

International Baccalaureate National Trends for Low-income Students 2008–2014

July 2015

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Suggested citation:

Caspary, K., Woodworth, K., Keating, K., & Sands, J. (2015). *International Bacculaureate National Trends for Low-income Students 2008–2014*. Menlo Park, CA: SRI International.

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Acknowledgments

The study would not have been possible without the support of the International Baccalaureate (IB). We thank Beth Brock, Rory Mooney, and Matthew White who laid the foundation for the national trends study and the Michael & Susan Dell Foundation for supporting IB in commissioning this research. We are also grateful to Bridging the Equity Gap Program Director Asheesh Misra for his keen insights and ongoing support for our work, to Matthew Wilson for providing the IB data for the study and answering our many questions with patience and care, and to Olivia Halic for her input and advice.

In addition, we appreciate the administrators, teachers, and students at the IB high schools we visited who shared their promising practices and identified some of the persistent challenges facing IB high schools serving large numbers of low-income students.

Last, many SRI staff contributed to this report. In particular, we thank Ashley Campbell and Paul Petit who conducted qualitative data collection and contributed analysis, Mimi Campbell for her careful editing, and Bonnee Groover and Chi Nguyen for their assistance with report production.

Executive Summary

Given the importance of college for employment and social mobility, policymakers and education leaders are attempting to strengthen the pipeline from high school completion through graduation from a postsecondary institution. The purpose of this research is to examine that pipeline for low-income International Baccalaureate (IB) Diploma Programme (DP) students. The objectives are to understand how the experiences of low-income DP students compare with those of their higher-income peers and identify obstacles to low-income students' participation and success in the DP and postsecondary education as well as possible levers to improve long-term outcomes for low-income students. We drew on IB exam data, National Student Clearinghouse college participation data, and visits to five high schools serving significant populations of low-income DP students.

Key Findings: Diploma Programme Participation and Performance

We compared the participation rates and performance over time of low-income and higher-income DP students, both those pursuing the full Diploma (Diploma candidates) and those taking one or more DP courses but not attempting the full Diploma (course students).

Overall Trends

- The IB Diploma Programme grew rapidly from 2008 to 2014, with increases in both the absolute number of course students and Diploma candidates and the percentages of low-income student in each group.
- As participation of low-income students in the DP has increased, overall student performance in it remained fairly constant.
- Gaps between the performance of low-income DP students and their higher-income peers persisted over the 7-year period, both on the DP exams and pass rates for the Diploma.

Participation and Performance for Low-income Diploma Candidates

- On average, low-income Diploma candidates earned just around the 24 total points needed to earn the Diploma. Low assessment scores, particularly in science, math, individuals and societies, and arts, were the greatest barrier to successful completion of the Diploma for low-income candidates.
- Pass rates for the extended essay and theory of knowledge were high, so these two requirements were not the primary barrier to earning the Diploma for low-income candidates.
- Diploma candidates, regardless of income status, were more likely to take exams at the higher level (HL) in individuals and societies and in language than in other subjects; across the HL subject exams, low-income students scored highest on average in HL language acquisition.

Participation and Performance of Low-income Diploma Programme Course Students

- Low-income DP course students, like their higher-income peers, were most likely to take IB exams in language and individuals and societies and least likely to take them in art.
- Low-income DP course students performed well on IB exams in language acquisition and poorly in science.

- Only 20% of low-income course students scored well enough on at least one IB HL exam to earn college credit from most US colleges and universities compared with 60% of low-income Diploma candidates. However, low-income course students who took language acquisition exams at the higher level earned a mean score of 5 or higher.

Key Findings: Postsecondary Enrollment, Retention, and Graduation

We explored college outcomes for course students and Diploma candidates from the 2008 and 2013 graduating cohorts, examining immediate postsecondary enrollment rates at 2- and 4-year colleges or universities and 1- and 2-year retention rates and 4- and 6-year graduation rates for the subset of students who enrolled in a 4-year college immediately after high school. We report on retention and graduation rates at the same 4-year colleges or universities where students first enrolled the fall after finishing high school.

College Outcomes for Low-income Diploma Candidates

- Regardless of whether they earned the Diploma, low-income Diploma candidates enrolled in 4-year colleges and universities at high rates: In the class of 2013, more than three-quarters of low-income Diploma candidates enrolled in a 4-year college or university immediately after finishing high school.
- Retention rates for low-income Diploma candidates at 4-year colleges and universities were close to those of their higher-income peers.
- Low-income Diploma candidates who enrolled at 4-year colleges and universities had 6-year graduation rates that were similar to the national average for all students, higher than the national average for low-income students, but lower than those of higher-income Diploma candidates.

College Outcomes for Low-income Diploma Programme Course Students

- Approximately half of low-income course students in the 2008 and 2013 cohorts enrolled in a 4-year college and just under a fifth enrolled immediately in a 2-year college immediately after high school.
- Although the gap between low-income course students and their higher-income peers was only 6 percentage points for 1-year retention rates, this increased to 12 percentage points for 2-year retention.
- Less than a third (32%) of low-income course students in the 2008 cohort who immediately enrolled in college graduated within 4 years, although 6-year graduation rates were higher (55%).

Lessons from IB Schools Serving Significant Populations of Low-income Students

Local schools' efforts to improve participation and performance in IB and postsecondary education suggest possible actions for all schools that would like to expand access to low-income students and support improved performance. We caution that these recommendations are based on visits to a small number of DP schools and that we were not able to link these practices causally to improved student outcomes.

Outreach and Admission

- Remove barriers to entry (such as placement exams and teacher recommendations) and make IB the default pathway (i.e., move to opt out rather than opt in policies).
- Actively recruit low-income students with targeted outreach to underrepresented students and their families.

Teaching and Learning

- Innovate to engage diverse learners and allow students to demonstrate their understanding in different ways (e.g., projects and varied learning tasks).
- Aim for mastery and deeper learning within the DP curriculum (e.g., cover fewer topics in more depth).
- Allow for flexible deadlines, increase scaffolding, and rethink homework.
- Examine trends in student performance to identify barriers to success and modify instruction accordingly.
- Emphasize academic and study skills (e.g., text-based analytic writing and time management) to prepare students for college success.

School-wide Student Supports

- Institute extensive opportunities for tutoring to ensure that students can access help before, during, and after school.
- Formalize peer supports (e.g., create or facilitate the formation of study groups).
- Establish wraparound services to prevent or respond to factors that might interfere with students' ability to focus on academics (e.g., partner with community-based organizations that offer social, emotional, and other services at the school site).
- Monitor individual student progress (e.g., through advisory classes) and tailor interventions (e.g., develop a tiered system of academic supports).
- Build a culture of high expectations for all students by hiring teachers who believe that diverse learners can succeed in the DP and by consistently reinforcing this belief through school policies and practices.

Postsecondary Supports

- Create systematic college planning processes (e.g., all students attend a college-planning event, take the SAT or ACT, complete the Free Application for Federal Student Aid, and apply to at least one broad-access college).
- Identify resources to facilitate college access for low-income students (e.g., scholarship opportunities, university-based outreach programs, local nonprofits that provide college counseling and other related supports).
- Proactively provide information to parents about college options, the college application process, and financial aid options.

I. Introduction

National attention is focused on expanding college opportunities for low-income students. Because of the importance of college for employment and social mobility, policymakers and education leaders are attempting to strengthen the pipeline from high school completion through graduation from a postsecondary institution (Greenstone et al., 2013; Pew, 2014). In 2014, President Obama set a goal for the United States to become first in the world in college attainment by 2020.

Many low-income students struggle to make it through the pipeline to college completion. In the cohort of 2003 high school completers, 53% of low-income students enrolled in a 2- or 4-year college in the fall after high school compared to 80% of students from families in the top income quintile (Institute of Education Sciences, National Center for Education Statistics, 2014a).¹ Of students from families in the bottom income quartile nationally who enrolled in a 4-year college, 47% earned a degree within 6 years compared to 77% of students from families in the top income quartile (Radford, Berkner, Wheless, and Shepherd, 2010).² Although many factors may contribute to student attrition at various points along the path to a college degree, one key factor is academic preparation. In 2014, ACT (2014) reported that “nearly all ACT-tested students from low-income families in the United States aspire to go to college—at an even higher rate than students overall—but many lack the academic preparation to reach this goal.”

To improve students’ college readiness, policymakers and schools are increasingly relying on accelerated learning programs that enable students to earn college credit while still in high school. For instance, in 2007 President Bush signed the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act (America COMPETES Act). One goal was to raise student achievement—particularly among low-income students—by increasing access and success in in Advanced Placement (AP) and International Baccalaureate (IB) Diploma Programme (DP) courses. The idea is that exposing students to rigorous coursework will heighten the potential for college matriculation and graduation by better preparing students for the academic demands of college, and the opportunity for early college credit will decrease the number of credits, and thus the cost, to earn a college degree.

Recent research on IB supports this idea. For example, in a study of 12 high schools in Chicago, Saavedra (2014) found that students enrolled in the Diploma Programme had higher ACT scores and greater probability of high school graduation and college enrollment than a matched sample of their peers.³ Similarly, Coca and colleagues (2012) showed that low-income students in Chicago

¹ Low-income students defined as those from families in the bottom 20% of all family incomes, or 2002 family income of \$24,000 or less (U.S. Census Bureau, Current Population Survey, n.d.).

