



**PPIC**

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# English as a Second Language in California's Community Colleges

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# Appendix A. Key Terms, Data, and Methods

## Glossary

**Sequence course:** ESL course that is required as part of the ESL sequence in order to access transfer-level English (i.e. ESL pre-requisite to transfer-level English).

**Non-sequence course:** ESL course that is not required in order to access transfer-level English courses (i.e. advisory or elective ESL courses).

**Credit ESL:** ESL courses offered to CCC students for credit and for which students pay tuition. Many of these courses confer non-degree applicable credit, but some do confer degree applicable or transferrable credit (see Appendix Table B1 for more details). AB 705 only applies to credit ESL.

**Non-Credit ESL:** ESL courses offered to CCC students at no cost. These courses are typically open entry/open exit and final grades are not recorded on student transcripts. AB 705 does not apply to non-credit ESL.

**Degree/transfer-seeking ESL students:** a student who (1) was ever enrolled in an ESL sequence course in their community college career, AND 2) ever took at least one degree-applicable course outside of ESL and transfer-level English in their community college career and/or at least one developmental English/math course. Throughout the report we use the terms degree/transfer seeking, degree-seeking and degree-intending interchangeably.

**Sequence length:** number of levels that an ESL student needs to take before being able to enroll in transfer-level English (e.g. levels below transfer-level English). Sequence length includes ESL course levels and any developmental English levels and/or non-credit ESL levels, if they are listed as pre-requisites in a sequence leading to transfer-level English.

**Sequence end point:** an ESL sequence can either lead directly to transfer-level English or to developmental English.

**Transfer-level English:** In this report, when we talk about transfer-level English (TLE) courses we are referring to the lowest-level English courses that are transferable to the University of California (UC) and/or to the California State University (CSU) systems on the basis of articulation agreements. These courses are also known as gateway courses. For English the first transfer-level composition course (C-ID ENGL 100) qualifies as the gateway course. We also include ESL versions of freshman composition if the course fulfills the TLE requirements—these courses were offered at 5 colleges and 7% of successful TLE completions within 6-years were done via the ESL version of freshman composition.

**Traditional sequence:** Curriculum that separates instruction into discrete language skills (i.e. writing, reading, grammar, and/or listening/speaking). A sequence at a given college is coded as traditional if 75 percent or more of the courses being offered in the sequence use a traditional approach.

**Integrated sequence:** Combines instruction of two or more skills into a single course (i.e. reading and writing). Integration is also known as horizontal compression. A sequence at a given college is coded as integrated if 75 percent or more of courses being offered in the sequence use an integrated approach.

**Mixed sequence:** Defined as sequences requiring both integrated and traditional courses within a single ESL sequence.

**Accordion sequence:** Defined as a sequence that allows students to skip levels based on demonstrated proficiency.

**Compressed sequence:** Defined as a sequence that combines two levels of ESL into a single level. This is also known as vertical compression.

## Data

Our analysis utilizes both quantitative and qualitative data to both descriptively illustrate the ESL landscape of the California community college system and evaluate the effect of primary structural features of ESL programs on various indicators of student success. Below we detail our quantitative and qualitative approaches.

### ESL Course Scan

An important component of our qualitative approach is a comprehensive scan of ESL course information collected from official college documents, namely college websites and course catalogs, to accurately capture the sequence of courses English learners would need to take in order to access transfer-level English, by college. Our scan was informed by conversations with members of the California Association of Teachers of English to Speakers of Other Languages (CATESOL), the California Community College Chancellor's Office (CCCCO) and the California Community College Academic Senate. Through these conversations we learned of the importance of appropriately re-coding the levels below transfer-level English (CB 21) data element in the Chancellor's Office MIS student database. The fact that some ESL courses transfer had resulted in colleges coding this variable using the same strategy that is used to code transfer-level English. Additionally, through the conversations we learned that an analysis of ESL would need to accurately capture the credit and transferability status of the courses, which could also be inaccurately captured in the data. These coding issues have implications for published outcome rates across the system, and highlight the importance of a thorough scan of course catalogs to ensure that course information is accurately captured.

To begin, we used the California Community College Chancellor's Office Management Information System (COMIS) database to obtain a list of all ESL courses offered in the CCC between 2009 and 2017. We used catalogs from the most recent academic year of college catalogs for all 114 colleges (2017-2018) to obtain and update the necessary course information (see below). If there were courses in the list that were not in the most recent catalog, we also reviewed earlier catalogs to ensure we accurately captured changes in the ESL sequence.

We employ a “backwards mapping” approach in our course scan methodology: at each college in our study, we identify the transfer-level English course offered. From there, we trace out the sequence of courses to transfer-level English by identifying the required courses that precede the transfer-level English course, until we identify the last required course that a student needs to take in order to reach transfer-level English (i.e. the required course that has no prerequisites). Once we identify the sequence of courses, we assign the level below the transfer-level English course by counting how many courses proceed a given course in the sequence in order for a student to take transfer-level English, and update our database of courses with the new coding. For example, a “1” code means the course is the only course needed before taking transfer-level English, “2” means there are two courses needed before taking transfer-level English, “3” means there are three courses, and so on. We also updated the course data relating to a course's credit-bearing status, transferability status, and number of credits offered where relevant. In the event that ESL sequence information at a given college was not readily available or comprehensible from college documents, we reached out to ESL department members at the college via email and phone to gain more clarity. Tables 1 and 2 illustrate details of the coding changes we made through our scan.

Our study includes a total of 105 colleges. The seven colleges not included in our study (Cerro Coso, Copper Mountain, College of the Desert, Lassen, College of the Siskiyous, Clovis, Victor Valley) did not have readily available or comprehensible information about their respective ESL sequences, and/or could not be reached for more information. These colleges collectively enrolled about 3% of students in our sample.

**TABLE A1**

Number of coding changes made for courses part of an ESL sequence to transfer-level English, by type of code change

	Total	Credit Status	Transfer Status	Units Maximum	Levels Below Transfer-level English
# Courses	823	218	232	378	636
%	72	19	20	33	55

NOTES: Categories do not add up to total because courses can have more than one category recoded

**TABLE A2**

Difference in the number of levels in the ESL sequence after course scan

Change in Number of Levels in ESL Sequence	Number of Colleges	% of All Colleges
Increase	38	36
Decrease	10	9
Same	57	54

SOURCE: Authors' calculations based on MIS data and college catalog scan.

## Student Longitudinal Data

Our quantitative approach utilizes student-level longitudinal data from the California Community College Chancellor's Office Management Information System (COMIS). Students in the dataset are enrolled across the 114 community colleges that comprise the California Community College system, and includes information on student demographics, course-taking behavior, course elements (e.g. title of course, basic skills status, minimum/maximum number of credits, etc.), and student outcomes (grades, credits earned, degree attainment, transfer, etc.). The timeframe covered by the data spans the 2009-10 academic year through the 2016-17 academic year. Appendix B Table B10 lists the variables from the COMIS data that we use in our analyses.

## ESL Faculty/Staff Interviews

To inform our quantitative results, we interviewed ESL faculty and administrators from various California community colleges. We selected interviewees from colleges that 1) demonstrated throughput rates that were both above and below the state average, 2) were representative of different ESL pathways we studied: traditional pathways, integrated pathways, mixed pathways, accordion model pathways, pathways that fed into developmental English coursework, pathways that fed directly into transfer-level English, pathways with parallel credit and non-credit sequences, and pathways with transferable ESL coursework, and 3) offered pathways at scale. We invited a total of 24 individuals from 20 community colleges and one adult school partner for an interview. They included a mix ESL faculty, department chairs, division deans and one adult school administrator. A total of 14 interviews were conducted in November and December 2018—including one group interview—across 13 community colleges. The final interview sample included 15 ESL department chairs and/or ESL faculty and 2 division deans. We spoke with each interviewee for about one hour over the phone. Interviewees were asked a variety of questions pertaining to their background in ESL; ESL sequence offerings, assessment, placement, and enrollment in ESL; ESL sequence experience; ESL students; ESL outcomes; professional development; and the role of AB705 in ESL. The data collection and data analysis were carried out simultaneously to avoid the collection of repetitive and unfocused data (Merriam 1998). Particularly, after each interview was conducted, researchers debriefed, reviewed detailed data notes and audio recordings, and kept notes to capture reflections, emerging themes, and points that needed to be pursued further. This process of review and reflection informed all subsequent interviews.

In this manner, data collected from each interview was continuously assessed and informed future interviews until data collection was complete. The data was organized and coded on a secure Excel database. This approach was used to come up with a number of patterns and themes.

## Empirical Strategy for Estimating the Overall Effect of ESL Pathways on Student Course Success

### Sample Construction

To estimate how ESL pathways affect student course success, our analysis is focused on students who first enrolled in the CCC between 2009-10 and 2014-15 academic years. We define a cohort as the first year of enrollment in any course in the California community college system. Students are tracked for either 3 or 6 years depending on when they entered. Namely, students entering between 2009-10 and 2011-12 are tracked for six years and students entering between 2009-10 and 2014-15 are tracked for three years. Our cohort definition and resulting statistics differ from the Chancellor's Office Student Success Scorecard in that the Scorecard defines cohorts based on when the student first attempted their first ESL course, we define a cohort based on when the student first enrolled at the college. Additionally, the Scorecard only includes credit-ESL enrollments while our data restricts to all students who took ESL courses that were part of a sequence leading to transfer-level English, this includes both credit and non-credit ESL courses. Within our timeframe, 13-20 colleges offer non-credit coursework as part of the ESL sequence, and 3% of our sample population take these non-credit courses.

The ESL population is notably different than the populations we focus on in our previous work in developmental math and English. Most notably, we include students with both valid and invalid SSNs in our study. Given the nature of our population of study and the proportion of invalid SSN holders in our sample (50% of our general ESL population; 30% of our degree-seeking population), we decide that including invalid SSN holders is paramount to accurately reflecting the true composition of ESL students in our study. However, by including invalid SSN holders in our sample, our unit of observation is at the college-student ID level instead of the SSN level. The main drawback of this approach is that we cannot observe students who may transition to different colleges within the community college system by using the college-student ID, so we may be double-counting students. However, given that the rate at which students transition to different community colleges within our valid SSN population is low (7%), we are confident that the results we present are robust.

We restrict our analysis sample to 1) students with valid enrollments (students that received valid grades), 2) first-time students aged 15-64 at time of entry into the California community college system who 3) are sequence students (a student that took an ESL course that is required in order to access to transfer-level English) and 4) are degree-intending students (a student that takes at least one degree-applicable course outside of ESL or transfer-level English and/or developmental math/English course). Our definition of valid enrollments is expanded to include grades students would receive in non-credit coursework (e.g. "UG" ungraded, "UD" ungraded dependent). We exclude students who hold bachelor's or associate's degrees at time of entry; students enrolled in only summer or winter terms; students enrolled in adult schools; and dual enrollment students. After implementing these restrictions, our sample of interest includes 120,365 first-time students in the CCC system across the 2010-15 cohorts. Tables 3 and 4 details a breakdown of the sample by cohort and ESL sequence type, respectively.

