

Summary: Community-Engaged Learning and Student Outcomes

Background and Methods: Community-engaged learning is an educational practice in which academic coursework is integrated with work done in partnership with nonprofit or other community groups. CEL has been shown in some higher education institutions to have a positive effect on student learning and retention. This report explores whether CEL at Salt Lake Community College leads to improved student outcomes: specifically, course grade, retention, and graduation. We investigated 12 courses that offer CEL sections, as well as in three degree programs where CEL is integrated into multiple courses (Occupational Therapy Assistant, Dental Hygiene, and Education).

Key Findings: SLCC students who have participated in CEL classes over the last eight years have outcomes that are largely similar to those of students who have not participated in CEL classes. We found no evidence that CEL students are more likely to pass the class in question, to return to SLCC in the next term, or to graduate than non-CEL students. However, we did find evidence that students who pass CEL classes tend to earn slightly higher grades than students who pass non-CEL classes.

Caveats and Recommendations: Although this study shows that CEL does not have a large quantitative effect on student outcomes at SLCC, it cannot tell us why there was a discrepancy between the lack of effect observed at SLCC and the effect observed at some other institutions. Moreover, because this study was purely quantitative, it cannot tell us anything about possible qualitative benefits of CEL. We recommend that these quantitative results be evaluated together with a qualitative assessment of CEL at SLCC (planned for fall 2022).

Introduction

Community-engaged learning (CEL), also known as service learning, is an educational practice in which academic coursework is integrated with work done in partnership with nonprofit or other community groups. CEL has been shown in some higher education institutions to have a positive effect on student learning and retention; for this reason, it is considered nationally to be a High-Impact Practice (HIP): a practice that is expected to have a substantial positive impact on student outcomes. Salt Lake Community College (SLCC) encourages faculty members to incorporate CEL into their teaching; there are now a sizeable number of courses at SLCC that include a CEL component, and in many cases have done so for years.

This report explores whether CEL courses have a measurable effect on student outcomes. Specifically, we assess the following questions, in each case comparing students enrolled in CEL courses to similar students not enrolled in such courses:

- Do students in CEL courses earn better grades?
- Are students in CEL courses more likely to return to SLCC in the next term?
- Are students in CEL courses more likely to graduate?

Datasets

COMPARISONS

We identified two sets of data for which it was possible to compare students enrolled in a CEL class and students enrolled in a similar non-CEL class:

Class-level comparison: Courses with many sections, including a robust number of both CEL and non-CEL sections. Most, but not all, are introductory courses and/or courses that fulfill a general education requirement. For this group, we can make the ideal comparison: between students enrolled in a CEL section and students enrolled in a non-CEL section of the same course in the same term.

Program-level comparison: Programs that have a CEL component in several of their courses. For three such programs (Occupational Therapy Assistant, Dental Hygiene, and Education), we were able to identify a plausible comparison group of students who did not experience CEL in their programs.

Occupational Therapy Assistant: This program has had a CEL component to many of its courses for many years. We compared its students to students in the Physical Therapy Assistant program, which has a similar structure but does not have CEL.

Dental Hygiene: This program phased in CEL in several of its courses starting in Fall 2017. We compared students who experienced CEL to earlier cohorts in the same program who did not.

Education: Three electives for this program (EDU 1400, EDU 2011, and EDU 2150) have a CEL component. We compared students in the Education program who took these courses to students in the Education program who took EDU 2010 (an elective with a similar subject but no CEL).

Table 1 lists courses that were excluded from the analysis due to the lack of a good comparison group.

Table 1: Courses excluded from this analysis. Courses with CEL sections that were excluded from this analysis because no viable comparison group was available.

Course		CEL Sections	CEL Enrollments
ANTH 2083	Primate Ecology & Ecosystems	4	35
ART 1375	Photographing Diversity	2	34
CSIS 2470	Advanced JavaScript and JSP	4	66
ENGL 1810	Mentoring Writers	3	28
HIST 2950	Archival Internship	9	49
INTR 1100	Connections to Community I	5	50
INTR 1110	Connections to Community II	5	47
INTR 2100	Connections to Community III	5	42
MATH 2010	Math for Elem. Teachers I	3	39
MATH 2020	Math for Elem. Teachers II	1	3
SW 2940	Social Work Internship	9	104
Total		50	497

MATCHING

In order to isolate the effects of CEL, we must ensure that students in the target group (enrolled in CEL) and the control group (not enrolled in CEL) are as similar as possible. For example, if students who are more academically prepared are more likely to enroll in CEL classes, then we might see better outcomes for CEL students, not because CEL has a positive effect, but because it attracts more prepared students to begin with. Anecdotally, the Engaged Learning Office believes that most students don't know in advance that they are registering for a CEL class, which makes this particular confound somewhat less of a concern. However, there is still the possibility that students in the target and control groups might differ systematically for other reasons.

