



What's Happening

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# Advanced course completion rates among New Mexico high school students following changes in graduation requirements

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## Key findings

In 2008, in an effort to promote college readiness, New Mexico began requiring high school students to complete at least one advanced course in order to graduate. This study examines advanced course completion rates after the change among students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years. Among the key findings:

- Over 56 percent of students completed at least one advanced course in high school.
- A higher percentage of White students than of American Indian and Hispanic students completed at least one advanced course. The gaps across racial/ethnic groups were smaller when high-performing students were examined separately.
- The percentage of students who completed at least one advanced course was substantially lower among students at small schools than among students at bigger schools. The gap across school size was about the same when high-performing students were examined separately.

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## Summary

In 2008 New Mexico changed its graduation requirements for regular education high school students who completed more than their senior year of high school in a New Mexico public school. Students who entered high school in 2009 were the first to have to complete (pass with a D or better) at least one advanced course (a course designated by the New Mexico Public Education Department as an honors or gifted and talented course or designated by the school district as an advanced, Advanced Placement, gifted and talented, honors, or International Baccalaureate course), dual-credit course, or distance learning course (New Mexico Statutes Annotated, 2008).<sup>1</sup> Numerous studies have shown the positive academic outcomes—such as higher high school graduation (Long, Conger, & Iatarola, 2012) and postsecondary enrollment and persistence rates (Adelman, 1999; Bielby, House, Flaster, & Desjardins, 2013)—associated with completing advanced courses.

This study examines advanced course completion rates (the percentages of students who completed zero, one, and two or more advanced courses) among New Mexico public high school students in the first three cohorts subject to the state’s new graduation requirements to identify whether gaps exist in the state and across student and school characteristics. It uses data on students who entered grade 9 in 2009–11 and remained enrolled for four years. The student characteristics examined were race/ethnicity, grade 8 standards-based assessment performance in math, eligibility for the federal school lunch program, and English learner status; the school characteristics examined were performance rating, size, Title I status, and urbanicity. The findings may help New Mexico policymakers and practitioners understand the extent to which traditionally underserved populations complete advanced courses in high school.

The study found that over 56 percent of New Mexico students completed at least one advanced course in high school but that gaps exist across racial/ethnic groups. White students were more likely than American Indian students and Hispanic students to complete an advanced course. The gap in the advanced course completion rate between White students and American Indian students was 17 percentage points, and the gap between White students and Hispanic students was 14 percentage points. The gaps across racial/ethnic groups were smaller when high-performing students (those who received a score of met expectations or exceeded expectations in math on the state’s grade 8 standards-based assessment) were examined separately. When high-performing students were examined separately, the gap between White students and American Indian students was 6 percentage points, and the gap between White students and Hispanic students was 4 percentage points. The percentage was much lower among lower performing students (51 percent among lower performing American Indian students, 52 percent among lower performing Hispanic students, and 64 percent among lower performing White students), and substantial gaps remained across racial/ethnic subgroups.

The study also found that advanced course completion rates were related to school characteristics. The percentage of students who completed at least one advanced course was higher among students at schools with a performance rating of A on the state’s A–F scale than among students at schools with a lower rating. The percentage who completed multiple advanced courses was substantially lower among students at small schools (those with fewer than 750 students) than among students at bigger schools. The gaps remained when high-performing students were examined separately. The percentage who completed

at least one advanced course was lower among high-performing students at small schools than among high-performing students at bigger schools.

Although this study was not designed to investigate the causes of gaps in advanced course completion rates, identifying the gaps across student and school characteristics is a first step in helping members of the New Mexico Achievement Gap Research Alliance develop strategies to reach traditionally underserved students. The next step could be to investigate areas for improvement in approaches to promoting awareness of the availability and benefits of advanced course completion among American Indian and Hispanic students. The finding that a large share of these students do not complete advanced courses highlights the need to further investigate the extent to which advanced courses are available to students across the state, particularly in small schools and schools with low performance ratings.

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## Why this study?

Evidence suggests that taking academically rigorous high school courses is related to post-secondary success, including continuing on to college and graduating with a bachelor's degree (Adelman, 1999; Attewell & Domina, 2008; Betts, Zau, & Bachofer, 2013; Joensen & Nielsen, 2009; Klopfenstein & Thomas, 2009; Long et al., 2012; Rose & Betts, 2001). Although the rigor of courses needed to graduate high school has increased nationally (Bielby et al., 2013), gaps in advanced course completion and adequate preparation for college remain between White students and traditionally underserved students (for example, American Indian, Black, and Hispanic students). Nationwide, about 24 percent of public high school students earn at least one Advanced Placement or International Baccalaureate math credit, and 14 percent complete at least one Advanced Placement or International Baccalaureate science course during high school (Dalton, Ingels, & Fritch, 2016). Other national- and state-level studies have found that American Indian, Black, and Hispanic students complete fewer advanced courses and more vocational courses than White students do (Cisneros, Gomez, Powers, Holloway-Libell, & Corley, 2014; Kao & Thompson, 2003; Klopfenstein, 2004; Oakes, 1983; Oakes, Joseph, & Muir, 2004). See appendix A for a literature review.

To improve student success after high school, many states have increased the rigor of graduation requirements. Keeping with national trends, in 2008 New Mexico adopted new high school graduation requirements designed to promote college readiness. Students who entered high school in grade 9 in 2009 (who were projected to graduate in 2013) were the first to have to complete (pass with a D or better) at least one advanced course (a course designated by the New Mexico Public Education Department as an honors or gifted and talented course or designated by the school district as an advanced, Advanced Placement, gifted and talented, honors, or International Baccalaureate course), dual-credit course, or distance learning course (New Mexico Statutes Annotated, 2008; see box 1 for definitions of key terms used in the report).<sup>2</sup>

No studies have examined course completion rates among New Mexico high school students since the change in graduation requirements to identify whether gaps exist in the state and across student groups and school characteristics. The New Mexico Achievement Gap Research Alliance<sup>3</sup> has voiced concern over whether American Indian and Hispanic students, who account for approximately 69 percent of the state's student population, are completing advanced courses at the same rates as other students since the change. The alliance has also expressed interest in how advanced course completion rates differ across students by prior standards-based assessment performance and race/ethnicity.

Identifying the extent to which high school students meet or exceed the New Mexico advanced course graduation requirement and whether gaps exist in advanced course completion rates across student characteristics is a first step in helping alliance members develop strategies to improve postsecondary readiness and success statewide, particularly among American Indian and Hispanic students. By better understanding the extent to which students with different characteristics successfully complete advanced courses, alliance members can highlight where improvement is needed in advanced course enrollment, persistence, and completion. Moreover, this information could help inform policy-makers who are working to improve student services and professional development for the staff who provide those services.

**Better understanding the extent to which students with different characteristics successfully complete advanced courses in New Mexico can highlight where improvement is needed in advanced course enrollment, persistence, and completion**



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## Box 1. Key terms

**Advanced course.** A course designated by the New Mexico Public Education Department as an honors or gifted and talented course or designated by the school district as an advanced, Advanced Placement, gifted and talented, honors, or International Baccalaureate course. Data on dual-credit and distance learning courses, which have counted toward the graduation requirement for advanced courses since 2009, were not available, and thus those courses are not included in the analysis.

**Advanced Placement course.** A course in one of 38 subject areas that offers high school students a college-level curriculum. Students may obtain course credit at colleges and universities for passing a year-end Advanced Placement exam, though they do not have to take an Advanced Placement course in order to take an Advanced Placement exam.

**Course completion.** A course that a student passed with a grade of D or higher, which is the requisite grade to receive course credit.

**High-performing student.** A student who received a score of met expectations or exceeded expectations in math on the state's grade 8 standards-based assessment. The assessment used in New Mexico changed during the study period from the New Mexico High School Competency Examination in 2009–11 to the Standards Based Assessment in 2012–15.

**International Baccalaureate course.** A course that is part of the broader International Baccalaureate Diploma Programme, which focuses on independent, student-driven learning and cultural awareness.

**School performance rating.** A school's rating on the New Mexico Public Education Department's A–F grading system, which is based on student performance on standards-based assessments, school and student growth, graduation rates, opportunity to learn, and college readiness, among other factors. The rating system was used to report adequate yearly progress under the No Child Left Behind Act of 2001 (2002).

**Title I school.** A school that qualifies for federal financial assistance because it has a high percentage of students from low-income families, as reported by the National Center for Education Statistics. Federal funds are allocated to schools through four statutory formulas based primarily on census poverty estimates and the cost of education by state (U.S. Department of Education, 2015).

**Urbanicity.** The degree to which a geographic area is urban, as defined by the National Center for Education Statistics (2006). The four major locale categories are city, suburban, town, and rural.

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## What the study examined

The study examined advanced course completion rates—the percentages of students who completed zero, one, and two or more advanced courses—among New Mexico public high school students in the first three cohorts subject to the graduation requirements that were introduced in 2008—that is, students who entered grade 9 in 2009–11. See box 2 for a summary of the data and methods and appendix B for further details.

The study addressed two research questions:

1. What percentage of students who entered a New Mexico high school in grade 9 and were enrolled for four years completed at least one advanced course? What percentage completed zero advanced courses, and what percentage completed two or more advanced courses?
2. How does the advanced course completion rate vary across student and school characteristics?

The student characteristics examined in the study were race/ethnicity, grade 8 standards-based assessment performance in math, eligibility for the federal school lunch program, and English learner status; the school characteristics examined in the study were performance rating, size, Title I status, and urbanicity. While these characteristics are important for policymakers in considering the impact of advanced course completion, this study is descriptive in nature and no causal attributions can be made on the basis of the findings.

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## **Box 2. Data and methods**

### **Data**

This study used student- and school-level data from the New Mexico Student Teacher Accountability Reporting System delivered by the New Mexico Public Education Department and school-level data from the Common Core of Data from the National Center for Education Statistics.