**TABLE A3**

Number of students, by cohort (year first enrolled in CCC system)

	Total	2010	2011	2012	2013	2014	2015
All	356,209	75,274	63,229	55,560	52,543	54,229	55,374
Our Sample	120,365	21,609	22,502	20,416	18,674	18,783	18,381
%	34	29	36	37	36	35	33

NOTES: Author calculations from Chancellor's Office MIS data. Cohort year is defined as 2009-2010 academic year = 2010, 2010-2011 academic year=2011, and so on.

Our definition of a degree-intending student is of particular importance, and is distinct from that of the CCCCO and other stakeholders. The CCCCO defines degree-intending students as a function of a student's informed or informal educational goal. However, the variables used to capture educational goals are not complete for years prior to 2015, which directly impacts students within our timeframe of analysis. Instead, our definition is based on course-taking behavior in at least one developmental math/English or degree-applicable courses. We employ a list of robustness checks to ensure that our degree intention flag does accurately capture students that are degree-intending, one of which is to compare the educational goals of our definition of degree-intending students to non-degree-intending students for cohorts 2015 forward. We find a high percentage of the degree-intending students in our sample with student goals relating to earning a degree and/or transferring, with about 63% of students indicating such, compared to 15% of students that never took a required course in the ESL sequence that leads to transfer-level English (e.g. non-sequence students). We also find that most sequence students, the population of students we presume are degree-intending, indicate degree-seeking behavior by our definition (about 70% of sequence students).

**TABLE A4**

Number of colleges/students in ESL sequences with various features

	All	Structure Type		Sequence Type				
		Total	Feed Directly into TLE	Feed into Developmental English	Traditional	Integrated	Mixed	Accordion
Colleges	101	61	40	29	44	20	4	3
%	*	60	40	29	44	20	4	3
Students	120,365	77,267	43,091	41,486	40,592	34,683	2,938	659
%	*	64	36	34	34	29	2	1

NOTES: In the timeframe of our analytical sample, the total number of colleges in each category fluctuates, as some colleges established ESL programs in different years (e.g. Foothill in 2011 and Chaffey in 2015), and colleges have changed their structure and sequence types between 2010 and 2017.

**TABLE A5**

Number of colleges/students in ESL sequences with various features, by sequence type and structure type

Sequence Type	Structure Type					
	Feed Directly into TLE		Feed into Developmental English		Transferable ESL	
	% (Colleges)	% (Students)	% (Colleges)	% (Students)	% (Colleges)	% (Students)
Traditional	55.2	71.8	44.8	28.3	69.0	59.9
Integrated	54.6	41.4	45.5	58.6	54.6	52.4
Mixed	70.0	81.3	30.0	18.7	55.0	42.6
Accordion	80.0	64.3	20.0	35.7	60.0	33.9
Compression	100.0	100.0	0.0	0.0	33.3	58.1

NOTES: College counts/percentages are for the most recent academic year (2016/17), while student counts/percentages reflect students enrolled for the first time in the CCC system between the 2009/10 and 2014/15 academic years. In the timeframe of our analytical sample, the total number of colleges in each category fluctuates, as some colleges established ESL programs in different years (e.g. Foothill in 2011 and Chaffey in 2015), and colleges have changed their structure and sequence types between 2010 and 2017. Missing students do not have ESL sequence type/structure information due to being first enrolled at a college in a year when ESL sequence type/structure information was not available. Refer to Table 4 for row totals.

**TABLE A6**

Throughput rates (3-year &amp; 6-year) in ESL sequences with various features

	All	Structure Type		Sequence Type			
	Total	Feed Directly into TLE	Feed into Developmental English	Traditional	Integrated	Mixed	Accordion
<b>Three-Year</b>							
#	120,365	77,267	43,091	41,486	40,592	34,683	2,938
%	26	30	18	28	22	29	16
<b>Six-Year</b>							
#	64,527	40,066	24,457	22,573	20,926	20,509	515
%	34	39	26	33	31	38	15

NOTES: Throughput rates (%) indicate students that have completed transfer-level English as a share of the total number of students enrolled at colleges within each structure/sequence type (#). We cannot track 6-year outcomes for students enrolled in colleges offering accordion model sequences at this time due to small sample sizes limited timeframe for follow-up (e.g. the earliest implementation of accordion model reform is in academic year 2012-2013). Missing students from row totals: when assigning a student a college-level ESL sequence and structure type we used the model what was in place when the student first enrolled at the college; if a student first entered a college in years where there was no ESL sequence in place that led a student to transfer-level English they will have a missing college-level ESL sequence/structure type. Three-year throughput rates include the 2010-2015 cohorts, and six-year throughput rates include the 2010-2012 cohorts.

## Regression Methods

Our treatment and control groups are as follows: our treatment group includes students that either enrolled in integrated coursework, in transferable ESL coursework, or a college that offered a sequence that feeds directly into transfer-level English, with the potential to be in more than one category. Our control groups in comparison to each of the former treatment groups include students that either enrolled in traditional coursework, in no transferable ESL coursework, or a college that offered a sequence that feeds into developmental English coursework, respectively, with the potential to be in more than one category. Our study focuses on several key outcomes: completion of transfer-level English, transferable credits earned, transfer to a four-year college, and degree attainment. Completion is measured as the share of students within a cohort that successfully completes a



transfer-level composition course within a given timeframe, also known as throughput. Credits earned is measured as units earned as a share of units attempted, each by total units and total transferable units.

We utilize various regression techniques to estimate the effect of ESL pathway features on student success, primarily naïve ordinary least squares (OLS) regressions. Our regression models take on the following form:

$$Y_{ijgt} = \gamma_t + \beta_g + \delta Z_i + \gamma W_{igt} + e_{ijgt} \quad (1)$$

where  $i$  indexes students,  $j$  course,  $g$  colleges, and  $t$  terms. Equation 1 is used to evaluate continuous outcomes, while equation 2 was used to evaluate dichotomous outcomes. In both equations, our outcome variables ( $Y_{ijgt}$ ) include dichotomous variables 1) completion of transfer-level English, 2) degree attainment, 3) transfer to a four-year college, and continuous variables 1) total transferable units earned as a share of total transferable units attempted, for the  $i$ th student attending college  $g$  enrolling in course  $j$  during term  $t$ . Included are term ( $\gamma_t$ ), and college ( $\beta_g$ ) fixed effects that will control for unobserved term and college specific policies and programs. Our treatment variable ( $W_{igt}$ ) is 1 if the student is enrolled in a course that was part of a sequence with one of three ESL pathway features: 1) feeds directly into college-composition (0 if feeds into developmental English coursework), 2) integrates discrete language skills courses such as reading and writing are combined into single courses (0 if sequence retains discrete language skills courses as separate), and 3) offers transferable ESL courses (0 if not). We also include interactions between these ESL pathway features to measure the combined effect of offering more than one pathway feature. The model controls for a vector of time invariant student attributes  $Z_i$  (i.e. age at enrollment, gender, race, ever a Pell grant recipient, prior educational attainment, and starting level in the ESL sequence; for others see Table 2). Finally, the model clusters errors at the transfer-level ( $e_{ijgt}$ ). Our parameter of interest is  $\gamma$ , the effect of ESL course sequence features on student outcomes. We run this model on different student racial/ethnic subgroups to gauge the effect of ESL pathway features on each subgroup.

However, this model may generate biased estimates of  $\gamma_t$ . The most notable arises due to omitted variable bias. Even when we control for a number of student characteristics, it is very difficult to measure other characteristics such as motivation or student ability upon college entry. Because these measures are likely correlated with enrollment in ESL and success in college, even when students have similar observed characteristics, the inability to control for motivation and prior ability could lead to biased estimates. In addition, selection bias may arise due to differential enrollment patterns in ESL. For instance, if the most motivated students are more likely to enroll in certain ESL courses while the least motivated are more likely to delay or never enroll in ESL coursework, we can observe upward bias.

## Robustness Checks

To test the structural validity of our regression results, we modify our regression specification with a number of variables that may be confounded with the effect of ESL pathway characteristics on student success. We run separate models that account for differences in regression estimates that may be due to term, student, and college characteristics (see Appendix B Tables B13-B24). To check for consistency of the significance of our estimates we also run models including each of the ESL sequence features separately.

## Comparing Our Estimates to Those in the Existing Literature

Studies on the impact of ESL pathway features on student success across California's community colleges are sparse; one study (Hodara 2012) implements quasi-experimental methods and utilizes administrative data similar to COMIS from the City University of New York (CUNY) to investigate the causal impact of an ESL student



starting in an ESL sequence versus the developmental writing sequence. Several of Hodara's primary findings are in line with ours, namely that longer ESL sequences negatively impact ESL students' progression through college and degree attainment. In addition, transfer-level analyses conducted by campus institutional researchers point to some of the trends we observe in our study. For example, Solano College found that 27% of students who started in ESL completed transfer-level English in an average time of under a year and a half after offering a three-level integrated sequence in fall 2015, a three-fold increase from the 2012 completion rate (California Acceleration Project, 2018). Another study by Elizabeth Park (forthcoming) investigates community college students' progression through the credit ESL sequence in the Los Angeles Community College District (LACCD), with a special focus on generation 1.5/2.0 students. Park's findings mirror some of our own, most especially where students start in the sequence, 3 levels below transfer-level English or lower, which is comparable to our student population for the 2016-2017 academic year (see Figure 3 in the report).

## Caveats

While our analysis employs statistical analysis and includes a substantial number of controls, we are unable to attribute causality to the findings and there are considerations to account for with regard to the data we use and our methods. Our data does not contain information pertaining to student assessment scores, placement recommendation, or high school GPA, all of which would most accurately control for student academic record prior to enrolling in ESL. We use a student's first course in the ESL sequence as a proxy for placement recommendation.

Our sample of interest is the 2010-2015 student cohorts, and we track student outcomes for these cohorts over three academic years (for the 2010-2015 cohorts), as well as six academic years (for the 2010-2012 cohorts). Given that there has been considerable change in the ESL landscape in our timeframe of interest, especially in more recent years, three years is still a relatively short amount of time to evaluate the effect of newly-reformed ESL pathways on longer-term outcomes such as transfer and degree completion. Time will generate larger sample sizes and allow for a more thorough evaluation of longer-term outcomes for accordion and compression strategies.

Our analysis focuses on enrollment in ESL sequences in relation to student outcomes. However, other types of reforms may have also been implemented within our timeframe of interest that may also contribute to our results. However, per our conversations with faculty we learned that most of the changes to assessment and placement and some curricular reforms, have happened more recently, partly in response to AB 705. Some of the changes that may have occurred during our timeframe, including changes to the sequence endpoint, length of sequence, transferability of courses, or to assessment and placement can be partly addressed by including college fixed-effects in our model aims to account for these other reforms implemented at the college level.

