The University of Texas at Austin

Education Research Center
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POLICY BRIEF

On Ramps to College Attainment: Examining the Impact of OnRamps Participation on College Persistence and Attainment

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Executive Summary

The University of Texas at Austin's OnRamps program uses a dual enrollment model via distance learning to increase the number and diversity of students who are fully prepared to follow a path to college and career success. A prior study improved our understanding of the academic and demographic characteristics of OnRamps students. Given the tremendous growth of the OnRamps program, which enrolled almost 42,000 students last year in sixteen courses, this study focuses on longitudinal measures of college readiness and success. Using a high school fixed effect model and a model using inverse probability weighting with regression adjustment (IPWRA), we examine the impact of OnRamps participation and performance on a range of student outcomes. We find that participating in OnRamps and/or earning college credit through OnRamps leads to positive impacts on semester credits earned and the likelihood of earning a bachelor's degree in four years. We also see that OnRamps tends to have the greatest benefit for underrepresented students.

What We Studied

A considerable number of studies have examined how dual-credit[1] programs – which allow students to earn high school and college credit for the same course – shape students' likelihood of enrolling in and completing college. Although the consensus in the literature is that dual-credit participation is positively related to college enrollment and attainment on average[2], the majority of dual-credit programs are established between high schools and community colleges rather than universities. Some studies suggest that dual-credit may divert students from 4-year to 2-year colleges, possibly

[1] The terms "dual-enrollment" and "concurrent enrollment" are often used interchangeably with dual-credit. We use the term dual-credit due to its prevalence in policy and practice in Texas. However, OnRamps is described as a dual-enrollment program due to key differences between the majority of dual-credit programs in Texas and the OnRamps model, which are described in this brief.

[2] See, for example, Taylor, J.L., Allen, T.O., An, B.P., Denecker, C., Edmunds, J.A., Fink, J., Giani, M.S., Hodara, M., Hu, X., Tobolowsky, B.F., & Chen, W. (2022). Research priorities for advancing equitable dual enrollment policy and practice. Salt Lake City, UT: University of Utah

due to students having participated in community college-based dual-credit programs. Far less research has examined how university-based dual-credit programs may influence students' college outcomes. The purpose of this brief is to summarize our findings on how OnRamps – the University of Texas at Austin's signature dual-enrollment program (described further below) – shapes college persistence and attainment.

Although our prior research suggested that OnRamps participation was positively related to students' likelihood of applying to and enrolling in 4-year colleges generally and selective institutions specifically, studies had yet to investigate how OnRamps shapes long-term college outcomes. This was largely due to the fact that OnRamps was created in 2012-13 and relatively few students had participated and graduated from high school until recently. As OnRamps has grown considerably over time, we now have an opportunity to examine how participating in OnRamps is related to students' long-term persistence and attainment in higher education. This brief summarizes our findings addressing three key questions related to this study:

1) How does OnRamps participation influence students' likelihood of persistence and baccalaureate attainment in higher education?
2) How does the relationship between OnRamps participation and long-term college outcomes vary across student populations?
3) How does the relationship between OnRamps participation and long-term college outcomes vary by the number of OnRamps courses (or "dosage") students complete?

OnRamps Overview

Several design features distinguish OnRamps from dual-credit and other forms of dual-enrollment in Texas and make it representative of the Texas Higher Education Coordinating Board's (THECB) strategy of promoting local creativity in pursuing goals outlines in the 60x30TX Strategic Plan. Each instance of OnRamps has two separate courses – a high school and a college course. Both courses are developed by UT Austin faculty and are aligned with the expectations of faculty and departments at a leading research university.

The high school course is taught in-person by a high school teacher, who receives nearly 80 hours of professional learning and development in their first year and 30+ hours each subsequent year on innovative pedagogical approaches and integrating technology in the classroom. The college course is taught via distance learning by a University faculty member and appointed academic course staff. OnRamps students complete assignments, engage with scientific software, and network with other students, among other things, through the same learning management system (Canvas) that is used by undergraduates at UT Austin.

In addition, OnRamps has taken an innovative approach to simultaneously broadening access to college-aligned curricula while maintaining academic rigor. Students in dual-credit courses in Texas must demonstrate Texas Success Initiative (TSI) eligibility. Because OnRamps students are non-degree seeking, non-admitted students at UT Austin, OnRamps does not require students to demonstrate TSI eligibility provisions prior to enrolling in an OnRamps course. This approach supports the goal of increasing both the number and diversity of students participating in college-aligned courses in high school. OnRamps students must demonstrate their readiness for the rigor of college-level coursework through the mid-term grade they receive at the end of the first semester.