The analytic sample consisted of 57,826 New Mexico high school students from 124 districts and 238 schools who entered a New Mexico high school in grade 9 in 2009–11 and were enrolled for four years. The 2009/10 school year was the earliest year for which data were available on student course completion and grades. The analyses included only American Indian, Hispanic, and White students, who account for about 97 percent of the state's student population.

Data for each student included course completion and performance records for each semester that the student was enrolled in a New Mexico public high school. The data did not include an indicator for whether the student graduated. As such, students in the analytic sample were in high school for four consecutive years, but it is unknown whether they later graduated or earned a General Educational Development certificate, continued into a fifth year or beyond, or dropped out after the fourth year.

### **Methods**

Cohorts were created to limit the students included in the analyses to the groups that entered high school together (thereby excluding new students who entered after grade 9). The cohorts represent 68 percent of all students who were ever enrolled in grade 9 in a New Mexico high school during the study timeframe. The analyses include data for all three cohorts combined because there were no substantive differences in advanced course completion across cohorts. Descriptive statistics were used to examine differences by student and school characteristics.

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## What the study found

The study identified many gaps in advanced course completion rates across student and school characteristics. This section presents the main findings, and appendix C presents supplementary findings.

### Over 56 percent of students completed at least one advanced course in high school

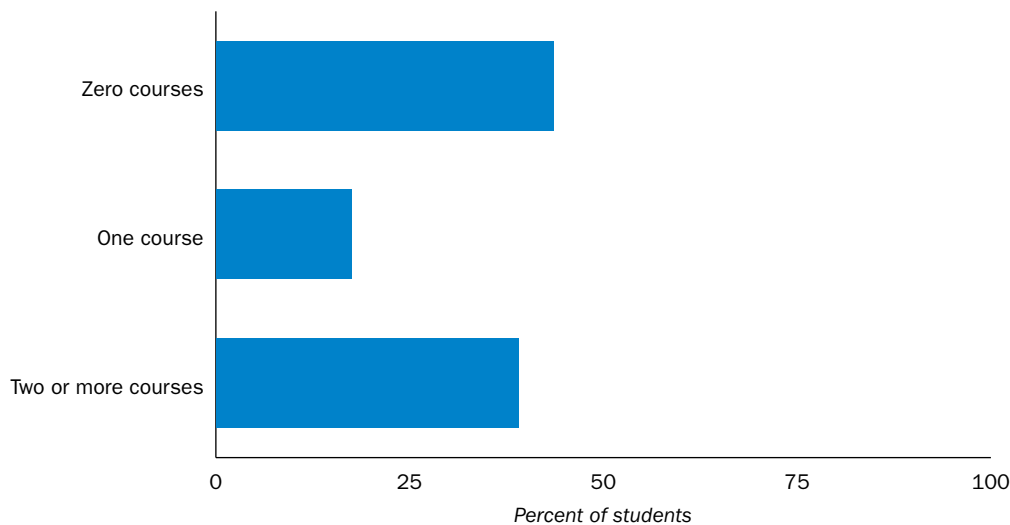
Approximately 44 percent of students completed zero advanced courses, 18 percent completed only one advanced course (meeting the graduation requirement), and 39 percent completed two or more advanced courses (exceeding the graduation requirement; figure 1). Students who completed zero advanced courses may have graduated with an alternative demonstration of competency,<sup>4</sup> dropped out, persisted for more than four years of high school, or otherwise exited from the New Mexico public school system (for example, left the state or exited to private or home school).<sup>5</sup> The average number of advanced courses completed was 2.3 (see table C1 in appendix C).

### A higher percentage of White students than of American Indian and Hispanic students completed at least one advanced course

The percentage of students who completed at least one advanced course in high school varied substantially by race/ethnicity (figure 2). Approximately 50 percent of American Indian students, 53 percent of Hispanic students, and 67 percent of White students completed at least one advanced course.

*Approximately 44 percent of students completed zero advanced courses, 18 percent completed only one advanced course (meeting the graduation requirement), and 39 percent completed two or more advanced courses (exceeding the graduation requirement)*

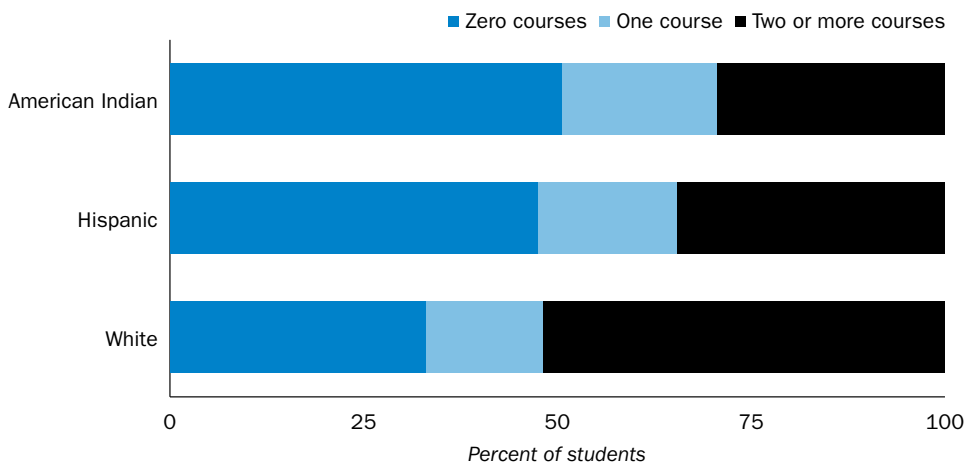
**Figure 1. More than half of students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years completed at least one advanced course**



**Note:** *N* = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Figure 2. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage who completed at least one advanced course was higher among White students than among American Indian and Hispanic students**



*Approximately 50 percent of American Indian students, 53 percent of Hispanic students, and 67 percent of White students completed at least one advanced course*

**Note:** N = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**The gaps in advanced course completion rates across racial/ethnic groups were smaller when high-performing students were examined separately from low-performing students**

Gaps in advanced course completion rates between White students and students of other races/ethnicities existed among both high-performing students and lower performing students (figure 3). But the gaps were substantially smaller when high-performing students were examined separately, despite the fact that those students account for only 7 percent of the analytic sample. The gap in the percentage who completed at least one advanced course between White students and students of other races/ethnicities was 4–6 percentage points among high-performing students and 12–13 percentage points among lower performing students.

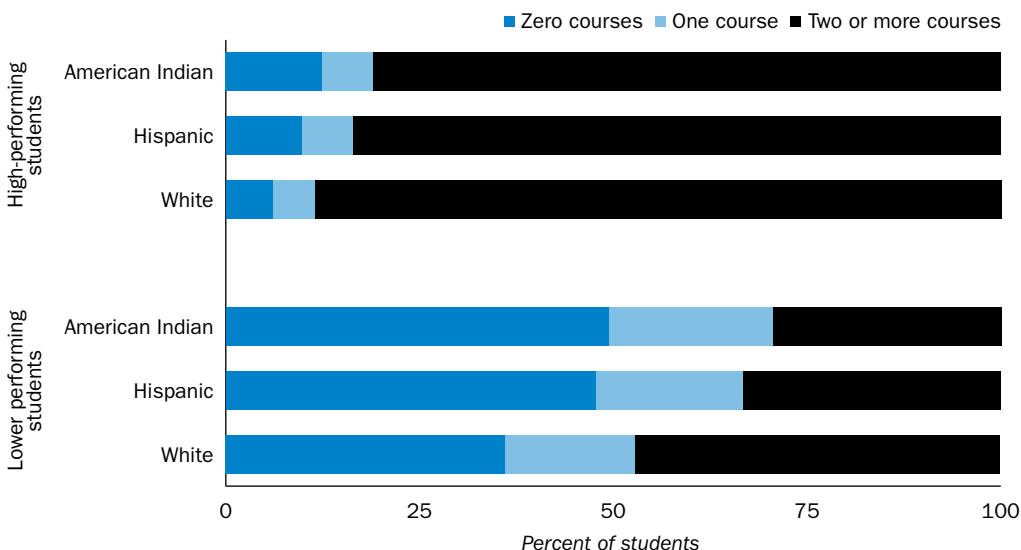
**The percentage of students who completed at least one advanced course was lower among students who were eligible for the federal school lunch program than among students who were not eligible**

Approximately 49 percent of students who were eligible for the federal school lunch program completed at least one advanced course, compared with 73 percent of students who were not eligible (figure 4). The average number of advanced courses completed was lower among students who were eligible for the federal school lunch program (1.7) than among students who were not eligible (3.7).

**The percentage of students who completed at least one advanced course was lower among English learner students than among non-English learner students**

Approximately 37 percent of English learner students completed at least one advanced course, compared with 60 percent of non-English learner students (figure 5). The average number of advanced courses completed was 0.8 among English learner students and 2.6 among non-English learner students.

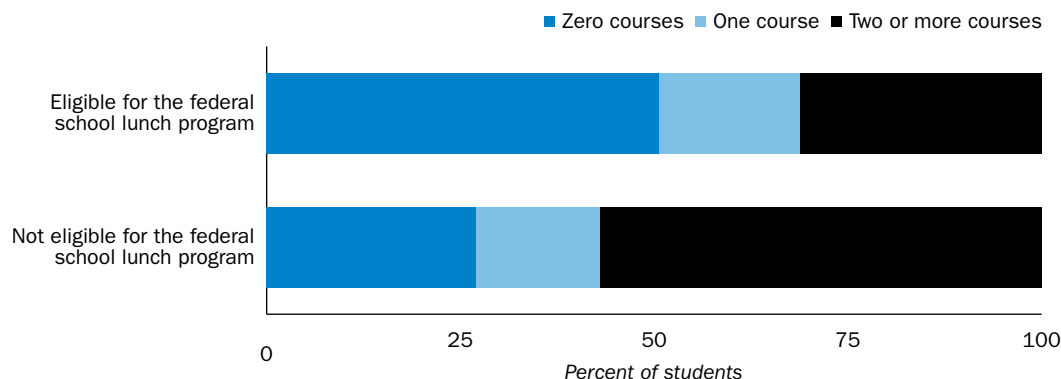
**Figure 3. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the gap in advanced course completion rates between White students and students of other races/ethnicities was smaller among high-performing students than among lower performing students**



**Note:** N = 53,796 students. High-performing students are those who received a score of met expectations or exceeded expectations in math on the state’s grade 8 standards-based assessment; lower performing students are all other students. Data on grade 8 standards-based assessment performance were missing for 4,030 students in the analytic sample.