To ameliorate this concern, we carried out a matching procedure: using a genetic matching algorithm, we matched each CEL student to at least one non-CEL student who was as similar as possible. ("Genetic" here refers to the procedure for finding the best overall set of matches: a widely used search algorithm inspired by chromosomal evolution.) The result was a subset of the data: the CEL students for whom we were able to find an appropriate match, and their non-CEL matches. (We lost a small amount of data — CEL students for whom no matches were available — but overall were able to preserve most of the CEL students.) We verified the similarity of the target and control groups on the following dimensions:

- Gender

- Race
- Hispanic origin
- First-generation status
- Pell eligibility
- GPA at the start of the term
- Credits earned at the start of the term
- Number of terms since the student started at SLCC

For each comparison dataset, we built a series of models, each predicting one outcome: whether or not the student passed the class, the letter grade the student received (passing grades only), whether or not the student returned to SLCC the next term, and whether or not the student has since graduated from SLCC. The predictor of interest in each model is whether the class was a CEL section; other predictors include the following:

- Term season (fall, spring, or summer)
- Whether the class occurred during the COVID-19 pandemic (defined as Spring 2020 through Fall 2021)
- Whether the class was taught online
- The course (e.g., ENGL 1010 or GEOG 1700)
- The student's gender, race, Hispanic origin, and age
- Whether the student was a first-generation college student
- Whether the student was Pell-eligible
- The number of terms elapsed since the student's first term at SLCC
- The student's GPA and credits earned before the start of the term
- The student's credit load this term

Not every predictor was included in every model, either due to insufficient data or because the predictor did not apply. (For example, course was not relevant for the program-level comparisons, where the unit of analysis was the student rather than the student's enrollment in a specific course.)

Class-level comparison

Table 2 lists the courses for which we conducted the class-level comparison. "Total" shows the total number of CEL sections for each course (and the total number of enrollments in those sections). "Comparison" shows the total number of sections (or enrollments) in the final matched dataset used for comparison; these are enrollments for which we were able to identify matching students, one in a CEL section and at least one in a non-CEL section of the same course in the same term, with similar demographic characteristics.

Table 2: Courses included in the class-level comparison.

Course		Sections			Enrollments		
		Total	Comparison		Total	Comparison	
		CEL	CEL	Non-CEL	CEL	CEL	Non-CEL
ANTH 1010	Culture & Human Experience	12	11	57	174	99	94
ART 1050	Intro to Photography	18	18	65	367	274	218
COMM 1020	Prin/Public Speaking	6	6	32	74	56	54
COMM 2150	Intercultural Commun.	24	24	35	528	354	233
ENGL 1010	Intro to Writing	33	33	482	774	701	677
ENGL 1200	Intro to Ling./Study of Lang.	1	1	1	7	2	2
ENGL 2010	Intermediate Writing	69	69	437	1,335	1,152	1,046
ENGL 2100	Technical Writing	10	10	22	204	158	117
ENGL 2250	Intro/ Imaginative Wrtg	3	2	2	70	27	17
GEOG 1700	Natural Disasters	8	8	49	221	183	157
MKTG 1030	Introduction To Marketing	83	20	5	1,576	145	35
SOC 1010	Intro to Sociology	42	42	291	1,175	890	778
Total		309	244	1,478	6,505	4,041	3,428

CLASS-LEVEL COMPARISON: GRADE

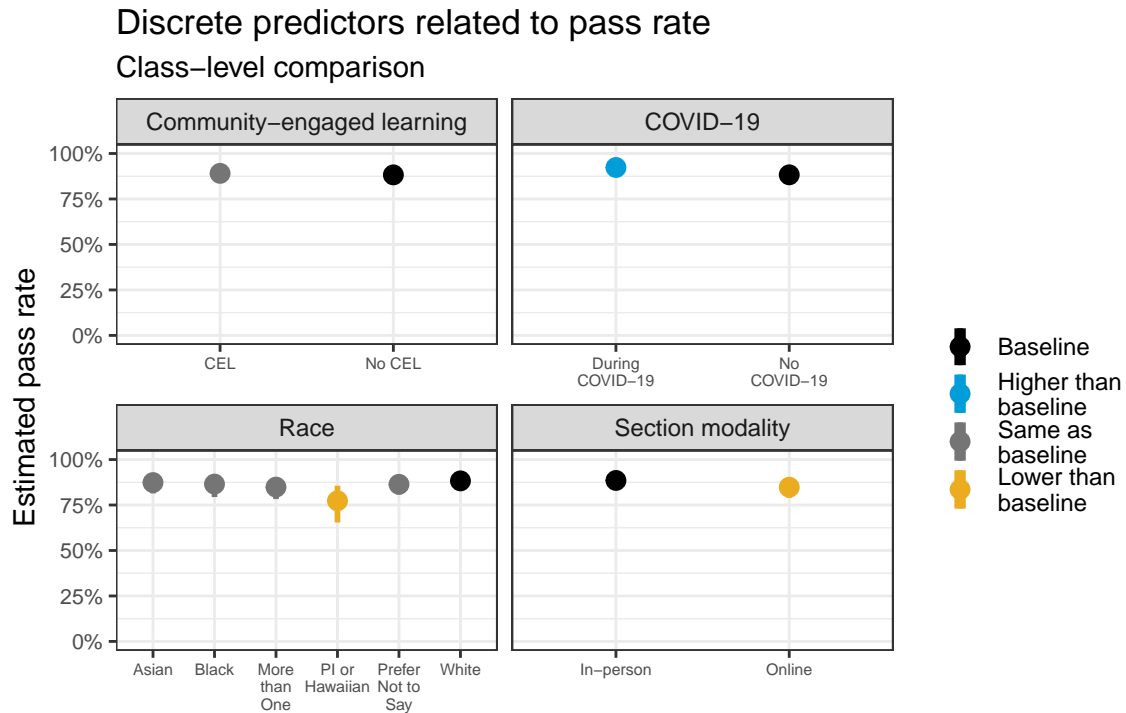


Figure 1: Discrete predictors related to pass rate in the class-level comparison. Dots show median pass rate estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

