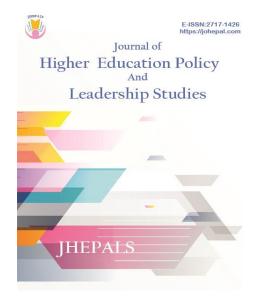
Journal of Higher Education Policy And Leadership Studies

JHEPALS (E-ISSN: 2717-1426)

https://johepal.com

A Comparison of Dual Credit Stratification by Provider Type in a US School District: Does Higher Education Provider Type Influence Dual Credit Program Access and Opportunity for Students?



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Article Received **2023/05/04**

Article Accepted 2023/06/17

Published Online **2023/06/30**

Cite article as:

Wiseman, A. W., Crevar, A. R., & Becknell, B. (2023). A comparison of dual credit stratification by provider type in a US school district: Does higher education provider type influence dual credit program access and opportunity for students? *Journal of Higher Education Policy and Leadership Studies*, 4(2), 119-127. https://dx.doi.org/10.61186/johepal.4.2.119

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Journal of Higher Education Policy And Leadership Studies (JHEPALS)

E-ISSN: 2717-1426 Volume: 4 Issue: 2 pp. 119-127

DOI:

10.61186/johepal.4.2.119

Abstract

Preliminary analyses reported here investigate the degree to which different dual credit provider types (four-year university or community college) influence individual student access and opportunity in dual credit programs in one US school district. Survey and district data for one US school district's dual credit programs in 2021-2022 were analyzed. Little statistically significant difference was found in dual credit students' access and opportunity in dual credit programs between four-year university and community college dual credit providers. Yet, some small, statistically significant differences were found. These small differences suggest that in this sample the fouryear university provided better student choice and direct communication, but that the local community college provided better information and communication on transfer policy and through one-to-one advising. Although research with more generalizable data is needed, these preliminary analyses suggest that institutional differences in higher education dual credit providers do make some small, but significant, impact on students' dual credit access and opportunity.

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Keywords: Dual Credit; Dual Enrollment; Dual Credit Provider; Credit Transfer; Provider Communication; Community College; Four-year University

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Introduction

The persistent stratification of educational access and opportunities is well-documented (Buchmann et al., 2008; Coleman, 1968; Ogbu, 1994; Schmidt et al., 2015). As a result, many educational programs across both basic (K-12) and higher education systems have been established to address and ideally ameliorate these inequalities (Blanden et al., 2022). Educational inequality in access and opportunity is, however, differently addressed in basic education systems compared to higher education, with the link between secondary to postsecondary education being a crucial transition point (Giani et al., 2014). One of the most prevalent programs to both facilitate the transition from secondary to post-secondary education and to address issues of educational inequality has been dual credit enrolment (Wang et al., 2015). Although several variations exist (An & Taylor, 2019; Garcia et al., 2020), a fundamental description of dual credit enrolment is when secondary school students enrol in classes offered at their school, which are taken for credit both towards their secondary school diploma and for college or university course credit (An, 2013). Because the students are based at the secondary level, the inequalities embedded in the secondary school context are often identified as the source of stratification in post-secondary access to and opportunity in dual credit programs (Cowan & Goldwater, 2015; Bettinger et al., 2022).

Inequalities and educational stratification persist at the higher education level, especially between community colleges and four-year universities. These inequalities often mimic the stratification seen at the secondary level where 'winners' and 'losers' arise based on students' race/ethnicity, socioeconomic status, and gender (Moreno et al., 2021). New research summarized here investigates the degree to which persistent stratification of educational access and opportunities varies by dual credit provider type (i.e., community college or four-year university) (Taylor, 2015; Museus et al., 2007; Ison, 2022; Mountjoy, 2022; Bertrand et al., 2021) and in relation to the following areas, which research suggests are likely contributors to the stratification of inequality in dual credit programs: communication (Tinberg & Nadeau, 2011), transferability and degree advising (Flaga, 2006; Witkowsky & Clayton, 2020), accessibility (Hu & Chan, 2021), and resource availability (Xu et al., 2021). This research, therefore, asks and provide preliminary answers to the question:

 How do dual credit access and opportunity for secondary students differ between university and community college dual credit providers?