**Source:** Authors’ calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

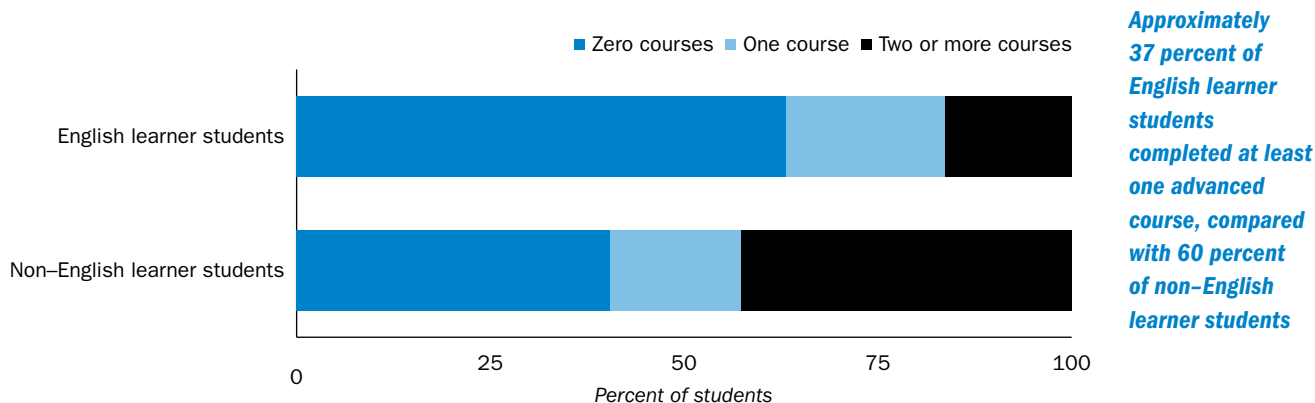
**Figure 4. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage who completed at least one advanced course was lower among students who were eligible for the federal school lunch program than among students who were not eligible**



**Note:** N = 57,826 students.

**Source:** Authors’ calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Figure 5. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage who completed at least one advanced course was lower among English learner students than among non-English learner students**



**Note:** N = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

#### Advanced course completion rates varied by school performance rating

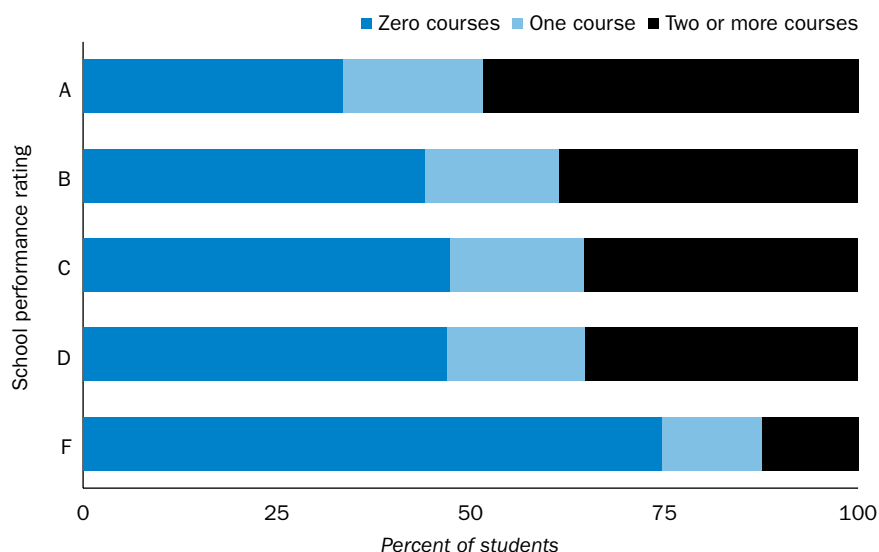
The percentage of students who completed two or more advanced courses was substantially higher among students at schools with the highest performance rating (48 percent) than among students at schools with a lower rating (12–39 percent), while the percentage who completed zero advanced courses was lower among students at schools with the highest rating (34 percent) than among students at schools with a lower rating (44–75 percent; figure 6).<sup>6</sup> The percentage of students who completed at least one advanced course was not substantially different across schools with a rating of B, C, or D (53–56 percent). Approximately 25 percent of students at schools with the lowest performance rating completed at least one advanced course (13 percent completed only one and 12 percent completed two or more).<sup>7</sup>

#### The percentages of high-performing American Indian and Hispanic students who completed at least one advanced course were higher among students at schools with a higher performance rating than among students at schools with a lower performance rating

When high-performing American Indian students were examined separately, the percentage who completed at least one advanced course was higher among students at schools with a performance rating of A or B (91 percent) than among students at schools with a rating of C, D, or F (84 percent; figure 7). When high-performing Hispanic students were examined separately, the percentage was also higher among students at higher rated schools (92 percent) than among students at lower rated schools (87 percent). In contrast, the gap in the percentage of high-performing White students who completed at least one advanced course was only 1 percentage point between students at higher rated schools (94 percent) and students at lower rated schools (95 percent).

When lower performing American Indian students were examined separately, the percentage who completed at least one advanced course was higher among students at schools with a performance rating of A or B (50 percent) than among students at schools with a rating of C, D, or F (48 percent; figure 8). When lower performing Hispanic students

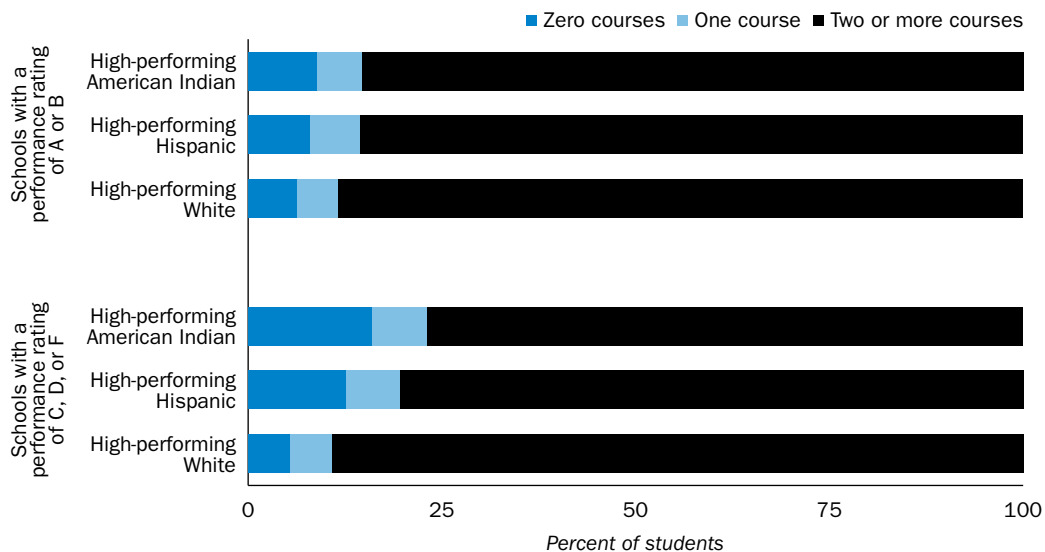
**Figure 6. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage who completed at least one advanced course was highest among students at schools with the highest performance rating**



**Note:** N = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

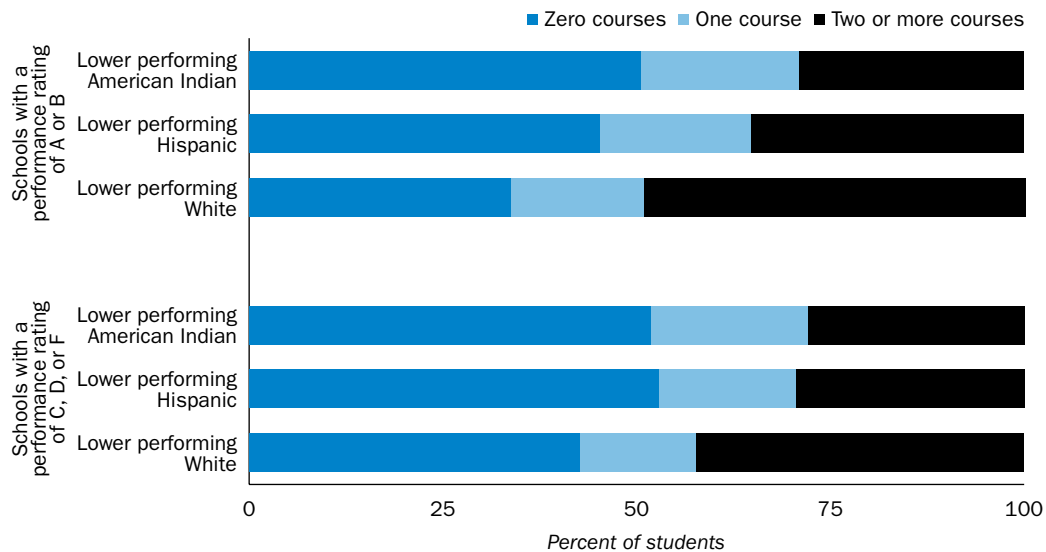
**Figure 7. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage of high-performing American Indian and Hispanic students who completed at least one advanced course was higher among students at schools with a high performance rating than among students at schools with a lower performance rating**



**Note:** N = 53,796 students. High-performing students are those who received a score of met expectations or exceeded expectations in math on the state's grade 8 standards-based assessment. Data on grade 8 standards-based assessment performance were missing for 4,030 students in the analytic sample.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Figure 8. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage of lower performing American Indian, Hispanic, and White students who completed at least one advanced course was higher among students at higher rated schools than among students at lower rated schools**



*When lower performing American Indian students were examined separately, the percentage who completed at least one advanced course was higher among students at schools with a performance rating of A or B (50 percent) than among students at schools with a rating of C, D, or F (48 percent)*

**Note:** N = 53,796 students. Lower performing students are all students who did not receive a score of met expectations or exceeded expectations in math on the state’s grade 8 standards-based assessment. Data on grade 8 standards-based assessment performance were missing for 4,030 students in the analytic sample.