² Low-income students defined as those from families in the bottom quartile families with first-time college going students, or 2002 family income of less than \$32,000.

³ Of students participating in DP, 77% were eligible for free or reduced-price meals.

who enrolled in the DP in 11th grade were more likely to enroll in college, enroll in a more selective college, and stay enrolled in college than matched students who did not enroll in DP.

Despite these efforts by schools and policymakers—and the research supporting them—low-income students are not enrolling in advanced courses at the same rate as their peers. For example, in a recent study, The Education Trust (Theokas & Saaris, 2013) examined the participation of low-income students and students of color in accelerated learning programs. The researchers found that participation gaps between low-income and higher-income students were greater than the racial/ethnic participation gaps; for a single year (2009–10), 20,000 additional low-income students would have had to enroll in the DP to close the participation gap between low-income and higher-income students.

The purpose of this research by SRI Education, a division of SRI International, was to examine the pipeline from high school through college for low-income DP students in US public schools. Our objectives were to understand how low-income students' experiences compare with those of higher-income peers and identify obstacles to low-income students' participation and success in the DP and postsecondary education, as well as possible levers to improve their long-term outcomes. The data informing this report come from three sources.

- 1) To explore trends in participation and performance of low-income DP students in US public schools, SRI researchers used data from the IB student data system (IBIS) for all 12th grade public school students in the United States from 2008 through 2014 who took IB assessments in either 11th or 12th grade. We examined trends for course students (students who took at least one IB assessment but did not attempt the full Diploma) and Diploma candidates (students who attempted to complete the full IB Diploma) both across and within the six IB subject areas—language, language acquisition, individuals and societies, science, mathematics, and arts.⁴
- 2) To examine the postsecondary enrollment, retention, and graduation trends for low-income Diploma candidates and course students—and how they compared with those of their higher-income peers—we relied on data from the National Student Clearinghouse (NSC).
- 3) To understand the factors that are most critical in determining low-income students' participation and success in the DP, as well as low-income students' and their teachers' experiences with and perceptions of the DP, we conducted 1-day site visits to five IB high schools serving large populations of low-income students in the DP.

This research report integrates the findings from these data sources. The extant data analysis enabled us to describe IB participation and performance trends on a national level and present postsecondary enrollment, retention, and graduation rates for six cohorts of DP public school students. The findings from the qualitative data point to promising practices designed to increase

⁴ To be considered a Diploma candidate, students must take at least six DP exams and attempt the three components of the DP core—theory of knowledge, extended essay, and creativity, action and service—by the end of their 12th grade year.

participation and performance outcomes for low-income students as well as stubborn challenges that continue to limit low-income student participation, persistence, and performance in the DP and postsecondary education. Given the design of the research and data limitations, we were not able to conclude that any particular practices impact student participation or performance. Thus, these promising practices solely reflect the perspectives of local educators and students regarding their experiences with the DP.

II. Trends in Diploma Programme Participation and Performance

Presented here are data on participation rates for low-income Diploma candidates and DP course students from the 2008 through 2014 12th grade cohorts, as well as a comparison of the performance of low-income and higher-income DP students.⁵ We identified low-income students on the basis of whether they were coded as eligible for free- or reduced-price meals (FRPM) in the IBIS.⁶ Higher-income students include all students who were not identified as FRPM eligible and represent a range of income levels, including those just above the FRPM eligibility threshold as well as FRPM-eligible students at schools that did not report these data to IB.⁷

To understand barriers to Diploma attainment, we examine low-income Diploma candidates' course-taking patterns and performance on specific DP components. Finally, we explore low-income DP course students' course-taking patterns and performance. The numbers graphed in this section are presented in Appendix A.

Overall Trends

We begin with a description of the nature of the growth in the DP in US public schools and overall performance patterns from 2008 to 2014.

The IB Diploma Programme grew rapidly from 2008 to 2014, with increases in both the absolute number of course students and Diploma candidates and the percentages of low-income students in each group.

Between 2008 and 2014, IB grew rapidly. The number of course students surpassed the number of Diploma candidates in 2010; an increase between 2013 and 2014 brought the number of Diploma candidates approximately equal to that of course students, with just over 23,000 in each group by 2014 (Exhibit 1). Access to the DP for low-income students also grew steadily during this period; the percentage of low-income course students rose 8 percentage points, from 18% to 26%, and the percentage of low-income Diploma candidates rose from 15% to 23% (Exhibit 2). Nationally, the

⁵ We defined cohorts of students on the basis of their 12th grade year so 2014 Diploma candidates and course students may have taken IB assessments in 2013 (when they were in 11th grade), in 2014 (when they were in 12th grade), or both years.

⁶ Eligibility for FRPM is based on family income. The U.S. Department of Health and Human Services issues annual federal poverty income guidelines that determine the poverty threshold for families based on household size (i.e., number of family members). Students from families at 130% of the federal poverty threshold are eligible for free school meals, and students from families at 185% of the poverty threshold are eligible for reduced-price school meals.

⁷ Some districts have policies that prohibit reporting on students' FRPM eligibility status, so national summaries for higher-income students may also include FRPM-eligible students at schools that do not report these data. From 13% to 16% of public schools that offer the DP reported no FRPM-eligible students, varying by year. The results of a survey IB conducted in early 2015 of DP schools that reported no FRPM students in 2014 suggested that 40% of these schools did not in fact have any low-income DP students.

percentage of US public school students eligible for FRPM rose from 33% in 2006–07 to 38% in 2009–10, the most recent year for which these numbers are available (Institute of Education Sciences, National Center for Education Statistics, n.d.). Nonetheless, the absolute number of low-income students participating in the DP remained small: 6,155 course students and 5,394 Diploma candidates in 2014.

Exhibit 1
Growth in Number of Diploma Programme Students, Overall and by Income Status

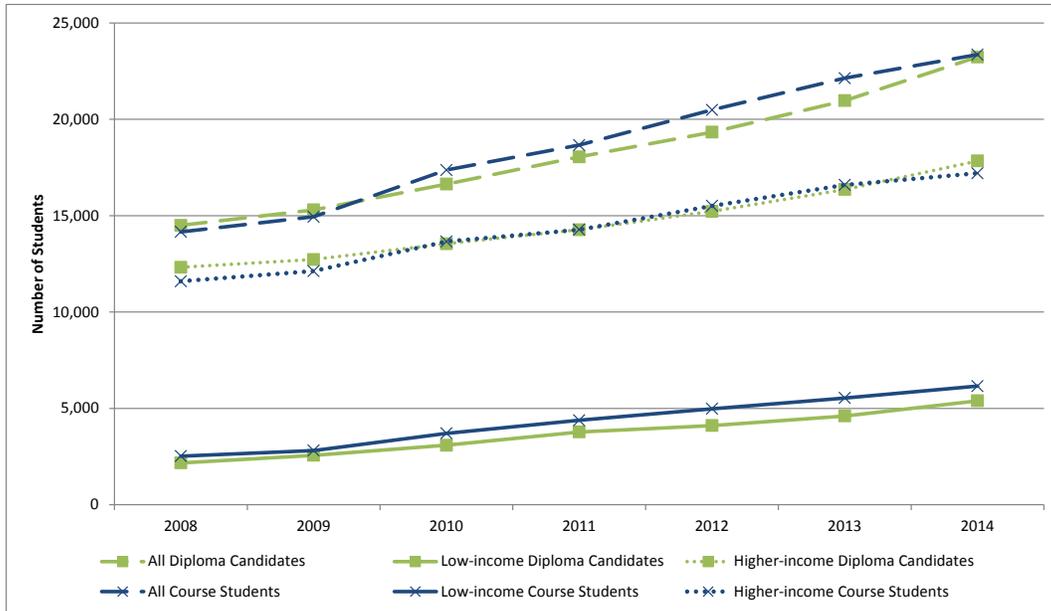
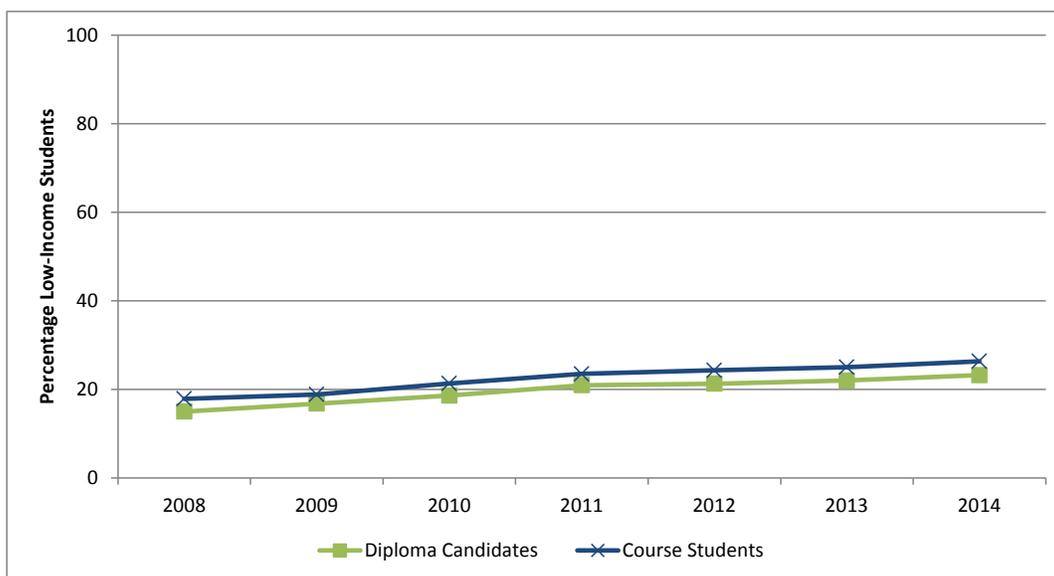