## Appendix B. Figures and Tables

**TABLE B1**

Characteristics of degree-seeking ESL students, by race/ethnicity (Figures 4 and 5 in report)

	Overall	Latino	Asian	Black	White	Start in Sequence (Median)
<b>Educational attainment</b>						
Less than HS	5.6	8.8	5.2	6.5	3.4	4
Adult school	1.6	1.6	1.5	1.1	2.2	4
High school diploma	32.8	53.2	28.6	30.7	25	3
GED / HS equivalency/ CA HS proficiency certificate	5.3	8.8	4.6	8.7	4.1	3
Foreign secondary school diploma	41.1	18	44.3	41.7	54.5	4
Unknown	13.5	9.6	15.9	11.3	10.9	4
<b>Citizenship status</b>						
U.S. Citizen	22.6	49.8	14.8	31.2	13.6	3
Permanent resident	38.1	29.2	40.9	39.6	52.1	4
Temporal resident	2.1	2.9	1.9	5.8	1.6	4
Refugee/Asylee	6.1	0.8	2.9	8.9	20.6	4
Student Visa holder (F1 or M1)	24.5	3.5	34.2	12.1	9.4	3
Other/Unknown	6.6	13.8	5.3	2.4	2.8	3
<b>Gender</b>						
Female	56.2	62.1	53.3	53	59.9	4
Male	42.9	37.1	46	46.3	39.1	3
<b>Other characteristics</b>						
Traditional-age college student	62.4	62.9	71.5	44.5	36.6	3
Financial aid recipient	55.9	69.6	48.2	72.1	71.1	4
EOPS recipient	19.5	18.4	17.4	18.6	30.9	4
Start in Sequence (Median)	3	3	3	4	4	
Number of Students	120,365	27,301	55,982	2,587	22,755	

SOURCES: Authors' calculation based on MIS data.

NOTES: Sample includes students first enrolled in ESL in the CCC system between the 2009-2010 and 2014-2015 academic years.

**TABLE B2**

Characteristics of degree-seeking ESL students, by education status at first term of enrollment

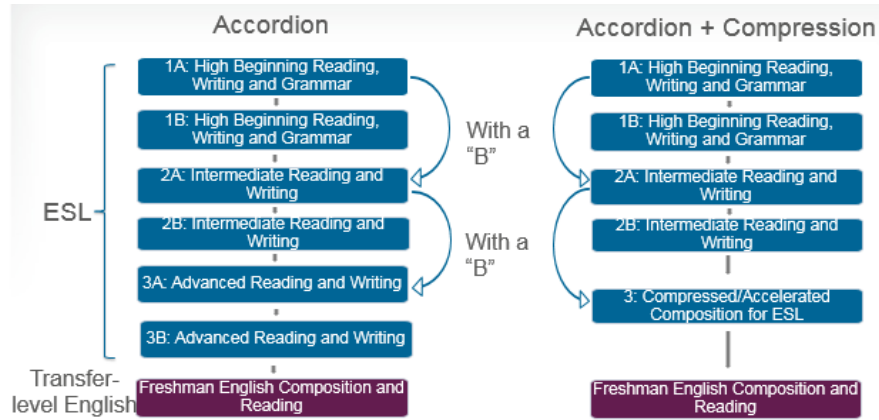
	Overall	Less Than HS	Adult School	US HS Diploma	GED or Equivalent	Foreign Secondary School Diploma	Unknown
<b>Race/Ethnicity</b>							
Latino	22.7	35.9	22.9	36.8	37.5	9.9	16
Asian	46.5	43.3	44.7	40.5	40.1	50	54.5
Black	2.1	2.5	1.5	2	3.5	2.2	1.8
White	18.9	11.7	26.4	14.4	14.4	25	15.2
<b>Citizenship status</b>							
U.S. Citizen	22.6	29.7	19.2	37	35.2	11.1	14.8
Permanent resident	38.1	46	56.9	37.2	41.2	38.9	31.2
Temporal resident	2.1	5.4	2.8	1.7	2.5	2.1	1.3
Refugee/Asylee	6.1	4.6	11.9	4	3.8	7.9	6.7
Student Visa holder (F1 or M1)	24.5	7.2	2.5	10	8.7	36.3	40.1
Other/Unknown	6.6	7.1	6.7	10.1	8.7	3.8	5.9
<b>Gender</b>							
Female	56.2	56.8	65.4	54.9	57.6	56.9	55.5
Male	42.9	41.7	33.2	44.3	41.6	42.4	43.2
<b>Other characteristics</b>							
Traditional-age college student	62.4	54	46.5	76.1	52.9	56.5	56.2
Financial aid recipient	55.9	67.8	75.4	67.9	67	46.4	44.5
EOPS recipient	19.5	20	25.3	21.8	20.7	19.2	13.4
Start in Sequence (Median)	3	4	4	3	3	4	4
Number of Students	120,365	6,706	1,908	39,526	6,432	49,507	16,286

SOURCES: Authors' calculation based on MIS data.

NOTES: Sample includes students first enrolled in ESL in the CCC system between the 2009-2010 and 2014-2015 academic years.

**FIGURE B1**

Accordian models and compressed courses are two reforms ESL programs have adopted



SOURCE: Author’s chart based on PPIC ESL program database.

**TABLE B3**

Basic characteristics of ESL courses

	Sequence courses	Non-sequence courses
Non-credit	11%	25%
Credit, non-degree applicable	66%	64%
Credit, degree-applicable, including transferable	23%	12%
Credit, transferable to CSU only	6%	3%
Credit, transferable to CSU or UC	10%	1%
Reading (traditional or integrated)	54%	NA
Writing (traditional or integrated)	80%	NA
Listening/speaking (traditional or integrated)	17%	NA
Grammar (traditional or integrated)	30%	NA

SOURCE: Author calculations from Chancellor’s Office MIS data and PPIC ESL program database.

NOTE: Based on ESL courses offered between the 2009-10 and 2014-15 academic years. Program database only includes skills codes (reading, writing, listening/speaking, grammar) for courses that are part of a sequence that leads to transfer-level English.

**TABLE B4**

Number of students and college by start in the sequence, 2009-2010 to 2014-2015 cohorts (Figure 2 in report)

Number of Levels in Sequence	Colleges	%	Students	%
9+	6	6	1,532	1
8	8	8	2,648	2
7	14	14	5,014	4
6	25	25	12,241	10
5	17	17	15,652	13
4	16	16	22,908	19
3	11	11	24,808	21
2	2	2	25,542	21
1	2	2	9,863	8
Total	101	100	120,208	100

NOTES: Sample includes degree-seeking students who first enrolled in ESL at a California Community College between the 2009-2010 to 2014-2015 academic years. College counts are from the 2016-17 academic year, most recent year we have data for. We exclude students who first enroll in versions of transfer-level English for ESL students.

**TABLE B5**

Progression of students through the ESL sequence by start level, 6-year, 2010-2012 cohorts (Figure 6 in report)

Progression	Levels Below Transfer																		
	Nine+	%	Eight	%	Seven	%	Six	%	Five	%	Four	%	Three	%	Two	%	One	%	
Enroll 9+ LBT	831																		
Complete 9+ LBT	234	28																	
Enroll 8 LBT	287	33	1,361																
Complete 8 LBT	159	19	1,073	79															
Enroll 7 LBT	177	21	947	70	2,950	100													
Complete 7 LBT	129	16	814	60	2,599	88													
Enroll 6 LBT	183	20	815	60	2,099	71	6,981	100											
Complete 6 LBT	109	13	666	49	1,899	64	6,073	87											
Enroll 5 LBT	135	15	568	41	1,611	55	4,924	71	8,509	100									
Complete 5 LBT	78	9	463	34	1,437	49	4,358	62	7,210	85									
Enroll 4 LBT	263	32	406	30	1,249	42	3,954	57	5,867	69	12,702	100							
Complete 4 LBT	238	29	323	24	1,060	36	3,324	48	5,102	60	10,954	86							
Enroll 3 LBT	156	19	253	19	938	32	2,813	40	4,571	54	8,584	68	12,793	100					
Complete 3 LBT	129	16	217	16	805	27	2,412	35	3,953	46	7,668	60	10,924	85					
Enroll 2 LBT	141	17	229	17	661	22	2,033	29	3,473	41	5,902	46	7,602	59	13,212	100			
Complete 2 LBT	124	15	197	14	502	17	1,642	24	2,958	35	5,155	41	6,733	53	11,317	86			
Enroll 1 LBT	103	12	180	13	473	16	1,466	21	2,749	32	5,513	43	6,383	50	8,219	62	5,122	100	
Complete 1 LBT	84	10	156	11	396	13	1,252	18	2,385	28	4,842	38	5,683	44	7,352	56	4,287	84	
Took TLE	119	14	144	11	365	12	1,056	15	1,943	23	4,399	35	5,670	44	7,450	56	3,253	64	
Complete TLE	105	13	128	9	328	11	935	13	1,724	20	3,993	31	5,093	40	6,747	51	2,867	56	

NOTES: Numbers represent students, Percent (%) represent the number of students at each stage out of the total number of students that start in a given level of the ESL sequence. Sample includes degree-seeking students who first enrolled in ESL at a California Community College between the 2009-10 and 2011-12 academic years and are tracked for 6 years through the 2016-17 academic year.

**TABLE B6**

Six-year throughput rates, by racial/ethnic group and start in the sequence (Figure 7 in report)

	Overall		Levels Below Transfer (Six-Year)					
	Three-Year	Six-Year	One	Two	Three	Four	Five	Six
Latino	27,301	15,478	1,569	3,196	3,476	2,654	1,986	1,619
%	17	23	44	33	24	19	14	10
Asian	55,676	30,069	2,355	6,906	6,147	5,830	3,716	2,752
%	34	42	62	62	49	38	27	17
Black	2,587	1,434	117	236	294	291	231	165
%	19	25	48	42	30	21	17	9
Two or More	1,317	656	32	88	106	143	95	116
%	16	26	50	36	37	31	15	8
White	3,936	12,017	687	1,606	1,767	2,816	1,868	1,899
%	17	28	63	45	40	30	15	12

NOTES: Sample includes degree-seeking students who first enrolled in ESL at a California Community College between the 2009-10 and 2011-12 academic years and are tracked for 6 years through the 2016-17 academic year.

