IES Institute of Education Sciences

APPENDIX
May 2021

Regional Educational Laboratory Central
At Marzano Research

Understanding Access to and Participation in Dual Enrollment by Locale and Income Level

Appendix A. Data and methodology

See https://go.usa.gov/xHwHn for the full report.

Appendix A. Data and methodology

The study used publicly available, school-level data for the 2017/18 academic year from the Civil Rights Data Collection (CRDC; https://ocrdata.ed.gov/Home) and the Elementary/Secondary Information System of the National Center for Education Statistics (https://nces.ed.gov/ccd/elsi/), which uses the Common Core of Data (CCD; table A1). All public schools in the United States are required to submit data to the CRDC roughly every other year, including data on the number of students who participate in dual enrollment. The CCD is a collection of annual data on enrollment, staffing, and financial information received from nearly all public schools in the country. It provides school-level information on urban-centric locale and percentage of students who are eligible for the national school lunch program, a proxy for the percentage of students from low-income households.

The study team extracted information on dual enrollment participation and student and school characteristics for nearly all regular public schools (those that do not focus primarily on special education, vocational/technical education, alternative education, or any particular theme associated with magnet/special program emphasis schools)[1] in the United States (for national comparisons). However, the study team conducted detailed analyses only for the seven states in the Regional Educational Laboratory (REL) Central region. Informed by a review of literature on dual enrollment programs, which included studies based on national survey data and state and local administrative data (see, for example, Giani et al., 2014; Lochmiller et al., 2016; Nowicki, 2018; Taylor & Yan, 2018), the team identified a set of variables for analyzing dual enrollment access and participation across student and school characteristics of interest (see table A1).

Table A1. Analytic variables and data sources

Variable	Data source
Dual enrollment access	2017/18 Civil Rights Data Collection
Dual enrollment participation	2017/18 Civil Rights Data Collection
Urban-centric locale	2017/18 Elementary/Secondary Information System
Percentage of students eligible for the national school lunch program	2017/18 Elementary/Secondary Information System

Source: Authors' analysis of data from the Civil Rights Data Collection (https://ocrdata.ed.gov/Home) and the Elementary/Secondary Information System of the National Center for Education Statistics (https://nces.ed.gov/ccd/elsi/) for the 2017/18 school year.

[1] For the definition of public schools, see National Center for Education Statistics (n.d.).

Samples

The study team created samples by merging data from the CRDC and CCD at the school level. CRDC data included 2,291 public high schools (excluding junvenile justice facilities) that enrolled grade 11 or 12 students in the REL Central region, and 24,873 high schools across the country. The study team next merged in CCD data, keeping only regular schools and removing special education schools, vocational/technical education schools, and alternative education schools from the analysis. This resulted in a final analytic sample of 2,001 high schools in the REL Central region and 18,624 high schools nationally (table A2). The study team considered this dataset to be the universe of data: regular, non–juvenile justice schools that enrolled grade 11 and 12 students.

The sample contained relatively few missing data elements for this universe of schools. In the REL Central sample no high schools were missing data on locale, nine high schools (0.4 percent) were missing data on dual enrollment access and participation, and one high school was missing data on student eligibility for the national school lunch program. For the national sample no high schools were missing data on locale, 28 high schools (0.2 percent) were missing data on dual enrollment access and participation, and one high school was missing data on student eligibility for the national school lunch program.

Table A2. Numbers of high schools and grade 11 and 12 students in the analytic sample for states in the Regional Educational Laboratory Central region, the region, and the country

Geographic area	High schools	Grade 11 and 12 students
Colorado	411	120,865
Kansas	358	68,471
Missouri	548	127,386
Nebraska	268	47,055
North Dakota	164	14,812
South Dakota	161	17,007
Wyoming	91	12,906
REL Central region	2,001	408,502
United States	18,624	6,705,445

REL is Regional Educational Laboratory.
Source: Authors' analysis of data from the Elementary/Secondary Information System of the National Center for Education Statistics (https://nces.ed.gov/ccd/elsi/) for the 2017/18 school year.

Methodology

For research question 1 the study team calculated the rates of dual enrollment access and participation for each state in the REL Central region, for the region, and for the country. The study team calculated two measures to determine dual enrollment access: the percentage of high schools in the samples that reported providing at least one dual enrollment course and the percentage of grade 11 and 12 students attending high schools that provided at least one dual enrollment course. For instance, if 70 of 100 schools provided a dual enrollment course, the rate of schools providing dual enrollment would be 70 percent, and if 7,000 of 10,000 grade 11 and 12 students in a state attended high schools providing at least one dual enrollment course, the rate of student-level dual enrollment access for the state would be 70 percent. For dual enrollment participation the study team calculated the percentage of grade 11 and 12 students who participated in at least one dual enrollment course. For example, if 2,000 of 10,000 grade 11 and 12 students participated in at least one dual enrollment course, the rate of dual enrollment participation would be 20 percent.

For research question 2 on whether rates of dual enrollment access and participation varied by school locale or by percentage of students from low-income households, the study team calculated rates of dual enrollment access

and participation, disaggregated by school characteristics of interest, for each state in the REL Central region, the region, and the country. All analyses of access examined both student-level and school-level access.

