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Implementation of Career- and College-Ready Requirements for High School Graduation in Washington

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Implementation of Career- and College-Ready Requirements for High School Graduation in Washington

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In 2014 the Washington state legislature approved career- and college-ready (CCR) requirements for high school graduation that better align with career pathways and with admissions standards at the state's public universities than previous requirements did. The CCR requirements increased the total number of credits needed to graduate, from 20 to 24, by requiring an additional credit of laboratory science, an additional credit of fine arts, and two credits of world languages, though students can replace one fine arts credit and two world languages credits with credits in other content areas that align with their postsecondary plans. The requirements took effect for the class of 2019, though some districts implemented them earlier and others received a waiver to delay implementation until the class of 2021. State and local education leaders in Washington asked the Regional Educational Laboratory Northwest to study districts' progress in implementing the requirements for the classes of 2018 and 2019.

The study looked at differences in the percentages of 2018 graduates who met the requirements and of 2018 graduates who did not across student groups (by socioeconomic status, English learner status, race/ethnicity, and prior achievement). It also examined changes in student academic outcomes for districts that had increased total, science, fine arts, or world languages credit requirements each year between the class of 2013 and the class of 2018. The study found that the percentage of districts that had implemented all the CCR graduation requirements increased from 9 percent for the class of 2018 to 56 percent for the class of 2019. The districts that had implemented the CCR graduation requirements for the class of 2018 tended to have more teachers and more courses per student across content areas than districts that had not. About 27 percent of 2018 graduates statewide met all the requirements; gaps across student groups suggest that barriers exist for students who are eligible for the national school lunch program and students who attend schools in which more than 75 percent of students are eligible, current English learner students, students of color, and students with low scores on grade 8 state assessments. Finally, district-level increases in total, science, fine arts, or world languages credit requirements between the class of 2013 and the class of 2018 showed little impact on student academic outcomes.

Why this study?

To make requirements for high school graduation rigorous enough to prepare young people for college and careers yet flexible enough to accommodate students' individual postsecondary plans, the Washington State Board of Education led the development of career- and college-ready (CCR) graduation requirements. In 2014 the state legislature approved the requirements to take effect for the class of 2019, with some districts allowed waivers for delayed implementation. The change aimed to better align high school graduation requirements with admissions standards at the state's public universities and to equip students with the skills to pursue the career of their choice.

The requirements increased the total number of credits needed to graduate, from 20 to 24, by adding a credit of laboratory science, a credit of fine arts, and two credits of world languages (table 1), though students can replace one fine arts credit and two world languages credits with credits in other content areas that align with their postsecondary plans. The flexibility in meeting requirements at the student level has allowed districts to interpret the state requirements in

For additional information, including background on the study, technical methods, and supporting analyses, access the report appendices at https://go.usa.gov/xfaRN.

Table 1. Credits required to graduate from high school in Washington for the classes of 2018 and 2019, by content area

Year of graduating class	Total	English	Math	Science[a]	Social studies	Health and physical education	Fine arts[b]	World languages[b]	Career and technical education	Electives
2018	20	4	3	2	3	2	1	0	1	4
2019	24†	4	3	3†	3	2	2†	2†	1	4

† indicates increased credit requirement for graduation.

a. Science credits must include one credit of laboratory science in 2018 and two credits of laboratory science in 2019.

b. Students can substitute one fine arts credit and two world languages credits with credits in other content areas that align with their postsecondary plans.

Source: Washington State Board of Education, 2017.

multiple ways. Some districts have made fine arts and world languages requirements for graduation, others allow students to opt in or opt out of the fine arts and world languages requirements based on their postsecondary plans, and still others designate fine arts and world languages as elective courses. Some districts implemented the CCR requirements for the class of 2019 or earlier, while the remaining districts received a waiver from the state allowing them to delay implementation until the class of 2021.

Representatives from the Washington State Board of Education and the Washington Office of Superintendent of Public Instruction asked the Regional Educational Laboratory Northwest to conduct this study to understand districts' progress in implementing the CCR graduation requirements from 2018 (before they took effect) to 2019 (when districts without waivers implemented them) and to gain insight into the conditions that might facilitate future implementation. To that end, this study identifies districts that implemented the CCR requirements for the class of 2018 (referred to as early implementer districts; see box 1 for definitions of key terms used in the report) and describes the characteristics of those districts and their high schools.

Some school and district leaders also expressed an urgent need for information about how the CCR graduation requirements are affecting student groups, especially students in rural areas, English learner students, students of color, and students eligible for the national school lunch program. Many of these student groups have graduation rates that are persistently below the state average (Washington Office of Superintendent of Public Instruction, 2017a). By describing how many students with different characteristics met all the requirements in previous years and what credits students who did not meet all the requirements were missing, this study can help local education leaders understand how to support their students. By looking back at previous increases in graduation requirements at the local level, it also explains some relationships between increasing graduation credit requirements and key academic outcomes tied to secondary and postsecondary success.

State and local education leaders in Washington hope to use the information in this study to help all districts meet the CCR graduation requirements and to understand the advantages and challenges of the policy change. The study findings might inform future evaluations of the requirements in the state and help other state and local education agencies understand the advantages and challenges of implementing more rigorous graduation requirements.

The currents study adds to previous research showing that increased credit requirements for high school graduation have had mixed results for student academic outcomes. Some studies show that increased requirements are associated with a higher number of math and science credits earned by low-achieving students, students of color, and students eligible for the national school lunch program (Clune & White, 1992; Goodman, 2009). But the additional courses students take may lack the rigor needed to prepare them for college and careers (Booth, Shields, & Carle, 2017; Finn, Gerber, & Wang, 2002; Montgomery & Allensworth, 2010). In addition, several studies have found that increased graduation requirements have a negative relationship with high school completion rates

(Daun-Barnett & St. John, 2012; Lillard & DeCicca, 2001; Plunk, Tate, Bierut, & Grucza, 2014), while evidence of their effect on postsecondary outcomes is inconclusive (Buddin & Croft, 2014; Plunk et al., 2014).