Exhibit 2
Low-income Course and Diploma Candidate Participation

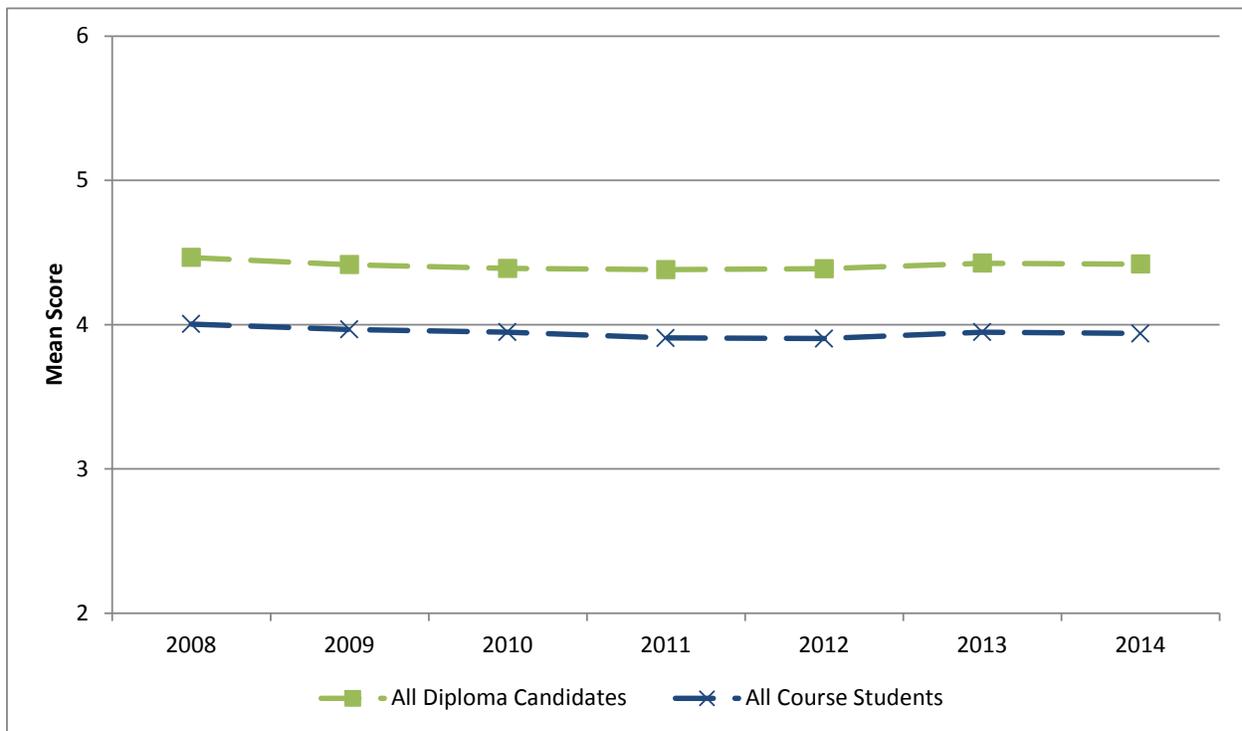


The rise in enrollment can be attributed to increasing numbers of schools offering the DP and to the growth and expansion of access within existing programs. The number of US public schools with graduating DP cohorts rose from 476 in 2008 to 679 in 2014, an increase of 43% (see Appendix A, Table A-3 for number of schools in interim years). In the 437 schools with graduating DP cohorts from 2008 through 2014, the mean number of DP students in each cohort increased from 63 in 2008 to 81 in 2014, and the mean percentage of low-income students in the DP at these schools increased from 18% to 27%.⁸

As participation of low-income students in the Diploma Programme increased, overall student performance in it remained fairly constant.

As the DP grew from 2008 to 2014, both in terms of number of students and schools, overall student performance declined slightly. From 2008 to 2014, the mean exam score for Diploma candidates decreased less than a tenth of a point (from 4.46 to 4.42) (Exhibit 3), and the percentage of Diploma candidates who succeeded in earning the Diploma decreased from 70% to 68% (Exhibit 4). The decline in mean assessment scores for course students was also slight—from 4.00 to 3.94.

**Exhibit 3
Mean Exam Scores for Diploma Candidates and Course Students**



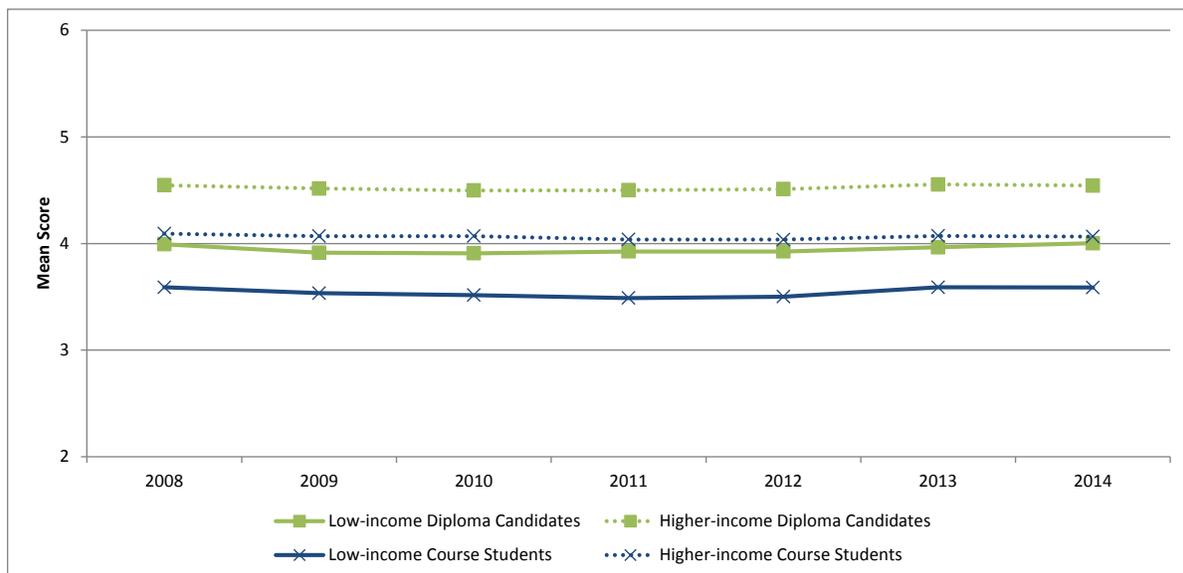
Note: Although scores on the IB exams are on a scale of 1 to 7, the graph shows only the middle range of scores (2 to 6) to allow greater readability.

⁸ In schools that did not have DP graduates in 2008 but did in at least one year between 2009 and 2014, the mean percentage of low-income DP students in each graduating cohort was slightly higher, reaching 30% in 2014, and the average number of DP students (Diploma candidates and course students) in each graduating cohort rose from 18 in 2008 to 46 in 2014.

Gaps between the performance of low-income Diploma Programme students and their higher-income peers persist, both on the Diploma Programme exams and pass rates for the Diploma.

Nationally, low-income students do not perform as well on assessments of college readiness as their higher-income peers. For example, the College Board (2009) found a positive correlation between family income and performance on the three components of the SAT. Similarly, California Watch (Taggart, 2011) reported a negative correlation between district poverty rates in California (as measured by FRMP) and student performance on AP exams. The performance gap between low-income and higher-income students holds for the DP assessments as well. From 2008 to 2014, the gap in performance between low-income students and their higher-income peers remained constant for both course students and Diploma candidates. On average, low-income Diploma candidates scored approximately 0.50 point lower than their higher-income peers (Exhibit 4).

