helps to reduce the effect of the commonly observed pre- and post-education program dip in earnings (known as the "Ashenfelter dip").

[2]The cohort should include first-time college students (excluding all with prior postsecondary credentials or credits, including dual enrollment credits) who enrolled in any term in a given academic year. Previous research suggests that the cohort should ideally be tracked for a period of at least 5 years.

[3]ABE, ESL and developmental categories include students who take at least one course at the given level or whose placement test scores indicate a need for remedial instruction at that level. All other students should be classified in the "college-level" category.

[4]Based on students' program objective self-reported at matriculation or inferred by the college based on course enrollments, reported major, or other information.

TABLE 2: STUDENT UNIT RECORD DATA ELEMENTS NEEDED FOR TIPPING POINT ANALYSIS

Data Element	Required	Term-by-Term Data	Comments
Student Identifier			
Social Security Number (SSN)	•		Need SSN for matching to Unemployment Insurance (UI) wage records.
Program of Initial Enrollment			
Program level	•		See Table 1, note 3.
Program objective			See Table 1, note 4.
Courses and Credits			
Course level or type	•	•	Need to be able to distinguish among ABE, ESL, developmental and college-level courses. It would be ideal to know whether a course is a college-level math or English "gatekeeper" (math and English 101) and, if possible, to differentiate between college-level occupational and general education or liberal arts courses.
Course subject	•	•	Ideally need to be able to distinguish among developmental courses (math, reading, English); and among college-level math and English.
Credits attempted	•	•	
Credits earned	•	•	
Grade		•	It is useful to have course grades, including withdrawals and failures.
Credentials Earned			
Credential type earned	•	•	
Baccalaureate Transfer			
Institution/level transferred to	•	•	Some states track 2-year to 4-year transfers within state; a growing number of states now use the National Student Clearinghouse, which tracks transfers to most public and private colleges.
Employment			
Quarterly earnings	•	•	Use Unemployment Insurance (UI) quarterly earnings records for 8 quarters before first enrollment to latest available.
Demographics			
Age	•		
Gender	•		
Race/ethnicity	•		
Socioeconomic status			Often correlated with outcomes; however, only one state we know of (WA) systematically measures it for community college students using a method CCRC helped develop (see Endnote 3 on p. 4).
Welfare recipient			Colleges generally do not collect this information; however, some states (e.g., CA, WA) are able to match student records with TANF records.
Other			Includes any other demographic variables consistently available on a unit record basis.
Educational Background			
Highest level of education	•		Ideally distinguishes between those who do and do not have a high school credential, and among those who do, whether they have a diploma or GED.
Prior college credits	•		For tipping point studies, ideally select only first-time students with no prior credits.
Measured ability (standardized test scores)	•		Placement test and/or ACT/SAT scores (note: placement test and ACT/SAT scores can generally be normed). This is a very important control variable.
Other			Includes any other demographic variables consistently available on a unit record basis.
Supports			
Financial aid	•	•	At the very least it is helpful to know whether a student received financial aid. Being able to distinguish between Pell and other types is helpful as is knowing the total amount of financial aid received.
Pell Grant recipient		•	Receipt and ideally amount.
Other federal financial aid		•	
State financial aid		•	
Private financial aid		•	
Total financial aid		•	
Special program participant		•	It would be ideal to have information on participation in TRIO, Student Support Services, or any other sorts of special programs or services for which data are collected at the state level.
College of Attendance			
Institution code	•	•	Can be used to control for institutional effects on student attainment. In addition, makes it possible to disaggregate results by college.
Institution name		•	

colleges to push for financial aid specifically designed for low-income working adults. In its last session, the Washington State legislature provided $23 million over two years for financial aid for students in families with incomes up to 200 percent of the poverty line. Colleges receive $1,500 per FTE grant recipient to provide needed support services.

Data Elements

The table on page 3 lists the data elements that are needed to conduct the analysis. The table indicates the minimum set of elements ideally required for such an analysis. Obviously, data availability varies by state and college. For example, the Washington State SBCTC's database does not include placement test scores, although it does have a measure of socio-economic status (SES), which is useful as a control variable.[3]

Uses and Potential Benefits

Studies that track the progression and outcomes of students over time can help colleges and states to identify "leakage points" (such as the transition from basic skills to college or completion of developmental education) where students tend to struggle, as well as "momentum points" (such as passing a college-level math course or accumulating a semester's worth of credits) beyond which students' chances of completion increase markedly. And while they can help assess whether receiving financial aid or taking developmental courses is correlated with successful outcomes, ultimately it must be left to educators at the college level to diagnose the reasons some students do not make adequate progress and to devise ways to increase student advancement and success. This is why it is crucial that state agencies make available to individual colleges data on the progression of their own students. It is then incumbent on the colleges to further disaggregate the data by student race/ethnicity and other characteristics in order to examine gaps in achievement among student groups and to engage faculty and student services staff in figuring how to close achievement gaps and raise the overall level of student success.

By continuing to track cohorts of first-time students over time and by comparing the progression and success rates of new cohorts with those of earlier ones, colleges and states can evaluate the extent to which efforts to improve student attainment are effective.

Endnotes

1. See David Prince and Davis Jenkins (April 2005), *Building pathways to success for low-skill adult students: Lessons for community college policy and practice from a longitudinal student tracking study*, CCRC Brief No. 25, New York: Columbia University, Teachers College, Community College Research Center. Available at: http://ccrc.tc.columbia.edu/Publication.asp?uid=288.

2. See Washington State Board for Community and Technical Colleges (December 2005), *I-BEST: A program integrating adult basic education and workforce training*, Research Report No. 05-2, Olympia, WA: Author. Available at: http://www.sbctc.ctc.edu/college/d_basicskills.aspx.

3. For information on the methodology with which the SES measure was constructed, see Peter Crosta, D. Timothy Leinbach, and Davis Jenkins (July 2006), *Using census data to classify community college students by socioeconomic status and community characteristics*, CCRC Research Tools No. 1, New York: Columbia University, Teachers College, Community College Research Center. Available at: http://ccrc.tc.columbia.edu/Publication.asp?uid=430.

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