In addition to providing policy-relevant information to Washington education stakeholders, this study contributes new evidence on the relationship between increasing credit requirements for high school graduation and student secondary and postsecondary outcomes, with an emphasis on students in rural areas, English learner students, students of color, and students eligible for the national school lunch program. Appendix A offers additional information about the purpose of the study, provides background information to contextualize the results, and summarizes the related literature.

Research questions

This study used a statewide sample of districts and students to answer three research questions:

1. How did the percentage of districts that implemented the CCR graduation requirements change between 2017/18 and 2018/19?
   a. How did early implementer districts (those that implemented the CCR graduation requirements for the class of 2018) differ from districts that were not early implementers?

2. What percentage of students met the CCR graduation requirements between 2013/14 and 2017/18?
   a. How did 2018 graduates who met the CCR graduation requirements differ from those who did not?

3. How were district-level increases in total, science, fine arts, and world languages credit requirements for graduation between 2012/13 and 2017/18 associated with high school academic performance, high school completion, and postsecondary readiness?

Definitions of key terms used in the report are in box 1. The data sources, sample, and analytic methods used for this study are in box 2, and additional information about the study methods is in appendix B.

Box 1. Key terms

Assessment scores. Scores on the English language arts and math Smarter Balanced assessment administered by Washington state.

Career- and college-ready (CCR) graduation requirements. Credit requirements for high school graduation for the class of 2019 and beyond set by the Washington State Board of Education. They include 24 total credits, comprising 4 English credits, 3 math credits (Algebra I, geometry, and a third math course), 3 science credits (2 of which must be laboratory science), 3 social studies credits, 2 health and physical education credits, 2 fine arts credits, 2 world languages credits, 1 career and technical education credit, and 4 electives credits. Students can replace one fine arts credit and two world languages credits with credits in other content areas that align with their postsecondary plans.

Credits attempted. The total number of credits for courses that a student enrolled in during high school.

Credits earned. The total number of credits a student earned during high school (by receiving a passing grade or test score).

Dropout. Students whose most recent withdrawal code indicated that they dropped out.

Early implementer district. A district that implemented the CCR graduation requirements for the graduating class of 2018.

English learner status. Students who were classified as limited English proficient at any time during grades 9–12 were considered current English learner students, English learner students who were reclassified as English proficient before grade 9 were

considered former English learner students, and students who were never classified as limited English proficient were considered never English learner students.

High-poverty school. A school in which at least 75 percent of students were eligible for the national school lunch program.

Low-poverty school. A school in which less than 25 percent of students were eligible for the national school lunch program.

Moderate-poverty school. A school in which 25–74 percent of students were eligible for the national school lunch program.

On-time graduates. Students who graduated from high school within four years.

Postsecondary readiness. Whether a student met the credit requirements for admission to a public four-year university in Washington (known as the College Academic Distribution Requirements). The requirements include 15 credits in college-preparatory courses, comprising 3 English credits, 3 math credits (including Algebra II or math beyond Algebra II), 3 social studies credits, 2 laboratory science credits, 1 fine arts credit, and 2 world languages credits in the same language, and a grade 12 math-based quantitative course. One English credit could be met with an English elective, such as journalism or creative writing, and the grade 12 math-based quantitative course could be met with math beyond Algebra II or an algebra-based science course. Admissions standards were first adopted by the Higher Education Coordinating Board in 1994 and updated most recently in 2017 (Washington Student Achievement Council, 2017).

School locale. One of five school categories based on locale codes from the National Center for Education Statistics (Geverdt, 2015) and modeled after the classification system used by the Education Research and Data Center (2010) in Washington state: large metro schools (locale codes 11 and 12), metro suburb schools (locale code 21), midsize schools (locale codes 13, 22, and 23), urban fringe schools near metropolitan areas (locale codes 31 and 41), and distant schools farther from metropolitan areas (locale codes 32, 33, 42, and 43).

Student academic outcomes. The outcome variables examined in the study. Student academic outcomes were divided into three categories: high school academic performance (cumulative credits attempted and earned in high school, high school grade point average, and scores on high school state assessments in English language arts and math), high school completion (the probability of graduating on time and the probability of dropping out), and postsecondary readiness (the probability of meeting credit requirements for admission to a public four-year university in Washington).

Box 2. Data sources, sample, and methods

Data sources. The study drew on four data sources. Data on district credit requirements for graduation in 2012/13–2018/19 and class schedules in 2018/19 are from the Washington State Board of Education. Data on educators working in public schools in 2017/18 are from the Washington Office of Superintendent of Public Instruction (OSPI) S-275 Personnel Database. Data on school locale are from the National Center for Education Statistics Common Core of Data (Geverdt, 2015). K–12 student-level data—including transcripts, demographic information, eligibility for the national school lunch program, eligibility for special education services, state assessment scores, and school enrollment (including withdrawal status)—for 2009/10–2017/18 are from the Comprehensive Education Data and Research System at the OSPI. Data on English learner students for 2004/05–2017/18 are from the OSPI's Transitional Bilingual Instructional Program records. Although public data on district graduation requirements in 2018/19 show important implementation progress, student-level data from that year were not available. So, the student-level analyses use data from before the 2018/19 school year.

Sample. The sample for research question 1 on the change in the percentage of districts that implemented the career- and college-ready (CCR) graduation requirements between 2017/18 and 2018/19 and the differences between early implementer districts and other districts comprised 251 of the 295 districts that reported graduation requirements to the Washington State Board of Education in 2017/18 and 2018/19. (Forty-three districts did not offer grade 12 in 2017/18, 2018/19, or both, and the remaining district shared a high school with another district.)