Research Methodology

Research Context

Although the phenomenon of stratification and inequality in education occurs in both secondary school and post-secondary educational contexts worldwide, a US-specific context provides the data for this analysis. This research specifically uses data from two sources: secondary student survey data and school district data. In this school district, which is the largest school district in its region (covering 85.5 square miles and serving a total of 61 school campuses), there are four upper secondary school campuses (i.e., high schools) that offer a dual credit program for students. One local community college and one regional four-year university serve as the two core dual credit providers for these secondary schools and

participating students. Pseudonyms are used for the school district (TISD), local community college (LCC), and four-year university (FYU).

In Fall 2021 and again in Spring 2022, surveys were administered to TISD students (n=128), their parents, high school teachers, and high school administrators. These surveys gathered information about students', parents', teachers', and administrators' perceptions of the dual credit experience at their schools and with their dual credit providers. The four main sections of the survey addressed the following areas relevant to the possible stratification of access and opportunity: (1) communication, (2) transferability and degree advising, (3) accessibility, and (4) resources. In each of these sections, these stakeholders provided input regarding their experiences with their dual credit provider (either LCC or FYU) on their respective campuses. De-identified secondary student data from TISD for all students participating in dual credit programs throughout the district (n=125) included student demographic data, performance data, and other indicators useful in understanding the role of student background and performance in relation to their access and opportunities to participate in their dual credit programs with each provider. Data across 32 dual credit classrooms in TISD were available for analysis in the district level data. Student, parent, teacher, and administrator data is nested and linkable within the combined survey and district datasets but was not used in the analyses reported here.

Data Analysis

Two main analytic approaches were employed, including descriptions of variability in access and opportunity as well as a hierarchical linear modelling (HLM) approach with the nested data available in the combined survey and district datasets. The data provides a baseline descriptive comparison of dual credit provision and stratification of access and opportunities by dual credit provider, which was enhanced by the addition of student background characteristics from the TISD data.

Data at the individual student level was collected via survey and supplemented through de-identified matching with the district data. The dependent or outcome variables used in these analyses include a student reported indicator of clarity of dual credit application procedures (CLEARADM) and clarity of dual credit registration processes (CLEARREG). The student level independent variables measure student gender (FEMALE), socioeconomic status (ECONDIS), and race or ethnicity, specifically Black or African American (BLACK), Asian American (ASIAN), and Hispanic or Latino (HISPANIC). There also is an individual student indicator of whether they were enrolled in dual credit coursework through a four-year university or local community college provider (DCPROVIDERTYPE).

Data at the classroom level is clustered by dual credit course and section and is a combination of student-reported indicators aggregated to the classroom level and district-supplied classroom indicators. Dual credit provider communication type and frequency specifically focused on whether providers provided one-on-one meetings with students or their parents at least once per semester (SEMONEMTG). Dual credit information and resources measures included indicators of whether dual credit providers provided materials for course registration (MAT_REG) or provided materials for online sources (MAT_ONLINE). Finally, dual credit accessibility was measured by whether dual credit providers initiated meetings about how to use dual credit (MTGDC), initiated meetings about degree planning (DEGREEPLANMTG), and communicated tuition payment due dates (COMPAYDUEDATE).

Several limitations arose with the data, which are noted here and influence the researchers' ability to generalize the results beyond the specific schools and district included in the data set. The first limitation is that the data is drawn from one Texas (USA) school district only. Another is that not all dual credit students participated in the survey due to absence on the day the survey was administered. Finally, dual credit courses are not exclusive to dual credit students in some schools, so there may be some unintentional overlap in data collected from students enrolled in dual credit and those students in courses that may be dual credit even if the students are not enrolled in a dual credit program.

A two-level HLM estimates the relationships between dual credit access and opportunity, student background characteristics, and conditions related to dual credit communication, transferability and degree advising, accessibility, and resource availability and its variability by student (level 1; n=125) within dual credit classes (level 2; n=32) in TISD. Since HLM considers the nested nature of data, it has the potential to explain the estimation of variance (Raudenbush & Bryk, 2002). HLM was run with the Bernoulli outcome setting on since both outcome variables are dichotomous, and with full PQL estimation. Most variables were uncentered because they were dichotomous variables. To analyze whether level-one factors' effects on dual credit access and opportunity vary by provider, the dual credit provider type served as the level one interaction with dual credit provider access and opportunity variables at level two.