**Source:** Authors’ calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

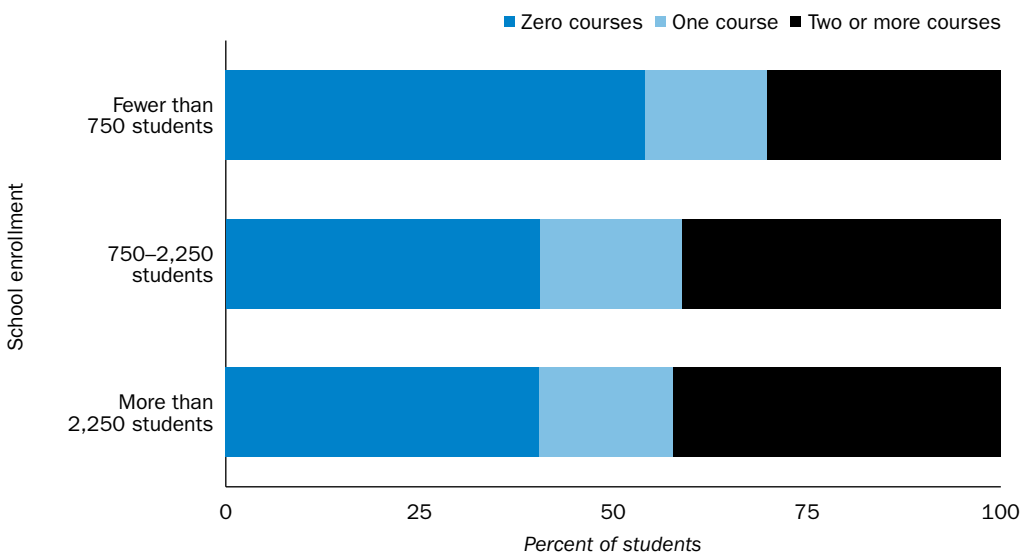
were examined separately, the percentage was also higher among students at schools with a higher rating (55 percent) than among students at schools with a lower rating (47 percent). And when lower performing White students were examined separately, the percentage was higher among students at higher rated schools (67 percent) than among students at lower rated schools (57 percent).

**The percentage of students who completed at least one advanced course was lower among students at small schools than among students at bigger schools**

The percentage of students who completed at least one advanced course was much lower among students at schools with fewer than 750 students than among students at bigger schools. Approximately 46 percent of students at schools with fewer than 750 students completed at least one advanced course, compared with 60 percent of students at schools with 750–2,250 students and 61 percent of students at schools with more than 2,250 students (figure 9).



**Figure 9. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage who completed at least one advanced course was lowest among students at schools with fewer than 750 students**



*Approximately 46 percent of students at schools with fewer than 750 students completed at least one advanced course, compared with 60 percent of students at schools with 750–2,250 students and 61 percent of students at schools with more than 2,250 students*

**Note:** N = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**For both high-performing and lower performing students the gap in the percentage who completed at least one advanced course across racial/ethnic groups was larger among students at small high schools than among students at bigger schools**

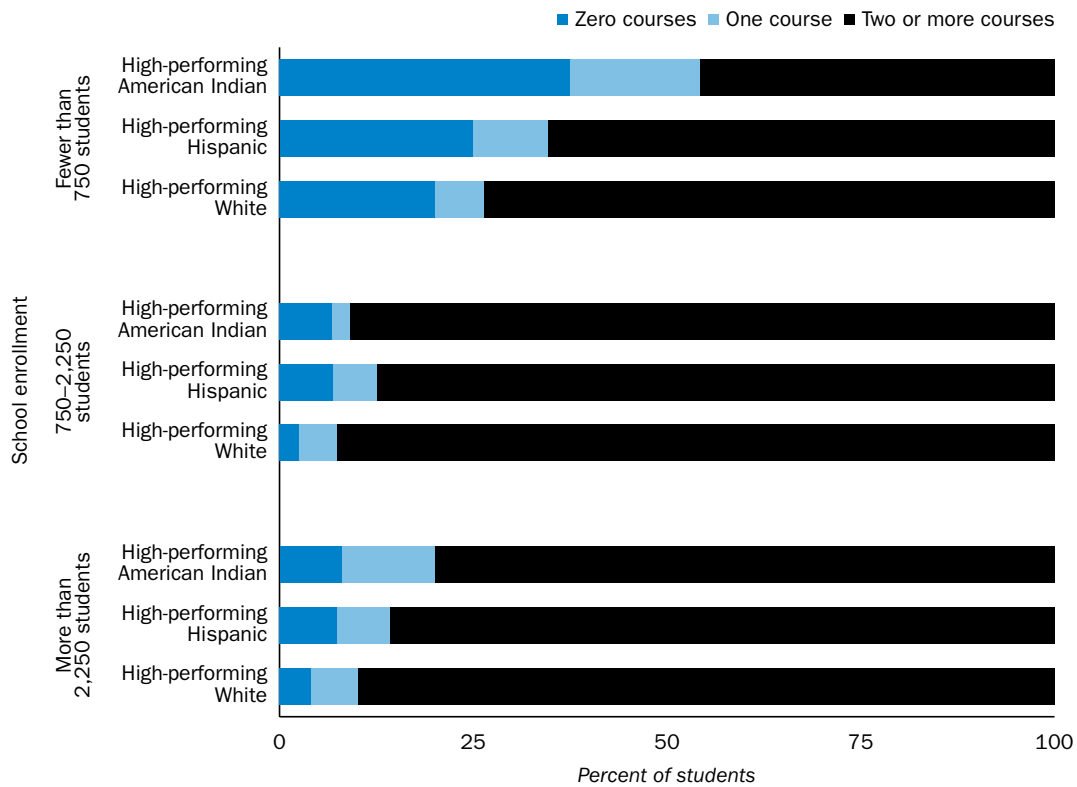
The largest gaps in the percentage of students who completed at least one advanced course across racial/ethnic groups were among students in small schools. When high-performing students were examined separately, the gap between White students and students of other races/ethnicities was 5–17 percentage points among students at schools with fewer than 750 students, 4 percentage points among students at schools with 750–2,520 students, and 3–4 percentage points among students at schools with more than 2,520 students (figure 10).

The pattern was similar when lower performing students were examined separately. The gap between White students and students of other races/ethnicities was 13–18 percentage points among students at schools with fewer than 750 students, 10–12 percentage points among students at schools with 750–2,250 students, and 12–17 percentage points among students at schools with more than 2,250 students (figure 11).

**The percentage of students who completed at least one advanced course was lower among students at Title I high schools than among students at non-Title I schools**

Advanced course completion rates varied by school Title I status. The percentage of students who completed at least one advanced course was 54 percent among students at Title I high schools (which accounted for 84 percent of schools in the analytic sample) and 71 percent among students at non-Title I high schools (figure 12).

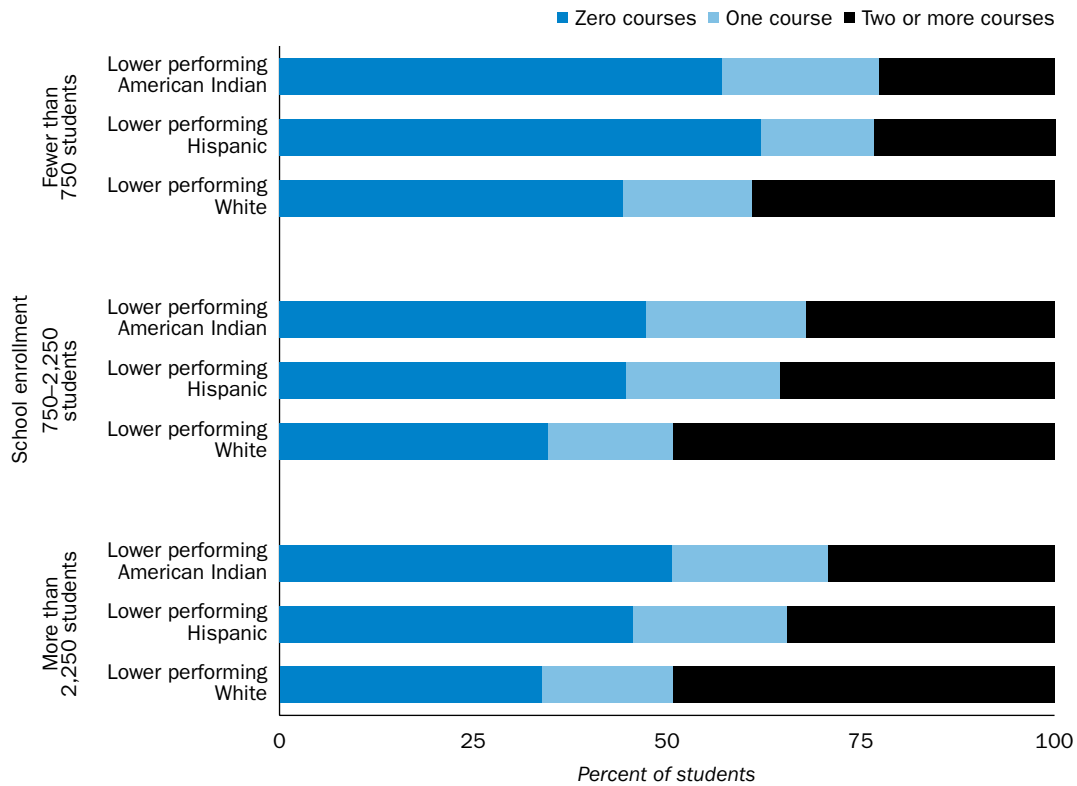
**Figure 10. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the largest gap in the percentage of high-performing students who completed at least one advanced course across racial/ethnic groups was among students at schools with fewer than 750 students**