The sample for research question 2 on the percentage of students who met the CCR graduation requirements and for research question 3 on the association between district-level increases in total, science, fine arts, and world languages credit requirements

for graduation and student academic outcomes comprised 365,485 students who began grade 9 between 2010/11 and 2014/15, were held accountable for graduation requirements between 2013/14 and 2017/18, and attended a public school in one of the 248 school districts that enrolled grade 12 students and reported graduation requirements to the Washington State Board of Education between 2012/13 and 2017/18. (Three of the 251 districts that reported graduation requirements did not enroll grade 12 students during the study sample years.) Students who were still enrolled in high school at the end of 2017/18 were excluded because academic outcome data were not available.

Methodology. For research question 1 the study team calculated counts of districts that implemented the CCR graduation requirements for the classes of 2018 and 2019 by content area. Districts were classified into three groups—those that implemented all the CCR graduation requirements; those that did not implement all the CCR graduation requirements; and those that implemented all the CCR graduation requirements except the fine arts requirement or the world languages requirement, or both. Next, the study team used a regression model with robut standard errors to examine relationships between whether a district implemented all the CCR graduation requirements for the class of 2018 (the predictor variable) and district characteristics, including student demographic composition, educator workforce, course offerings, and physical characteristics, such as locale (the outcome variables). This analysis was repeated for districts that implemented all the CCR graduation requirements except the fine arts requirement or the world languages requirement, or both. The results for these supporting analyses are in appendix C. The study team also used 2018/19 data from the Washington State Board of Education to compare class period schedules among districts that implemented all the CCR graduation requirements; districts that did not implement all the CCR requirements; and districts that implemented all the CCR graduation requirements except the fine arts requirement or the world languages requirement, or both.

For research question 2 the study team calculated the percentage of 2014–18 graduates and nongraduates who met the CCR graduation requirements overall and by student group. Results are shown for students who met all the CCR graduation requirements and for students who met all the CCR graduation requirements except the fine arts requirement or the world languages requirement, or both. The results for nongraduates show the credits they were most often missing. Some nongraduates may have met all the CCR credit requirements but did not meet other graduation requirements, such as passing state assessments or other school-level requirements.

For research question 3 the study team used regression analysis to identify relationships between district-level increases in total, science, fine arts, and world languages credit requirements for graduation between 2012/13 and 2017/18 and student academic outcomes. Statistical models accounted for the school year in which students were held accountable for the requirements (a variable provided by the OSPI), gender, race/ethnicity, scores on grade 8 state assessments in English language arts and math, whether students had ever been eligible for the national school lunch program, whether students received special education services, whether students were a current or former English learner student (compared with never English learner students), whether students were ever eligible for migrant student services, the percentage of students who were eligible for the national school lunch program in the last high school attended, the locale of the last high school attended (based on National Center for Education Statistics locale codes), and the district in which the last school attended was located. Additional details on the methods are in appendix B.

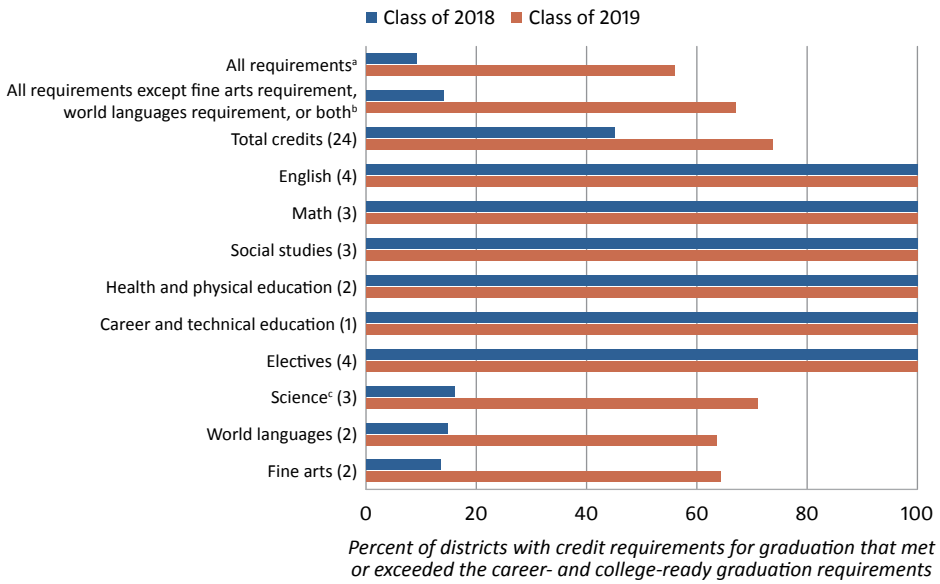
Findings

This section describes salient findings that can inform ongoing Washington state and local efforts to implement the CCR graduation requirements. Additional results are in appendix C.

The percentage of districts that implemented all the career- and college-ready requirements for high school graduation increased from 9 percent for the class of 2018 to 56 percent for the class of 2019

As implementation of the CCR graduation requirements ramps up, understanding the characteristics of districts that have achieved full implementation can provide insight into the conditions that facilitate districts' ability to adapt to new requirements. Only 9 percent of districts implemented the CCR graduation requirements for the class of 2018, with 45 percent of districts requiring 24 total credits (figure 1). These percentages were consistent for graduating classes between 2012 and 2017. In contrast, 56 percent of districts implemented the CCR requirements for the class of 2019. Those that did not implement all the requirements for the class of 2019 either had

Figure 1. The percentage of districts that implemented all the Washington career- and college-ready requirements for high school graduation increased from 9 percent for the class of 2018 to 56 percent for the class of 2019



a. Indicates districts that required at least 24 total credits, including 4 English credits, 3 math credits, 3 science credits (including 2 laboratory science credits), 2 fine arts credits, 2 world languages credits, and 4 electives credits.

b. Indicates districts that required at least 24 total credits, including 4 English credits, 3 math credits, 3 science credits (including 2 laboratory science credits), 1 fine arts credit, and 4 electives credits, but did not require a second fine arts credit or 2 world languages credits, or both.

c. Includes two credits of laboratory science.