Unsurprisingly, we found a strong relationship between prior GPA and pass rates: students with a higher prior GPA were more likely to pass the class. We also found statistically reliable effects of time (pass rates were higher during the COVID-19 pandemic), race (pass rates were lower for Native Hawaiian or Pacific Islander students), and modality (pass rates were lower for online classes). However, we did not find any evidence of a difference in pass rates between CEL and non-CEL classes. Figure 1 shows estimated overall pass rates for the three statistically significant discrete predictors, as well as for the CEL predictor.

For the actual letter grade the student received, we again found the expected strong relationship with prior GPA. We also found statistically reliable effects of gender (male students received lower grades), race (Black, Native Hawaiian, and Pacific Islander students received lower grades), Pell eligibility (Pell-eligible students received lower grades), and age (younger students received lower grades). In contrast with pass rates, the CEL predictor *did* exhibit a statistically reliable relationship with grades: students in CEL classes received slightly higher grades (less than one full letter grade higher). Figure 2 shows estimated average final grades for the statistically significant discrete predictors; for this analysis, we treated age as a discrete predictor with three categories (0-22, 23-40, and 41+).

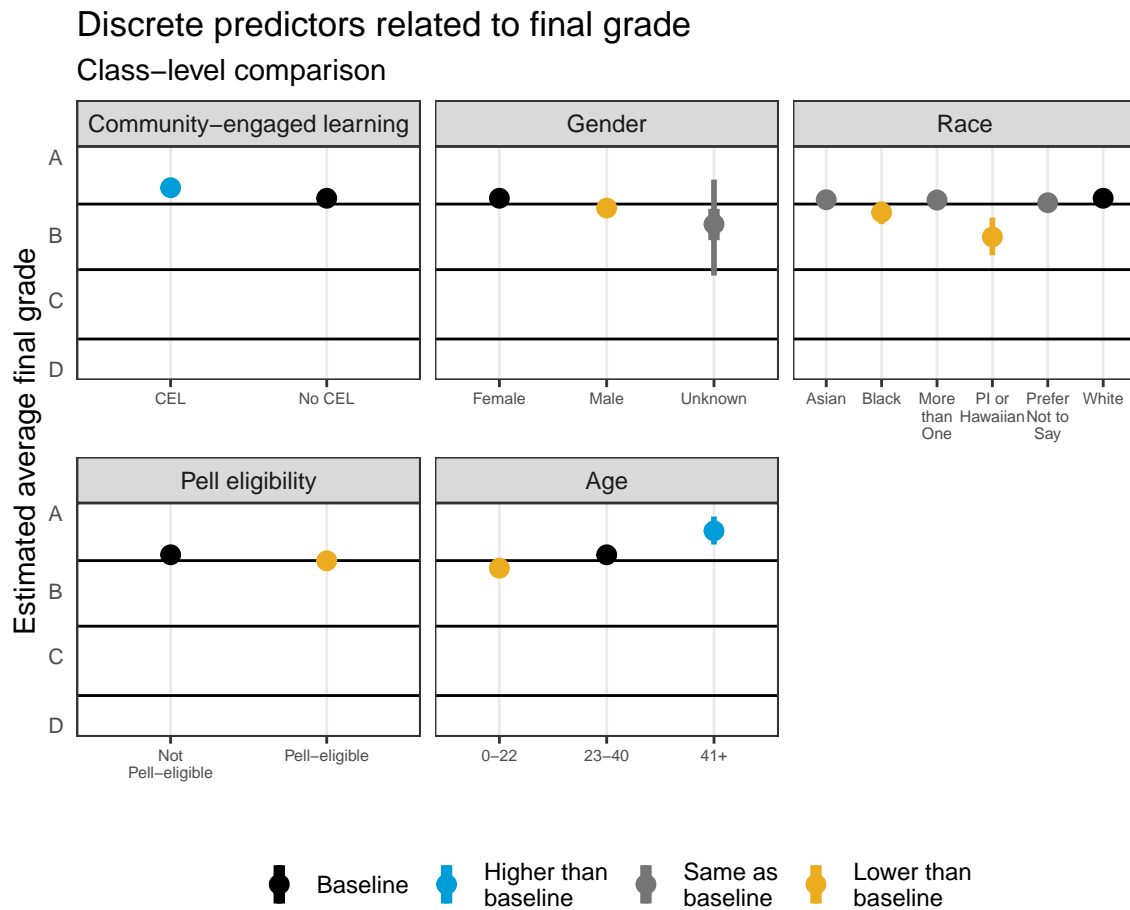


Figure 2: Discrete predictors related to final grade in the class-level comparison. Dots show median grade estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

CLASS-LEVEL COMPARISON: RETENTION

We found a strong relationship between various academic predictors and retention rates: students with a higher prior GPA, with more credits earned, and with a higher credit load were all more likely to return to SLCC the next term. We also found statistically reliable effects of time (students were less likely to return during the COVID-19 pandemic) and modality (students who took online classes were less likely to return). We did not find any evidence for an effect of CEL on retention. Figure 3 shows estimated overall retention rates for the two statistically significant discrete predictors and for the CEL predictor.

