

## State Contexts, Local Markets: U.S. Public Four-Year Universities' Role in Offering Dual Enrollment Programs

Xiaodan Hu<sup>1</sup> , Yi (Leaf) Zhang<sup>2</sup> , Frank Fernandez<sup>3</sup> , Matthew J. Capaldi<sup>4</sup> 

<sup>1</sup>Department of Education Policy and Leadership, Southern Methodist University, USA, <sup>2</sup>Department of Educational Leadership and Policy Studies, University of Texas at Arlington, USA, <sup>3</sup>Department of Educational Leadership and Policy Analysis, University of Wisconsin–Madison, USA, <sup>4</sup>School of Human Development and Organizational Studies in Education, University of Florida, USA.

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### Abstract

*Given the surge of dual enrollment programs in the United States, this study focuses on the relationship between public four-year universities' offering of dual enrollment programs in the context of in-state and within-proximity community colleges offering similar programs. This study is guided by the classic supply and demand perspective in higher education to understand public four-year universities' behaviors in offering dual enrollment programs and the size of these programs. Using a national dataset, we found that public four-year universities, especially non-doctoral institutions, do not seem to compete with nearby community colleges to offer similar dual enrollment programs. However, non-doctoral public four-year universities are responsive to student needs in dual enrollment in-state overall, and they supplement community colleges' role to supply dual enrollment programs when needed.*

**Keywords:** *US higher education; dual enrollment; institutional competition.*

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## 1. Introduction

While higher education remains a cornerstone of youth preparation for civic engagement, career development, and lifelong learning, U.S. colleges and universities have experienced significant enrollment declines over the past decades. Between 2010 and 2020, enrollment in higher education dropped by nearly 2 million students (National Student Clearinghouse Research Center [NSCRC], 2023). This decline can be attributed to various factors, including demographic shifts such as lower birth rates leading to fewer high school graduates (Grawe, 2018), a strong labor market reducing the immediate need for postsecondary education (Barr &

Turner, 2015), rising tuition costs (Ma & Pender, 2021), and growing concerns over the return on investment of a college degree (Akers & Chingos, 2016; Carnevale et al., 2010).

In contrast to this downward trend, dual enrollment programs, which allow high school students to simultaneously earn high school and college-level credits, have seen rapid growth, becoming a vital strategy for both educational access and institutional sustainability. Between 2003 and 2011, dual enrollment grew at an average annual rate of 7% (Marken et al., 2013), driven by state policies promoting early college access and partnerships between high schools and postsecondary institutions. The growth accelerated further during COVID, a period marked by overall enrollment struggles for colleges and universities. Community colleges, in particular, experienced a nearly 10% drop in traditional-age student enrollment from 2019 to 2020 (NSCRC, 2022). However, the rate of decline was reduced to just 0.4% the following year, primarily due to an 11% increase in dual enrollment among high school students (11%) (NSCRC, 2022). According to Fink (2024), nearly 2.5 million high school students enrolled in at least one dual enrollment course at a college or university in the 2022-23 academic year, and over 70% of students enrolled in community colleges' dual enrollment programs. Given intensified enrollment competition among public colleges and universities and the constant struggle between institutional prestige and access expansion (Jaquette, 2013; Torres Lugo & Pingel, 2024), it is important to understand the role public four-year universities play in the surge of dual enrollment programs. The research questions guiding this study include:

1. Are public four-year universities more likely to offer dual enrollment programs, with fewer community colleges offering similar programs in-state and within proximity?
2. Do public four-year universities enroll more dual enrollment students, with fewer community colleges offering similar programs in-state and within proximity?
3. Does this relationship vary based on the public four-year universities' Carnegie classification?

## **2. Enrollment Competition in the Complex Postsecondary Landscape in the U.S.**

This surge in dual enrollment reflects both changing student needs and institutional strategies. High school students and their families view dual enrollment as a way to reduce future college costs and improve college readiness and success (Schaller et al., 2023). Simultaneously, higher education institutions, especially community colleges, have leveraged dual enrollment to stabilize enrollment numbers amidst broader declines (Fink, 2022). Dual enrollment has the potential to serve as an innovative enrollment management strategy.

While the U.S. higher education system is highly stratified based on institutional selectivity and resources available (Slaughter & Taylor, 2016), enrollment competition amongst institutions intensifies when the number of high school graduates declines (Bransberger et al., 2020; Plane, 1989). Previous research indicated that public colleges and universities strategically invest in

enrollment management to attract particular student groups and prioritize institutional missions (Schulz & Lucido, 2011). In particular, regional public universities struggle between striving to gain prestige and ensuring access and equity (Warshaw et al., 2021). These institutions are often expected to “evolve dynamically as anchor institutions to respond to regional needs while advancing educational equity and opportunity” (Supplee & Orphan, 2023, p. 518).