**TABLE B7**

Enrollment in ESL sequence courses that lead to transfer-level English, by year (Figure 8 in report)

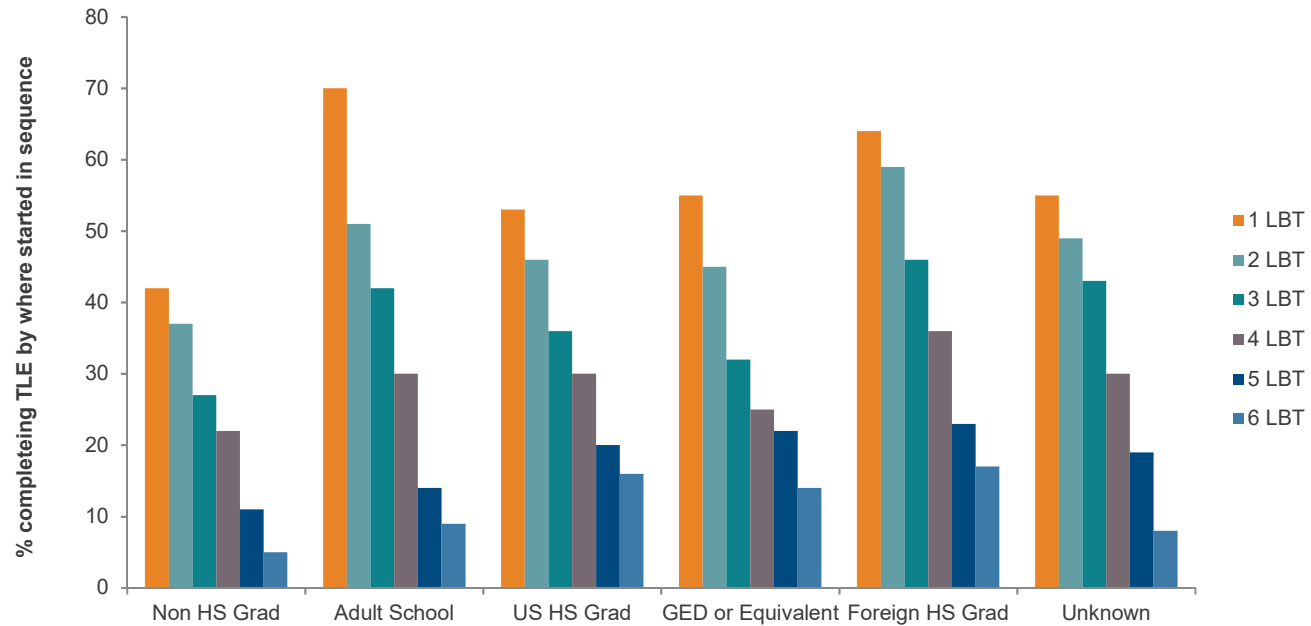
	2010	2011	2012	2013	2014	2015	2016	2017
Traditional	30,999	31,100	28,888	25,965	24,695	24,088	24,005	22,381
Integrated	31,898	33,975	32,405	31,755	32,533	32,064	32,169	32,568
Total	62,897	65,075	61,293	57,720	57,228	56,152	56,174	54,949

NOTES: Enrollment for all ESL students over time where 2010 refers to 2009-10, and so on. Students are counted a single time in a given academic year, according to the type of ESL course(s) he or she enrolled in. If the student enrolled in both traditional and integrated coursework in a given academic year, they are counted in both rows. Otherwise students are unduplicated within college but may be duplicated across colleges if students enrolled in multiple colleges at any point in their college career. Enrollments are for all ESL students.



**FIGURE B2**

Rates of successful completion of transfer-level English, by starting level and prior education



SOURCES: Author calculations from Chancellor’s Office MIS data and PPIC ESL program database.

NOTES: Sample includes degree-seeking students who first enrolled in ESL at a California Community College between the 2009-10 and 2011-12 academic years and are tracked for 6 years through the 2016-17 academic year.

**TABLE B8**

Six-year throughput rates, by education status and start in the sequence (Figure B2)

	Overall		Levels Below Transfer (Six-Year)					
	Three-Year	Six-Year	One	Two	Three	Four	Five	Six
Non-HS Grad	6,706	3,937	179	387	744	806	739	569
%	13	19	42	37	27	22	11	5
Adult School	1,908	1,234	61	97	232	426	191	129
%	14	29	70	51	42	30	14	9
US HS Grad	39,526	23,564	2,832	5,443	5,005	3,847	2,634	2,107
%	26	34	53	46	36	30	20	16
GED or Equivalent	6,432	2,939	259	540	640	544	381	325
%	23	30	55	45	32	25	22	14
Foreign HS Grad	49,507	23,529	1,302	5,302	4,125	5,093	3,225	2,436
%	29	39	64	59	46	36	23	17
Unknown	16,286	9,324	489	1,443	2,047	1,986	1,339	1,415
%	26	31	55	49	43	30	19	8

NOTES: Sample includes degree-seeking students who first enrolled in ESL at a California Community College between the 2009-10 and 2011-12 academic years and are tracked for 6 years through the 2016-17 academic year.

**TABLE B9**

Variable Definitions

Variable	Description
<b>Student Outcomes</b>	
Throughput (3 year & 6 year)	This variable is 1 if a student successfully completed freshman composition, conditional on when a student started in the community college system. Observed within 3, 6, and all years of first year of enrollment
Earn a Degree	This variable is 1 if a student ever earned a degree or certificate. Observed within 3, 6, and all years of the first year of enrollment.
Transfer to a 4-Year Institution	This variable is 1 if a student ever transferred to a 4-year university. Observed within 3, 6, and all years of the first year of enrollment
Proportion of Units Completed vs. Attempted (Transferable)	Proportion of the number of units a student completes divided by the total number of units a student attempts. Generated for all courses and by degree-applicable courses, within 3, 6, and all years of the first year of enrollment
<b>Student demographic attributes</b>	
Gender	Categorical variables for female and unknown sex, with male as the reference category
Race/ethnicity	Categorical variables for Latino, African American, Asian, other race (includes two or more races, Native American), and unknown race. White is the reference category.
Citizenship status	Categorical variable for non-citizen (permanent resident, temporary resident, refugee/asylee, F-1 or M-1 student visa, other status) and unknown citizenship. US citizen is the reference category.
Traditional College-age Student	Categorical variable for a student is age 24 years or younger at first term of enrollment
<b>Student academic preparedness proxies</b>	
Highest level of education at first term	Categorical variable for not a high school graduate, adult education, GED or equivalent, graduate from a foreign high school, and unknown education. High school graduate is the reference category
Disability status	This variable is 1 if a student was ever reported with at least one primary disability (SD01)
Limited English Proficiency (LEP) status	This variable is 1 if a student was ever enrolled in a course with a TOP Code equal to 493084, 49085, 49086, 493087, or 493100 (English as a Second Language – Writing, Reading, Speaking/Listening, Integrated; Vocational English as a Second Language, respectively) or if the student was identified as ever needing English as a second language services during the matriculation process (SM03)
Full-Time Enrollment status	This variable is 1 if the student attempted 12 or more units in a term (SX03)
Extended Opportunity Programs and Services (EOPS) recipient	This variable is 1 if a student every received support from EOPS
Starting level in the ESL sequence	Categorical variable for one to two levels, three to four levels, and five or more levels below transfer-level English
Prior dual enrollment	This variable is 1 if the student was previously enrolled as a special admit student (i.e., simultaneously enrolled in K-12)
Prior non success	This variable is 1 if a student attempted to complete a course more than once
Ever enrolled in English or Math (developmental or transfer-level)	This variable is 1 if a student ever enrolled in at least one developmental or transfer-level math or English course
<b>ESL Characteristics (Student-Level)</b>	
Traditional Student	This variable is 1 if a student ever enrolled in a course flagged as traditional at any point in their community college career
Integrated Student	This variable is 1 if a student ever enrolled in a course flagged as integrated at any point in their community college career
Mixed Student	This variable is 1 if a student ever enrolled in either a traditional or integrated course in a college flagged as having a mixed sequence structure in any given year
Accordion Student	This variable is 1 if a student ever enrolled in a course flagged as an accordion course at any point in their community college career
Sequence/Non-Sequence Student	This variable is 1 if a student ever enrolled in a course that was part of a sequence of courses that lead a student to freshman composition (sequence student). This variable is 0 if a student never enrolled in such a course (non-sequence student)
Degree-Intending Student	This variable is 1 if a student: 1) ever took at least one degree-applicable course outside of ESL and freshman composition in their community college career and/or at least one developmental English/math course, AND 2) was ever enrolled in a sequence course in their community college career

Variable	Description
<b>ESL Characteristics (College-level)</b>	
Traditional Sequence Structure	By year. This variable is 1 if a college was flagged as having a traditional ESL sequence structure (defined as 75% or more of courses being offered in the sequence requiring separate reading and writing courses that students must take to reach transfer-level English)
Integrated Sequence Structure	By year. This variable is 1 if a college was flagged as having an integrated ESL sequence structure (defined as 75% or more of courses being offered in the sequence requiring courses that embed both reading and writing skills into a single course that students must take to reach transfer-level English).
Mixed Sequence Structure	By year. This variable is 1 if a college was flagged as having a mixed ESL sequence structure (defined as requiring both courses that integrate reading and writing skills into a single course and courses that separate reading and writing skills into separate courses within a single ESL sequence that students must take to reach transfer-level English).
Accordion Sequence Structure	By year. This variable is 1 if a college was flagged as having an “accordion” style ESL sequence structure (defined as A/B courses that allow students to skip levels based on demonstrated proficiency to reach transfer-level English)
Structure Feeds into Developmental English Coursework	By year. This variable is 1 if a college was flagged as requiring coursework in developmental English at the highest level(s) in order to reach transfer-level English
Structure Feeds Directly into Freshman Composition	By year. This variable is 1 if a college was flagged as having an ESL structure that did not require developmental English coursework at the highest level(s); students segue into transfer-level English upon completion of ESL sequence
Change in ESL Sequence	This variable is 1 if a college had ever experienced a change in any of the above transfer-level ESL characteristics between 2010 and 2015.
Number of Levels in ESL Sequence	Continuous variable that captures the number of levels in the ESL sequence at a given college in a given year, between 2010 and 2015
<b>Student socioeconomic proxies</b>	
Board of Governors Enrollment Waiver (BOGW)/Pell recipient	This variable is 1 if a student ever received a Board of Governor’s waiver or Pell grant (SF21)

NOTES: The CCCCO MIS data element dictionary provides a more detailed description of each variable used in our study (CCCCO undated).