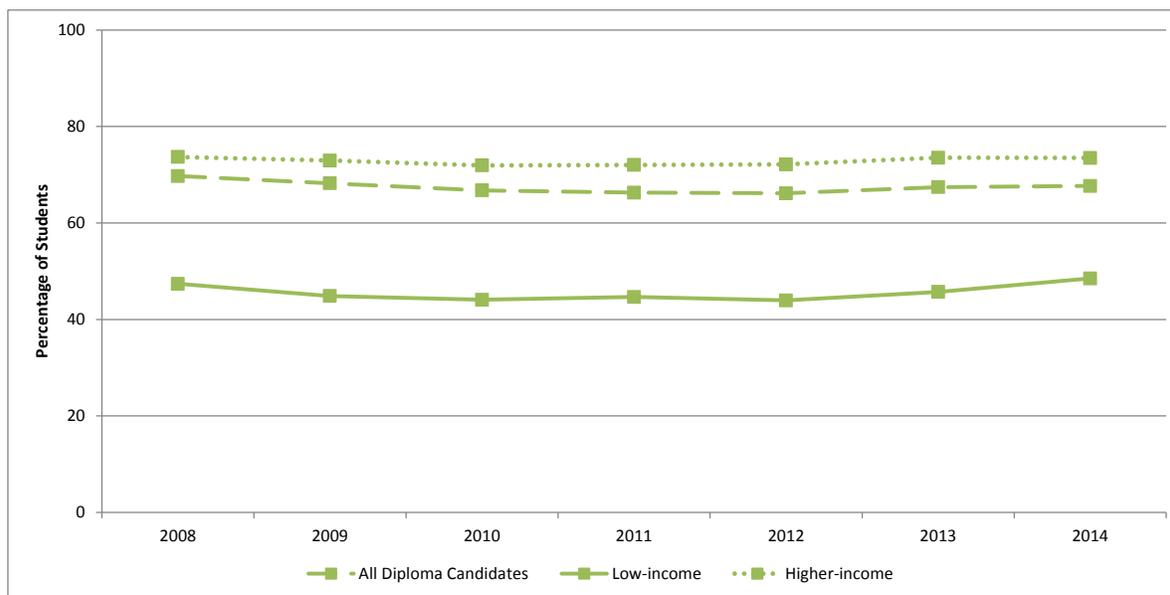
Exhibit 4
Mean Exam Scores for Diploma Candidates and Course Students, by Income Status



Note: Although scores on the IB exams are on a scale of 1 to 7, the graph shows only the middle range of scores (2 to 6) to allow greater readability.

The overall lower mean assessment scores of low-income Diploma candidates shown in Exhibit 4 translated into lower pass rates for the Diploma itself. Over the 7 years, the Diploma pass rate was around 27 percentage points lower for low-income candidates than for their higher-income peers, although this differential decreased to 25 percentage points in 2014 as a result of an increase in the pass rate for low-income students from 46% in 2013 to 48% in 2014 (Exhibit 5).

Exhibit 5
Diploma Candidates Earning the Diploma, Overall and by Income Status



The same gap of approximately 0.50 point between the mean exam scores of low-income and higher-income students persisted over the time period for course students as well (see Exhibit 5). Because course students in both income groups had lower mean assessment scores than Diploma candidates in the same income group, the mean assessment scores of low-income course students were well under 4. For example, in 2014, the mean exam score for higher-income course students was 4.1, whereas the mean exam score for low-income course students was 3.6.

Participation and Performance for Low-income Diploma Candidates

Here we examine the components of the Diploma to see whether we can identify the reasons low-income student may not succeed in earning it. Specifically, we explore the particular requirements that may be barriers to low-income students' success.

Pass rates for the extended essay and theory of knowledge are high, so these two requirements were not the primary barrier to earning the Diploma for low-income candidates.

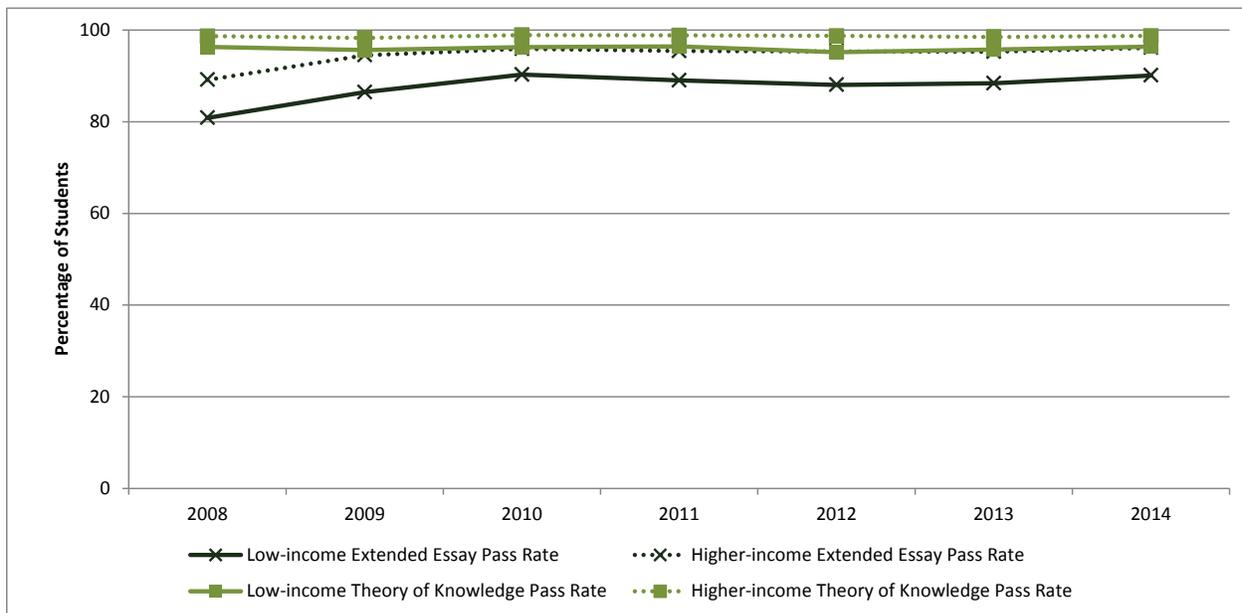
To earn the rigorous Diploma, students must take six subject examinations, one from each of the following curriculum groups: studies in language and literature, language acquisition, individuals and societies, science, math, and either the arts or a second subject from sciences, individuals and societies, or languages. Students must take at least three exams/courses at the higher level, while three can be standard-level courses.⁹ In addition to the six content area courses, students must

⁹ Higher-level courses require at least 240 class hours and are typically offered over 2 years. Standard-level courses require at least 150 class hours.

successfully complete three compulsory core components: (1) creativity, action, and service; (2) extended essay; and (3) theory of knowledge. Students must earn a passing grade on an extended essay in a subject of their choice and in the IB theory of knowledge course. The examination scores in each of the six subjects range from 1 to 7, and the Diploma is awarded to students who gain at least 24 points, up to three of which can be earned on the basis of a combination of students' theory of knowledge and extended essay grades.

Overall, most students—regardless of income level—earned passing grades of D or higher for the theory of knowledge and extended essay requirements (Exhibit 6). Before 2009, when IB awarded the Diploma to students as long as they received a passing grade for theory of knowledge *or* the extended essay, the percentage of failing grades on the extended essay approached 20% for low-income Diploma candidates and 10% for their higher-income peers. Pass rates for the extended essay increased after 2009, when IB instituted a new policy of requiring passing scores for *both* the theory of knowledge and extended essay; however, the percentage of low-income students who fulfilled the extended essay requirement still lagged that of their higher-income peers through 2014. From 2008 through 2014, the mean total points earned by low-income Diploma candidates who did not earn a passing grade on the extended essay was 18.2, suggesting that these students were not likely to earn the Diploma even if they had fulfilled this requirement.

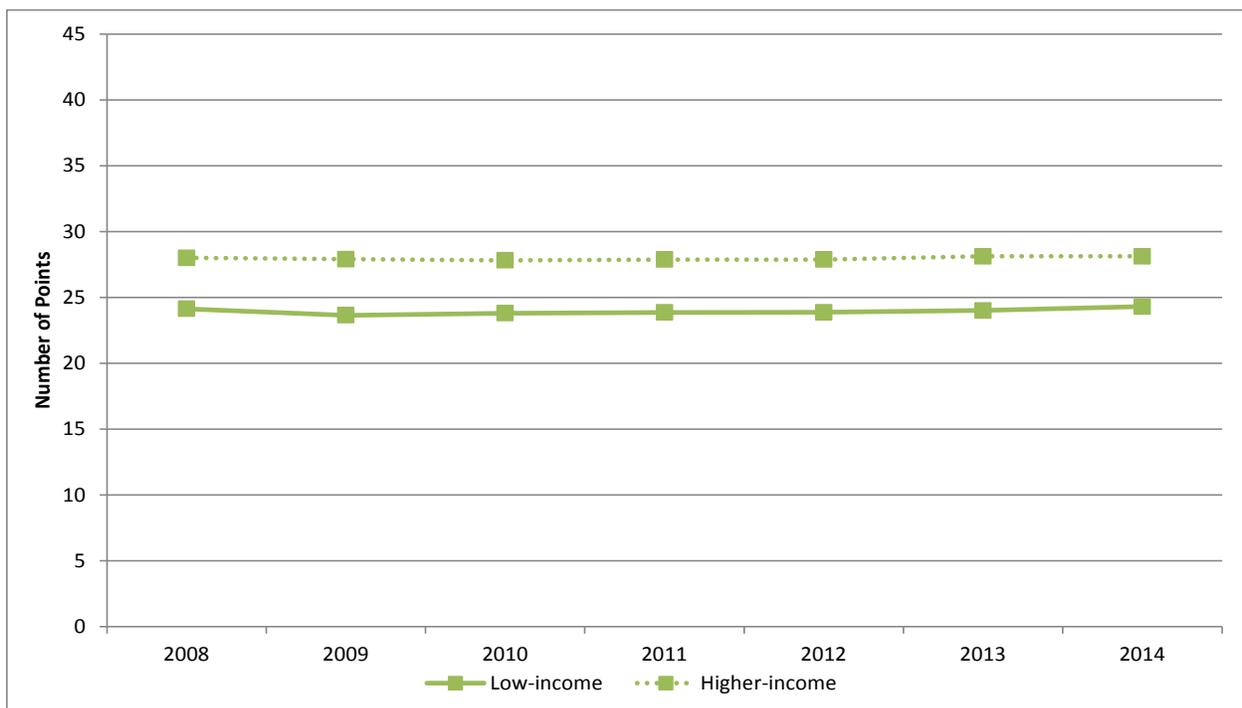
Exhibit 6
Diploma Candidates Earning a Passing Grade (D or Above)
on the Extended Essay or Theory of Knowledge Requirements



On average, low-income Diploma candidates earned just around the 24 total points needed to earn the Diploma. Low assessment scores, particularly in science, math, individuals and societies, and arts, are the greatest barrier to successful completion of the Diploma Programme for low-income candidates.