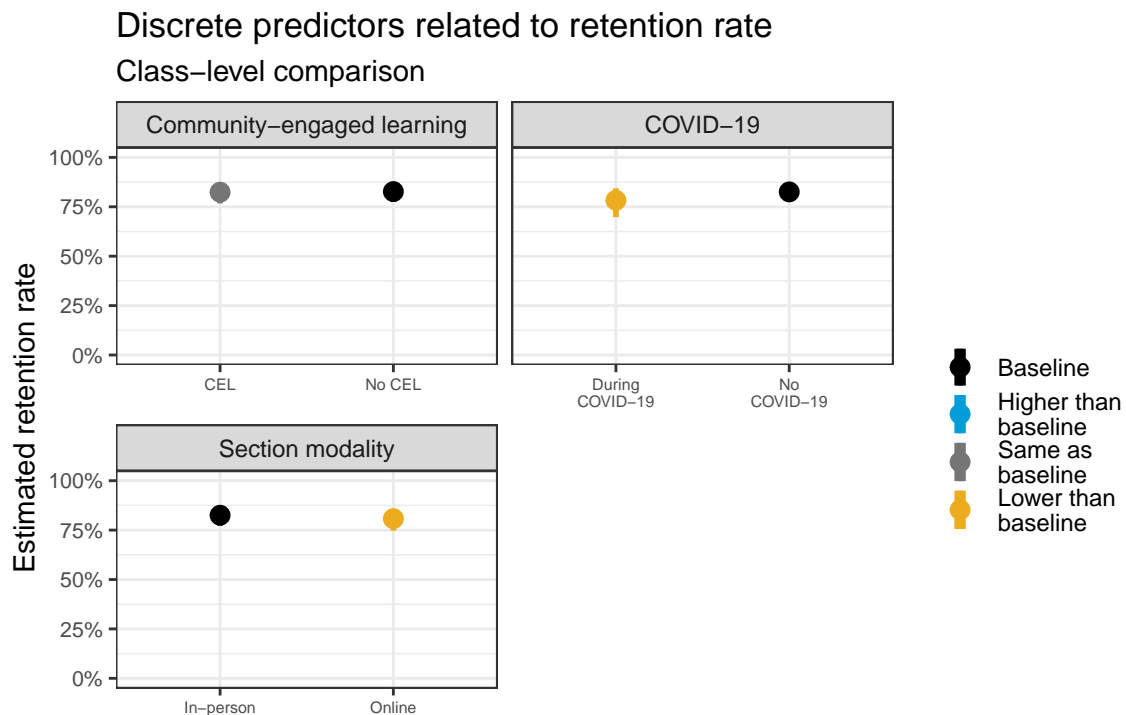


Figure 3: Discrete predictors related to retention rate in the class-level comparison. Dots show median retention rate estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

CLASS-LEVEL COMPARISON: GRADUATION

Because graduation is a long-term outcome, it is more difficult to assess than more immediate outcomes such as course grade or retention to the next term. For the class-level comparison, we determined, for each student, whether the student has graduated from SLCC since taking the class in question. We controlled for the length of time since the class and the number of credits the student already had, to account for the fact that we don't expect students to graduate until they have earned a certain number of credits. In addition to the expected effect of prior GPA (students with higher GPA were more likely to graduate), we found statistically reliable effects of time (students were less likely to graduate after the COVID-19 pandemic), gender (male students were less likely

to graduate), and race (Native Hawaiian or Pacific Islander students were less likely to graduate). We did not find any evidence for an effect of CEL on graduation. Figure 4 shows estimated overall graduation rates (since taking the class in question) for the three statistically significant discrete predictors and for the CEL predictor.