This grade is used to determine whether OnRamps students are "credit eligible." Only credit eligible students have the opportunity to earn college credit at the end of the year. The students who are not credit eligible remain in the high school course to attempt high school credit only.

Perhaps most crucially, OnRamps students have their high school and college work evaluated separately by their high school teacher and instructors of record at UT Austin, and students receive separate grades for their high school and UT Austin courses. Providing students with separate high school and college grades and separate university feedback on assignments designed by UT Austin faculty and course staff allows them to more deeply understand the expectations of an institution like UT Austin and how those expectations differ from those of their high school. Much like AP scores, OnRamps students are given the option of "claiming" the UT Austin credit as part of their academic record, which they may or may not do for any number of reasons. This approach mitigates the risk of students stretching themselves in a challenging dual-credit course only to receive an unsatisfactory grade in the course that becomes a part of their college transcript.

OnRamps has grown significantly since its inception: from a few hundred students in 2013-14 to more than 41,500 in nearly 200 school districts in 2022-23. As OnRamps grows, the ability to investigate the extent to which OnRamps is fulfilling its mission of supporting students on their path to college enrollment has grown. The purpose of this study is to expand understanding of the relationship between OnRamps participation and college-going.

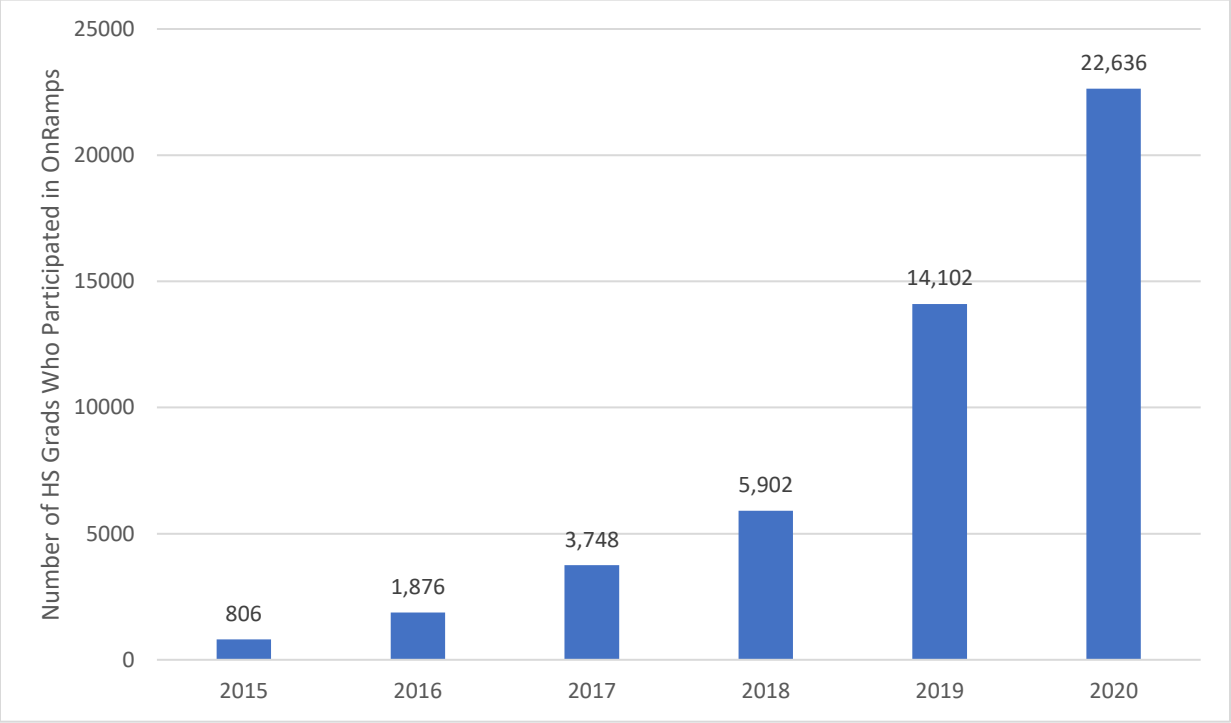
How We Analyzed the Data

We used data from the Texas Education Research Center (TERC) to address our research questions. The TERC contains data on the demographic and academic characteristics of all public K-12 students in Texas as well as all students enrolled in higher education in Texas, whether public or private, 2-year or 4-year. By linking K-12 and higher education at the student level, we are able to examine how students' K-12 experiences (including OnRamps participation) relate to their college outcomes. Importantly, we used data from OnRamps administrative records to identify the population of students who participated in and/or completed an OnRamps course, as OnRamps' administrative records are more detailed than the OnRamps indicator contained in the ERC.