A cumulative gap of about 4 points persisted in mean total points earned by low-income Diploma candidates compared with their higher-income peers (Exhibit 7). Because low-income candidates on average just barely earned the 24 points needed to be awarded the Diploma, pass rates hovered just under 50% for this group, as noted above (Exhibit 5).

**Exhibit 7
Mean Total Points, Diploma Candidates**



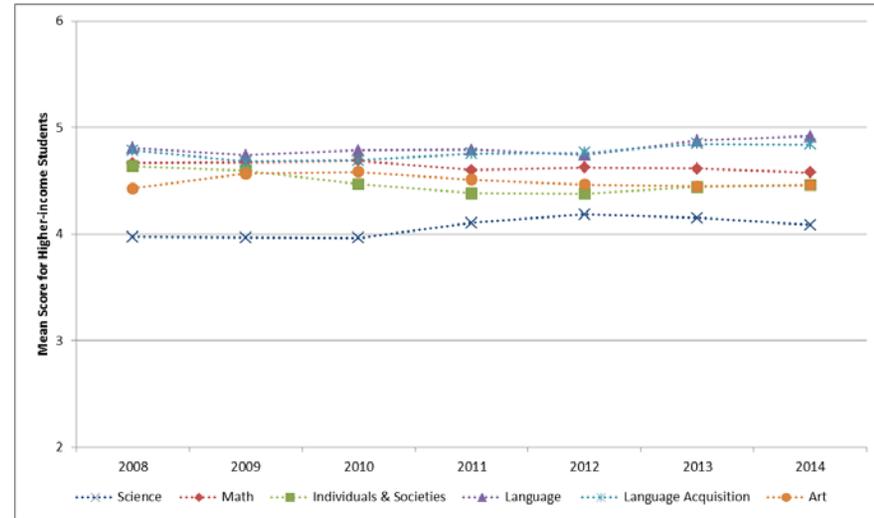
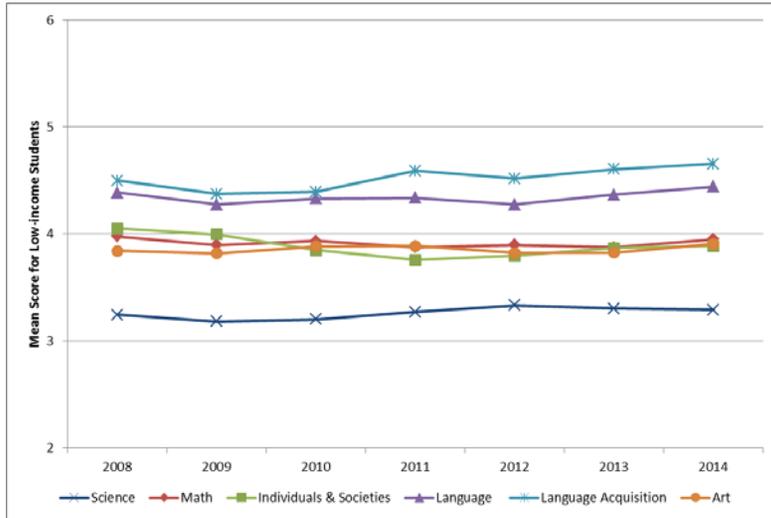
Note: Diploma candidates can earn up to 45 total points.

Although most students earn the minimum grade required for the theory of knowledge and the extended essay, mean grades for these two requirements are low, so few students earn many points toward the Diploma from these requirements.¹⁰ As a result, most students must earn an average score of 4 across the six subject examinations to earn the Diploma.

Exhibit 8 displays the mean performance scores for low-income DP candidates by subject. Although the DP exams are scored on a scale of 1 to 7, only the middle range of scores (2 to 6) are shown to allow greater readability; this has the effect of exaggerating changes in mean scores over time and

¹⁰ Across the 8-year period, the average grade was 1.8 for the extended essay and 2.2 for theory of knowledge, or just under a C for the extended essay and just above a C for theory of knowledge. For low-income students, these averages were 1.6 and 1.9, respectively.

Exhibit 8 Mean Exam Scores by Subject, Diploma Candidates



differences between groups. Across the six subjects, low-income Diploma candidates scored the highest in language acquisition followed by language. Mean scores in math, science, and arts for low-income Diploma candidates were under 4 over the entire time period and were under 4 in individuals and societies from 2009 through 2014.¹¹ Although the relative performance of higher-income students in each subject paralleled that of low-income students, with science the lowest, the mean science score for higher-income students was over 4 from 2011 through 2014.

As a result of their lower mean exam scores, low-income students are not reaping the full benefits of college credit from the Diploma Programme.

Although every university determines its own criteria and policies vary, some universities award general education credit at the college level to students who earn the IB Diploma with a total of 30 points or more. In addition, most universities that award credit for DP courses require a score of 5 or better on higher level (HL) exams.¹² Approximately 20% of low-income Diploma candidates earned the full 30 points that some universities award significant college credit for compared with approximately 40% of their higher-income peers; similar percentages of low-income Diploma candidates and their higher-income peers earned between 24 and 29 total points toward the Diploma (Exhibit 9). Although the majority of Diploma candidates (low- or higher-income) did not meet this 30-point threshold, 60% of low-income Diploma candidates and 80% of their higher-income peers earned a score of 5 or greater on at least one HL exam (Exhibit 10), providing the possibility of earning some college credit for their IB coursework.

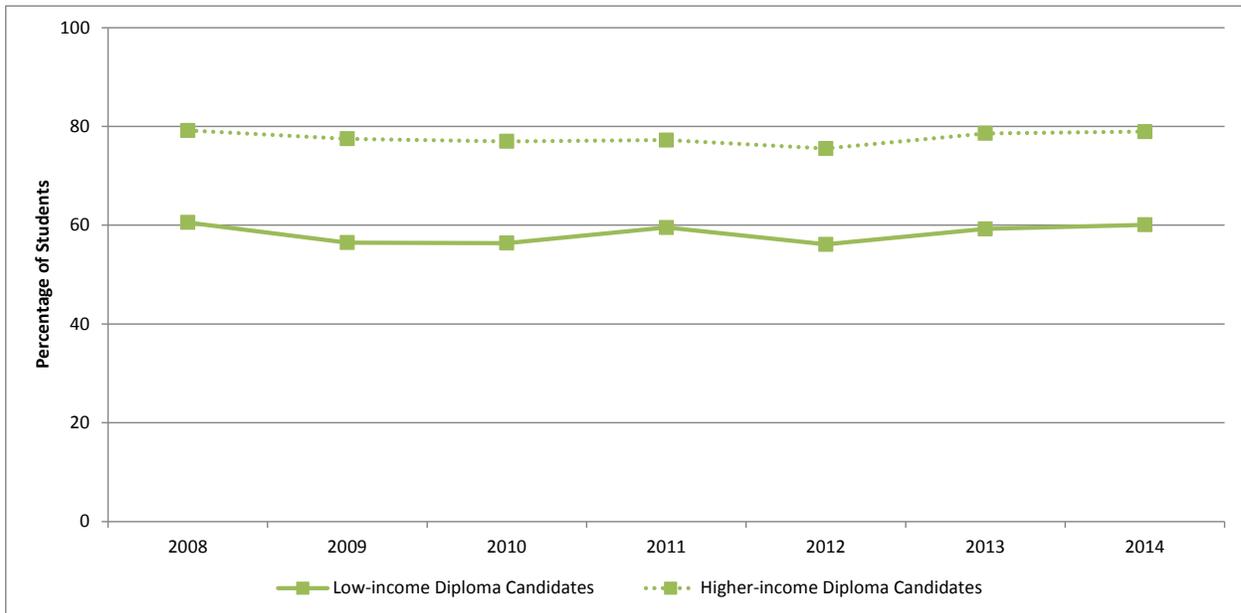
¹¹ Environmental systems and societies is an interdisciplinary course that can fulfill the science or individuals and societies requirement. For this study, we classified it as group 4, science.

¹² For example, the University of California (UC) awards students who complete the IB Diploma with a score of 30 or above with 30 quarter (20 semester) units toward their UC degree. Students who receive a score of 5, 6, or 7 on HL exams receive 8 quarter (5.3 semester) units (University of California Office of the President, 2015).