**Note:**  $N = 53,796$  students. High-performing students are those who received a score of met expectations or exceeded expectations in math on the state's grade 8 standards-based assessment. Data on grade 8 standards-based assessment performance were missing for 4,030 students in the analytic sample.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

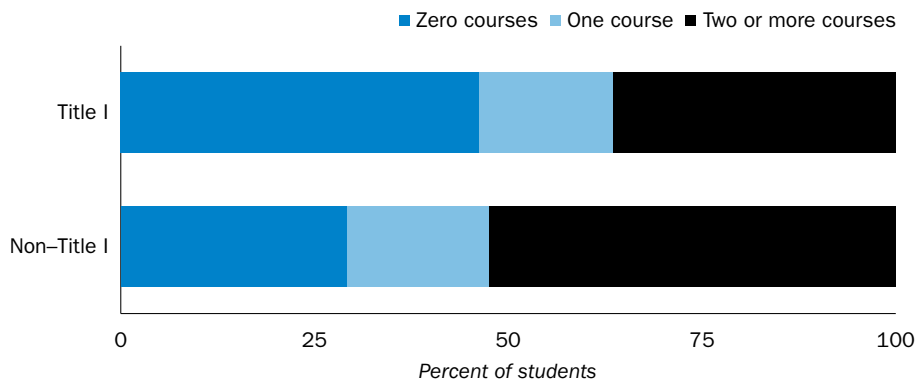
**Figure 11. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the largest gap in the percentage of lower performing students who completed at least one advanced course across racial/ethnic groups was among students at schools with fewer than 750 students**



**Note:** N = 53,796 students. Lower performing students are all students who did not receive a score of met expectations or exceeded expectations in math on the state’s grade 8 standards-based assessment. Data on grade 8 standards-based assessment performance were missing for 4,030 students in the analytic sample.

**Source:** Authors’ calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Figure 12. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the percentage who completed at least one advanced course was higher among students at non–Title I schools than among students at Title I schools**



**Note:** N = 57,826 students.

**Source:** Authors’ calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

## Implications of the study findings

After prior student performance was accounted for, gaps in advanced course completion rates across racial/ethnic groups remained. Gaps across racial/ethnic groups remained even when students at schools with a similar performance rating and size were examined separately. The gaps were smaller—but not eliminated—when high-performing students were examined separately. When high-performing students were examined separately, the gaps across racial/ethnic groups were smaller among students at schools with a higher performance rating than among students at schools with a lower performance rating and smaller among students at larger schools than among students at smaller. These findings point to the importance of programs that help students gain the skills necessary for advanced coursework. The findings are in line with existing research that shows that completion of advanced courses is much higher among White students than among Hispanic students and students of other races/ethnicities (see appendix A).

A lower percentage of students who were eligible for the federal school lunch program than of students who were not eligible completed at least one advanced course, as did a lower percentage of English learner students than of non-English learner students. These findings suggest that future research could explore academic readiness (beyond prior exam performance) and support (for example, instructional and linguistic support) for students who were eligible for the federal school lunch program and for English learner students to better understand the factors associated with advanced course completion among these student groups. A better understanding of the academic preparation that contributes to academic success across subgroups could inform practices and programs in New Mexico schools. For example, some evidence suggests that strong advising and individualized learning models (coupled with enhanced curriculum, instructional and assessment practices, and educator professional development) can help underserved students develop academic skills and can increase their chance of success in advanced and college preparatory courses (Lipp, 2011).

Advanced course completion rates varied among students at schools with different performance ratings and at schools of different sizes. The percentage of students who completed at least one advanced course was lower among students at small schools than among students at larger schools and lower among students at schools with a low performance rating than among students at schools with a higher performance rating. The largest gaps between high-performing White students and high-performing American Indian students were at schools with the lowest performance ratings and at schools with fewer than 750 students. Similarly, the largest gaps between high-performing White students and high-performing Hispanic students were at schools with the lowest performance ratings and at schools with fewer than 750 students. Differences in school resources (for example, staff development efforts, teacher quality, and budget to pay for student Advanced Placement exam fees) and advanced course offerings may explain some of the gaps across school types. Improving school resources and increasing advanced course offerings at schools with low advanced course completion rates could improve advanced course participation and completion rates. Future research could explore the types of school resources, controlling for student population served, that improve advanced course completion outcomes.

The findings from this study may help members of the New Mexico Achievement Gap Research Alliance identify gaps in services (such as advising and instructional and linguistic support) and may highlight areas for improvement in approaches to promoting

***Improving school resources and increasing advanced course offerings at schools with low advanced course completion rates could improve advanced course participation and completion rates. Future research could explore the types of school resources, controlling for student population served, that improve advanced course completion outcomes***

advanced course completion rates among all students, particularly traditionally underserved students. The findings may also be of interest to policymakers in New Mexico and other states that require students to complete advanced coursework prior to graduation as a way of increasing high school graduation and college-going rates, especially among American Indian and Hispanic students. While this study does not identify any specific causes or remedies for gaps in advanced course completion rates, it is a first step in informing alliance members and state policymakers should they decide to target additional support and services to increase college readiness and success (such as professional development for counseling staff and teacher-level support aimed at routing or encouraging students to enroll and succeed in advanced courses where there is lower completion and support for districts and schools to provide additional advanced course offerings). One extension of this research could include examining data on course enrollment and other advanced course offerings, such as dual-credit and distance learning courses, to better understand access to advanced courses at schools across the state. Future research could also examine the number of courses offered at schools, which potentially shapes the advanced course completion rate, to identify the types of schools that offer smaller numbers or fewer types of advanced courses.

***The findings from this study may help identify gaps in services (such as advising and instructional and linguistic support) and may highlight areas for improvement in approaches to promoting advanced course completion rates among all students, particularly traditionally underserved students***

### **Limitations of the study**

This study has two main limitations.

First, the study team lacked information about factors that are likely related to advanced course completion rates across the state, including rates of graduation, dropout, and continuation beyond the fourth year of high school. The study team also lacked information on the number of students who enrolled in advanced courses and then failed to complete them. And data were not available on student completion of dual-credit or distance-learning courses, which can also be used to meet graduation requirements, because that information was not included in the course tables provided by New Mexico Public Education Department. Districts and schools have to establish those courses with a college or university, so the study's focus is limited to the types of advanced courses that all high schools can offer (honors, gifted and talented, Advanced Placement, and International Baccalaureate).

Second, because the cohorts included in the study were restricted to students who were continuously enrolled for four years at a New Mexico public high school and because data on dual-credit and distance learning courses were unavailable, the findings may not be representative of all New Mexico students and courses completed. The findings can be generalized only to American Indian, Hispanic, and White students who took a course designated by the New Mexico Public Education Department as an honors or gifted and talented course or designated by the school district as an advanced, Advanced Placement, gifted and talented, honors, or International Baccalaureate course and who did not transfer into or out of New Mexico public schools or drop out before their fourth year of school. Because of these conditions, the advanced course completion rates reported here do not match actual advanced course completion rates across the state. The effects of these conditions may differ by student race/ethnicity because successful grade transition rates and four-year graduation rates are higher among White students than among students of other races/ethnicities (Cameron & Heckman, 2001).

## **Appendix A. Literature review**

A wealth of research reinforces the practical notion that students who complete more academically rigorous courses in high school tend to go to college more often and to be more successful in college once enrolled. Long et al. (2012) found that, after students' prior achievement, demographic characteristics, and school environment were controlled for, high school advanced course enrollment was a significant predictor of bachelor's degree attainment. Specifically, they found that students who enrolled in more-rigorous courses were more likely to earn a bachelor's degree than were students who were otherwise similar in observable characteristics, such as grade 8 test performance, and demographics but enrolled in less rigorous courses.

Taking advanced math courses is another strong indicator of academic success after high school. For instance, Adelman (1999) showed that the level of math course completed in high school was more predictive of college degree attainment than were students' standardized test scores and family income. Bielby et al. (2013) found that, after student characteristics and prior achievement were adjusted for, students who enrolled in Algebra II in high school were roughly three times more likely to persist into their second year of college and to earn a four-year degree than were students who did not enroll in Algebra II. According to Long et al. (2012), students who enrolled in at least one rigorous course early in high school had better outcomes, including higher graduation and postsecondary enrollment rates, than did students with similar prior performance who did not enroll in advanced high school courses. The researchers observed that the gaps were slightly greater among Black and Hispanic students and among students from low-income households.

### **Student characteristics associated with gaps in advanced course completion**

Several studies have illustrated the importance of student characteristics in advanced course completion patterns or gaps, though none has done so for New Mexico. One area where persistent gaps in education opportunities remain for underserved students is in high school courses (Kao & Thompson, 2003; Klopfenstein, 2004). Research conducted from the early 1980s into the 2000s demonstrated that racial/ethnic minority and economically disadvantaged students were consistently placed into vocational courses more frequently than were White and economically advantaged students, who were more often placed into college-bound courses (Oakes, 1983; Oakes et al., 2004).