Note: Numbers in parentheses are the number of credits in the career- and college-ready (CCR) graduation requirements. Districts that did not require the class of 2019 to meet all the CCR graduation requirements held a state-authorized waiver to delay implementation or did not hold a waiver and did not meet credit requirements for fine arts or world languages, or both. Sample includes 251 school districts.

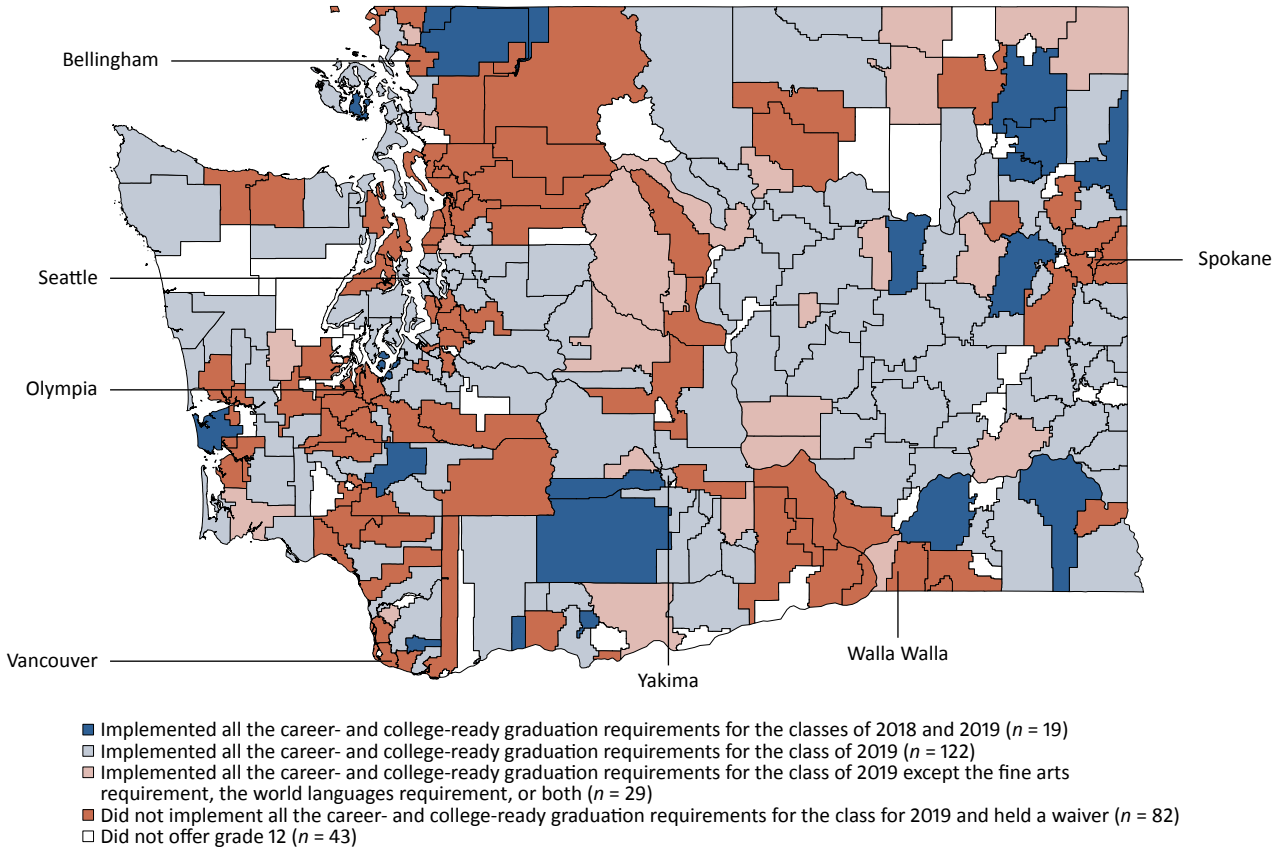
Source: Authors' analysis of 2018 and 2019 data from the Washington State Board of Education.

a waiver to delay implementation (33 percent of districts) or did not implement the credit requirements for fine arts or world languages, or both (12 percent of districts). Since students can replace the fine arts and world languages credits with credits from another content area aligned with their postsecondary plans, the state allowed some districts without a waiver to require fewer than two credits in each of these content areas for the class of 2019 and beyond. All districts without a waiver required students in the class of 2019 to earn at least 24 total credits, including 3 credits of science (2 of which must be laboratory science). And all districts required a number of credits that met or exceeded the CCR graduation requirements for English, math, social studies, health and physical education, career and technical education, and electives for the classes of 2018 and 2019.

On average, districts that were early implementers of the CCR graduation requirements were smaller and farther from urban areas, but their student compositions were similar to those of districts that were not early implementers. Overall, early implementer districts enrolled 19 percent of students in 2017/18 (67,814 of 362,485). On average, schools in early implementer districts enrolled 353 fewer students in 1.7 fewer high schools (see table C1 in appendix C). They also were located in less urban areas (map 1). This finding may seem counterintuitive because small rural schools tend to have more challenges than urban schools do recruiting educators with specific endorsements, particularly in science, technology, engineering, and math content areas (Miller, 2012; Player, 2015). This finding suggests that rural schools might be poised to adapt to the CCR graduation requirements despite such challenges.