Sample

The primary sample includes all students who graduated from a public high school in Texas between 2014-15 and 2019-20 (n = 2,034,008). We began with the 2014-15 cohort because this is the first cohort of high school graduates for which a sufficient number of students had participated in OnRamps during high school (n = 806). Across all years, 49,070 students in the sample participated in OnRamps and graduated from a public high school during our study timeframe. Figure 1 presents the number of OnRamps HS graduates by cohort.

Figure 1



The overall sample is restricted in two ways depending on the outcome being analyzed. First, for analyses of semester credit hour (SCH) accumulation, we restrict the sample to students who enrolled in a public college or university (whether 2-year or 4-year) in their first year after graduating from high school. This is because private colleges and universities do not submit data on SCH attainment to the Texas Higher Education Coordinating Board (THECB) and the data is unavailable in the ERC. Second, we restrict the sample to eligible cohorts in analyses of both SCH attainment and baccalaureate attainment. In general, the sample is restricted in each analysis to only students who are eligible to have experienced that outcome. For example, because we only had access to college attainment data through Spring 2022 at the time these analyses were conducted, the analyses of 4-year baccalaureate attainment were restricted to students who graduated high school in 2018 or before. Only the 2015 and 2016 cohorts were included in the analyses of 6-year baccalaureate attainment.

Outcomes

We examined two outcomes for the purposes of this brief: SCH accumulation and baccalaureate attainment. Data on SCH accumulation were drawn from THECB's student schedule report (cbm00s), which lists all of the courses students enrolled in and earned credit for each semester. Courses for which students do not earn college credit (e.g. developmental education, student success courses) were excluded from the calculations of SCH accumulation. As mentioned above, because the cbm00s files are only submitted by public institutions, the sample for these analyses was restricted to students who enrolled in a public college or university in their first year after graduating from high school.

Baccalaureate attainment (referred to as "BA attainment" for conciseness) was measured using the college attainment files (cbm009) submitted to THECB by all colleges and universities in the state, both public and private. We focus on baccalaureate attainment due to the fact that OnRamps is a university-based dual-enrollment program that seeks to increase the number and diversity of students completing bachelor's degrees.

Independent Variables

Our primary independent variable is an indicator of whether students participated in at least one OnRamps course before graduating from high school. This indicator identifies all students who participated, regardless of their outcome in the course (e.g. whether or not they passed the course, earned college credit, or accepted the credit). This variable is modified in two ways in some analyses. First, some models redefine the variable as earning college credit in an OnRamps course to more closely mirror research on similar programs, such as dual-credit or Advanced Placement (AP). These estimates are therefore similar to estimates of the effect of earning college credit in a dual-credit course or scoring above the college credit threshold (typically a three on a 3-5 scale) in an AP course. Second, in some models, the OnRamps variable represents the number of OnRamps courses a student successfully completed rather than being a dichotomous indicator of any OnRamps. This is done to address RQ #3 and examine how the "dosage" of OnRamps influences its estimated relationships with college outcomes.

To isolate the relationship between OnRamps participation and college outcomes, we account for a number of covariates in our models. Demographic controls include race/ethnicity, gender, free-or-reduced-price lunch (FRPL) status, a dichotomous indicator of whether students had a disability, a dichotomous indicator of whether students received school discipline (e.g. in-school suspension), whether students participated in an English as a Second Language (ESL) program, whether students were identified as gifted, and whether students were immigrants. Academic controls include students' math and reading standardized test scores measured in eighth grade, the number of advanced courses (e.g. AP and International Baccalaureate or IB courses) students completed in high school, the number of dual-credit courses students completed in high school, whether students participated in vocational education/career and technical education (CTE) courses, and the type of high school diploma students earned (e.g. minimum, recommended, advanced). Because not all students had eighth grade test scores, we calculated mean test scores for each high school and imputed missing test scores with the school-level mean. The mean-imputed test score variables were then standardized with mean = 0 and standard deviation = 1. The models also include HS graduate cohort and school fixed effects. Additional detail on the variables used in our analyses is provided in the technical appendix.