**TABLE B10**

Student characteristics, by type of ESL student

	Full Sample		Non-Sequence Students		Sequence Students		Degree-Intending Students	
	Student Count	%	Student Count	%	Student Count	%	Student Count	%
Total	356,209	*	190,327	53	165,882	47	120,365	34
<b>Traditional age student at entry (Age 24 or less)</b>								
0	217,836	61	138,673	73	79,163	48	45,244	38
1	138,373	39	51,654	27	86,719	52	75,121	62
<b>Gender</b>								
Female	203,807	57	109,179	57	94,628	57	67,661	56
Male	147,539	41	78,274	41	69,265	42	51,626	43
Unknown	4,863	1	2,874	2	1,989	1	1,078	1
<b>Race/ethnicity</b>								
White	43,169	12	14,246	7	28,923	17	22,755	19
Latino	174,634	49	124,891	66	49,743	30	27,301	23
Asian	97,148	27	29,100	15	68,048	41	55,982	47
Black	5,639	2	2,299	1	3,340	2	2,587	2
Other Race	253	0	128	0	125	0	95	0
Two or more races	2,133	1	570	0	1,563	1	1,317	1
Unknown race	33,233	9	19,093	10	14,140	9	10,328	9
<b>Citizenship status</b>								
U.S. Citizen	92,605	26	53,507	28	39,098	24	27,173	23
Permanent Resident	105,628	30	41,031	22	64,597	39	45,873	38
Temporal Resident	7,272	2	3,683	2	3,589	2	2,470	2
Refugee/Asylee	17,523	5	8,340	4	9,183	6	7,342	6
Visa (F-1 or M-1 visa)	37,858	11	7,119	4	30,739	19	29,544	25
Other Status	67,874	19	55,916	29	11,958	7	5,519	5
Unknown (X)	27,449	8	20,731	11	6,718	4	2,444	2
<b>Highest level of education</b>								
Not a graduate or no longer enrolled in high school	42,045	12	25,114	13	16,931	10	6,706	6
Currently enrolled in adult school	15,278	4	11,744	6	3,534	2	1,908	2
High school diploma	71,710	20	24,017	13	47,693	29	39,526	33
GED or Equivalent	12,270	3	3,683	2	8,587	5	6,432	5
Foreign Secondary School Diploma/Certificate of Graduation	93,949	26	29,905	16	64,044	39	49,507	41
Unknown	120,957	34	95,864	50	25,093	15	16,286	14
<b>Previous dual enrollment</b>								
0	352,932	99	189,112	99	163,820	99	118,458	98
1	3,277	1	1,215	1	2,062	1	1,907	2

	Full Sample		Non-Sequence Students		Sequence Students		Degree-Intending Students	
	Student Count	%	Student Count	%	Student Count	%	Student Count	%
<b>BOGW or Pell Grant recipient (anytime during his/her college career)</b>								
0	249,109	70	165,859	87	83,250	50	53,024	44
1	107,100	30	24,468	13	82,632	50	67,341	56
<b>Starting level in ESL Sequence</b>								
One to two levels below	38,132	23	*	*	38,132	23	35,405	29
Three to four levels below	59,705	36	*	*	59,705	36	47,716	40
Five or more levels below	67,344	41	*	*	67,344	41	37,040	31
<b>Ever enrolled in developmental English</b>								
0	300,095	84	175,486	92	124,609	75	79,092	66
1	56,114	16	14,841	8	41,273	25	41,273	34
<b>Ever enrolled in developmental math</b>								
0	283,975	80	175,641	92	108,334	65	62,817	52
1	72,234	20	14,686	8	57,548	35	57,548	48
<b>Ever enrolled in any math or English</b>								
0	237,861	67	167,273	88	70,588	43	25,439	21
1	118,348	33	23,054	12	95,294	57	94,926	79
<b>Proportion of Transfer Credits Earned (percent)</b>								
<i>Three-Year</i>	73.21		65.15		75.29		75.90	
<i>Six-Year</i>	71.46		63.50		73.68		74.28	
<b>Earned a degree/certificate</b>								
<i>Three-Year</i>								
0	333,588	94	180,977	95	152,611	92	109,235	91
1	22,621	6	9,350	5	13,271	8	11,130	9
<i>Six-Year</i>								
0	173,096	89	98,123	93	74,973	85	52,488	81
1	20,967	11	7,834	7	13,133	15	12,039	19
<b>Transfer to a four-year college</b>								
<i>Three-Year</i>								
0	352,944	99	188,915	99	164,029	99	118,866	99
1	3,265	1	1,412	1	1,853	1	1,499	1
<i>Six-Year</i>								
0	185,081	95	103,538	98	81,543	93	58,386	90
1	8,982	5	2,419	2	6,563	7	6,141	10
<b>Complete transfer-level English</b>								
<i>Three-Year</i>								
0	317,112	89	182,577	96	134,535	81	89,163	74
1	39,097	11	7,750	4	31,347	19	31,202	26
<i>Six-Year</i>								
0	166,859	86	100,799	95	66,060	75	42,556	66
1	27,204	14	5,158	5	22,046	25	21,971	34

	Full Sample		Non-Sequence Students		Sequence Students		Degree-Intending Students	
	Student Count	%	Student Count	%	Student Count	%	Student Count	%
<b>Full-time student</b>								
0	323,801	91	186,000	98	137,801	83	96,080	80
1	32,408	9	4,327	2	28,081	17	24,285	20
<b>Extended Opportunity Programs and Services (EOPS) participant</b>								
0	327,880	92	186,501	98	141,379	85	96,896	81
1	28,329	8	3,826	2	24,503	15	23,469	19
<b>Student with limited English proficiency</b>								
0	54,622	15	15,379	8	39,243	24	35,345	29
1	301,587	85	174,948	92	126,639	76	85,020	71
<b>Student with disabilities</b>								
0	349,146	98	188,241	99	160,905	97	115,755	96
1	7,063	2	2,086	1	4,977	3	4,610	4
<b>Student educational goal at first term of enrollment</b>								
Obtain an associate degree and transfer to a baccalaureate granting institution	35,452	23	5,346	8	30,106	33	28,257	37
Transfer to a baccalaureate granting institution without an associate degree	10,740	7	1,307	2	9,433	10	9,008	12
Obtain a two-year associate degree without transfer	15,070	10	3,108	5	11,962	13	10,537	14
Earn a career technical certificate without transfer	3,148	2	733	1	2,415	3	2,053	3
Discover/formulate career interests, plans, goals	1,443	1	837	1	606	1	464	1
Acquire job skills	5,182	3	3,240	5	1,942	2	1,334	2
Update job skills	2,225	1	1,227	2	998	1	589	1
Maintain certificate or license	696	0	290	0	406	0	329	0
Pursue educational development	9,105	6	6,780	10	2,325	3	1,225	2
Improve basic skills in Math/English	19,769	13	13,430	21	6,339	7	2,534	3
Complete credits for HS or GED	2,989	2	2,272	3	717	1	433	1
Undecided on goal	47,705	30	25,581	39	22,124	24	16,781	22
Move from noncredit coursework to credit	577	0	433	1	144	0	82	0
University/4-Year college students taking courses to meet university/4-year requirements	2,810	2	544	1	2,266	2	1,975	3

NOTES: (1) Includes students ages 15 to 64, (2) students first enrolled in the CCC system between 2009-2010 and 2014-2015, and (3) first-time college enrollees (i.e. students with no prior college credentials). First-term enrollment is defined as the first time a student appears in the CCCCO MIS enrollment file as a non-special admit student (Education Status SB11 not = 10000). (4) Includes students who have taken at least one ESL course. We exclude cells with n<10. We include student educational goal (SM01/SS01) for informational purposes; student educational goal is not a determinant in defining our degree-seeking population.



**TABLE B11**

Main linear and fixed effects models of achieving throughput in an ESL sequence within 3 years (2010-2015 cohorts)

	(1)	(2)	(3)	(4)	(5)
Student Took an Integrated Course	-0.041	0.029	0.024	0.031	0.118
	(0.047)	(0.028)	(0.036)	(0.035)	(0.035)***
Sequence Feeds into TLE	0.076	-0.006	0.049	0.054	0.074
	(0.060)	(0.032)	(0.052)	(0.049)	(0.042)*
Student Took Transferable ESL Course	0.175	0.069	0.053	0.055	0.161
	(0.028)***	(0.023)***	(0.034)	(0.033)	(0.039)***
Integrated Student x Feed Direct TLE	0.022	0.016	0.027	0.019	-0.035
	(0.068)	(0.034)	(0.032)	(0.031)	(0.039)
LBT 3 to 4		-0.188	-0.174	-0.163	-0.062
		(0.013)***	(0.039)***	(0.037)***	(0.028)**
LBT 5 to 12		-0.339	-0.242	-0.226	-0.075
		(0.017)***	(0.041)***	(0.039)***	(0.032)**
LBT 3 to 4 x Integrated Student			0.018	0.012	-0.052
			(0.026)	(0.024)	(0.022)**
LBT 5 to 12 x Integrated Student			-0.044	-0.053	-0.138
			(0.028)	(0.027)*	(0.029)***
LBT 3 to 4 x Direct TLE			-0.085	-0.088	-0.082
			(0.036)**	(0.035)**	(0.031)***
LBT 5 to 12 x Direct TLE			-0.079	-0.083	-0.049
			(0.036)**	(0.034)**	(0.035)
LBT 3 to 4 x Transferable ESL			0.065	0.063	0.021
			(0.027)**	(0.027)**	(0.027)
LBT 5 to 12 x Transferable ESL			-0.035	-0.036	-0.102
			(0.032)	(0.032)	(0.031)***
Constant	0.138	0.304	0.265	0.257	0.157
	(0.043)***	(0.036)***	(0.043)***	(0.043)***	(0.056)***
Observations	120,365	120,365	120,365	120,365	120,365
R-squared	0.057	0.210	0.214	0.221	0.249
Controls and Fixed Effects					
Student Characteristics		X	X	X	X
ESL and Levels Below Interactions			X	X	X
Term & Year Fixed Effects				X	X
College Fixed Effects					X

SOURCES: Authors calculations from COMIS data.

NOTES: Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**TABLE B12**

Main linear and fixed effects models of achieving throughput in an ESL sequence within 6 years (2010-2012 cohorts)

	(1)	(2)	(3)	(4)	(5)
Student Took an Integrated Course	0.050	0.085	0.031	0.035	0.112
	(0.040)	(0.024)***	(0.036)	(0.035)	(0.046)**
Sequence Feeds into TLE	0.113	0.018	0.089	0.092	0.115
	(0.059)*	(0.029)	(0.044)**	(0.042)**	(0.030)***
Student Took Transferable ESL	0.228	0.137	0.079	0.079	0.204
	(0.032)***	(0.024)***	(0.034)**	(0.033)**	(0.043)***
Integrated Student x Feed Direct TLE	-0.017	-0.006	0.026	0.022	-0.027
	(0.065)	(0.034)	(0.034)	(0.033)	(0.058)
LBT 3 to 4		-0.161	-0.173	-0.167	-0.078
		(0.015)***	(0.037)***	(0.036)***	(0.031)**
LBT 5 to 12		-0.313	-0.263	-0.255	-0.101
		(0.020)***	(0.043)***	(0.042)***	(0.038)***
LBT 3 to 4 x Integrated Student			0.064	0.060	-0.007
			(0.027)**	(0.026)**	(0.025)
LBT 5 to 12 x Integrated Student			0.020	0.016	-0.091
			(0.031)	(0.031)	(0.031)***
LBT 3 to 4 x Direct TLE			-0.109	-0.112	-0.079
			(0.036)***	(0.036)***	(0.030)***
LBT 5 to 12 x Direct to TLE			-0.122	-0.123	-0.076
			(0.039)***	(0.038)***	(0.039)*
LBT 3 to 4 x Transferable ESL			0.104	0.104	0.052
			(0.025)***	(0.025)***	(0.029)*
LBT 5 to 12 x Transferable ESL			0.045	0.045	-0.023
			(0.035)	(0.034)	(0.039)
Constant	0.128	0.231	0.227	0.218	0.125
	(0.039)***	(0.034)***	(0.041)***	(0.041)***	(0.052)**
Observations	64,527	64,527	64,527	64,527	64,527
R-squared	0.075	0.206	0.210	0.212	0.243
<b>Controls &amp; Fixed Effects</b>					
Student Characteristics		X	X	X	X
ESL and Levels Below Interactions			X	X	X
Term & Year Fixed Effects				X	X
College Fixed Effects					X

SOURCES: Authors calculations from COMIS data.