Schools in early implementer districts tended to have fewer students per teacher than schools in districts that were not early implementers. One way to measure readiness for increasing graduation requirements is to measure how many educators are available to teach required courses to all students in the school. When there are few students

Map 1. Districts that implemented all the Washington career- and college-ready requirements for high school graduation for the classes of 2018 and 2019 were generally located in less densely populated areas in Central and Eastern Washington



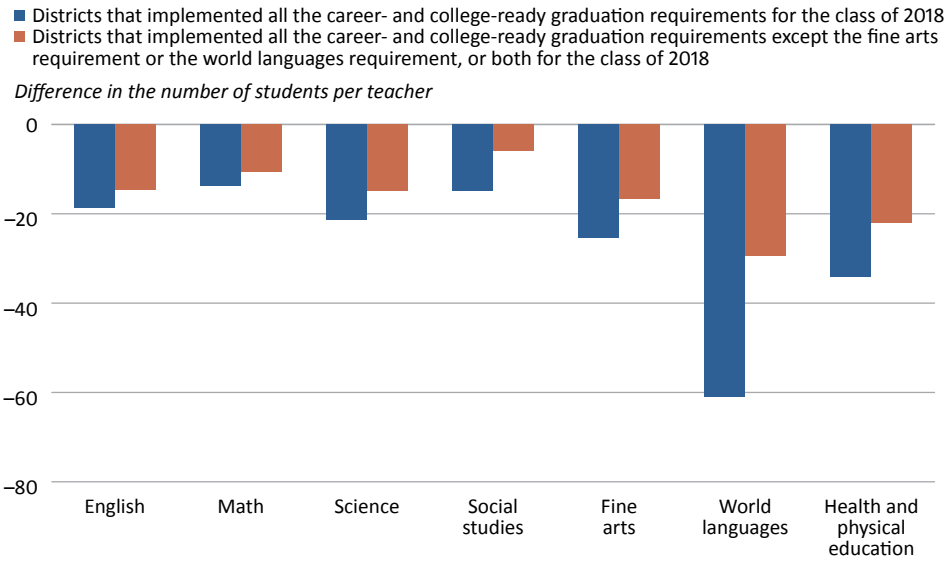
Source: Authors' analysis of 2018 and 2019 data from the Washington State Board of Education.

per teacher in required content areas, the school may be able to schedule required courses every year. When there are many students per teacher, space may not be available for all students to take required courses as often. Scarcity of classroom space to retake a failed required course could further complicate students' paths to graduation.

Schools in early implementer districts had fewer students per teacher in all required content areas (figure 2; see also table C1 in appendix C for results on career and technical education and other content areas). On average, schools in early implementer districts had 14–61 fewer students per teacher in English, math, science, social studies, fine arts, world languages, and health and physical education. For example, districts that implemented all the CCR graduation requirements for the class of 2018 had, on average, 43 students enrolled per English teacher compared with 61 students per English teacher in districts that did not implement all the requirements.

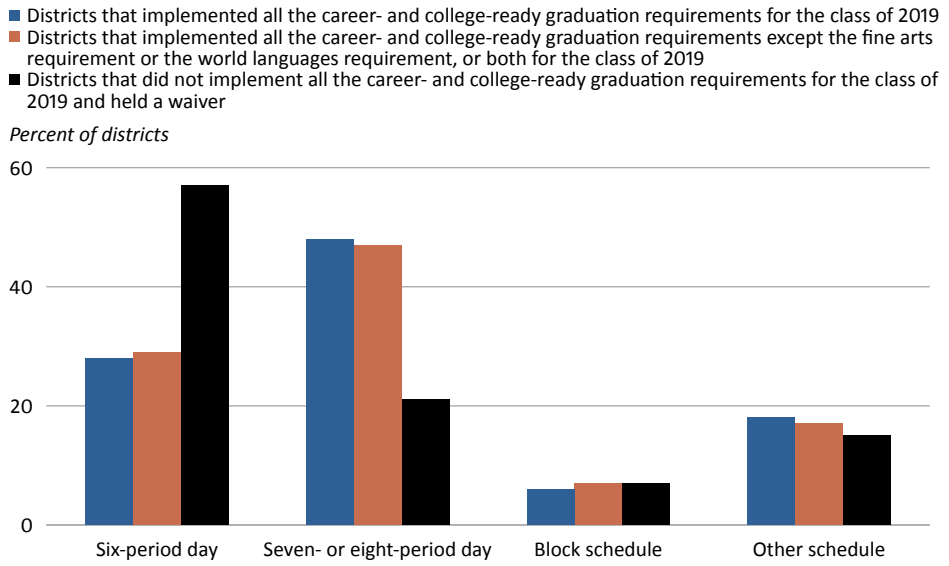
Districts that implemented all the CCR graduation requirements for the class of 2019 tended to have more class periods per day than districts that did not implement all the CCR graduation requirements. Another way to measure readiness for implementing the new graduation requirements is to examine how many credits school class period schedules allow students to earn per year. Districts that implemented all the CCR graduation requirements for the class of 2019 tended to have more class periods per day than districts that did not implement the requirements (figure 3). Similarly, districts that implemented all the CCR graduation requirements except the fine arts requirement or the world languages requirement, or both, more often reported seven or eight class periods per day than districts that did not implement all the CCR graduation requirements.

Figure 2. Early implementer districts—districts that required the class of 2018 to meet all the Washington career- and college-ready requirements for high school graduation—tended to have fewer students per teacher in required content areas



Source: Authors' analysis of 2009/10–2017/18 data from the Washington Office of Superintendent of Public Instruction.

Figure 3. Districts that implemented all the Washington career- and college-ready requirements for high school graduation for the class of 2019 tended to have more class periods per day than districts that did not implement all the requirements



Source: Authors' analysis of 2019 data from the Washington State Board of Education.