Exhibit 9
Diploma Candidates Earning a Total of 30 Points or More



Exhibit 10
Diploma Candidates Earning a 5 or Higher on at Least One HL Exam



Diploma candidates, regardless of income status, are more likely to take HL exams in individuals and societies and in language than in other subjects; across the HL subject exams, low-income students scored highest on average in HL language acquisition.

Diploma candidates were most likely to take language and individual and societies at the higher level and least likely to take math (Exhibit 11). The trends for low-income candidates mirrored those of their higher-income peers, except that low-income candidates were more likely to take language acquisition at the higher level and less likely to take math at the higher level. The percentage of low-income Diploma candidates taking math HL fell from 7% in 2008 to 5% in 2014 but remained constant at 13% for higher-income candidates during this time. The participation of low-income student in art HL also increased 5 percentage points during this period.¹³ Course-taking patterns reflect some combination of school offerings (i.e., HL courses in some subjects are not offered at a given school) and student choice.

On average, Diploma candidates (regardless of income status) did not earn a score of 5 on HL exams in any subject over the 7-year period, although low-income candidates came closest in language acquisition (Exhibit 12). Language acquisition was also the subject in which the gap in mean scores on HL exams between low-income candidates and their higher-income peers was smallest, averaging 0.25 over the 7-year period; this gap was greatest in science, followed by math. Low-income Diploma candidates performed lowest on science HL exams, with a mean score hovering around 3.3 from 2008 through 2014.

¹³ Art is the only subject exam not taken by all Diploma candidates. Between 2008 and 2014, approximately 36% of low-income Diploma candidates and 30% of their higher-income peers took an exam in art.

Exhibit 11
HL Participation by Subject for Diploma Candidates

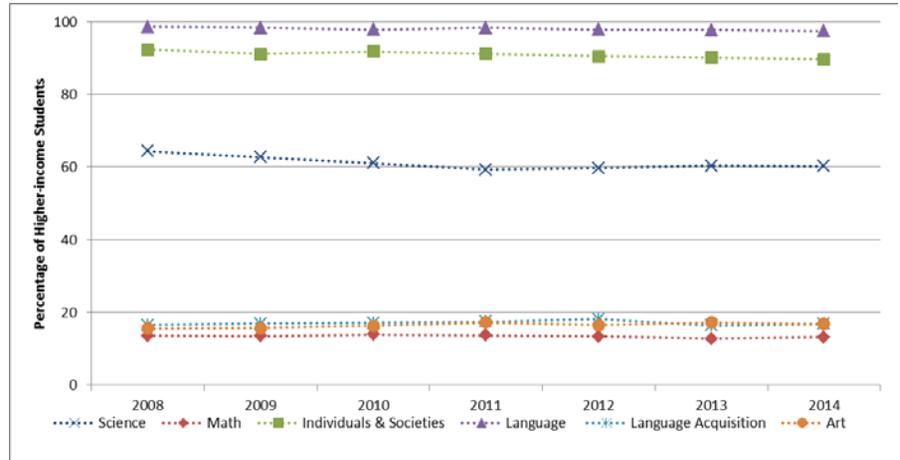
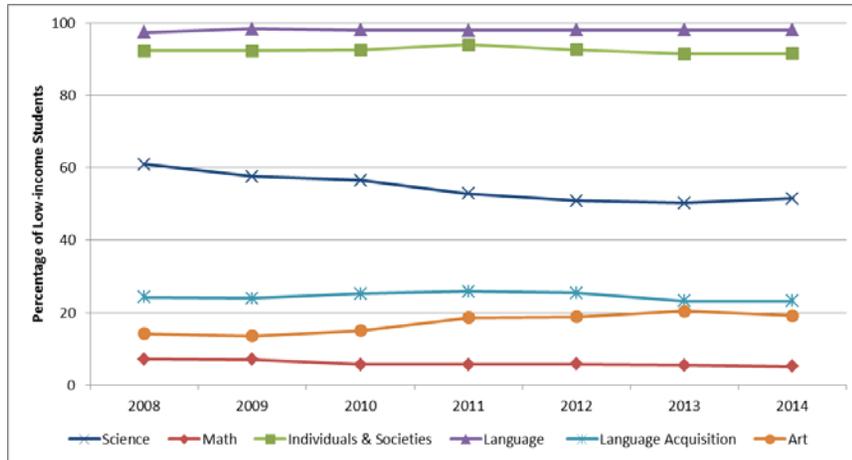
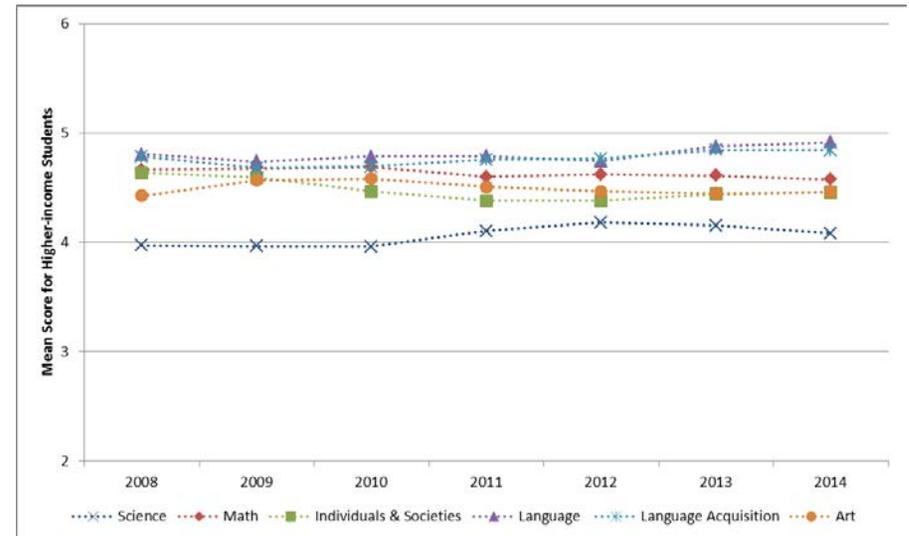
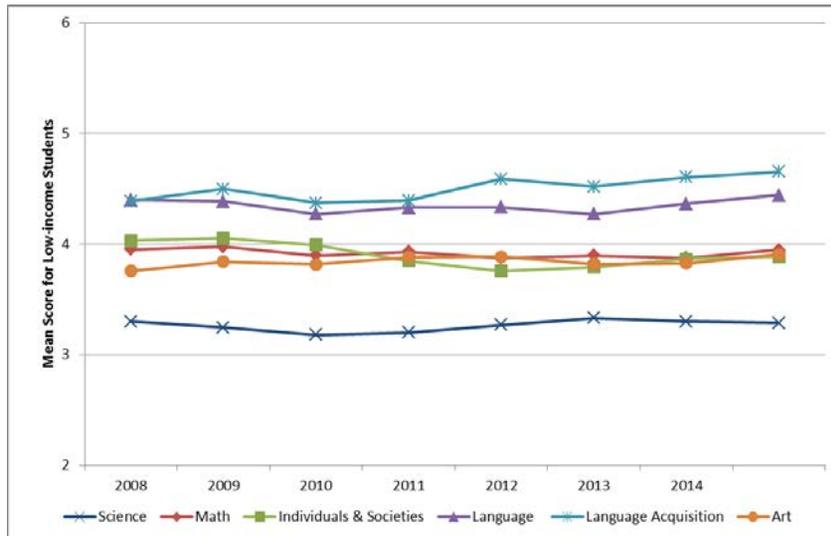


Exhibit 12
Mean HL Score by Subject for Diploma Candidate



Participation and Performance for Low-income Course Students

To understand the course-taking patterns and success rates for course students, we analyzed low-income and higher-income DP course students' participation in and performance on IB exams.

Low-income course students, like their higher-income peers, are most likely to take IB exams in language and individuals and societies and least likely to take them in art.

Course students do not have to complete any particular requirements but can enroll in the DP courses available at their schools that match their interests and goals. Over the 7-year period from 2008 to 2014, participation rates for low-income course students increased in language and math and decreased in language acquisition (Exhibit 14). In 2008, low-income course students were most likely to take an IB exam in individuals and societies (45%) and least likely to take one in the arts (15%). By 2014, language (most often IB English or English literature) had surpassed individuals and societies as the most common subject that low-income course students took exams in increasing from 38% of low-income course students in 2008 to 47% in 2014, and the least common remained arts (14%). For higher-income course students, rates of exam-taking by subject were fairly constant during this time period; we did not see the same 9 percentage point increase in language exam taking for higher-income course students as we did for their low-income peers, and thus individuals and societies remained the most commonly taken subject for these students throughout the period.

The percentage of low-income course students who took language and math also increased from 2008 to 2014, mirroring the increase in individual course taking. In 2008, 14% of low-income course student took exams in language and math, and this rose to 17% in 2014. For higher-income course students, this rate remained constant at 14%. From 2008 to 2014, the number of DP course students taking exams in language and math increased rapidly; the number of low-income course students overall increased 144% (from 2,527 to 6,155, Exhibit 1) while the number of low-income course students taking an IB exam in both language and math increased nearly 200% over the same time period (from 346 to 1,031).

Low-income course students perform well on IB exams in language acquisition and poorly in science.