National data demonstrate that these trends have existed in more recent times. Cisneros et al.'s (2014) study of advanced course enrollment in Arizona shows that traditionally underserved students, particularly Hispanic students, are underrepresented in Advanced Placement courses. Theokas and Saaris (2013) found that this mirrors national-level findings of the gaps in Advanced Placement and International Baccalaureate course enrollment among underserved student groups. Enrollment in advanced science and math courses among racial/ethnic minority students continues to lag behind that of non-racial/ethnic minority students (Aud et al., 2012; Laird, Alt, & Wu, 2009; Texas Education Agency, 2011). Laird et al. (2009) found that White students enrolled in calculus courses at nearly three times the rate that Black students did and nearly twice the rate that Hispanic students did and that Black and Hispanic students earned nearly one-half fewer advanced math and advanced science and engineering credits than White students did. Laird et al. examined transcript records from a nationally representative sample and found no statistically significant

changes in advanced science and math course enrollment and completion among Black, Hispanic, or White students between 1990 and 2005. In 2009 Black and American Indian high school students earned the fewest math and science course credits in high school while earning the largest number of vocational education credits (Nord et al., 2011). Conversely, racial/ethnic minority students completed fewer advanced courses; the proportion of White students who earned Advanced Placement credits in calculus, chemistry, and physics was roughly double that of Black and Hispanic students who did.

Research has also shown gaps in advanced course completion rates across student characteristics other than race/ethnicity. Several studies have explored course enrollment gaps by household income or socioeconomic status. Barton (2003) and Kelly (2004) found that economically disadvantaged students were less likely to enroll in advanced courses than their more affluent peers were. Riegle-Crumb and King (2010) found that gaps in advanced coursetaking between economically disadvantaged White students and economically disadvantaged Hispanic students were larger than those between economically disadvantaged White students and economically disadvantaged Black students. Gaps in advanced coursetaking between students whose first language is not English and their peers have also been noted. Callahan, Wilkinson, and Muller (2010) found that even after a host of individual, familial, and school characteristics (such as socioeconomic status and tested English language ability) were controlled for, students who were taking English as a second language courses in high school were almost 50 percent less likely to take college preparatory science courses and more than a third less likely to take college preparatory math classes than students who were not taking English as a second language courses.

#### **School characteristics associated with gaps in advanced course enrollment and completion**

Many studies have found that the associations between student characteristics and advanced course enrollment and completion patterns are mediated by more-complex features of different schooling environments, such as the performance of a student's peer group or the academic expectations set in particular schools (Kelly & Carbonaro, 2012; Riegle-Crumb & King, 2010).

Typically, research into the contextual, school-level factors that may explain gaps in course completion among students from different racial/ethnic backgrounds has considered both between- and within-school characteristics (that is, course completion gaps that emerge from one school to the next, as well as gaps across students who attend the same school).

Some researchers maintain that these gaps are due to differences in course access by race/ethnicity, with regard to upper-level courses such as calculus and to the prerequisites for those courses earlier in high school. Examining differences between schools, Oakes et al. (2004) demonstrated that the number of Advanced Placement math courses offered in California high schools was inversely related to the proportion of Black and Hispanic students enrolled in the schools, even after total student enrollment was controlled for. In exploring whether the quality of high schools impacted postsecondary success among racial/ethnic minority and non-racial/ethnic minority students, Fletcher and Tienda (2010) found that gaps in postsecondary outcomes did not vary by race/ethnicity. The real-world implications of this are stark: gaps between racial/ethnic minority and non-racial/ethnic minority students' access to high-quality high school courses and gaps in advanced course completion have implications for students' success after high school.



School socioeconomic status may also affect advanced course enrollment. Palardy (2013) found that high school graduates who attended a school with high aggregate socioeconomic status were more than two-thirds more likely to enroll in four-year postsecondary institutions than were students who attended a school with a higher percentage of economically disadvantaged students. Using 2001–06 data from Florida, Iatarola, Conger, and Long (2011) found that school size is strongly associated with the likelihood of offering an advanced course, such as an Advanced Placement or International Baccalaureate course. They also found that less than 10 percent of schools in the lowest decile of student enrollment offered at least one Advanced Placement or International Baccalaureate course, compared with nearly 100 percent of schools in the top three enrollment deciles. In addition, the academic makeup of a school's student body was found to be strongly associated with Advanced Placement or International Baccalaureate course offering. And the more students whose state assessment score was above a certain threshold (one standard deviation above the median) in a school, the more likely the school was to offer an Advanced Placement or International Baccalaureate course in any subject.

### Shifts in advanced course completion rates and graduation requirements

In response to national efforts to raise high school graduation standards, many states have been working to substantially raise graduation requirements for advanced course completion (Bielby et al., 2013). Between 1990 and 2009 the percentage of U.S. high school graduates who completed Algebra II or trigonometry rose from 54 percent to 76 percent, and the percentage who completed a physics course rose from 21 percent to 36 percent (Aud et al., 2012). In states with more-intensive graduation coursetaking requirements, students enrolled in higher level math classes early in their high school tenure and persisted in advanced math courses later in high school. Additionally, gaps in course completion by race/ethnicity were lower in states with more-intensive testing policies in high school (Schiller & Muller, 2003).

When graduation requirements are strengthened, evidence suggests that advanced course completion increases. Blank, Langesen, and Petermann (2007) found that the percentage of Texas students who completed at least one advanced math course increased 13 percentage points between 1996 and 2006 after new graduation requirements required more advanced math and science courses. However, some studies have found that students from traditionally disadvantaged groups fail to meet the new graduation requirements. Betts et al.'s (2013) study exploring the impact of changing graduation requirements in California found that racial/ethnic minority students and students at high-poverty schools had far lower course completion rates than their peers did.



## Appendix B. Data and methodology

This appendix provides details on the data and methodology used for the analyses.

### Data

The data used in the study were from two sources: the New Mexico Public Education Department Student Teacher Accountability Reporting System (STARS) and the National Center for Education Statistics Common Core of Data (U.S. Department of Education, 2015). The data included student- and school-level variables for all students entering high school in New Mexico for the first time in 2009–11 (table B1).

The analytic sample was constructed by linking student administrative records and course enrollment and completion records from STARS and school-level records from STARS

**Table B1. Definitions and sources of study variables**

Variable	Definition	Source
<b>Student-level variables</b>		
Course name and long code	Course name and full eight-digit course long code	New Mexico Public Education Department Student Teacher Accountability Reporting System
Credits	Credits attempted and earned in each course	
Student enrollment status	Student enrollment school and year	
Grade level	Student grade level (grades 8–12)	
Race/ethnicity	Race/ethnicity code of student; includes flag for Hispanic students and primary New Mexico Tribe or Pueblo with which the student is affiliated	
Grade 9 entry year	Grades 9–12 cohort indicator for the student's first grade 9 year	
Eligibility for the federal school lunch program	Whether the student was ever eligible for the federal school lunch program during the study timeframe	
English language learner status	Whether the student was ever an English learner student during the study timeframe	
Test score (prior achievement)	Score (scaled), type, and date of grade 8 standards-based assessment for math and English language arts	
Special education status	Whether a student was ever in special education during the study timeframe	
<b>School-level variables</b>		
District	District name and identification number	New Mexico Public Education Department
School	School name and identification number	Student Teacher Accountability Reporting System
Urbanicity	School's urbanicity code	National Center for Education Statistics
Title I	Whether a school was a Title school I during the study timeframe	Common Core of Data
School performance rating	A school's rating on the New Mexico Public Education Department's A–F grading system, which is based on student performance on standards-based assessments, school and student growth, graduation rates, opportunity to learn, and college readiness, among other factors. The rating system was used to report adequate yearly progress under the No Child Left Behind Act of 2001 (2002)	New Mexico Public Education Department Student Teacher Accountability Reporting System
School enrollment	School size (four categories) (highest school enrollment during cohort timeframe)	

**Source:** Authors' compilation.

and the Common Core of Data. The study team removed students with missing course records from the sample and recoded out-of-range or nonsensical values for student-level variables. The study team coded students who changed schools within the New Mexico public school system as members of the school in which they had the most enrolled days on the basis of attendance records and then removed duplicate student records within a school or year (less than 1 percent of the records were removed during this process). The study team also linked course enrollment records to course completion, credits, and grading records to check that courses with recorded grades matched enrollment records.

Whether a course was considered an advanced course was based on flags in the STARS data; courses that were flagged as an advanced course or an Advanced Placement, gifted and talented, honors, or International Baccalaureate course were considered advanced courses. (The STARS data did not include data on dual-credit or distance-learning courses, which could also have been used to meet the graduation requirement for advanced courses.) The study team checked the flags against the course codes (because the digits in the course codes also designate the advanced status of a course for honors and Advanced Placement courses) and recoded the small number of discrepancies to follow the course code (for example, if the course code indicated that the course was an Advanced Placement course, but the flag for Advanced Placement was missing from the course enrollment or completion data, the course code was used to define the course as an Advanced Placement course for the study). The study team then merged the data on whether a course was considered an advanced course with student and school records and removed students whose records could not be linked because of missing information or nonmatching common variables across course enrollment and completion or student demographic records (less than 1 percent of the records were removed during this process).

The study team then linked demographics records and school attended records for each student to grade 8 standards-based assessment performance in math records. Students who met expectations or exceeded expectations on the state exam are considered to be high performing and on-track for college by the New Mexico Public Education Department.<sup>8</sup> The assessment used in New Mexico changed during the study period from the New Mexico High School Competency Examination in 2009–11 to the Standards Based Assessment in 2012–15. The analyses were also conducted using grade 8 standards-based assessment performance in English language arts score, and comparable results were obtained, so only findings that are based on math performance are reported.