About 27 percent of 2018 high school graduates statewide met all the career- and college-ready requirements for graduation

A successful transition to more rigorous graduation credit requirements would, at a minimum, maintain graduation rates and ideally narrow gaps in secondary and postsecondary outcomes for traditionally underserved students. To help local educators deploy resources for certain content areas and student groups, the findings below

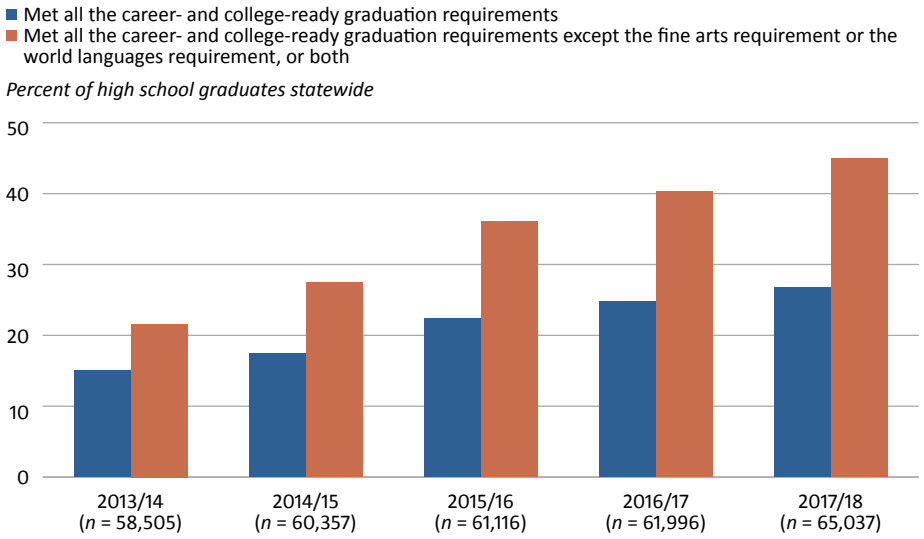
show the CCR graduation requirements that were most often unmet by the class of 2018 and how meeting the credit requirements varied across student groups.

The percentage of on-time graduates who met all the CCR graduation requirements increased steadily with each graduating class, from 15 percent in 2013/14 to 27 percent in 2017/18 (figure 4). During this time students who met the CCR graduation requirements might have been aiming to meet the requirements for admission to Washington's four-year universities, which are similar to the CCR graduation requirements, but with two differences. The admissions requirements include only one credit of fine arts, and the two world languages credits must be earned in the same language. In addition, universities will not require three credits of science until 2021 but require two credits of laboratory science. Among on-time 2018 graduates the most frequently unmet requirements were in laboratory science (37 percent did not meet), fine arts (29 percent did not meet), and world languages (23 percent did not meet; see table C2 in appendix C). Beginning with the class of 2021, all students will have to meet the science requirements, but they will be able to replace fine arts and world languages credits with credits from other content areas based on their postsecondary plans.

Among on-time 2018 graduates statewide, gaps in meeting all the CCR graduation requirements were evident by socioeconomic status, English learner status, race/ethnicity, and prior achievement. No student group had more than 36 percent of 2018 on-time graduates meeting all the CCR graduation requirements (figure 5; see also table C2 in appendix C). Gaps were most evident by socioeconomic status—36 percent of students in low-poverty schools met all the requirements compared with 10 percent of students in high-poverty schools. Similarly, 31 percent of students who had never been eligible for the national school lunch program met all the requirements compared with 23 percent of students who had ever been eligible.

Other disparities existed. For example, 16 percent of current English learner students met all the requirements compared with 28 percent of never English learner students (see figure 5 and table C2 in appendix C). About 29 percent of White students met all the requirements compared with 20–27 percent of students of color. And 21 percent of students with scores in the bottom quartile on the grade 8 state assessments in English language arts and math met all the requirements compared with 30 percent of students with scores in the top quartile. Gaps also persist

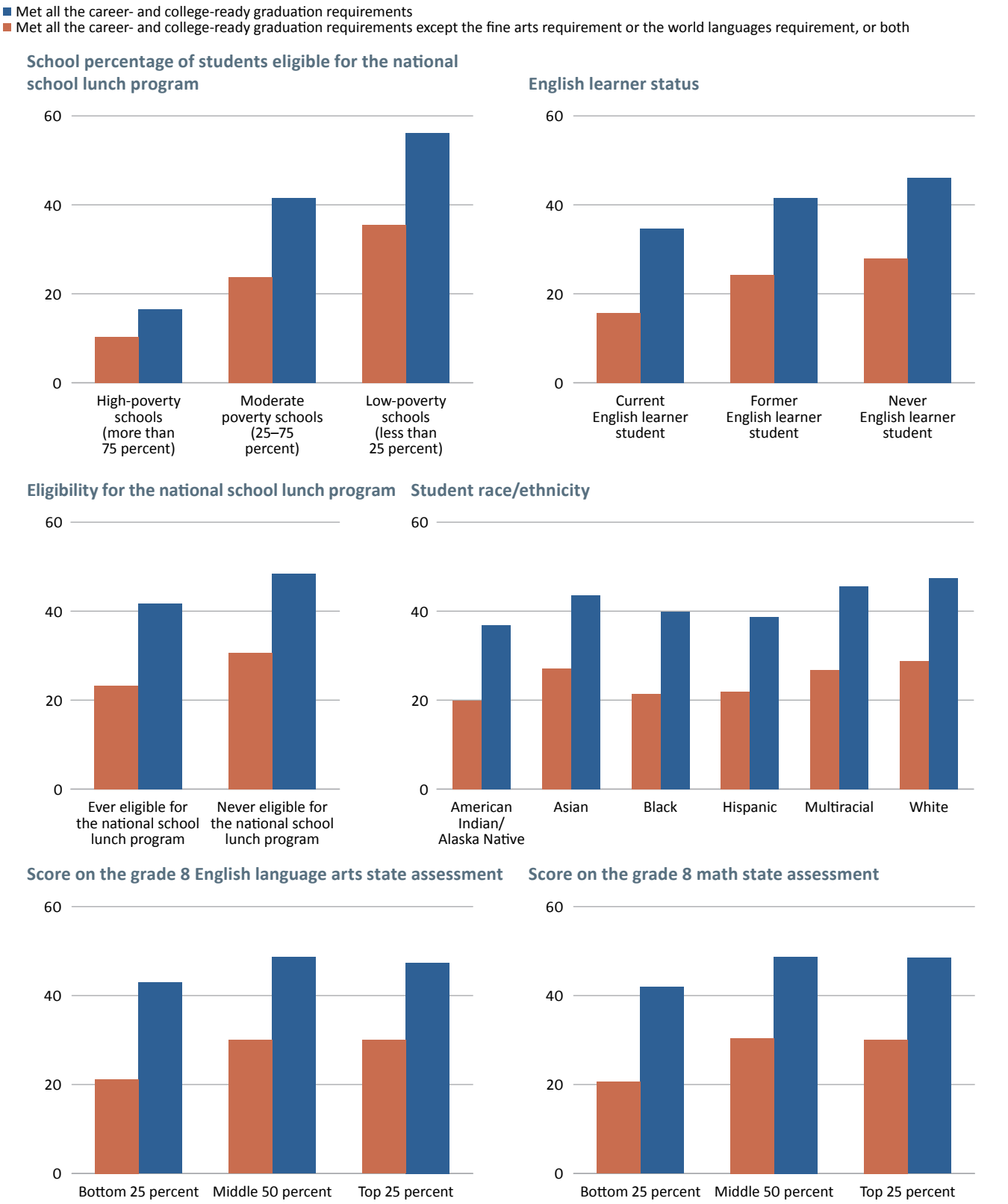
Figure 4. The percentage of high school graduates statewide who met the Washington career- and college-ready graduation requirements increased between 2013/14 and 2017/18