Statistical Models

Because students are not randomly assigned to participate in OnRamps, we attempt to address the inherent self-selection bias related to OnRamps participation in two ways. First, only some schools offer OnRamps courses, and schools that offer OnRamps may be systematically different from those that do not. We address the issue of school selection into offering OnRamps by including school fixed effects in our models. We use Stata's xtreg command to fit HS fixed effects models. The estimates of these models can be interpreted as: "What is the relationship between OnRamps participation and college outcomes, controlling for students' demographic and academic characteristics and the high school they graduated from?" We use linear regression for models of

both SCH accumulation and BA attainment. Because the latter outcome is dichotomous, these models can be referred to as linear probability models. These estimates therefore represent the percentage point change in the probability that the student earned a bachelor's degree.

Although the HS fixed effect models account for school selection and compare OnRamps to non-OnRamps students in the same school, the estimates may still be biased by the presence of an unrealistic comparison group: all high school graduates. Put differently, some students may be very unlikely to participate in OnRamps (e.g. they are very low-achieving), so comparing OnRamps students to the entire sample of non-OnRamps high school graduates may produce biased estimates. To address the issue of systematic differences between OnRamps and non-OnRamps students, we use a technique known as inverse probability weighting with regression adjustment (IPWRA). IPWRA is one of a class of models that creates balanced samples between "treatment" (e.g. OnRamps) and "control" (e.g. non-OnRamps) groups using propensity scores, or the predicted probabilities of participating in the treatment. Our IPWRA analysis proceeded in three stages. First, the probability of participating in OnRamps was modeled using logistic regression as a function of students' demographic and academic characteristics. Second, the sample was weighted based on students' predicted probabilities of OnRamps participation ("inverse probability weighting"). This weighting produces samples of OnRamps and non-OnRamps students that should be "observably equivalent," or statistically indistinguishable on any observed characteristics included in the prediction model. Third, an outcome model was fit to the weighted sample to estimate the treatment effect, and the covariates used in the prediction model were also included in the outcome model ("regression adjustment"). Because our primary interest is the effect of OnRamps for students who are likely to participate, our estimate is the average treatment effect on the treated (ATET). Put differently, because it is unrealistic to generalize estimates of the effect of OnRamps to the entire population of high school graduates as many students are unlikely to participate in OnRamps, we instead generalize to the sub-population of high school graduates who are observably equivalent to OnRamps students.

Because it is often infeasible to include high school fixed effects in models such as IPWRA for statistical reasons[3], we account for the issue of between-school differences in both OnRamps participation and baccalaureate attainment in two ways. First, for all IPWRA models, we restrict the sample to students enrolled in "OnRamps schools," or schools where at least one student in our sample participated in an OnRamps course. Our estimates can therefore be interpreted as the "effect" of OnRamps for students who attend schools that offer OnRamps. Second, we add a covariate to the prediction model that represents the proportion of students in the school who participated in OnRamps, as this variable is strongly related to each individual student's likelihood of participating in OnRamps.