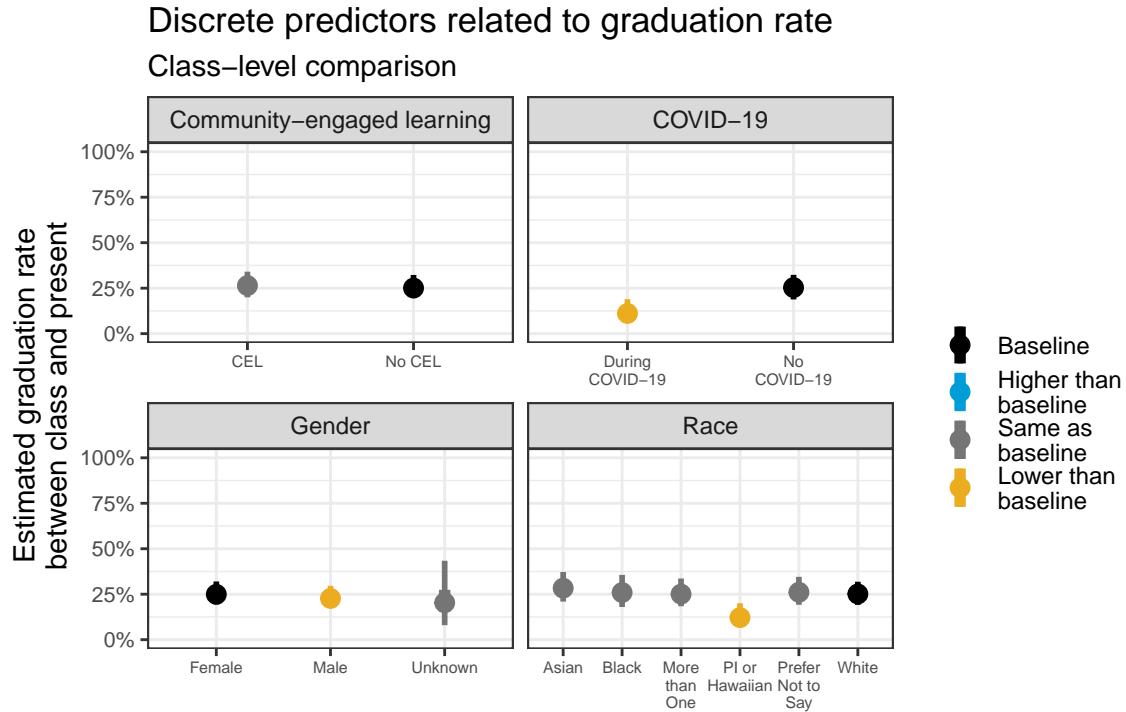


Figure 4: Discrete predictors related to graduation rate in the class-level comparison. Dots show median graduation rate estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

Program-level comparisons

Table 3 lists the programs for which we did a program-level comparison; it shows the total number of students and enrollments in the CEL and non-CEL groups. (If a student took both CEL and non-CEL classes, the student is in both groups.) The actual matched datasets are slightly smaller; we did matching separately for each outcome, and those numbers are reported below.

Table 3: Students and enrollments available for inclusion in the program-level comparison.

Program	Students		Enrollments	
	CEL	Not CEL	CEL	Not CEL
Occupational Therapy Assistant	192	348	2,435	4,490
Dental Hygiene	126	178	860	2,248
Education	751	364	1,161	383

OCCUPATIONAL THERAPY ASSISTANT

We can compare students enrolled in the Occupational Therapy Assistant program (many of whose courses involve CEL) to students enrolled in the Physical Therapy Assistant program (which does not involve CEL). It turns out that the vast majority of students in both programs pass all their classes, return each term, and graduate on time; this is excellent for the students, but for the purposes of this report, we don't have the data necessary to do a meaningful analysis of pass rates, retention rates, or graduation rates.

However, it is possible to explore whether students in CEL classes earn higher grades than students in non-CEL classes. Table 4 shows the number of students and enrollments in the matched dataset.

Table 4: Students and enrollments in the matched dataset for the Occupational Therapy Assistant comparison.

Outcome	Students		Enrollments	
	CEL	Not CEL	CEL	Not CEL
Grade	173	288	2,112	2,230

In addition to the expected relationship to prior GPA (students with higher GPA received higher grades), we found statistically reliable effects of gender (male students and students of unknown gender received lower grades), race (students who preferred not to identify a race received higher grades), and first-generation status (students of unknown status received lower grades). We also found evidence for an effect of CEL: students received higher grades in CEL classes than in non-CEL classes. Figure 5 shows estimated average final grades for the three statistically significant discrete predictors and for the CEL predictor.

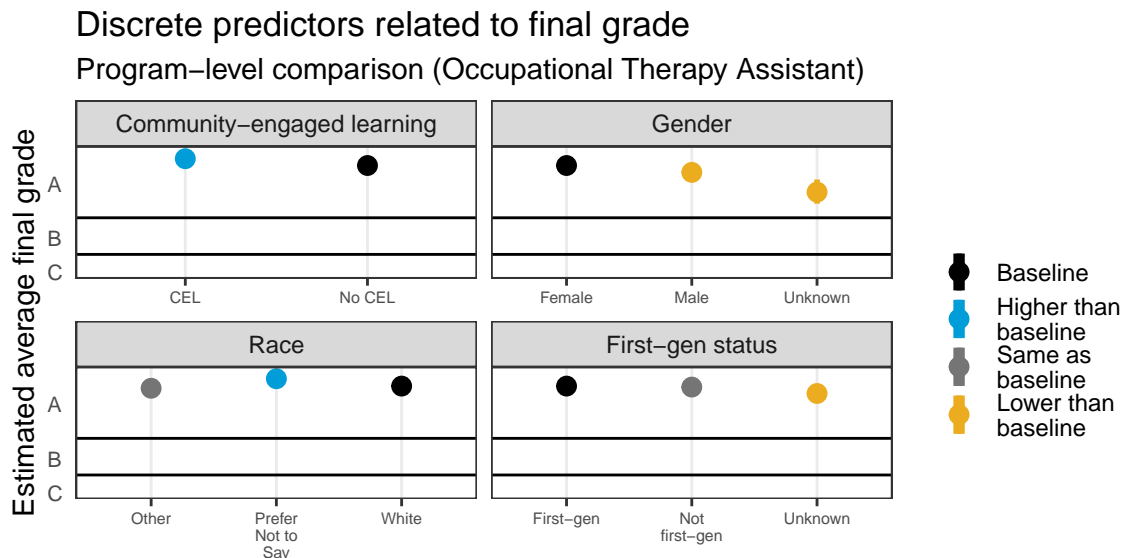


Figure 5: Discrete factors related to final grade in the Occupational Therapy Assistant comparison. Dots show median grade estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

DENTAL HYGIENE

We can compare students in the Dental Hygiene program starting in Fall 2017 (when CEL was phased in within the program) to students who started earlier. As in the Occupational Therapy Assistant and Physical Therapy Assistant programs, the vast majority of students in the Dental Hygiene program — regardless of the time period — pass all their classes, return each term, and graduate on time; therefore, we don’t have the data necessary to do a meaningful analysis of pass rates, retention rates, or graduation rates.