Source: Authors' analysis of 2009/10–2017/18 data from the Washington Office of Superintendent of Public Instruction.

Figure 5. Among on-time 2018 graduates statewide, gaps in meeting all the Washington career- and college-ready requirements for high school graduation were evident by socioeconomic status, English learner status, race/ethnicity, and prior achievement

Percent of on-time 2018 graduates



Source: Authors' analysis of 2017/18 data from the Washington Office of Superintendent of Public Instruction.

across student groups in the percentages of students meeting all the CCR graduation requirements except the fine arts requirement or the world languages requirement, or both, even though those percentages are higher.

Students in groups that did not meet all the CCR graduation requirements as often as their peers tended to lack credits in the content areas with increased requirements: science, fine arts, and world languages (see table C2 in appendix C). For instance, among 2018 on-time graduates, 21 percent of students in high-poverty schools earned at least two credits of laboratory science compared with 79 percent of students in low-poverty schools. Likewise, 53 percent of current English learner students met the world languages credit requirement compared with 81 percent of former English learner students and 78 percent of never English learner students.

Districts that had increased total, science, fine arts, or world langauges credit requirements for high school graduation at any time between 2012/13 and 2017/18 saw few changes in student academic outcomes

One intent of the CCR graduation credit requirements is to equip students with knowledge and skills that are in line with expectations for college admission, career training programs, and employment. State and local leaders are interested in knowing whether the new requirements will achieve that goal. Likewise, they are interested in understanding the risks of increasing the rigor of high school curricula, such as potential decreases in grade point averages and graduation rates among students who may not be prepared to meet more advanced academic requirements. The findings reported below describe relationships between district-level increases in graduation credit requirements in previous years and changes in students' academic outcomes.

Few relationships were found between district-level increases in total, science, fine arts, or world languages credit requirements for graduation between 2012/13 and 2017/18 and student academic outcomes (see table C4 in appendix C). On average, credits attempted, credits earned, grade point averages, state assessment scores, and the probability of graduating on time, dropping out, or meeting credit requirements for admission to a public four-year university in Washington varied little from year to year, despite increases in graduation requirements.

There were some exceptions among student groups (table 2). These emerging patterns provide a starting point for understanding relationships between increases in high school graduation requirements and student outcomes. However, districts that chose to increase graduation requirements on their own might differ from other districts in ways that could explain the observed patterns. After all districts have implemented the CCR graduation requirements, these analyses could be repeated to see whether the findings remain consistent.

Among patterns to watch as all districts begin implementation, one is the positive associations that were found between certain increases in graduation credit requirements and some student outcomes. For example, increases in total credits required were associated with at least a 0.5 credit increase in credits attempted and in credits earned among American Indian/Alaska Native, Asian, and Black students. In addition, increases in science, fine arts, and world languages credit requirements were related to increases in scores on high school state assessments in English language arts for at least one of the following groups: American Indian/Alaska Native students, former English learner students, and students in distant schools.

On the other hand, some increases in credit requirements for graduation were negatively associated with academic outcomes for some student groups. Increases in world languages credit requirements were associated with at least a 0.5 credit decrease in credits attempted for Asian students, Black students, Hispanic students, never English learner students, and students in distant schools (see table 2). Increases in fine arts credit requirements were associated with at least a 0.5 credit decrease in credits attempted and credits earned for Black students. And increases in total credit requirements and world languages credit requirements were associated with at least a 5 percentage point decrease in the probability of meeting credit requirements for admission to a public four-year university in Washington for Asian students.

Table 2. Associations between district-level increases in total, science, fine arts, and world languages credit requirements for graduation between 2012/13 and 2017/18 and academic outcomes among student groups

		Area of change in credit requirements for graduation			
Outcome	Amount of change	Total	Science	Fine arts	World languages
High school academic performance					
Credits attempted	At least 0.5 credit	(+) American Indian/Alaska Native students (+) Asian students (+) Black students (+) Multiracial students (+) Never English learner students (+) Students in large metro schools (+) Students in midsize schools (+) Students in urban fringe schools	(+) Multiracial students (+) Students in large metro schools (+) Students in midsize schools	(–) Black students (+) Students in midsize schools	(–) Asian students (–) Black students (–) Hispanic students (–) Never English learner students (–) Students in distant schools
Credits earned	At least 0.5 credit	(+) American Indian/Alaska Native students (+) Asian students (+) Black students (+) Students in large metro schools (+) Students in midsize schools (+) Students in urban fringe schools	(+) Multiracial students (+) Students in large metro schools (–) Students in distant schools (–) Students in urban fringe schools	(–) Black students (+) Students in midsize schools	(–) Students in distant schools
Grade point aqerage	At least 0.1 grade point		(+) Current English learner students		
Scores on high school state assessment in English language arts	At least 0.1 standard deviation[a]		(+) Former English learner students (+) Students in large metro schools (+) Students in distant schools	(+) American Indian/Alaska Native students	(+) American Indian/Alaska Native students (+) Former English learner students
Scores on high school state assessment in math assessment	At least 0.1 standard deviation[a]				
High school completion					
Probability of graduating on time	At least 5 percentage points				(–) Students in urban fringe schools
Probability of dropping out	At least 5 percentage points				
Postsecondary readiness					
Probability of meeting credit requirements for admission to a public four-year university in Washington	At least 5 percentage points	(–) Asian students (–) Students in large metro schools (–) Students in metro suburb schools	(+) Students in large metro schools (–) Students in metro suburb schools	(–) Students in metro suburb schools	(–) Asian students (–) Students in metro suburb schools