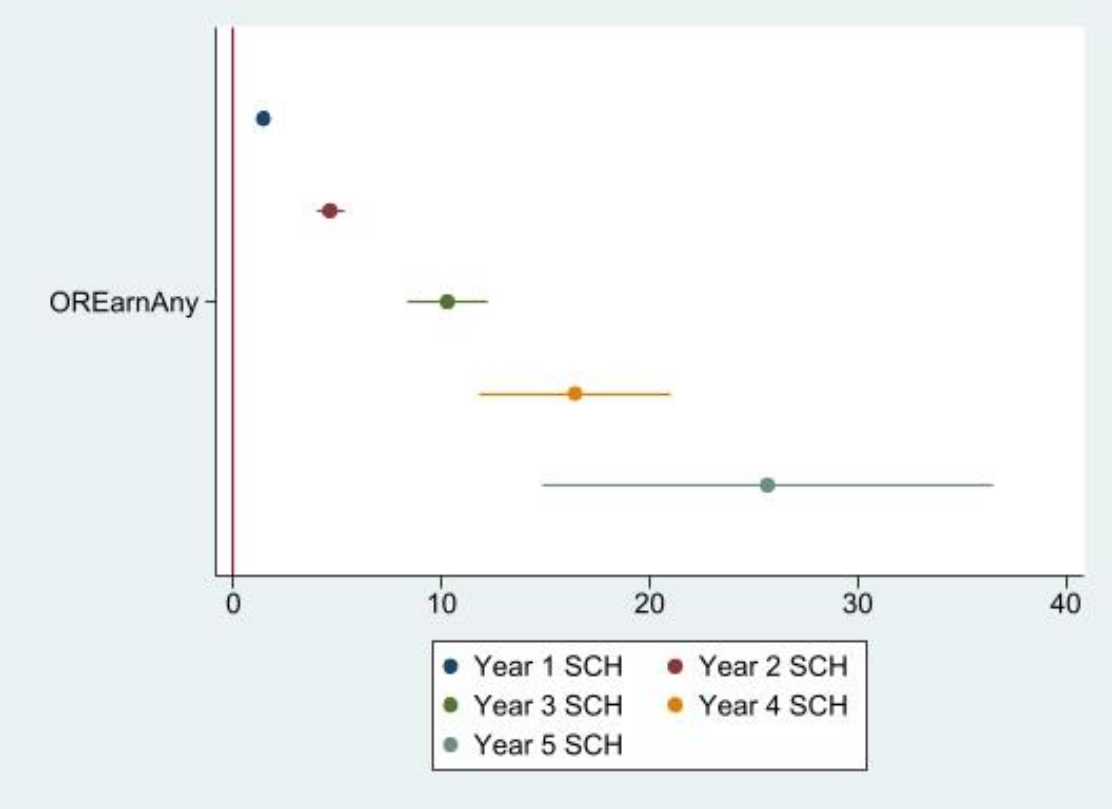
[3] Because the treatment in IPWRA is modeled using logistic regression, HS fixed effects often prove challenging to include in the treatment model for two reasons. First, any high school with no variation in the treatment (e.g. if no or all students in the school participated in OnRamps) is automatically dropped from the sample because logistic regression cannot produce an estimate if there is no variation within a group. In our case, this would result in all non-OnRamps schools being dropped from the model, which is why we delimited our sample to OnRamps schools. Second, because IPWRA models are designed to produce balance between the treatment and control groups, including HS fixed effects would require balance between the treatment and control groups in the proportion of students enrolled in each high school in the state. It is often impossible for IPWRA to produce this level of balance, resulting in unbalanced samples that violate the key assumption of IPWRA that the technique produces observably equivalent samples that are statistically indistinguishable on all covariates included in the treatment model.

What We Found

OnRamps is Positively Related to College Persistence and Attainment

We begin with the results from HS fixed effect models estimating the relationship between whether students earned credit in an OnRamps course and the number of SCH they had accumulated in college after each year. These estimates are represented visually in Figure 2. Each dot on the figure represents a point estimate from a single statistical model, and the lines stretching out from the dot represent the 95% confidence intervals. As discussed above, each model restricts the sample to students who were eligible to experience that outcome. Estimates for six-year SCH accumulation were excluded because of the highly imprecise estimate.

Figure 2



As shown in the figure, OnRamps students accumulate significantly more SCH compared to non-OnRamps students, and this relationship grows over time. One year after graduating from high school, OnRamps students have earned 1.4 SCH ($p < .001$) compared to non-OnRamps students. Five years after graduating from high school, this difference has grown to 25.7 SCH ($p < .001$). In IPWRA models, the estimates were 29.0 SCH ($p < .001$) for 4-year SCH accumulation and 47.9 SCH ($p < .001$) for 6-year SCH accumulation. These results suggest that earning OnRamps credit does not simply give students a "head start" on college that either remains flat or tapers off over time. The estimated benefit of OnRamps grows with each year, suggesting OnRamps is positively related to college persistence and the accumulation of SCH.