The STARS data included 59,929 students in 238 schools and 124 public or charter school districts—68 percent of students who were ever enrolled in grade 9 in 2009–12 (table B2). There were several reasons why students were not covered by the data: they exited or dropped out of high school before the fourth year, they were special education students who were not required to complete advanced courses to graduate, they transferred out of state, or they transferred to a private school. Restricting the analytic sample to students who were continuously enrolled for four years ensured that gaps in advanced course completion rates did not depend on the length of students' enrollment in a New Mexico public school. The study team also removed 30 students with a suspiciously high number of advanced courses (more than 25) and 2,073 students who were not American Indian, Hispanic, or White, leaving an analytic sample of 57,826 (table B3).<sup>9</sup> Analyses using data on grade 8 math performance were based on a smaller sample size because of missing information (for example, 4,030 students did not have data on grade 8 standards-based assessment performance in math).

**Table B2. Number of students in data received from the New Mexico Public Education Department Student Teacher Accountability Reporting System, by cohort**

Year entered grade 9 for first time	Year entered grade 12	Number of students
2009	2012	19,304
2010	2013	19,056
2011	2014	21,569

**Source:** Authors' compilation of data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Table B3. Distribution of students in the analytic sample across student-level variables**

Variable	Number of students	Percent of students
<b>Race/ethnicity</b>		
American Indian	6,698	11.6
Hispanic	35,409	61.2
White	15,719	27.2
<b>Performance in math on grade 8 standards-based assessment<sup>a</sup></b>		
High performing	3,721	6.9
Lower performing	50,075	93.1
<b>Eligibility for the federal school lunch program</b>		
Eligible	40,536	70.1
Not eligible	17,290	29.9
<b>English learner status</b>		
English learner student	8,038	13.9
Non-English learner student	49,788	86.1

**a.** High-performing students are those who received a score of met expectations or exceeded expectations in math on the state's grade 8 standards-based assessment; lower performing students are all other students. Data on grade 8 standards-based assessment performance were missing for 4,030 students in the analytic sample.

**Source:** New Mexico Public Education Department Student Teacher Accountability Reporting System.

The study team divided schools into size groups on the basis of the statewide distribution of students in schools (table B4). About one-third of students are in the 184 schools with fewer than 750 students, about one-third of students are in the 41 schools with 750–2,250 students, and about one-third of students are in the 13 schools with more than 2,250 students. For urbanicity the study team condensed the 12 codes in the Common Core of Data to the main locale type (for example, the subtypes city, midsize; city, large; and city, small were categorized as the locale city; National Center for Education Statistics, 2006).

Most schools in the analytic sample had fewer than 750 students; town schools had the lowest share of students in that size group (67 percent; figure B1). Rural schools had the highest percentage of schools with fewer than 750 students (83 percent), and town schools had the highest percentage of schools with 750–2,250 students (31 percent) and the lowest percentage of schools with 2,250 or more students.

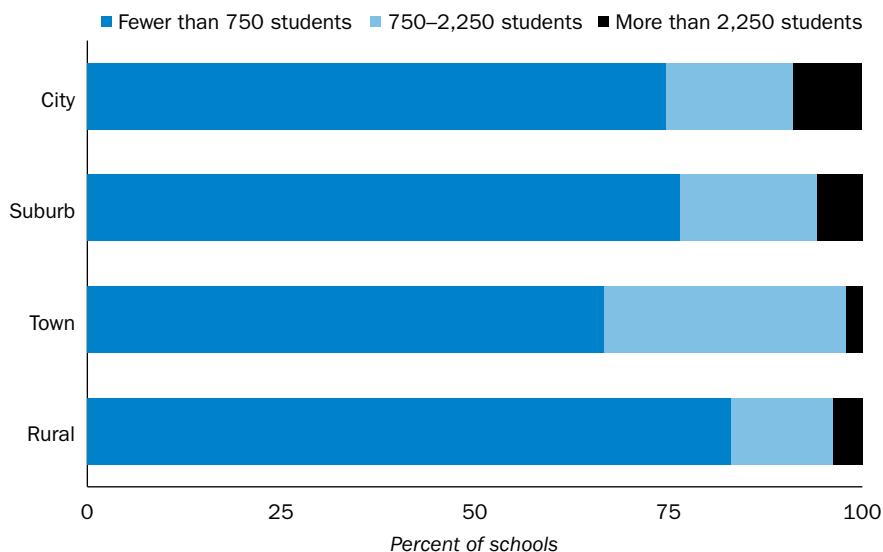
**Table B4. Distribution of school-level variables among schools with at least one student in the analytic sample**

Variable	Number of schools	Percent of schools
<b>Performance rating</b>		
A	37	16.2
B	65	28.3
C	73	31.9
D	47	20.5
F	8	3.1
<b>Size</b>		
Fewer than 750 students	184	77.3
750–2,250 students	41	17.2
More than 2,250 students	13	5.5
<b>Title I status</b>		
Title I school	151	66.8
Non–Title I school	75	33.2
<b>Urbanicity</b>		
City	67	28.4
Rural	103	43.6
Suburb	18	7.6
Town	48	20.3

**Note:** Data on performance rating were unavailable for 8 schools, data on Title I status were unavailable for 12 schools, and data on urbanicity were unavailable for 2 schools.

**Source:** New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Figure B1. Distribution of schools by size and urbanicity**



**Note:** N = 238 schools.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

## Methodology

The first step in the analysis was to examine the frequencies, measures of central tendency, ranges, and percentage categories for the variables of interest. To address the first research question, the study team examined the percentages of students who completed zero, one, and two or more advanced courses. These categories were used in part because the New Mexico Achievement Gap Alliance is interested in the percentages of students who did not meet the revised graduation requirement (completing no advanced courses),<sup>10</sup> the percentage who met it (completing at least one advanced course), and the percentage who exceeded it (completing two or more advanced courses).

To answer the second research question, on how advanced course completion rates varied by student and school characteristics, the percentages of students completing zero, one, or two or more advanced courses were cross-tabulated with student characteristics. Advanced course completion rates were initially examined by cohort, but no meaningful gaps were observed (for instance, the average number of advanced courses completed overall and by each racial/ethnic group differed by less than 0.02 across the three cohorts), so only pooled outcomes for all three cohorts are reported.

## Appendix C. Supplementary findings

This section provides several supplementary findings on the amount and types of advanced courses that students completed as well as information on advanced course completion rates by urbanicity of the school students attended.

### White students completed more advanced courses than American Indian and Hispanic students did

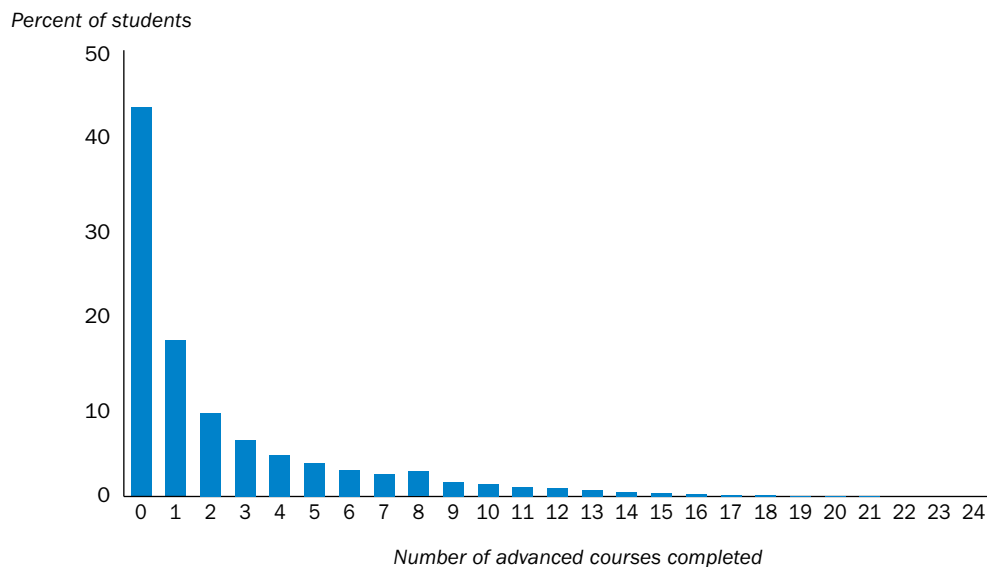
Across all students in the analytic sample the total number of advanced courses completed ranged from 0 to 24 (figure C1). About 30 percent of students completed more than two courses, and less than 10 percent of students completed more than seven courses.

The average number of advanced courses completed varied considerably across racial/ethnic groups: from 1.49 among American Indian students to 1.95 among Hispanic students to 3.44 among White students (table C1).

### Advanced Placement and honors courses were the most common types of advanced course completed

Advanced Placement courses were by far the most prevalent advanced course type for all subject areas. Approximately 74 percent of all advanced courses completed by students during the study period were Advanced Placement courses, 23 percent were honors courses, 2 percent were International Baccalaureate courses, and less than 1 percent were gifted and talented courses (figure C2). This pattern was consistent across each subject area, except for math, where the gap between Advanced Placement and honors courses was smaller than for other subject areas.