As discussed earlier, on average course students did not perform as well as Diploma candidates on IB exams; in addition, the mean exam score of low-income course students lagged below that of their higher-income peers by approximately 0.50 point. From 2008 to 2014, the mean assessment score for low-income course students ranged from 3.49 to 3.59 (Exhibit 4). However, the mean score for low-income course students in language acquisition was at least a half point higher than in any other subject and was higher for low-income course students than for their higher-income peers (Exhibit 14). All other mean assessments scores for low-income students were lower than the mean score for language acquisition and lower than the mean score for higher-income students. Similar to low-income Diploma candidates, low-income course students scored particularly low in

Exhibit 13
Exam Participation by Subject for Course Students

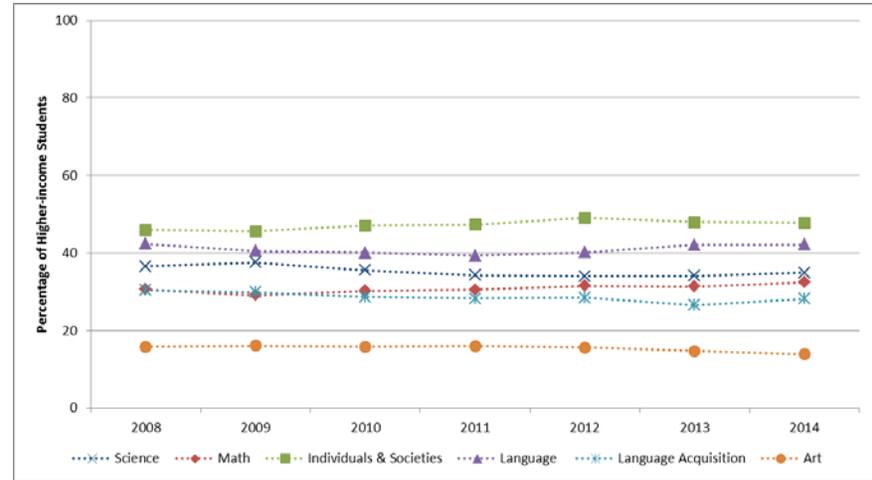
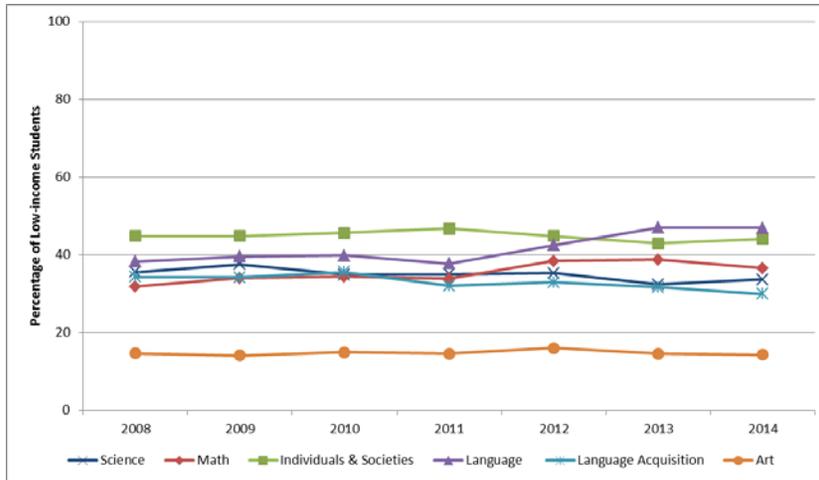
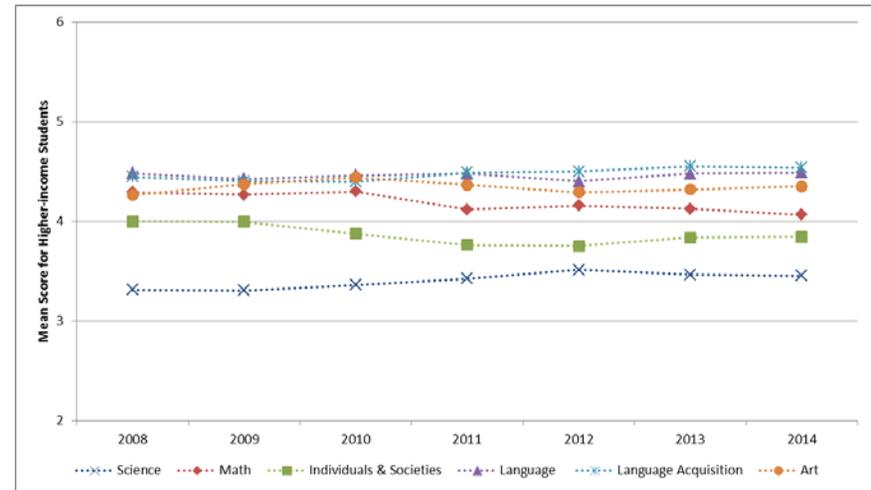
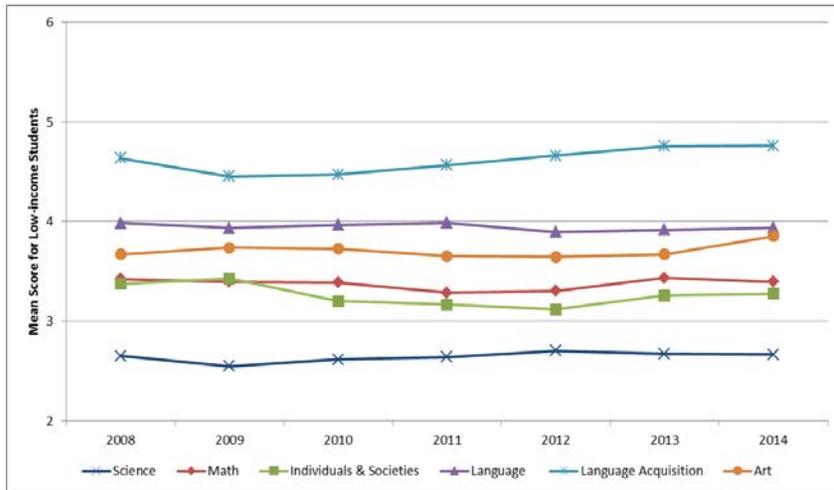


Exhibit 14
Mean Score by Subject for Course Students

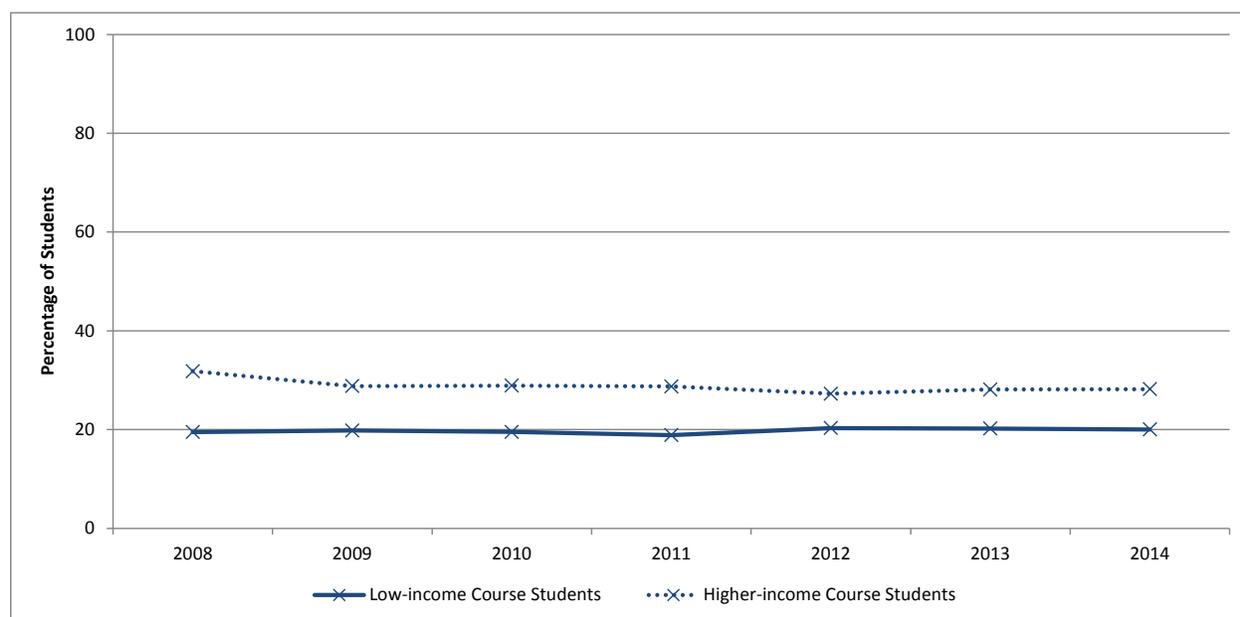


science, with a mean score under 3 every year since 2008.¹⁴ The percentage of low-income course students taking a language assessment increased 14 percentage points from 2011 to 2014; during that time, mean performance in this subject remained fairly constant.

Only 20% of low-income course students score well enough on at least one IB HL exam to potentially earn college credit from most US colleges and universities compared with 60% of low-income Diploma candidates. However, low-income course students who take HL language acquisition exams earn a mean score of 5 or higher.