In the higher education market, unique characteristics in supply and demand can complicate enrollment levels across different sectors of colleges and universities. With the proliferation of dual enrollment (Fink, 2024; Taylor et al., 2022), the demand for high school students remains strong. As U.S. colleges and universities face the enrollment cliff, dual enrollment has been used as a recruitment tool to boost college matriculation (Webber et al., 2022). In the meantime, in many rural areas and college deserts, limited supply of dual enrollment programs continues to prevent aspiring high school students from taking college-level courses, and dual enrollment access varies greatly even within the same state (Acton et al., 2024; Gagnon et al., 2021). In the broad higher education context, students' college choice is a function of institutional prestige, distance, price, and individuals' (perceived) academic ability (Toutkoushian & Paulsen, 2016). In the dual enrollment market, institutional mission, selectivity, location, and capacity can all lead four-year universities to consider offering dual enrollment programs to meet student needs.

### **3. Research Design**

In the study, we used institution-level data from the Integrated Postsecondary Education Data System (IPEDS) and state-level high school enrollment size from Common Core of Data in 2022-23 from the U.S. Institute of Education Sciences (IES) to examine public four-year universities' offering of dual enrollment programs in relation to programs offered by community colleges in-state and within-proximity, respectively. We first restricted our sample to 1,794 degree-granting, primarily baccalaureate or above institutions, and we further excluded 1,212 private, not-for-profit institutions. Among the 582 public four-year universities in the sample, 228 are doctoral universities, and 354 are non-doctoral universities. Over 80% of public four-year universities ( $n = 482$ ) enroll at least one high school student taking college-level courses, including 198 doctoral and 284 non-doctoral universities.

#### **3.1. Variables**

We define public four-year universities' role in providing dual enrollment as whether they offer dual enrollment programs, and the number of students enrolled in dual enrollment programs. We include these two dependent variables in the study, with the dual enrollment offering being dichotomous for the full sample and the number of students enrolled as a continuous variable for public four-year universities that offer dual enrollment programs.

The key independent variables are operationalized based on the role community colleges play in offering dual enrollment programs either in-state or within proximity. For *in-state* competition, we calculated the number of within-state community colleges offering dual enrollment programs and the total number of students enrolled in these programs. For *within-proximity* competition, we followed Turley (2009) to identify community colleges within proximity to each public four-year university (i.e., within 50 miles for universities in rural/town settings, within 25 miles for universities in urban/suburban settings). Similarly, we calculated the number of within-proximity community colleges offering dual enrollment programs and the total number of students enrolled in these programs.

Following prior literature on dual enrollment offering and the supply and demand theory, we controlled for state and institutional characteristics that could contribute to the likelihood and capacity of offering dual enrollment programs. We used a parsimonious model specification to control for the four variables, including institutional urbanicity, Carnegie classification, institutional size, and the total number of high school students in the state (logged).

### **3.2. Analytic Strategy**

We used logistic regression to test whether public four-year universities' likelihood of offering dual enrollment programs is associated with in-state and within-proximity competition from community colleges, and we used multiple linear regression to test whether the relationship between the number of students enrolled in dual enrollment programs was associated with in-state and within-proximity competition, respectively. We conducted statistical assumption checks to obtain unbiased estimates and implemented log transformations when the normality assumption was violated.

## **4. Results**

To answer the first research question, we found that public four-year universities are less likely to offer dual enrollment programs, with more community colleges offering similar programs in-state and within proximity (Table 1 Panel A). Specifically, each additional in-state community college offering dual enrollment programs is associated with a 3% reduced probability for the public four-year university to offer a similar program (odds ratio [OR] = 0.971,  $p < .001$ ), and a 7.9% reduced probability for each additional within-proximity community college offering dual enrollment programs (OR = 0.921,  $p = .008$ ). While no statistically significant relationship was found between public four-year universities' likelihood of offering dual enrollment programs and the number of dual enrollment students enrolled in in-state community colleges ( $\beta = -0.594$ ,  $p = .127$ ), a 1% increase in the number of dual enrollment students enrolled in within-proximity community colleges is associated with a 26.1% reduced probability for the public four-year university to offer a similar program (OR = 0.739,  $p = .012$ ).

In addition, our findings indicate that, among the public four-year universities that offer dual enrollment programs, the number of students enrolled is associated with in-state, but not within-proximity, community college offerings. Each additional in-state community college offering

**Table 1. Coefficients of the Relationship between Dual Enrollment (DE) Offering in Community Colleges and Dual Enrollment Offering at Public Four-Year Universities**