a. Scaled scores on state assessments were standardized within school year, grade level, and test to have a mean of 0 and a standard deviation of 1.

(+) indicates a positive association; (–) indicates a negative association.

Note: All associations are statistically significant at $p < .05$. Separate regression models were used for each student group and controlled for the school year in which students were held accountable for graduation requirements, gender, race/ethnicity, scores on grade 8 state assessments in English language arts and math, whether students were ever eligible for the national school lunch program, whether students received special education services, whether students were a current or former English learner student (compared with a never English learner student), whether students were ever eligible for migrant student services, the percentage of students eligible for the national school lunch program in the last high school attended, and the locale of the last high school attended (based on National Center for Education Statistics locale codes). Fixed effects are included for each school district. See table C4 in appendix C for exact values.

Source: Authors' analysis of 2009/10–2017/18 data from the Washington Office of Superintendent of Public Instruction.

Limitations

This study had four main limitations.

The results do not provide causal evidence of the impact of raising graduation requirements, nor do they measure the impact of the CCR graduation requirements. To inform ongoing policy implementation, the conclusions are based on historical data that show associations between past district-level increases in graduation requirements and student academic outcomes. Unobserved events that took place at the same time as increases in graduation requirements and other factors that are not easily quantifiable may explain some of the associations. Future research might be able to more rigorously evaluate the effects of the CCR graduation requirements.

This study included only Washington public schools and students, so the findings should not be generalized to other contexts. However, the findings might offer insights for state and local education agencies nationwide that are implementing new graduation requirements.

Some high schools might have graduation requirements that exceed their district's minimum. Since this information cannot be reliably accessed, the associations between increases in district graduation requirements and student outcomes might be underestimated. In addition, district graduation requirements are self-reported to the Washington State Board of Education and verified by follow-up only if they do not meet or exceed state requirements.

This study classified each course in one content area, and not all exemptions and waivers were reported in state data. Some schools might count the same course for graduation requirements in two or more content areas. In addition, students might meet graduation requirements through competency exams and high school–level courses taken during middle school. This means that the percentage of students meeting requirements is likely to be underestimated.

Despite these limitations, this study provided descriptive and correlational evidence that might help policymakers anticipate advantages and challenges associated with increases in graduation requirements. In addition, this study might help Washington education leaders identify districts and student groups to monitor closely for signs of progress or struggle.

Implications

This study aims to provide actionable information to help Washington state implement its CCR graduation requirements. The results suggest several actions that state and local education leaders and policymakers might consider.

Assessing districts' capacity to implement the career- and college-ready graduation requirements and exploring ways to strengthen it

Districts that required the class of 2018 to meet the CCR graduation requirements had fewer students per teacher and more class periods per day, on average. This implies that they have more capacity to offer all students opportunities to acquire credits in each required content area. Follow-up investigations could improve state leaders' understanding of the obstacles to increasing credit requirements, including physical and human capital resources, which could help in deploying appropriate supports to assist these districts in overcoming barriers. State leaders could ask early implementer districts how they were able to implement early and learn about the conditions that might be needed to facilitate implementation efforts elsewhere. For example, how many and which CCR requirements did districts without waivers have in place before the class of 2019?

Investigating ways to support students and make them aware of options for meeting the career- and college-ready graduation requirements

Three out of four 2018 on-time graduates statewide did not meet the CCR graduation requirements; gaps suggest that barriers exist for students in high-poverty schools, students of color, students eligible for the national school lunch program, current English learner students, and students with low scores on grade 8 state assessments. State policymakers and education leaders might want to consider ways to ensure that all students—particularly those in the groups mentioned above—are aware of the new graduation requirements and receive support and guidance on how to meet them. Understanding of how to meet the new CCR graduation requirements will vary based on the courses available to them in their schools. All students might benefit from information about policies that provide flexibility for meeting graduation requirements, such as replacing one credit of fine arts with a course aligned with a student's postsecondary plans, as well as other policies that support on-time graduation, such as earning world languages credits by taking a competency exam. Raising awareness of these opportunities and helping students take advantage of them could make it easier for some students to meet all the CCR graduation requirements.

Using data to understand how increases in graduation requirements are associated with course-taking patterns that help or hinder students' ability to qualify for admission to four-year universities

Past district-level increases in total, science, fine arts, and world languages credit requirements were not associated with increases in students' likelihood of meeting credit requirements for admission to a public four-year university in Washington, despite the fact that the CCR graduation requirements aim to prepare students for college. Future research that identifies which requirements students are missing could be useful in determining whether increasing requirements in one content area is associated with taking fewer courses in another content area. If so, it would be important to investigate whether having to take an extra course to graduate keeps students from taking a course that interests them or prepares them for their preferred career. School guidance counseling could also help students select the courses needed to meet specific university admissions criteria that go beyond state graduation requirements, such as algebra-based science courses and two credits of the same world language. Finally, state officials might consider investigating whether the CCR graduation requirements were associated with any two- or four-year college outcomes, such as enrollment and persistence.

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