NOTES: Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1.

**TABLE B13**

Main linear and fixed effects models of accumulating transfer credits within 6 years (2010-2012 cohorts)

	(1)	(2)	(3)	(4)	(5)
Student Took an Integrated Course	4.283	2.831	2.961	2.911	3.617
	(1.053)***	(0.912)***	(1.453)**	(1.459)**	(1.944)*
Sequence Feeds into TLE	0.357	-1.330	1.171	1.207	0.717
	(1.851)	(1.308)	(1.447)	(1.453)	(1.702)
Student Took Transferable ESL Course	10.864	8.188	4.721	4.746	8.854
	(1.261)***	(1.108)***	(1.799)**	(1.790)***	(2.219)***
Integrated Student x Feed Direct TLE	-0.681	0.242	0.920	0.933	-1.091
	(2.343)	(1.491)	(1.443)	(1.437)	(1.957)
LBT 3 to 4		-2.828	-1.153	-1.119	-2.790
		(1.169)**	(1.855)	(1.837)	(1.431)*
LBT 5 to 12		-4.624	-4.789	-4.732	-6.066
		(1.063)***	(2.319)**	(2.310)**	(2.235)***
LBT 3 to 4 x Integrated Student			-0.703	-0.700	0.851
			(1.221)	(1.240)	(1.148)
LBT 5 to 12 x Integrated Student			-1.013	-1.010	0.610
			(1.932)	(1.933)	(1.790)
LBT 3 to 4 x Direct TLE			-4.050	-4.093	-2.699
			(1.876)**	(1.859)**	(1.519)*
LBT 5 to 12 x Direct TLE			-3.206	-3.292	-3.691
			(1.964)	(1.967)*	(1.965)*
LBT 3 to 4 x Transferable ESL			2.800	2.780	3.239
			(1.644)*	(1.647)*	(1.146)***
LBT 5 to 12 x Transferable ESL			6.824	6.819	6.520
			(1.942)***	(1.931)***	(1.991)***
Constant	65.923	72.526	72.766	71.721	67.080
	(1.089)***	(1.703)***	(2.074)***	(2.005)***	(2.590)***
Observations	62,962	62,962	62,962	62,962	62,962
R-squared	0.040	0.095	0.098	0.098	0.128
<b>Controls &amp; Fixed Effects</b>					
Student Characteristics		X	X	X	X
ESL and Levels Below Interactions			X	X	X
Term & Year Fixed Effects				X	X
College Fixed Effects					X

SOURCES: Authors calculations from COMIS data.

NOTES: Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**TABLE B14**

Main linear and fixed effects models of transferring to a four-year college within 6 years (2010-2012 cohorts)

	(1)	(2)	(3)	(4)	(5)
Student Took an Integrated Course	0.013 (0.021)	0.008 (0.014)	0.004 (0.017)	0.007 (0.017)	0.003 (0.022)
Sequence Feeds into TLE	0.016 (0.021)	-0.018 (0.014)	0.010 (0.019)	0.013 (0.018)	-0.013 (0.017)
Student Took Transferable ESL Course	0.029 (0.014)**	0.016 (0.010)	-0.008 (0.012)	-0.007 (0.011)	0.027 (0.012)**
Integrated Student x Feed Direct TLE	0.001 (0.027)	0.014 (0.019)	0.023 (0.018)	0.020 (0.017)	0.017 (0.020)
LBT 3 to 4		-0.045 (0.010)***	-0.026 (0.018)	-0.021 (0.017)	-0.009 (0.019)
LBT 5 to 12		-0.104 (0.011)***	-0.090 (0.021)***	-0.081 (0.020)***	-0.064 (0.024)**
LBT 3 to 4 x Integrated Student			-0.002 (0.015)	-0.005 (0.014)	-0.022 (0.015)
LBT 5 to 12 x Integrated Student			-0.005 (0.014)	-0.010 (0.014)	-0.031 (0.013)**
LBT 3 to 4 x Direct TLE			-0.041 (0.017)**	-0.044 (0.017)**	-0.037 (0.016)**
LBT 5 to 12 x Direct TLE			-0.042 (0.020)**	-0.046 (0.019)**	-0.027 (0.023)
LBT 3 to 4 x Transferable ESL			0.023 (0.015)	0.021 (0.015)	0.010 (0.014)
LBT 5 to 12 x Transferable ESL			0.042 (0.017)**	0.042 (0.016)**	0.005 (0.013)
Constant	0.062 (0.018)***	0.190 (0.020)***	0.184 (0.023)***	0.144 (0.022)***	0.156 (0.026)***
Observations	64,527	64,527	64,527	64,527	64,527
R-squared	0.004	0.114	0.115	0.126	0.144
<b>Controls &amp; Fixed Effects</b>					
Student Characteristics		X	X	X	X
ESL and Levels Below Interactions			X	X	X
Term & Year Fixed Effects				X	X
College Fixed Effects					X

SOURCES: Authors calculations from COMIS data.

NOTES: Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1.

**TABLE B15**

Main linear and fixed effects models of earning a degree or credential within 6 years (2010-2012 cohorts)

	(1)	(2)	(3)	(4)	(5)
Student Took an Integrated Course	0.046	0.042	0.007	0.009	0.021
	(0.022)**	(0.018)**	(0.026)	(0.026)	(0.034)
Sequence Feeds into TLE	0.038	0.009	0.005	0.007	-0.021
	(0.033)	(0.025)	(0.036)	(0.035)	(0.033)
Student Took Transferable ESL Course	0.120	0.081	0.072	0.072	0.127
	(0.021)***	(0.015)***	(0.028)**	(0.028)**	(0.032)***
Integrated Student x Feed Direct TLE	-0.012	-0.004	0.003	0.001	0.046
	(0.042)	(0.033)	(0.029)	(0.029)	(0.043)
LBT 3 to 4		-0.032	-0.066	-0.062	-0.017
		(0.013)**	(0.027)**	(0.027)**	(0.030)
LBT 5 to 12		-0.087	-0.106	-0.102	-0.041
		(0.015)***	(0.034)***	(0.034)***	(0.042)
LBT 3 to 4 x Integrated Student			0.056	0.054	0.010
			(0.021)***	(0.021)**	(0.018)
LBT 5 to 12 x Integrated Student			0.029	0.027	-0.033
			(0.026)	(0.026)	(0.026)
LBT 3 to 4 x Direct TLE			-0.001	-0.003	0.022
			(0.029)	(0.028)	(0.025)
LBT 5 to 12 x Direct TLE			0.001	-0.001	0.011
			(0.034)	(0.034)	(0.032)
LBT 3 to 4 x Transferable ESL			0.008	0.008	-0.027
			(0.033)	(0.033)	(0.036)
LBT 5 to 12 x Transferable ESL			0.017	0.017	-0.033
			(0.036)	(0.036)	(0.036)
Constant	0.077	0.075	0.098	0.085	0.156
	(0.020)***	(0.023)***	(0.028)***	(0.026)***	(0.030)***
Observations	64,527	64,527	64,527	64,527	64,527
R-squared	0.028	0.076	0.077	0.078	0.110
<b>Controls &amp; Fixed Effects</b>					
Student Characteristics		X	X	X	X
ESL and Levels Below Interactions			X	X	X
Term & Year Fixed Effects				X	X
College Fixed Effects					X

SOURCES: Authors calculations from COMIS data.

NOTES: Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**TABLE B16**

Fixed effects models of ESL pathway features on achieving throughput, within 3 years—by race/ethnicity and education status

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
Student Took an Integrated Course	0.125	0.073	0.119	0.208	0.110	0.121	0.111	-0.146	0.091
	(0.047)***	(0.025)***	(0.050)**	(0.069)***	(0.043)**	(0.034)***	(0.043)**	(0.105)	(0.042)**
Sequence Feeds into TLE	0.079	0.151	0.071	0.320	0.073	0.147	0.165	-0.087	0.083
	(0.069)	(0.028)***	(0.043)*	(0.047)***	(0.055)	(0.054)***	(0.056)***	(0.122)	(0.040)**
Student Took Transferable ESL Course	0.163	0.127	0.188	0.031	0.196	0.137	0.218	0.161	0.136
	(0.052)***	(0.028)***	(0.042)***	(0.049)	(0.043)***	(0.034)***	(0.052)***	(0.100)	(0.040)***
Integrated Student x Feed Direct TLE	-0.077	-0.019	0.033	-0.045	-0.055	-0.056	-0.037	0.118	-0.057
	(0.055)	(0.027)	(0.040)	(0.072)	(0.044)	(0.034)	(0.037)	(0.077)	(0.027)**
LBT 3 to 4	-0.164	-0.018	0.046	0.034	-0.102	-0.037	-0.100	-0.105	-0.036
	(0.030)***	(0.021)	(0.050)	(0.059)	(0.034)***	(0.024)	(0.047)**	(0.113)	(0.046)
LBT 5 to 12	-0.197	-0.021	0.001	0.036	-0.132	-0.053	-0.125	-0.209	-0.062
	(0.044)***	(0.028)	(0.053)	(0.064)	(0.041)***	(0.029)*	(0.047)***	(0.110)*	(0.045)
LBT 3 to 4 x Integrated Student	-0.024	-0.037	-0.093	-0.089	-0.040	-0.051	-0.020	0.057	-0.048
	(0.023)	(0.021)*	(0.045)**	(0.044)**	(0.024)	(0.019)***	(0.037)	(0.080)	(0.047)
LBT 5 to 12 x Integrated Student	-0.119	-0.097	-0.143	-0.237	-0.100	-0.142	-0.114	0.054	-0.083
	(0.037)***	(0.027)***	(0.048)***	(0.051)***	(0.031)***	(0.025)***	(0.042)***	(0.081)	(0.042)**
LBT 3 to 4 x Direct TLE	-0.020	-0.087	-0.117	-0.225	-0.052	-0.102	-0.012	-0.182	-0.073
	(0.032)	(0.019)***	(0.045)**	(0.057)***	(0.036)	(0.024)***	(0.050)	(0.075)**	(0.040)*
LBT 5 to 12 x Direct TLE	0.033	-0.084	-0.058	-0.150	0.012	-0.075	0.026	-0.080	-0.071
	(0.045)	(0.031)***	(0.046)	(0.067)**	(0.044)	(0.031)**	(0.050)	(0.084)	(0.035)**

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
LBT 3 to 4 x Transferable ESL	0.052	-0.014	-0.073	0.084	0.024	0.026	-0.046	-0.053	0.011
	(0.029)*	(0.021)	(0.037)**	(0.053)	(0.035)	(0.025)	(0.040)	(0.089)	(0.043)
LBT 5 to 12 x Transferable ESL	-0.078	-0.089	-0.175	0.047	-0.135	-0.082	-0.160	-0.095	-0.075
	(0.034)**	(0.028)***	(0.041)***	(0.054)	(0.036)***	(0.029)***	(0.052)***	(0.094)	(0.034)**
Constant	0.201	0.033	0.096	0.101	0.123	0.150	0.012	0.351	0.156
	(0.095)**	(0.038)	(0.052)*	(0.064)	(0.069)*	(0.064)**	(0.071)	(0.152)**	(0.062)**
Obs	55,982	27,301	22,755	2,587	49,507	39,526	6,432	1,908	6,706
R-squared	0.273	0.162	0.246	0.271	0.275	0.226	0.242	0.265	0.219

SOURCES: Author calculations from COMIS data.