However, it is possible to explore whether students in CEL classes earn higher grades than students in non-CEL classes. Table 5 shows the number of students and enrollments in the matched dataset. Recall that it’s possible for a single student to be in the CEL and non-CEL groups (because even students who started after Fall 2017 took some non-CEL classes as well.)

Table 5: Students and enrollments in the matched dataset for the Dental Hygiene comparison.

Outcome	Students		Enrollments	
	CEL	Not CEL	CEL	Not CEL
Grade	122	168	836	2,008

In addition to the expected relationship to prior GPA (students with higher GPA received higher grades), we found statistically reliable effects of gender (male students received lower grades), first-generation status (non-first-gen students received higher grades), and Pell eligibility (Pell-eligible students received lower grades). However, we did not find any evidence for an effect of CEL. Figure 6 shows estimated average final grades for gender and for the CEL predictor.

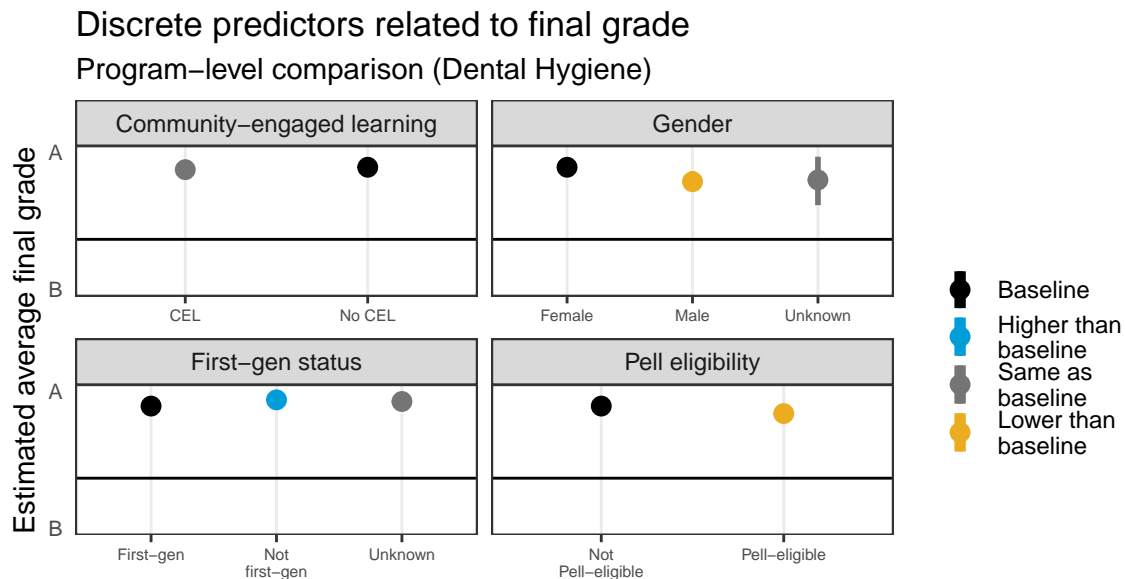


Figure 6: Discrete predictors related to final grade in the Dental Hygiene comparison. Dots show median grade estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

EDUCATION

The Education program has three elective courses that include CEL: EDU 1400 (Study of Disabilities), EDU 2011 (Inclusive Classrooms), and EDU 2150 (Intro to Multicultural Education). We can compare students in these courses to students who took the elective EDU 2010 (Intro to Special Education).

Table 6: Students and enrollments available for inclusion in the Education comparison.

Outcome	Students		Enrollments	
	CEL	Not CEL	CEL	Not CEL
Grade	452	197	652	207
Retention	335	160		

We found the expected effect of prior GPA for both pass rates and final grades: students with higher GPA were more likely to pass and received higher grades. For pass rates, there was a statistically reliable effect of Hispanic origin (Hispanic students were less likely to pass) but not of CEL. For final grades, there were statistically reliable effects for section modality (students in online sections received lower grades) and CEL (students in CEL received higher grades). Figures 7 and 8 show the estimated retention rate and average final grade, respectively, for the CEL predictor and the statistically significant discrete predictors.