Level-one (Individual Student) Model:

```
\begin{aligned} &\operatorname{Prob}(OUTCOMEij=1 \,|\, \beta_j) = \phi_{ij} \\ &\log[\phi_{ij}/(1-\phi_{ij})] = \eta_{ij} \\ &\eta_{ij} = \theta_{0j} + \theta_{1j} *(\operatorname{FEMALE}_{ij}) + \theta_{2j} *(\operatorname{ECONDIS}_{ij}) + \theta_{3j} *(\operatorname{BLACK}_{ij}) + \theta_{4j} *(\operatorname{ASIAN}_{ij}) + \theta_{5j} *(\operatorname{HISPANIC}_{ij}) + \theta_{6j} *(\operatorname{DCPROVIDERTYPE}_{ij}) + r_{ij} \\ &\operatorname{Level-1 variance} = 1/[\phi_{ij}(1-\phi_{ij})] \end{aligned}
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Level-two (Dual Credit Classroom) Model:

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\theta_{6j} = \gamma_{60} + \gamma_{61}*(SEMONEMTG_j) + \gamma_{62}*(MAT\_REG_j) + \gamma_{63}*(MAT\_ONLINE_j) + \gamma_{64}*(MTGDC_j) + \gamma_{65}*(DEGREEPLANMTG_j) + \gamma_{66}*(COMPANYDUEDATE_j)
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In the level 1(individual student) model, θ_{0j} refers to the estimate of an adjusted mean of the student reported dependent variable measuring either the clarity of dual credit application procedures (CLEARADM) or the clarity of dual credit registration processes (CLEARREG) – separate models run for each dependent variable – for the j_{th} student in each dual credit classroom. θ_{1j} , θ_{2j} , θ_{3j} , θ_{4j} , θ_{5j} , and θ_{6j} represent the coefficients of gender (FEMALE), socioeconomic status (ECONDIS), black or African American race/ethnicity (BLACK), Asian race/ethnicity (ASIAN), Hispanic race/ethnicity (HISPANIC), and dual credit provider type (DCPROVIDERTYPE), respectively. rij is a student-level residual.

In the level 2 (classroom) model, γ_{00} (not shown in the equation above) is each classroom's mean of student reported measures of either the clarity of dual credit application procedures (CLEARADM) or the clarity of dual credit registration processes (CLEARREG). γ_{60} is the adjusted mean of either dependent variable (i.e., CLEARADM or CLEARREG) for the classroom level effect. γ_{61} , γ_{62} , γ_{63} , γ_{64} , and γ_{65} represent the adjusted mean classroom level effects of dual credit communication (SEMONEMTG), dual credit

information and resources (MAT_REG, MAT_ONLINE), and dual credit accessibility (MTGDC, DEGREEPLANMTG, COMPAYDUEDATE) on the relationship between dual credit provider type (DCPROVIDERTYPE) and either dependent variable.

Results

Results of the descriptive analysis focus on comparisons between the dual credit providers by type. Students, parents, faculty, and administrators reported varied perceptions in the areas of dual credit provider communication and frequency, dual credit information and resources, and dual credit accessibility. In short, there is little difference in provider communication type and frequency between the local community college and four-year university. Overall, dual credit accessibility was not significantly different by provider type in the descriptive analyses, but when differences by provider type are significantly different (p<.10), they are small. Some small, statistically significant differences suggest that (1) the four-year university provides better student choice and direct communication with a school-based dual credit liaison, whereas (2) the local community college provides better information and communication on transfer policy and one-on-one advising.

Although dual credit provider type does not significantly predict clarity of dual credit application procedures (CLEARADM) or registration procedures (CLEARREG) overall, there are some small, but statistically significant effects worth noting. The four-year university (FYU) as a dual credit provider significantly increases clarity of both CLEARADM (γ_{64} =0.028; p<0.10) and CLEARREG (γ_{64} =0.020; p<0.10) when they initiate meetings about how to use dual credit (MTGDC). But, students report that FYU significantly reduces clarity of both CLEARADM (γ_{66} =-0.012; p<0.10) and CLEARREG (γ_{66} =-0.010; p<0.10) when they communicate pay due dates (COMPAYDUEDATE), and FYU reduces clarity of CLEARADM (γ_{65} =-0.050; p<0.10) when they initiate meetings about degree plans (DEGREEPLANMTG). Likewise, the local community college (LCC) as a dual credit provider does not significantly predict CLEARADM at all, but LCC does significant increase clarity of CLEARREG by providing materials for course registration (MAT_REG; γ_{62} =0.005; p<0.10) and initiating meetings about how to use dual credit (MTGDC; γ_{64} =0.014; p<0.10). LCC as a dual credit provider also significantly reduces clarity of CLEARREG (γ_{63} =-0.016; p<0.10) when they provide online source materials (MAT_ONLINE).

