

Bridge to Finish Outcome Study Technical Appendix



Data

The dataset used in this report was created by combining Bridge to Finish intervention records, provided by the United Way of King County (UWKC), with student information provided by the State Board for Community and Technical Colleges (SBCTC). The intervention records span the terms from summer 2018 through fall 2021. SBCTC data include these terms, as well as records for winter 2022 so that retention from the fall 2021 term could be determined. An anonymous student identification number, hereafter referred to as the 'StudentId,' was created for joining the data files. Some of the input files were aggregated or summarized prior to being joined to other files. The result is an analysis file with one record per student, college, and term.

There were 75,907 intervention records for 11,770 students (i.e., distinct StudentIds). Many students received more than one intervention per term at a college and therefore have multiple records per college/term. Twenty-five distinct kinds of interventions are reported, and these were grouped into fourteen intervention types. Intervention records were then aggregated by student/college/term to indicate which intervention types a student received at a college for each term of enrollment.

The core of the student data received from SBCTC is a pair of term files with demographic and enrollment data. There is one file for Bridge to Finish participants and another with the same variables for non-participants. These files have one record per student/college/term.

There are 3,381 StudentIds on the intervention file that were not on the SBCTC participant term file, resulting in missing records for 28.7% of the distinct StudentIds in the intervention file. This resulted in the exclusion from the analysis of 15,840 intervention records. The exclusions were spread across all colleges but ranged from a low of about 9% of intervention records to a high of almost 49% of intervention records. The exclusions were also spread across all the terms from summer 2018 through fall 2021, ranging from a low of approximately 8% to a peak of almost 38% (Table 1). The trend was for exclusions to increase with time (as did caseload), albeit unsteadily, with the highest percent of missing StudentIds in fall term 2021.

Table 1. Intervention and Academic Data Match Rate Over Time

	Missing Student Identification Number			
	No		Yes	
	Number	Percent	Number	Percent
<i>Term</i>				
Summer 2018	207	92.0%	18	8.0%
Fall 2018	2,551	92.1%	219	7.9%
Winter 2019	4,370	90.0%	485	10.0%

Spring 2019	5,921	90.5%	622	9.5%
Summer 2019	1,535	81.6%	345	18.4%
Fall 2019	5,500	88.5%	712	11.5%
Winter 2020	4,487	82.8%	935	17.2%
Spring 2020	1,139	91.2%	110	8.8%
Summer 2020	161	72.5%	61	27.5%
Fall 2020	3,516	87.5%	502	12.5%
Winter 2021	5,583	81.2%	1,293	18.8%
Spring 2021	8,779	77.3%	2,579	22.7%
Summer 2021	7,457	74.1%	2,605	25.9%
Fall 2021	8,861	62.3%	5,354	37.7%
Total	60,067	79.1%	15,840	20.9%

Additional exclusions were made when joining the intervention records and student term records. Term records for three students were excluded because the StudentId was missing and records for another 10 students were excluded because there was not a one-to-one match on the term file between the anonymous StudentId (used to join to intervention records to student term records) and the SBCTC student identification number. Key aspects of the analysis require determining the first intervention term of students. There were 974 students for whom there was not a matching student term record for their first intervention term. The records for these students were also excluded from the final dataset. The final dataset includes 46,871 records for 7,396 students participating in the Bridge to Finish program. There are an additional 820,968 records for 257,352 non-participants, bringing the total record count to 867,839.

SBCTC data on term credits and credential completion was also available for both participants and non-participants. The credential data indicated whether students completed a program during a term that resulted in the formal award of any of the six types of credentials listed in Table 2 in order from lowest to highest level. When students completed more than one credential in a term, the credential selected for inclusion in the dataset was the one with the highest level.

Table 2. Types of Credentials

Non-credit completions
Pre-college completions
Certificate
Apprenticeship
Associate degree
Bachelor's degree

Students were counted as retained to the next term under two conditions: 1) the student enrolled again in the very next term, and 2) the student was enrolled in a spring term, skipped the following summer term, and enrolled again the next fall term. Students were counted as having received a credential for a term if they completed a program during that term. In some cases, a completed program is the end of a student's community college career. However, students might continue

enrollment after a completion either to take additional courses of interest or to pursue additional credentials. Hence, students might be counted both as having a completion during a term and as being retained to the next term. A key indicator in the analysis is whether a student was retained to the next term **or** completed a program during the term of record. Because students may do both, the sum of the counts of retained students and students with completions will exceed the count of students who were retained **or** completed. In the latter case, students who were retained to the next term and who also completed a program are counted only once.