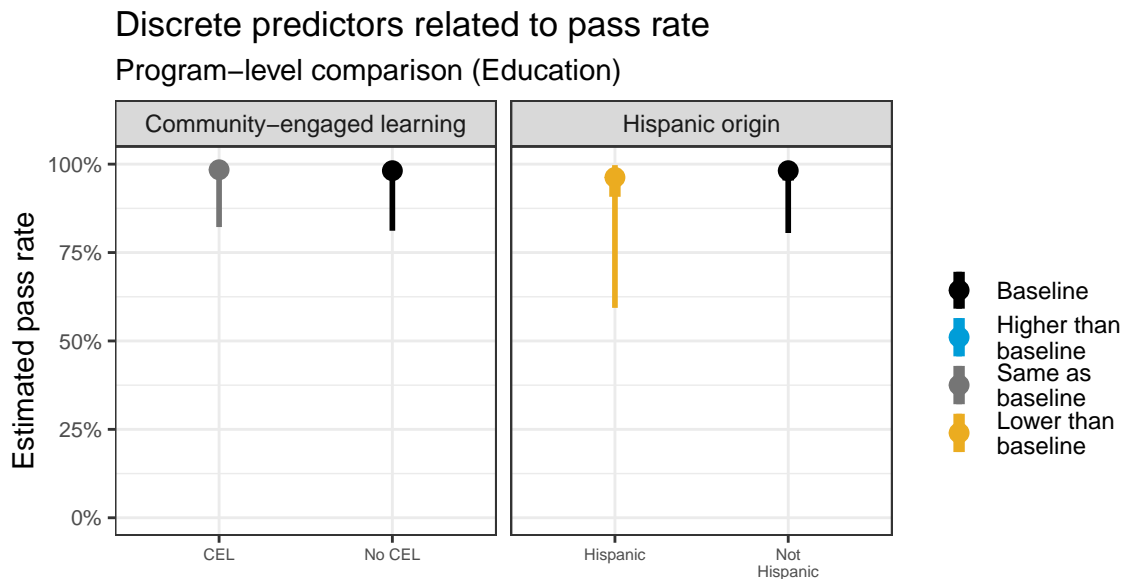


Figure 7: Discrete predictors related to pass rate in the Education comparison. Dots show median pass rate estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

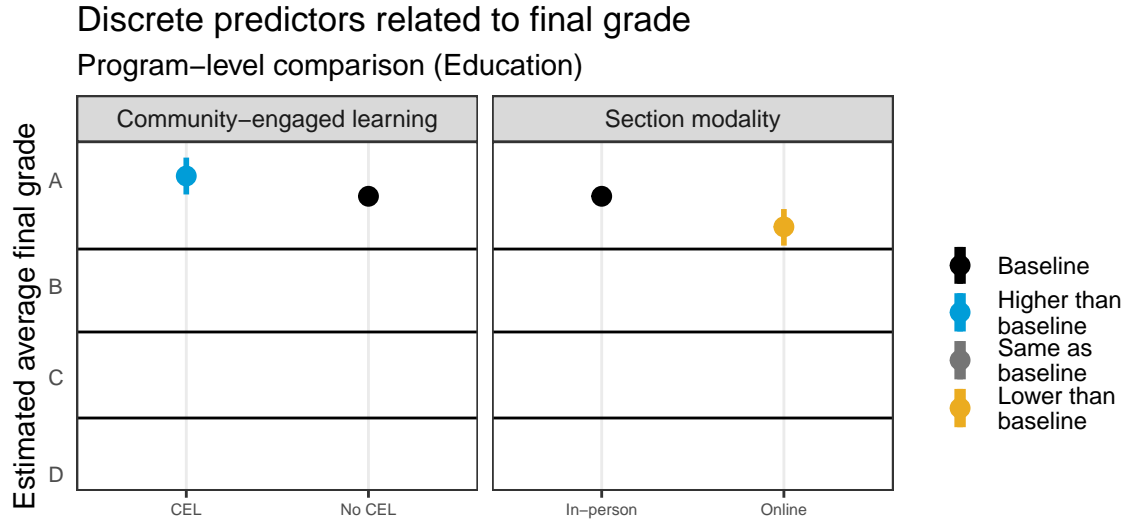


Figure 8: Discrete predictors related to final grade in the Education comparison. Dots show median grade estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

Since retention is a term-level outcome rather than a course-level outcome, we counted a student in a given term as a CEL student if the student took at least one CEL class. We found the expected relationship between retention and prior GPA (students with higher GPA were more likely to return to SLCC the next term), but no relationship with any of the discrete predictors, including CEL. Figure 9 shows the estimated retention rate by CEL.