Preliminary Conclusions

Although further data collection and analysis are necessary to confirm and generalize the results of this study, there are several takeaways from this preliminary analysis regarding the role of dual credit provider type either in exacerbating, ameliorating, or otherwise intervening in the stratification of dual credit access and opportunity individual secondary students have. Four broad findings from this preliminary analysis are: (1) dual credit provider type does not matter as much to educational stratification as individual indicators of inequality; (2) providers that initiate meetings with students about how to use dual credit increase access and opportunity across all students; (3) four-year universities may complicate dual credit access and opportunity by over-emphasizing degree planning and tuition payment due dates; and (4) local community colleges may enhance dual credit access

and opportunity by focusing on practical information like course registration and how to use dual credit.

These findings provide a foundation for examining dual credit enrolment beyond the specific community where this data came from, as well as for developing a comparative analysis of dual credit provider effects within and across varying communities based on geography, culture, demographic trends, and other economic, demographic, and political indicators of stratification in the broader society. What these limited preliminary findings do suggest, however, is that individual inequality persists even in otherwise more equitable educational contexts. This aligns with findings regarding basic mass education as well as higher education institutions across national and other systems of education (Horvatek & Baker, 2020). These findings also suggest that information about dual credit enrolment and explicit instruction on enrolling in dual credit programs reduces the likelihood of stratification in dual credit access and opportunity regardless of individual students' gender, socioeconomic status, or race/ethnicity. This confirms prior research on the influence of explicit instruction and information in bridging gaps in awareness, understanding, and ability to take advantage of educational opportunities (e.g., Kirschner et al., 2006).

What differences were small, but statistically significant, seemed to suggest that local community colleges had a slight advantage over four-year universities in providing students with dual credit access and opportunity by clarifying dual credit application and registration procedures. In particular, these findings suggest that local community colleges may do a better job of providing practical information to students and their families regarding not only registration in dual credit courses, but also what to do with dual credit beyond their secondary school experience. There is some irony that four-year universities were not better equipped to inform students and their parents about how to use their dual credit if and when they transition to the four-year university, but the findings reported here suggest that this may be caused by four-year universities' emphasis on degree planning rather than personal needs or individual uses of dual credit.

Using these preliminary results as the foundation for further data collection and analysis, more individual student data is being collected and aligned with district level data from a wider sample of school districts where dual credit enrolment is offered. This data will provide more indicators of variation by cultural, social, economic, and political context and be able to consider cross-system effects by dual credit provider type as well as within district effects. In the meantime, dual credit providers and the schools or districts they partner with are encouraged to plan and provide information to students and their families about what dual credit enrolment is, how to apply, how to register for dual credit courses, and what to do with dual credit beyond the coursework itself.

Corresponding Author's Note:

An earlier version of this research was presented by the authors at the Association for Education Finance and Policy (AEFP) annual conference, March 2023, in Denver, Colorado, USA.

Declaration of Conflicting Interests

The authors declare that there is no conflict of interest to be cited here.

Funding

This research received no financial support.

Human Participants

Institutional Review Board (IRB) approval was obtained through Texas Tech University's Office of Research prior to data collection.

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