NOTES: Each column is a separate regression on pathway features using the population indicated in the column. All models include gender, race/ethnicity/highest level of education, academic preparedness/and low-income covariates, as well as year, college, and term fixed effects. Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only main effects are shown here, but full results are available upon request. All models only include those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2015.



**TABLE B17**

Fixed effects models of ESL pathway features on achieving throughput, within 6 years—by race/ethnicity and education status

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
Student Took an Integrated Course	0.152	0.059	0.064	0.126	0.126	0.096	0.195	-0.038	0.109
	(0.069)**	(0.032)*	(0.064)	(0.104)	(0.055)**	(0.048)**	(0.065)***	(0.159)	(0.061)*
Sequence Feeds into TLE	0.048	0.115	0.184	0.361	0.131	0.197	0.061	-0.325	0.117
	(0.032)	(0.032)***	(0.048)***	(0.087)***	(0.042)***	(0.043)***	(0.158)	(0.150)**	(0.084)
Student Took Transferable ESL Course	0.205	0.168	0.249	0.131	0.222	0.191	0.195	0.206	0.188
	(0.062)***	(0.037)***	(0.052)***	(0.086)	(0.052)***	(0.046)***	(0.072)***	(0.112)*	(0.048)***
Integrated Student x Feed Direct TLE	-0.106	0.013	0.086	-0.111	-0.064	-0.051	-0.048	0.105	-0.039
	(0.076)	(0.037)	(0.077)	(0.104)	(0.071)	(0.052)	(0.065)	(0.125)	(0.048)
LBT 3 to 4	-0.154	-0.050	0.006	-0.036	-0.110	-0.062	-0.032	-0.292	-0.014
	(0.032)***	(0.030)	(0.059)	(0.087)	(0.041)***	(0.030)**	(0.054)	(0.141)**	(0.063)
LBT 5 to 12	-0.212	-0.021	-0.035	0.035	-0.167	-0.067	-0.167	-0.281	-0.001
	(0.052)***	(0.034)	(0.072)	(0.090)	(0.053)***	(0.035)*	(0.065)**	(0.159)*	(0.069)
LBT 3 to 4 x Integrated Student	0.011	-0.003	-0.012	0.037	-0.008	0.003	-0.128	0.111	0.001
	(0.026)	(0.028)	(0.053)	(0.069)	(0.030)	(0.023)	(0.052)**	(0.108)	(0.060)
LBT 5 to 12 x Integrated Student	-0.072	-0.086	-0.066	-0.148	-0.062	-0.089	-0.132	-0.037	-0.107
	(0.042)*	(0.031)***	(0.063)	(0.072)**	(0.040)	(0.027)***	(0.057)**	(0.134)	(0.057)*
LBT 3 to 4 x Direct TLE	-0.011	-0.100	-0.131	-0.165	-0.055	-0.109	-0.064	-0.029	-0.081
	(0.028)	(0.027)***	(0.049)***	(0.084)*	(0.041)	(0.027)***	(0.061)	(0.091)	(0.058)
LBT 5 to 12 x Direct TLE	0.006	-0.099	-0.116	-0.237	-0.028	-0.123	0.015	0.022	-0.130
	(0.052)	(0.031)***	(0.051)**	(0.084)***	(0.049)	(0.036)***	(0.070)	(0.106)	(0.062)**

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
LBT 3 to 4 x Transferable ESL	0.068	0.019	-0.018	0.105	0.068	0.061	0.025	0.002	0.019
	(0.038)*	(0.029)	(0.049)	(0.091)	(0.039)*	(0.029)**	(0.064)	(0.099)	(0.048)
LBT 5 to 12 x Transferable ESL	0.022	-0.055	-0.113	0.159	-0.017	-0.004	0.028	-0.123	-0.065
	(0.053)	(0.035)	(0.057)*	(0.095)*	(0.050)	(0.041)	(0.070)	(0.114)	(0.048)
Constant	0.224	0.001	-0.062	0.010	0.105	0.091	0.101	0.497	0.065
	(0.074)***	(0.044)	(0.066)	(0.128)	(0.057)*	(0.065)	(0.170)	(0.193)**	(0.099)
Obs	30,069	15,478	12,017	1,434	23,529	23,564	2,939	1,234	3,937
R-squared	0.255	0.188	0.273	0.287	0.257	0.228	0.248	0.363	0.245

SOURCES: Author calculations from COMIS data.

NOTES: Each column is a separate regression on pathway features using the population indicated in the column. All models include gender, race/ethnicity/highest level of education, academic preparedness/and low-income covariates, as well as year, college, and term fixed effects. Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only main effects are shown here, but full results are available upon request. All models only include those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2012.

**TABLE B18**

Fixed effects models of ESL pathway features on accumulating transfer credits, within 6 years—by race/ethnicity and education status

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
Student Took an Integrated Course	3.623	2.232	2.112	4.193	3.088	1.510	12.256	5.308	11.316
	(2.512)	(2.144)	(3.873)	(6.801)	(2.234)	(2.817)	(4.649)***	(10.101)	(6.366)*
Sequence Feeds into TLE	-3.818	10.833	-2.114	10.841	-5.361	17.051	27.425	2.615	13.732
	(1.141)***	(2.329)***	(3.406)	(6.601)	(2.196)**	(3.574)***	(6.426)***	(18.043)	(10.096)
Student Took Transferable ESL Course	7.975	8.587	12.208	16.721	7.723	8.792	11.902	13.850	9.389
	(2.650)***	(2.143)***	(3.255)***	(6.986)**	(2.796)***	(2.604)***	(3.840)***	(10.638)	(4.174)**
Integrated Student x Feed Direct TLE	-0.671	-0.316	-0.014	-6.724	-1.868	-0.817	-2.976	0.010	-4.285
	(2.664)	(2.384)	(3.221)	(6.678)	(2.278)	(2.883)	(4.772)	(8.278)	(4.641)
LBT 3 to 4	-5.124	-0.695	-2.366	7.717	-5.892	-0.151	2.196	-11.071	3.764
	(1.343)***	(1.742)	(4.321)	(6.942)	(2.091)***	(2.192)	(4.856)	(11.508)	(5.726)
LBT 5 to 12	-10.929	-4.206	-4.473	-1.106	-10.376	-5.391	0.875	-3.848	0.718
	(2.501)***	(1.927)**	(4.872)	(7.961)	(3.191)***	(2.702)**	(6.752)	(13.014)	(6.668)
LBT 3 to 4 x Integrated Student	0.283	0.717	2.629	-0.435	1.564	0.908	-6.176	1.040	-4.408
	(1.125)	(1.774)	(1.832)	(5.641)	(1.037)	(1.529)	(3.042)**	(6.789)	(4.258)
LBT 5 to 12 x Integrated Student	1.222	5.388	-1.213	3.488	0.425	2.151	-1.928	2.404	-2.447
	(2.159)	(2.075)**	(3.011)	(6.229)	(2.395)	(1.901)	(4.971)	(7.099)	(4.611)
LBT 3 to 4 x Direct TLE	0.870	-5.309	-2.809	-6.309	-0.615	-5.420	-1.528	8.839	-4.775
	(1.176)	(1.542)***	(3.742)	(6.405)	(1.831)	(1.891)***	(4.017)	(7.618)	(4.393)
LBT 5 to 12 x Direct TLE	0.560	-7.709	-2.460	-7.904	-0.375	-4.977	-4.825	1.554	-12.501
	(1.750)	(2.752)***	(4.261)	(7.754)	(2.474)	(2.454)**	(5.560)	(9.086)	(5.470)**

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
LBT 3 to 4 x Transferable ESL	2.443	5.196	-0.211	0.670	3.930	3.380	2.053	2.366	1.895
	(1.355)*	(1.544)***	(2.838)	(6.416)	(1.502)**	(1.288)**	(3.901)	(9.588)	(4.260)
LBT 5 to 12 x Transferable ESL	5.646	7.154	4.798	7.338	8.043	6.396	3.222	3.072	9.386
	(2.267)**	(2.402)***	(3.301)	(7.422)	(2.653)***	(2.332)***	(3.878)	(10.405)	(3.931)**
Constant	72.884	55.723	63.909	41.321	73.197	51.103	39.236	54.144	35.756
	(2.767)***	(2.937)***	(5.252)***	(9.969)***	(3.114)***	(4.448)***	(6.725)***	(21.024)**	(11.426)***
Obs	29,525	14,915	11,729	1,367	23,088	23,066	2,851	1,178	3,739
R-squared	0.117	0.100	0.156	0.297	0.114	0.126	0.150	0.259	0.149

SOURCES: Author calculations from COMIS data.

NOTES: All models include gender, race/ethnicity/highest level of education, academic preparedness/and low-income covariates, as well as year, college, and term fixed effects. Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only main effects are shown here, but full results are available upon request. All models only include those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2012.

**TABLE B19**

Fixed effects models of ESL pathway features on degree-attainment, within 6 years—by race/ethnicity and education status

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
Student Took an Integrated Course	0.013	0.043	-0.026	0.104	0.037	0.013	0.131	-0.073	-0.010
	(0.050)	(0.024)*	(0.047)	(0.054)*	(0.038)	(0.042)	(0.049)***	(0.104)	(0.046)
Sequence Feeds into TLE	-0.057	0.056	0.016	0.011	-0.010	0.079	0.072	-0.346	0.009
	(0.048)	(0.033)*	(0.048)	(0.048)	(0.038)	(0.050)	(0.068)	(0.130)***	(0.068)
Student Took Transferable ESL Course	0.144	0.051	0.149	0.099	0.175	0.081	0.094	0.030	0.137
	(0.047)***	(0.026)*	(0.038)***	(0.054)*	(0.035)***	(0.025)***	(0.050)*	(0.113)	(0.039)***
Integrated Student x Feed Direct TLE	0.076	0.028	0.039	0.018	0.020	0.038	-0.084	0.190	0.084
	(0.065)	(0.035)	(0.043)	(0.042)	(0.044)	(0.049)	(0.057)	(0.091)**	(0.040)**
LBT 3 to 4	-0.032	-0.026	0.012	0.067	0.014	-0.012	-0.135	-0.140	-0.002
	(0.040)	(0.030)	(0.049)	(0.055)	(0.037)	(0.028)	(0.051)**	(0.132)	(0.054)
LBT 5 to 12	-0.057	-0.025	-0.063	0.091	-0.018	-0.027	-0.213	-0.232	-0.005
	(0.063)	(0.030)	(0.056)	(0.053)*	(0.049)	(0.034)	(0.061)***	(0.139)*	(0.063)
LBT 3 to 4 x Integrated Student	0.015	0.009	0.028	-0.085	-0.016	0.018	0.001	-0.102	0.018
	(0.022)	(0.023)	(0.032)	(0.050)*	(0.019)	(0.020)	(0.038)	(0.069)	(0.040)
LBT 5 to 12 x Integrated Student	-0.045	-0.045	0.028	-0.114	-0.054	-0.031	-0.011	0.002	0.016
	(0.036)	(0.025)*	(0.038)	(0.051)**	(0.033)*	(0.024)	(0.044)	(0.072)	(0.043)
LBT 3 to 4 x Direct TLE	0.067	-0.035	-0.015	-0.068	0.023	-0.029	0.121	0.246	0.039
	(0.034)*	(0.022)	(0.048)	(0.050)	(0.030)	(0.023)	(0.045)***	(0.079)***	(0.046)
LBT 5 to 12 x Direct TLE	0.042	-0.019	0.016	-0.131	0.029	-0.040	0.164	0.167	-0.027
	(0.047)	(0.028)	(0.054)	(0.051)**	(0.036)	(0.026)	(0.054)***	(0.086)*	(0.054)