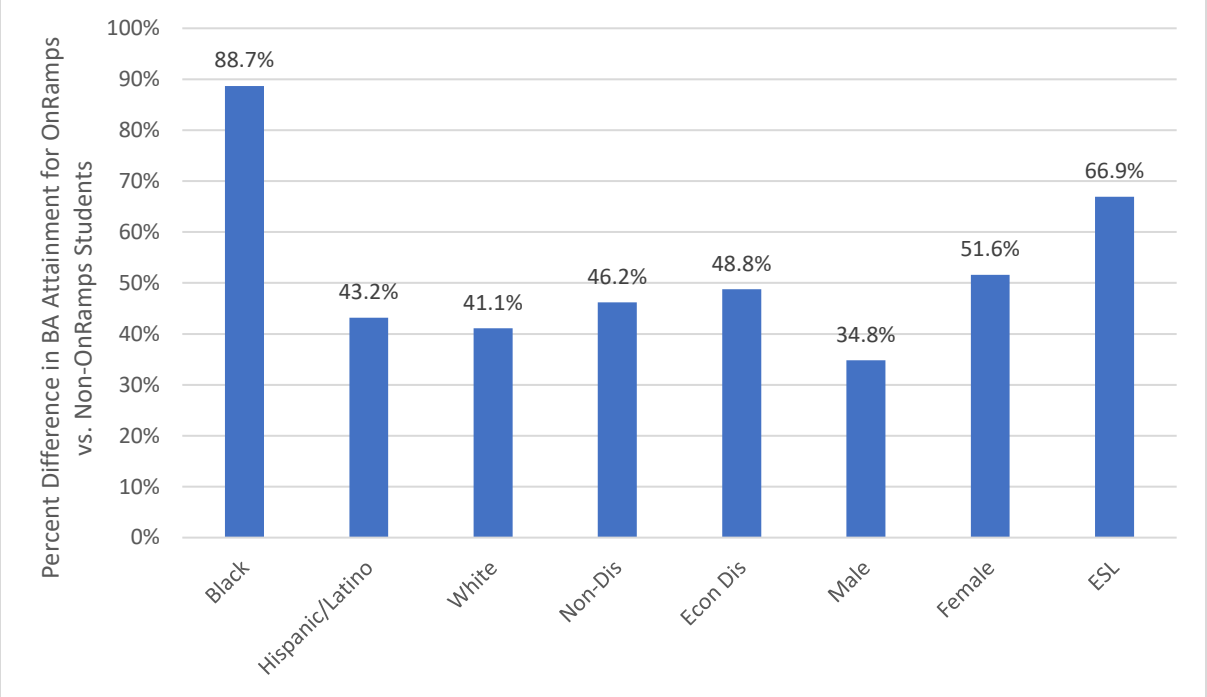
OnRamps students' increased accumulation of SCH compared to non-OnRamps students also translates into a higher probability of baccalaureate attainment, although the estimates vary based on whether we model the OnRamps "effect" as participating in an OnRamps course vs. earning credit and whether we use HS fixed effect models with the full sample of HS graduates or the IPWRA models with the sub-sample of students who attended OnRamps schools. The estimated effect of OnRamps participation on 4-year BA attainment is 0.9 pp ($p < .01$) using a HS fixed effect model but 5.3 pp ($p < .001$) using the IPWRA model. The estimates for OnRamps credit receipt are 6.1 pp ($p < .001$) using the HS fixed effect model but 10.3 pp ($p < .001$) using the IPWRA model. While the magnitude of the estimates varies across models, two findings are consistent across analyses. First, OnRamps is positively related to baccalaureate attainment in every model. Second, the estimates are even larger for students who earn credit in an OnRamps course.

OnRamps Tends to Have the Greatest Estimated Benefit for Underrepresented Students

To address our second RQ, we fit separate IPWRA models to demographic groups estimating the relationship between OnRamps credit receipt and college outcomes for that population. We focus on the outcome of 4-year BA attainment. Table A1 in the appendix includes the estimates from these IPWRA models for racial/ethnic, gender, and economic groups as well as for students in ESL programs. As discussed above, the ATET estimates can be interpreted as changes in the predicted probability of the outcome occurring. However, because different populations have different baseline rates of baccalaureate attainment, we convert these estimates into percentage changes for interpretability. For example, the ATET estimate for Black students was 14.1 pp ($p < .001$), and the baseline BA attainment rate for Black, non-OnRamps comparison students was 15.9%. This means that earning OnRamps credit was associated with a near-doubling (an 89% increase) in Black students' likelihood of earning a bachelor's degree.

These estimates of percent changes are included in Table A1 and visualized in Figure 3. As shown in this figure, the estimated benefits of OnRamps are often larger for populations of students with lower baseline rates of college attainment. The percent increase in baccalaureate attainment associated with earning OnRamps credit was more than twice as large for Black students compared to White students (88.7% vs. 41.1%) and the estimate for Hispanic students (43.2%) was slightly larger than the estimate for White students. The estimate for economically disadvantaged students was slightly larger than the estimate for non-disadvantaged students (48.8% vs. 46.2%), and ESL students are also estimated to receive a greater increase in their likelihood of earning a bachelor's degree (66.9%) than the full-sample average. The one finding at odds with this theme relates to gender. Females are estimated to receive greater benefit from OnRamps compared to males (51.6% vs. 34.8%), despite female students having a higher baseline BA rate than males (25.4% vs. 19.4%).