Methods

In addition to basic descriptive statistics to give an overview of the services provided by the Bridge to Finish program and highlight characteristics of the participants and non-participants included in our analyses, the study included two main categories of analyses: a sequence analysis to explore how and when students participate, and an outcome analysis to assess the extent to which participation is associated with key academic outcomes.

Sequence Analysis

The sequence analysis is a form of analysis typically used on longitudinal data that can visualize the different changes (or states) over time. In regard to this study, sequence analysis was used to visualize the change in services received over time. At the first step the research team created variables for each quarter that identified if a participant received any service. The research team then created a variable to identify how many terms the participant received services consecutively. This allowed the research team to identify the most common sequences:

1. Participants who accessed services in one term only (67%)
2. Participants who accessed services in two or more consecutive terms (25%)
3. Participants who accessed services in two or more non-consecutive terms (8%)

Outcome Analysis

Main Outcome Analysis

The main outcome analysis assessed the association between program participation and probability of academic outcomes:

- Persistence through or completion before the next academic term
- Persistence through or completion before the next fall term

As a first step, the research team graphed *unadjusted* (i.e., not controlling for differences in the composition of the two groups) rates of persistence and completion for both Bridge to Finish participants and non-participants across terms. Then, an associational analysis was used to adjust the predicted odds of key outcomes for both participants and non-participants to take into account

differences in composition between the two groups. The data did not include information on important student characteristics that may matter for academic outcomes, such as motivation, resilience, experience with hardship and adversity in childhood, and interactions with school personnel. However, the data did include information on some factors that can provide insights into past academic achievement (e.g., number of prior credits and prior education status), possible experiences with systemic exclusion, adversity, or oppression (e.g., being a member of a racial/ethnic identity, being non-male, speaking English as a second language), and personal and familial capital and/or burden (e.g., parenting status, veteran status, Pell receipt).

The analysis focused on outcomes following a participant's first term in which they received Bridge to Finish services, to avoid confounding the effects of multiple terms of service receipt, and to understand the association of first service receipt with outcomes. A sample of non-participants was defined by randomly selecting one term for each non-participant. This step was taken to ensure that each student only had one focal term included in the analysis data set. The focal term for participants is easily identifiable since it is their first term of participation, though not necessarily their first term of school enrollment. However, for non-participants, there is no obvious criteria to select a focal term. For example, if we selected the first term for non-participants, we would oversample students who were just starting school, and if we include the last term, we would likely have a non-participant sample that may be further along in their academic trajectories. Selecting a random term for each non-participant allows us to create more balance across terms and produce an analytic comparison sample that is more like the participant sample. We use a covariate adjusted logistic regression technique, called variable importance analysis, which provides information on the extent to which a factor of interest (e.g., participation in Bridge to Finish) is associated with an outcome of interest (e.g., persistence and/or completion) after controlling for other factors (e.g., age, education history, etc.).

Association of Specific Services with Outcomes

Variable importance analysis was also used to assess the extent to which *specific services* were associated with successful outcomes among Bridge to Finish participants. This analysis focuses on the primary outcome of persistence through or completion before the next academic term. Service types are grouped into six main categories that were most frequently used: financial coaching, food access, benefits access and/or tax preparation support, support in paying for school, emergency grants, and housing support. Note the services are categorized based on the type of challenge addressed (e.g., housing or food instability) and not by the specific service type offered (e.g., information provided, grant, referral).

To disentangle the association of each individual service with our main outcome from the association of using multiple services combined, we limit this analysis to a comparison of participants who *only* received one *type* of service during their first term of participation (though they may have received this type of service multiple times) and compare them to non-participants who did not receive any services while controlling for all characteristics available in the data. Then separately, outcomes among participants who received multiple services were also compared to those among non-participants.

A sensitivity analysis was included to explore how participants who receive a specific service compare to all other participants. This analysis was limited to only Bridge to Finish participants. Results aligned

with those in the aforementioned analysis.

Additional Analyses

- In addition to our primary outcome which assesses the association of participation with likelihood of persisting through and/or completing by the following term, and our longer-term outcome which examines persistence and completion in the following fall term, we also examined two measures of credit accumulation: a measure of whether a student receives at least one credit in the term and a measure of whether the student receives six or more credits during the term. The one-credit threshold captures whether students are earning any credits at all, and the six-credit outcome captures whether students received a half-time course load worth of credits. For the purposes of awarding federal and state financial aid, a full-time student is enrolled for 12 or more credits per quarter, so a half-time course load would be 6 credits.

- Sub-analyses to assess the extent to which the association between participation and persistence and/or completion was also conducted to compare:
 - Pre-COVID vs. post-COVID periods
 - Student characteristics, including:
 - Race and/or ethnicity
 - Age
 - Parenting status
 - Prior college credits earned
 - Pell grant recipient
 - New versus transfer, continuing, or former student