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
LBT 3 to 4 x Transferable ESL	-0.046	0.028	-0.052	0.024	-0.053	0.013	0.025	0.061	-0.058
	(0.051)	(0.034)	(0.037)	(0.058)	(0.038)	(0.030)	(0.048)	(0.113)	(0.043)
LBT 5 to 12 x Transferable ESL	-0.020	0.005	-0.081	-0.004	-0.073	0.013	0.021	0.124	-0.051
	(0.053)	(0.029)	(0.041)*	(0.071)	(0.040)*	(0.031)	(0.057)	(0.116)	(0.045)
Constant	0.203	0.002	0.003	0.039	0.132	0.039	0.015	0.358	0.023
	(0.046)***	(0.035)	(0.055)	(0.068)	(0.042)***	(0.050)	(0.084)	(0.169)**	(0.073)
Obs	30,069	15,478	12,017	1,434	23,529	23,564	2,939	1,234	3,937
R-squared	0.127	0.093	0.096	0.180	0.122	0.102	0.143	0.167	0.139

SOURCES: Author calculations from COMIS data.

NOTES: Each column is a separate regression on pathway features using the population indicated in the column. All models include gender, race/ethnicity/highest level of education, academic preparedness/and low-income covariates, as well as year, college, and term fixed effects. Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only main effects are shown here, but full results are available upon request. All models only include those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2012.

**TABLE B20**

Fixed effects models of ESL pathway features on transfer to a four-year college, within 6 years—by race/ethnicity and education status

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
Student Took an Integrated Course	-0.012	-0.006	0.031	0.002	0.023	-0.004	0.064	-0.044	0.010
	(0.030)	(0.023)	(0.046)	(0.056)	(0.023)	(0.042)	(0.065)	(0.087)	(0.042)
Sequence Feeds into TLE	-0.007	0.036	0.045	0.047	0.012	0.065	-0.010	0.031	0.107
	(0.016)	(0.023)	(0.031)	(0.136)	(0.023)	(0.020)***	(0.178)	(0.070)	(0.033)***
Student Took Transferable ESL Course	-0.007	0.029	0.070	0.053	0.005	0.054	-0.040	-0.044	0.021
	(0.021)	(0.014)**	(0.029)**	(0.041)	(0.018)	(0.014)***	(0.036)	(0.084)	(0.031)
Integrated Student x Feed Direct TLE	0.033	0.008	0.005	0.025	0.006	0.020	-0.046	0.037	-0.018
	(0.029)	(0.018)	(0.037)	(0.043)	(0.025)	(0.040)	(0.061)	(0.051)	(0.028)
LBT 3 to 4	-0.056	-0.002	0.039	0.023	-0.024	0.015	-0.030	-0.028	0.004
	(0.020)***	(0.018)	(0.048)	(0.080)	(0.025)	(0.024)	(0.050)	(0.086)	(0.043)
LBT 5 to 12	-0.158	-0.025	0.000	-0.021	-0.107	-0.034	-0.062	-0.048	-0.044
	(0.034)***	(0.019)	(0.046)	(0.077)	(0.032)***	(0.027)	(0.056)	(0.084)	(0.044)
LBT 3 to 4 x Integrated Student	-0.018	-0.005	-0.044	-0.085	-0.037	-0.014	-0.041	0.002	-0.006
	(0.017)	(0.014)	(0.024)*	(0.055)	(0.020)*	(0.014)	(0.040)	(0.072)	(0.043)
LBT 5 to 12 x Integrated Student	-0.014	-0.008	-0.050	-0.041	-0.023	-0.040	-0.076	0.038	-0.003
	(0.018)	(0.017)	(0.022)**	(0.055)	(0.018)	(0.017)**	(0.040)*	(0.072)	(0.042)
LBT 3 to 4 x Direct TLE	-0.027	-0.017	-0.056	-0.030	-0.008	-0.069	-0.073	-0.071	-0.063
	(0.017)	(0.014)	(0.039)	(0.083)	(0.019)	(0.021)***	(0.044)	(0.050)	(0.036)*
LBT 5 to 12 x Direct TLE	-0.006	-0.006	-0.031	-0.083	0.019	-0.050	-0.063	-0.139	-0.082
	(0.032)	(0.016)	(0.035)	(0.077)	(0.028)	(0.027)*	(0.051)	(0.056)**	(0.034)**
LBT 3 to 4 x Transferable ESL	0.061	-0.018	-0.056	0.014	0.028	-0.009	0.099	0.066	-0.000
	(0.018)***	(0.013)	(0.025)**	(0.058)	(0.016)*	(0.019)	(0.039)**	(0.058)	(0.040)
LBT 5 to 12 x Transferable ESL	0.062	-0.013	-0.059	-0.030	0.023	-0.022	0.063	0.108	0.017
	(0.021)***	(0.015)	(0.027)**	(0.063)	(0.019)	(0.016)	(0.040)	(0.093)	(0.036)
Constant	0.196	0.070	0.078	-0.003	0.140	0.140	0.305	0.126	0.146
	(0.031)***	(0.031)**	(0.052)	(0.144)	(0.034)***	(0.029)***	(0.185)	(0.109)	(0.035)***

	Asian-PI	Latino	White	Black	Foreign HS	HS Diploma	GED or Equivalent	Adult Ed	Non HS graduate
Obs	30,069	15,478	12,017	1,434	23,529	23,564	2,939	1,234	3,937
R-squared	0.178	0.049	0.133	0.168	0.155	0.147	0.162	0.170	0.146

SOURCES: Author calculations from COMIS data.

NOTES: Each column is a separate regression on pathway features using the population indicated in the column. All models include gender, race/ethnicity/highest level of education, academic preparedness/and low-income covariates, as well as year, college, and term fixed effects. Reference categories: Asian, foreign HS, permanent resident, non-traditional student, one/two levels below transfer. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only main effects are shown here, but full results are available upon request. All models only include those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2012.



**TABLE B21**

Wald chi-square test across race/ethnic groups, by ESL pathway feature and outcome

Throughput (3-Year)	Throughput (6-Year)	Proportion Transfer Credits	Transfer to 4-Year	Degree Attainment
<b>Integration</b>				
Asian/Black (2.75) (0.0973)*				White/Black (5.01) (0.0252)**
Latino/Black (4.92) (0.0266)**				
<b>Direct TLE</b>				
Asian/Black (9.57) (0.0020)***	Asian/Latino (4.06) (0.0439)**	Asian/Latino (37.17) (0.0000)***	Asian/White (3.01) (0.0826)*	Asian/Latino (6.64) (0.0100)***
Latino/Black (14.35) (0.0002)***	Asian/Black (14.83) (0.0001)***	Asian/Black (5.41) (0.0201)**		
White/Black (12.95) (0.0003)***	Asian/White (8.59) (0.0034)***	Latino/White (9.01) (0.0027)***		
	Latino/Black (10.63) (0.0011)***			
	White/Black (4.30) (0.0381)**			
<b>Transfer ESL</b>				
Asian/Black (3.68) (0.0550)*			Asian/Latino (3.18) (0.0747)*	Asian/Latino (4.28) (0.0387)**
Latino/Black (3.69) (0.0547)**			Asian/White (6.97) (0.0083)***	Latino/White (4.81) (0.0283)**
White/Black (7.70) (0.0055)***				

NOTES: Each column represents an outcome, and each row header indicates the pathway feature within which we compare race/ethnic group coefficients. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only statistically significant results are shown, but full results are available upon request. Throughput (3-Year) includes those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2015; all other outcomes are that between 2010 and 2012.

**TABLE B22**

Wald chi-square test across prior education groups, by ESL pathway feature and outcome

Throughput (3-Year)	Throughput (6-Year)	Proportion Transfer Credits	Transfer to 4-Year	Degree Attainment
<b>Integration</b>				
Foreign/AdultEd (6.29) (0.0122)**		Foreign/GED (3.90) (0.0483)**		Foreign/GED (2.89) (0.0892)*
HS/AdultEd (7.32) (0.0068)***		HS/GED (7.40) (0.0065)***		HS/GED (6.10) (0.0135)**
GED/AdultEd (6.33) (0.0119)**				GED/AdultEd (4.79) (0.0286)**
Adult Ed/Non HS Grad (4.79) (0.0285)**				GED/NonHS Grad (6.48) (0.0109)**
<b>Direct TLE</b>				
Foreign/HS (4.33) (0.0373)**	Foreign/AdultEd (9.15) (0.0025)***	Foreign/HS (21.63) (0.0000)***	Foreign/HS (4.38) (0.0363)**	Foreign/HS (2.98) (0.0845)*
Foreign/GED (3.71) (0.0539)*	HS/AdultEd (12.58) (0.0004)***	Foreign/GED (21.19) (0.0000)***	Foreign/NonHS (8.18) (0.0042)***	Foreign/AdultEd (6.80) (0.0091)***
HS/AdultEd (4.28) (0.0385)**	AdultEd/NonHS (8.63) (0.0033)***	Foreign/NonHS (3.95) (0.0468)**		HS/AdultEd (10.71) (0.0011)***
GED/AdultEd (4.43) (0.0354)**		HS/GED (3.15) (0.0758)*		GED/AdultEd (10.92) (0.0010)***
				AdultEd/NonHS (9.21) (0.0024)***
<b>Transfer ESL</b>				
Foreign/HS (4.68) (0.0305)**			Foreign/HS (5.94) (0.0148)**	Foreign/HS (16.07) (0.0001)***
Foreign/NonHS (3.29) (0.0697)*			HS/GED (7.97) (0.0047)***	Foreign/GED (3.53) (0.0602)*
HS/GED (6.35) (0.0117)**				Foreign/AdultEd (2.78) (0.0955)*
GED/NonHS (3.40) (0.0650)*				

NOTES: Each column represents an outcome, and each row header indicates the pathway feature within which we compare race/ethnic group coefficients. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Only statistically significant results are shown, but full results are available upon request. Throughput (3-Year) includes those students enrolled in ESL pathways in our catalog scan and enrolled in college for the first time between 2010 and 2015; all other outcomes are that between 2010 and 2012.



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