Figure 3



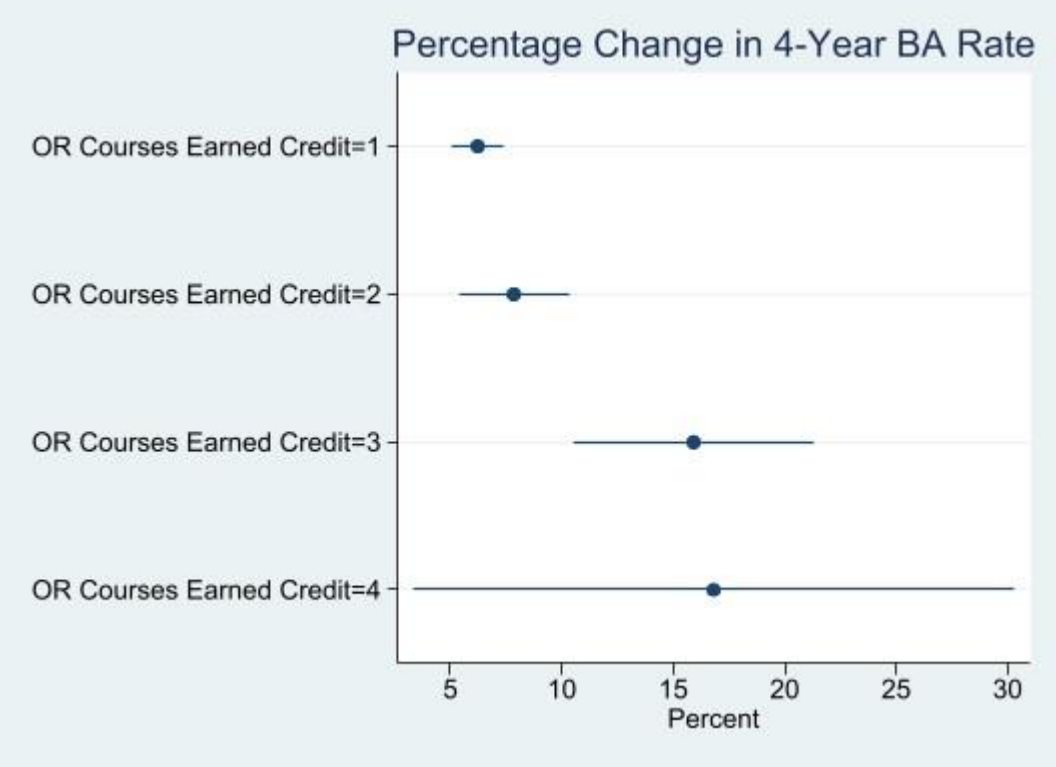
The Benefit of OnRamps Grows with Each Additional OnRamps Course

Thus far, our analyses have conceptualized OnRamps as a dichotomous treatment, whether the treatment is defined as participating in an OnRamps course or earning college credit through an OnRamps course. However, it is also important to examine whether the "effect" of OnRamps varies by the number of courses students completed or not. In the next analyses, we replace the dichotomous OnRamps indicator with a variable that represents the number of OnRamps courses in which the student earned college credit. Because the "treatment" variable in these models is no longer dichotomous, we use the HS fixed effect model rather than the IPWRA model, which is more appropriate for dichotomous treatments. We remind the reader that the HS fixed effect models tended to be more conservative in our previous analyses of the influence of the dichotomous OnRamps indicators on college outcomes. We also restrict the sample to students who enrolled in college after high school to isolate the effect of OnRamps on attainment (i.e. to ensure OnRamps doesn't promote college attainment only by increasing college enrollment).

Our estimate of the relationship between the number of OnRamps courses students completed and their likelihood of earning a bachelor's degree in four years is shown in Figure 4. We only focus on the 4-year BA rate because the number of students who completed multiple OnRamps courses is relatively small, and examining the 6-year BA rate requires us to restrict the sample to older cohorts when even fewer students completed multiple OnRamps courses. Even in this model, the estimate for students who completed four or more OnRamps courses is quite imprecise, with the confidence intervals ranging from nearly zero to over 30. Nevertheless, the results suggest that students' likelihood of earning a bachelor's degree within four years increases for each OnRamps course they successfully complete: the estimates are 6.2 pp ($p < .001$) for students who complete one course, 7.9 pp ($p < .001$) for students who complete two courses, 15.9 pp ($p < .001$) for students who complete

three courses, and 16.8 pp ($p < .05$) for students who complete four or more courses. While suggestive rather than causal, the estimates are aligned with the assumption that students benefit from each additional OnRamps course they complete.