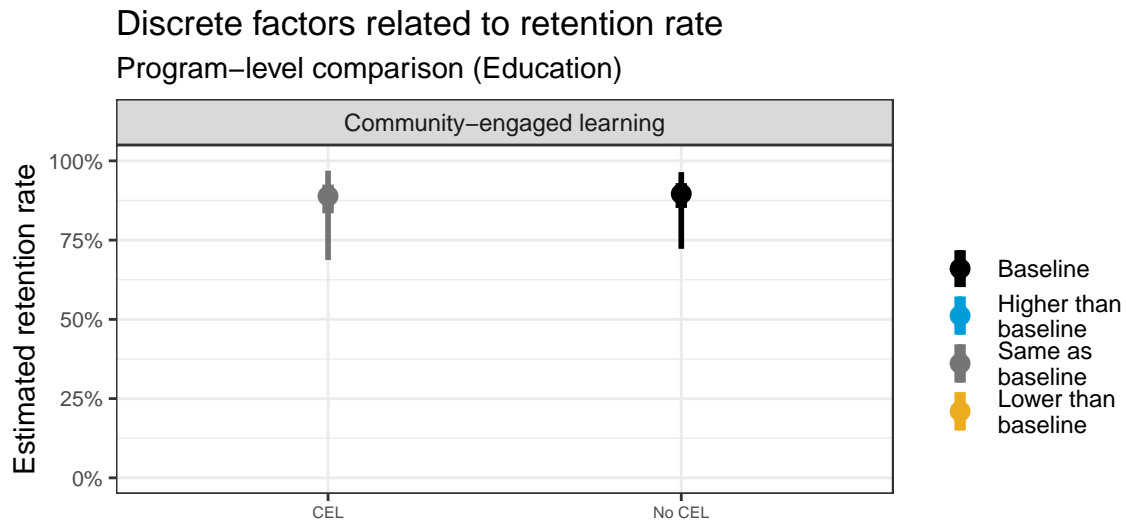


Figure 9: Discrete predictors related to retention rate in the Education comparison. Dots show median retention rate estimates for each group of students. Thick and thin lines show 50% and 95% confidence intervals, respectively.

We were unable to analyze graduation for students in the Education program. Although the three CEL courses are electives and therefore are not strictly required for graduation, it turns out that most students in our dataset eventually took at least one of those three courses. The students who did *not* take one of the three courses are systematically different from those who did (usually because the students who haven't yet taken one of the three courses are simply earlier in their SLCC career). For this reason, it was impossible to create a satisfactory control group for comparison, even with matching.

Relationship to prior research

One reason SLCC encourages faculty members to incorporate CEL into their teaching is that there is a substantial literature on CEL at other institutions, and much of that literature suggests that CEL results in positive outcomes for students. It's surprising and disappointing, therefore, that the present analysis found no effect of CEL on retention or graduation, and only a small effect on grades. Why such a discrepancy?

It's impossible to know the answer to this question for certain. Every implementation of CEL involves a host of unique characteristics, from specific aspects of the context in which it's occurring to the details of how it is carried out. Although there's plenty of evidence that CEL, on average, tends to be beneficial, there's less study of the specific characteristics that make one CEL program more effective than another. Indeed, it's simply not possible to study the effects of every possible way that one CEL program might differ from the next. Conway et al. (2009) and Celio et al. (2011) attempted to explore how the effectiveness of CEL programs relates to broad characteristics of their implementation; although they found some evidence that following recommended practices is helpful, they were hindered by the fact that many studies of CEL don't report sufficient detail to allow for this level of analysis. (In addition, both of these studies looked at a wide range of social and academic outcomes, which included grades but did *not* include retention or graduation.)

With this caveat in mind, however, it's worth observing that prior research on CEL has overwhelmingly been conducted at four-year institutions. In fact, *all* of the studies of CEL and retention/graduation that DSA has been able to find took place at four-year institutions (Bingle et al. 2010, Lockeman and Pelco 2013, Johnson and Stage 2018, Louviere 2020). Moreover, several studies have found weaker effects of CEL for populations of special interest to SLCC: Mungo (2017) found weaker effects of CEL for students with lower GPA; Song et al. (2017) found weaker effects of CEL for underrepresented students (which they defined as students of color, low-income students, and first-generation students); Yue and Hart (2017) found weaker effects of CEL for lower-division students. (By contrast, Reed et al. 2015 found *stronger* effects of CEL for commuter and part-time schools, but their findings were fragile overall and their analysis was at the level of the institution, not the student.) This pattern suggests that SLCC's context is very different from the context in which most CEL research has been conducted – a difference that could explain the different findings here at SLCC.

Conclusions

SLCC students who have participated in CEL classes over the last eight years have outcomes that are largely similar to those of students who have not participated in CEL classes. We found no evidence that CEL students are more likely to pass the class in question, to return to SLCC in the next term, or to graduate than non-CEL students. However, we did find evidence that students who pass CEL classes tend to earn slightly higher grades than students who pass non-CEL classes; this effect was apparent in the Occupational Therapy Assistant program, in the Education program, and in other CEL courses throughout the college.

Previous research at other institutions has found that participating in CEL is associated with improved retention and graduation. For this reason, it's somewhat surprising that we did not find a strong effect of CEL at SLCC. There would have been many differences between SLCC's program and the programs studied at other institutions in terms of the details of their implementations; unfortunately, we can't be certain what those differences are or which ones are responsible for these different outcomes. One possible explanation for this discrepancy – plausible but not guaranteed to be correct – is that the majority of prior CEL research involves 4-year institutions; it could be that CEL simply doesn't have the same impact in a community college setting.

Whatever the reason, it's clear that CEL does not have a large effect on these student outcomes at SLCC. However, the fact that CEL doesn't lead to large changes in retention or graduation doesn't mean that it has no value; one obvious consideration is the direct benefit to community partners who engage with students in CEL classes. A qualitative study may reveal less tangible (but no less real) benefits to the CEL students themselves. This report contributes one set of information with the goal of giving SLCC the clearest possible picture of what CEL looks like on the ground in our particular context. We look forward to the qualitative study of CEL that is planned for fall 2022 and recommend these quantitative results be evaluated together with qualitative findings.

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