<b>Independent Variable</b>	<b>Likelihood to Offer DE</b>	<b>Number of DE Students Enrolled (logged)</b>
<i>Panel A: Full Sample of Public Four-Year Institutions</i>		
Number of DE-offering in-state community colleges	-0.030*** (0.004)	-0.014*** (0.004)
Number of DE students enrolled in in-state community colleges (logged)	-0.594 (0.390)	0.769*** (0.203)
Number of DE-offering in-proximity community colleges	-0.083** (0.031)	0.002 (0.026)
Number of DE students enrolled in in-proximity community colleges (logged)	-0.303* (0.121)	0.032 (0.069)
<i>Number of Observations</i>	582	482
<i>Panel B: Sub-Sample of Doctoral Public Four-Year Institutions</i>		
Number of DE-offering in-state community colleges	-0.055*** (0.016)	-0.762 (1.623)
Number of DE students enrolled in in-state community colleges (logged)	-0.005 (0.006)	0.583 (0.344)
Number of DE-offering in-proximity community colleges	-0.056 (0.057)	-0.361 (0.302)
Number of DE students enrolled in in-proximity community colleges (logged)	0.020 (0.039)	0.189 (0.108)
<i>Number of Observations</i>	228	198
<i>Panel C: Sub-Sample of non-Doctoral Public Four-Year Institutions</i>		
Number of DE-offering in-state community colleges	-0.025*** (0.005)	-0.018*** (0.005)
Number of DE students enrolled in in-state community colleges (logged)	-0.665 (0.414)	0.912*** (0.252)
Number of DE-offering in-proximity community colleges	-0.087* (0.042)	-0.013 (0.036)
Number of DE students enrolled in in-proximity community colleges (logged)	-0.277* (0.138)	-0.077 (0.090)
<i>Number of Observations</i>	354	284

dual enrollment programs is associated with a 0.014% reduction in the number of students enrolled in a dual enrollment program offered by four-year universities ( $\beta = -0.014, p < .001$ ). Every 1% increase in the number of dual enrollment students enrolling in in-state community colleges, which perhaps indicates a greater demand, is associated with a 0.769% increase in the number of students enrolled in a dual enrollment program offered by four-year universities ( $\beta = 0.769, p < .001$ ). No such relationships were found between the number of dually enrolled students at public four-year universities and dual program offerings and enrollment size at within-proximity community colleges.

In our sub-group analysis to answer the third research question, we disaggregated doctoral universities ( $n = 228$ ) and non-doctoral universities ( $n = 354$ ) and repeated the regression analyses (Table 1 Panel B and C). We found that significant relationships might be driven by non-doctoral universities, and that all significant relationships for this sub-sample are consistent with the full sample analysis. Specifically, each additional in-state community college offering dual enrollment programs is associated with a 2.5% reduced probability for a non-doctoral public four-year university to offer a similar program ( $OR = 0.975, p < .001$ ) and an 8.4% reduced probability for each additional within-proximity community college offering dual enrollment programs ( $OR = 0.916, p = .038$ ). Each 1% increase in the number of dual enrollment students enrolled in within-proximity community colleges is associated with a 24.2% reduced probability for the non-doctoral public four-year university to offer a similar program ( $OR = 0.758, p = .045$ ). Among the non-doctoral public four-year universities that offer dual enrollment programs, each additional in-state community college offering dual enrollment programs is associated with a 0.018% reduction in the number of students enrolled ( $\beta = -0.018, p < .001$ ). Every 1% increase in the number of dual enrollment students enrolling in in-state community colleges is associated with a 0.912% increase in the number of students enrolled in a dual enrollment program offered by non-doctoral four-year universities ( $\beta = 0.912, p < .001$ ). However, for doctoral public four-year universities, the only statistically significant relationship indicated that each additional in-state community college offering dual enrollment programs is associated with a 5.4% reduced probability for doctoral public four-year universities to offer a similar program ( $OR = 0.946, p < .001$ ).

## **5. Discussion**

As U.S. higher education continues to expand dual enrollment programs, it is important to ensure equitable access for all high school students. Our study was guided by the demand and supply perspective in higher education to examine public four-year universities' behaviors in offering dual enrollment programs and the size of these programs. The findings indicate that public four-year universities, especially non-doctoral institutions, are less likely to offer dual enrollment programs when there are more community colleges in the state or within proximity that offer similar programs. They are also less likely to offer dual enrollment programs when

more high school students are dually enrolled in within-proximity community colleges. This correlational relationship provides suggestive evidence that public four-year institutions do not initiate programs to compete with community colleges, especially the ones within commuting distance for students in the region in the dual enrollment market. For universities that are at the margin of offering these programs to increase enrollment, they need to consider the uniqueness of their program with respect to program quality, class modality, and student services provided.

For the public four-year universities that offer dual enrollment programs, the size of their program follows the general principle of market supply and demand in the state context: When more community colleges provide similar programs in the state (i.e., a supply increase), the number of dually enrolled students reduce, probably because students have more accessible in-district options and do not rely on public four-year universities which often have a great service area. When more students attend community colleges for their dual enrollment programs (i.e., a demand increase) in the state overall, more students also dually enrolled at public four-year universities. Doctoral public four-year universities are less responsive to the dual enrollment market due to their mission of research development beyond state or regional service, while non-doctoral public four-year universities, which are commonly regional public universities, often supplement community colleges' role to meet student needs when there is a demand (Supplee & Orphan, 2023). Future research should incorporate the qualitative approach to understand dual enrollment in the context of mission prioritization and as an innovative approach to manage enrollment at public four-year universities in the U.S. and beyond.

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