Figure 4



Discussion/Policy Recommendations

The results of this study expand our understanding of how OnRamps' innovative strategy increases success in post-secondary educational attainment for students. A large body of literature has long shown that dual-credit programs lead to improved college outcomes for participants. A previous study[4] of OnRamps showed that OnRamps students in particular experience better college-going outcomes when controlling for a variety of factors. Our findings in this study show that underrepresented students benefit more from OnRamps in BA attainment than their counterparts do. The results also show that there is a significant dosage effect for OnRamps courses—with students who take more courses benefiting more for every course they take up through at least four courses.

Based on these findings, policymakers who want to increase the contributions of dual-credit programs to meet goals such as those in the 60x30TX strategy plan should put particular emphasis on policies that increase the number of underrepresented students taking dual-enrollment classes. Districts should be encouraged not only to provide access to advanced academics but to focus on providing access for and increasing enrollment among students who are traditionally underrepresented in dual-credit programs. Also, districts should be encouraged to provide outreach to students and their families to highlight the potential benefits of dual-enrollment programs such as OnRamps.

Additionally, policies that increase the number of students who take multiple dual-enrollment courses during high school are likely to increase BA attainment for students. Our research shows that students who complete more than one OnRamps course have a higher likelihood of earning a bachelor's degree than students who take only one. The impact of each additional course increases up through at least four OnRamps courses. These findings support the creation of incentives for districts and schools to create pathways for students to plan for and complete perhaps three or four courses during high school.

[4] Giani, M. S., Schell, J., Wade, E., & Keller, H. (February 2018). OnRamps to College: Examining the Impact of OnRamps Participation on College Enrollment. https://texaserc.utexas.edu/wp-content/uploads/2020/06/16-UTA037-Brief-OnRamps-5.14.20-REV.pdf

Appendix

Table A1:

IPWRA Estimates of OnRamps Credit Receipt, by Demographic Group

	Black	Hispanic/ Latino	White	Non-Dis	Econ Dis	Male	Female	ESL
ATET								
OnRamps Credit Receipt Estimate	0.141***	0.075***	0.113***	0.122***	0.080***	0.068***	0.131***	0.040
	(5.24)	(6.94)	(8.79)	(9.45)	(7.64)	(6.52)	(11.51)	(1.66)
Non-OnRamps Baseline Mean	0.159***	0.174***	0.275***	0.264***	0.163***	0.194***	0.254***	0.060***
	(12.32)	(28.14)	(31.05)	(26.11)	(28.42)	(31.94)	(31.99)	(6.33)
Percent Increase	88.7%	43.2%	41.1%	46.2%	48.8%	34.8%	51.6%	66.9%
N	19760	91366	57127	75347	105814	89890	91271	14509

t statistics in parentheses
* p < 0.05, ** p < .01, *** p < .0001

Technical Appendix – Variable Creation

To conduct this analysis, a student-level file containing all Texas high school graduates for the years 2014-2021 was created using TEA p_graduate files. Demographic information plus economically disadvantaged indicators from TEA p_enrol_demog files were merged in along with students' 8th grade reading and math STAAR scores. Missing STAAR scores were imputed first using campus averages when available, then using district averages. TEA p_attend files were utilized to compile overall high school attendance measures. To complete the TEA data, indicators of the number of advanced academic or dual enrollment courses in high school were assembled from p_course_complete files.

Post-secondary participation and outcomes were determined from Texas Higher Education Coordinating Board (THECB) data. First, cbm001 files provided enrollment indicators by year along with the type of institution (4-year Public university, 4-year Independent college or university, 2-year community, technical, or state college, Health-Related institutions, and Career schools). Total credits attempted, total credits earned by year and overall credit total were compiled from cbm00s (end of semester data files). Based on cohort year, variables indicating the summation of post-secondary credits earned at the end of the first year, second year, and up to six years post-high school graduation were created for modeling. Similarly, utilizing cbm009 (degree data files), variables indicating whether a student earned a Bachelor's degree after one, two, and up to six years post-high school graduation were created. Lastly, the cbm009 degree data files allowed the creation of broader variables indicating year earned and the type of post-secondary degrees or certificate earned.

Data on OnRamps participation collected by OnRamps was provided as a supplemental data file to TEA (which matched OnRamps enrollment records to the student ID#s used by TEA) and added to the ERC data repository. This allowed the research team to merge OnRamps enrollment data with the student-level file of all Texas high school graduates. Three main independent variables of interest were employed based on any OnRamps courses a student was enrolled in prior to graduating from high school. The three variables are the number of OnRamps courses a student completed, the number of OnRamps courses for which a student earned credit, and the number of OnRamps courses for which a student accepted the credit and were thus issued a college transcript. Dichotomous versions of these variables were also created.