**Figure C1. Number of advanced courses completed by students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years**



**Note:**  $N = 57,826$  students.

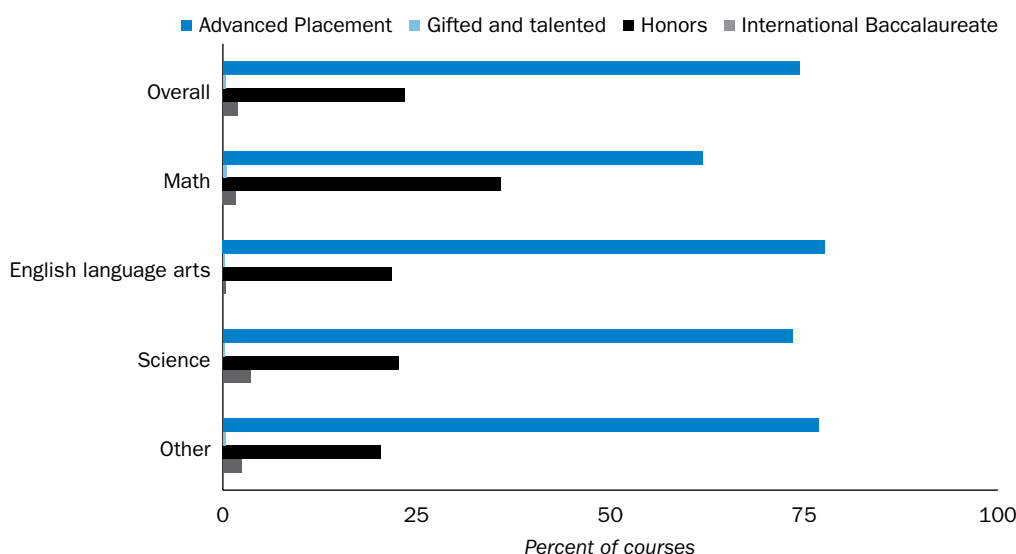
**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Table C1. Average number of advanced courses completed by students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, by race/ethnicity**

Race/ethnicity	Average	Number of students
American Indian	1.49	6,698
Hispanic	1.95	35,409
White	3.44	15,719
Total	2.31	57,826

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**Figure C2. Most advanced courses completed by students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years were Advanced Placement and honors courses**



**Note:** *N* = 57,826 students. Course type and subject designation were based on eight-digit course long codes in the course and student grades data and the staff course assignment files.

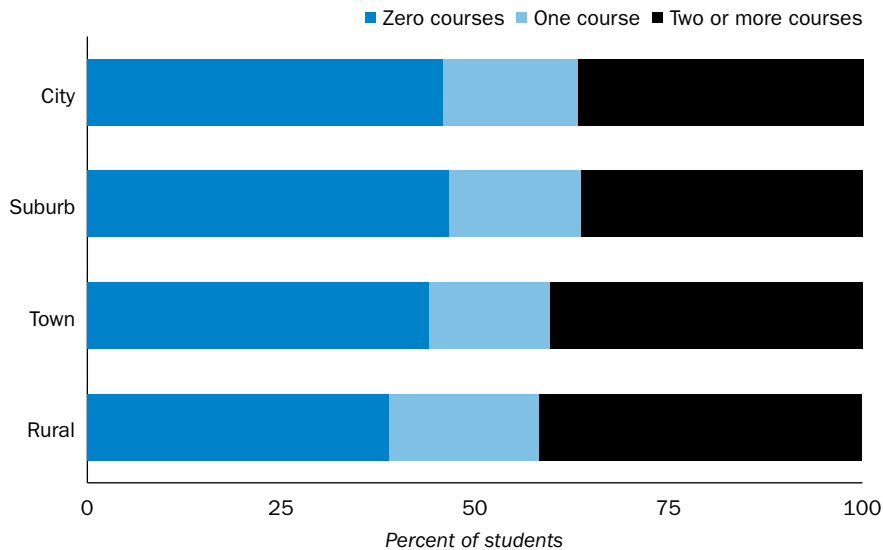
**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

**The proportion of students who completed at least one advanced course was higher at rural schools than at other schools**

Advanced course completion rates were relatively similar among students at city, suburb, and town schools (53–56 percent) but were higher among students at rural schools (61 percent; figure C3).

When students at schools with fewer than 750 students were examined separately, students at rural schools had the highest advanced course completion rate (figure C4). When students at rural schools were examined separately, the percentage of students who completed at least one advanced course was 55 percent among students at schools with fewer than

**Figure C3. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, the advanced course completion rate was higher among students at rural schools than among students at other schools**



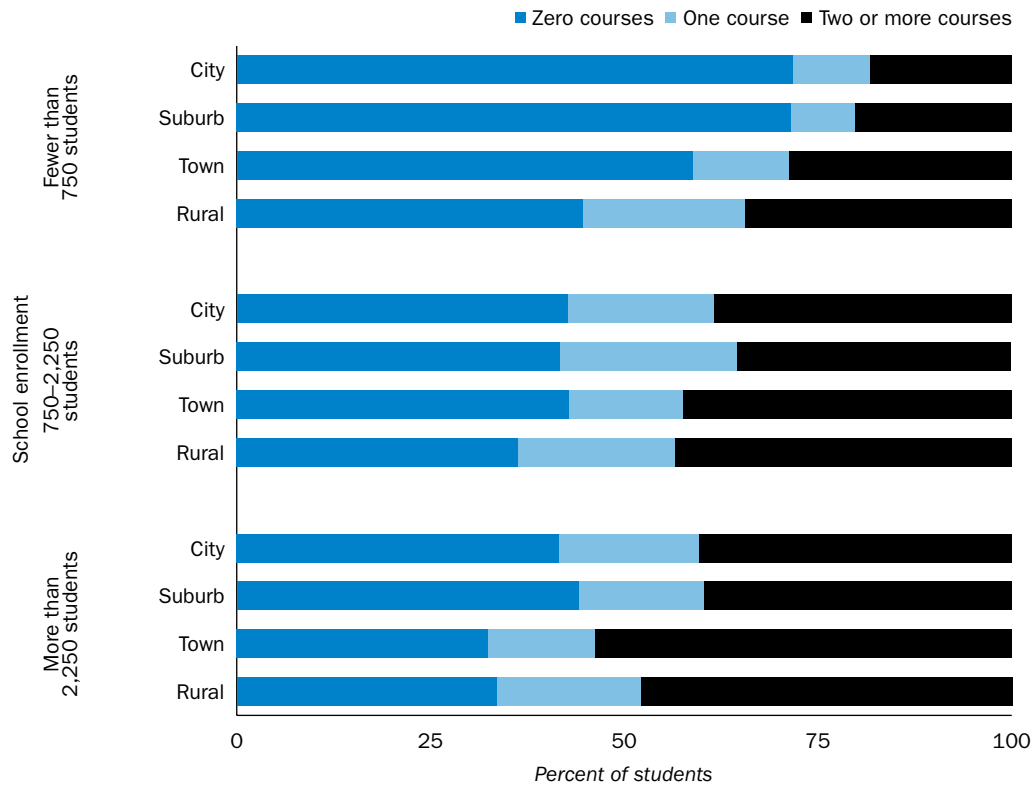
**Note:** N = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

750 students and 64 percent among students at schools with 750–2,250. When schools with more than 2,250 students were examined separately, the percentage was higher among students at town schools (68 percent) than among students at other schools. Except for schools with 750–2,250 students, students at suburban and city schools had the lowest advanced course completion rates.



**Figure C4. For students who entered a New Mexico high school in grade 9 in 2009–11 and remained enrolled for four years, those at rural schools generally had the highest advanced course completion rates, regardless of school size**



**Note:** N = 57,826 students.

**Source:** Authors' calculations based on data from the New Mexico Public Education Department Student Teacher Accountability Reporting System.

## Notes

1. Advanced Placement, dual-credit, and distance learning courses allow high school students to earn college credit in high school, while gifted and talented, honors, and International Baccalaureate courses do not.
2. Advanced Placement, dual-credit, and distance learning courses allow high school students to earn college credit in high school, while gifted and talented, honors, and International Baccalaureate courses do not.
3. New Mexico Achievement Gap Research Alliance member organizations are Cooperative Educational Services, Dual Language Education of New Mexico, Eastern New Mexico University, High Plains Regional Education Cooperative #3, the Intercultural Development Research Association South Central Collaborative for Equity, Las Cruces Public Schools, Native Solutions in Education, the New Mexico Association for Bilingual Education, the New Mexico Coalition of Educational Leaders, the New Mexico Coalition of School Administrators, New Mexico Highlands University, the New Mexico Legislative Education Study Committee, the New Mexico Public Education Department, New Mexico State University, Northeast Regional Education Cooperative #4, Northern New Mexico College, the Region IX Education Cooperative, Santa Fe Indian School, the University of New Mexico, and the U.S. Bureau of Indian Education.
4. During the study period alternative demonstration of competency for graduation included submitting a competency portfolio (which includes school-based projects such as extended papers, themes, theses, or research projects; performances or works of art that can be recorded in an electronic format; or community-based projects such as internships, service learning, preapprenticeships, or afterschool job performance) or passing other qualifying exams to demonstrate proficiency in reading, math, and science.
5. Students may have also completed a dual-credit course or distance learning course to fulfill the advanced course requirement. Data on these courses were not available for analysis.
6. Because school performance is based partly on student performance, there is a strong correlation between advanced course completion rates and school performance ratings, particularly for schools with the highest and lowest ratings.
7. Only 3.1 percent of schools in the study sample had an F rating.
8. Nearly 6.5 percent of students in the analytic sample with data on grade 8 standards-based assessment performance ( $n = 3,495$ ) are considered high performing by this standard. Data were unavailable for 4,030 students (7 percent) in the analytic sample.
9. American Indian, Hispanic, and White students account for approximately 96.5 percent of New Mexico's student population; Asian students account for 1.4 percent, Black students account for 2 percent, and Native Hawaiian or Pacific Islander students account for 0.1 percent.
10. Students may have also completed a dual-credit course or distance learning course to fulfill the advanced course requirement. Data on these courses were not available for analysis.

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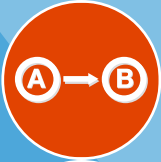
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