The study team first calculated the dual enrollment access and participation rates by school locale (city, suburban, town, and city). Next, the study team disaggregated dual enrollment access and participation rates by school income quartiles for high schools, as represented by each school's percentage of students eligible for the national school lunch program (a proxy for percentage of low-income households), and again for each state in the REL Central region, the region, and the country.

To examine differences by percentage of students from low-income households, the team analyzed differences in rates of eligibility for national school lunch program for the entire REL Central region sample, creating school income quartiles. The first quartile comprised high schools with the lowest percentages (up to 27.3 percent) of eligible students. The second quartile comprised high schools with 27.4–40.7 percent of eligible students. The third quartile comprised high schools with 40.8–55.3 percent of eligible students. The fourth quartile comprised high schools with 55.4–100 percent of eligible students. For national comparisons the national sample was divided into school income quartiles as well.

To address stakeholder concerns and understand how school size could contextualize the findings, the study team separated high schools into school enrollment quartiles and compared differences in dual enrollment access and participation across the quartiles. This was a secondary analysis to provide additional context to the findings reported in the main report, specifically to better understand differences between school-level and student-level dual enrollment access. Schools were grouped into enrollment quartiles for the REL Central region. The first quartile comprised all high schools with enrollments of up to 100 students, the second quartile comprised high schools with enrollments of 101–210 students, the third quartile comprised high schools with enrollments of 211–575 students, and the fourth quartile comprised high schools with enrollments of 576–3,641 students.

Tables A3 and A4 relate school enrollment quartiles to school locale and income quartiles. Rural high schools were more likely to have lower enrollments than were high schools in other locales (table A3). For instance, 35 percent of rural high schools were in the first (lowest) school enrollment quartile compared with 6 percent of suburban high schools and 9 percent of city high schools. Schools with higher percentages of students from low-income households tended to have higher enrollments than did schools with lower percentages of students from low-income households (table A4). For instance, 40 percent of high schools in the fourth school income quartile (highest percentage of students from low-income households) were also in the fourth (highest) school enrollment quartile, compared with 24 percent of high schools in the first school income quartile.

Table A3. Percentage of high schools in the Regional Educational Laboratory Central region, by school locale and enrollment quartile, 2017/18 (percent)

	School locale			
School enrollment quartile	Rural	Town	Suburban	City
First quartile (lowest enrollment)	35	10	6	9
Second quartile	36	6	5	8
Third quartile	21	50	14	21
Fourth quartile (highest enrollment)	7	35	75	61
Number of high schools	1,240	303	199	259

Source: Authors' analysis of data from the Civil Rights Data Collection (https://ocrdata.ed.gov/Home) and the Elementary/Secondary Information System of the National Center for Education Statistics (https://nces.ed.gov/ccd/elsi/) for the 2017/18 school year.

Table A4. Percentages of high schools in the Regional Educational Laboratory Central region, by school income quartile and enrollment quartile, 2017/18 (percent)

School enrollment quartile	School income quartile			
	Fourth quartile (lowest income)[a]	Third quartile	Second quartile	First quartile (highest income)[b]
First quartile (lowest enrollment)	20	26	27	26
Second quartile	18	29	29	25
Third quartile	23	26	27	26
Fourth quartile (highest enrollment)	40	20	17	24
Number of high schools	497	493	495	494

a. High schools with the highest percentages of students from low-income households.
b. High schools with the lowest percentages of students from low-income households.
Source: Authors' analysis of data from the Civil Rights Data Collection (https://ocrdata.ed.gov/Home) and the Elementary/Secondary Information System of the National Center for Education Statistics (https://nces.ed.gov/ccd/elsi/) for the 2017/18 school year.

References

Giani, M., Alexander, C., & Reyes, P. (2014). Exploring variation in the impact of dual-credit coursework on postsecondary outcomes: A quasi-experimental analysis of Texas students. *The High School Journal, 97*(4), 200–218. https://eric.ed.gov/?id=EJ1026262.

Lochmiller, C. R., Sugimoto, T. J., Muller, P. A., Mosier, G. G., & Williamson, S. E. (2016). *Dual enrollment courses in Kentucky: High school students' participation and completion rates* (REL 2016–137). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Appalachia. https://eric.ed.gov/?id=ED566741.

National Center for Education Statistics. (n.d.). *School and district glossary*. Retrieved October 23, 2020, from https://nces.ed.gov/ccd/commonfiles/glossary.asp.

Nowicki, J. M. (2018). *K–12 education: Public high schools with more students in poverty and smaller schools provide fewer academic offerings to prepare for college* (GAO No. 19-8). U.S. Government Accountability Office. https://eric.ed.gov/?id=ED590911.

Taylor, J. L., & Yan, R. (2018). Exploring the outcomes of standards-based concurrent enrollment and Advanced Placement in Arkansas. *Education Policy Analysis Archives*, *26*(123), 1–22. https://eric.ed.gov/?id=EJ1193679.