As discussed in the previous section on Diploma candidates, US colleges and universities determine their own policies on awarding credit for DP courses, but they typically award credit for a score of 5 or higher on HL exams. Between 2008 and 2014, approximately 20% of low-income course students earned a score of 5 or above on an HL exam (Exhibit 15).

Exhibit 15
Course Students Earning a 5 or Higher on At Least One HL Exam



Language and individuals and societies were the most common courses taken at the higher level by low-income and higher-income course students alike, and math was the least common (Exhibit 16). We also looked at the mean scores for course students taking HL courses. Again, low-income students on average performed lower than their higher-income peers on HL exams and well below the score of 5 needed for college credit. The notable exception was language acquisition. In this subject, low-income course students scored on average higher than their higher-income peers and high enough to earn college credit (Exhibit 18). Low-income course students performed very poorly on HL exams in math and science, but very few attempted these exams in math (only 62 in 2014), which accounts for the greater fluctuation in performance from year to year than in other subjects.

¹⁴ Mean scores for low-income Diploma candidates were more than 3, hovering around 3.3 (Exhibit 9).

Exhibit 16
HL Participation by Subject for Course Students

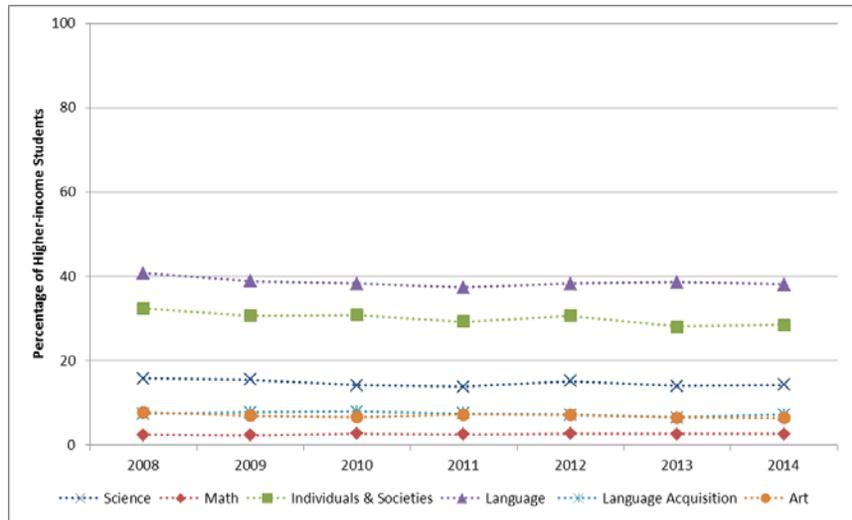
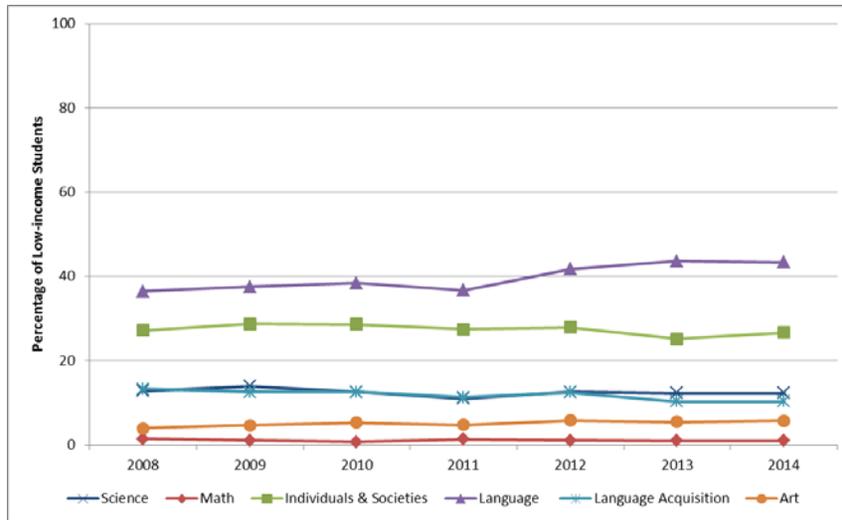
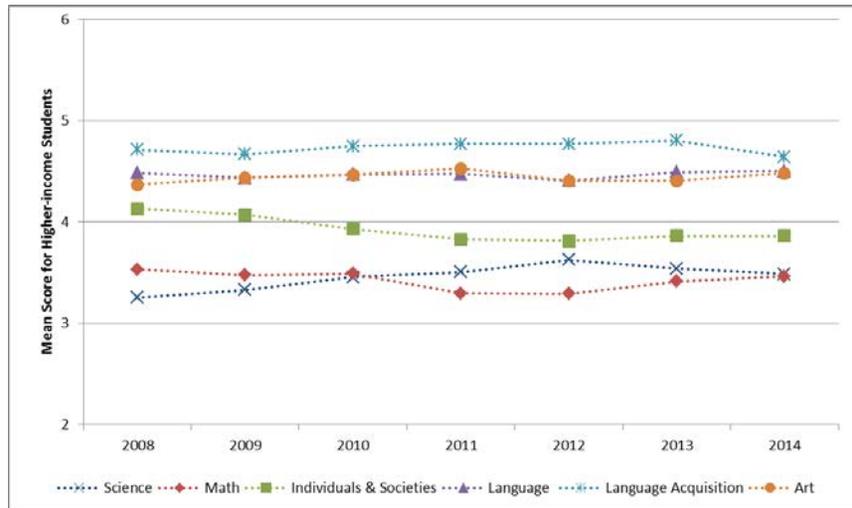
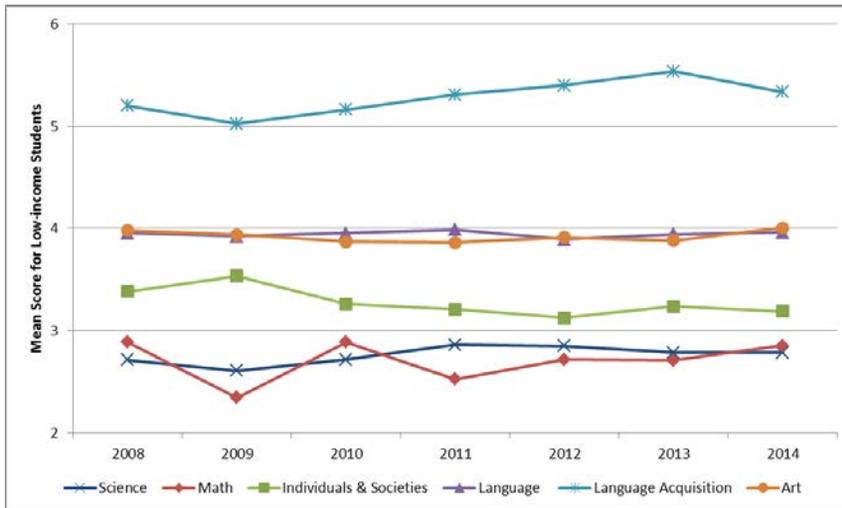


Exhibit 17
Mean HL Score by Subject for Course Students



* * *

As the IB Diploma Programme has grown, with increases in both the absolute number of course students and Diploma candidates and the percentages of low-income students in each of these groups, gaps between the performance of low-income Diploma Programme students and their higher-income peers remained constant. On average for the 2014 graduating cohorts, relative to their higher-income peers low-income Diploma candidates scored 0.48 point lower and low-income course students scored 0.54 points lower on DP exams. For low-income Diploma candidates, low assessment scores, particularly in science, math, individuals and societies, and art, were the greatest barrier to attainment of the IB Diploma. Among DP course students, low-income students, like their higher-income peers, were most likely to take DP exams in language and individuals and societies and least likely to take exams in art. Only 20% of low-income course students scored well enough (score of 5 or higher) on at least one IB HL exam to earn college credit from most US colleges and universities compared with 60% of low-income Diploma candidates. However, low-income course students who took language acquisition exams at the higher level earned a mean score of more than 5.

III. Trends in Postsecondary Enrollment, Retention, and Graduation

Using data from the National Student Clearinghouse (NSC), this section presents college outcomes for course students and Diploma candidates. IB submitted student records for all DP course students and Diploma candidates from the 2008 and 2013 graduating cohorts to the NSC. The returned files identify postsecondary registrations at any of the US postsecondary institutions that participate in the NSC, capturing 96% of postsecondary student enrollments nationally.¹⁵ By merging these data with the IBIS data, we were able to examine college enrollment, retention, and graduation rates for course students and Diploma candidates.

We examine immediate postsecondary enrollment rates at 2- and 4-year colleges or universities for DP students from these two cohorts. We then provide 1- and 2-year retention rates and 4- and 6-year graduation rates for just the subset of students who enrolled in a 4-year college immediately after high school. Because we received college registration data from the NSC in March 2015, we are able to report only on 2-year retention and 4- and 6-year graduation rates for the 2008 cohort (Exhibit 18).

Exhibit 18
Enrollment, Retention, and Graduation Rate Definitions

	Definition	Cohorts
Immediate Enrollment	Enrollment at an NSC-participating college or university between August and December immediately after high school graduation	2008 and 2013
1-Year retention	Enrollment at same 4-year college or university the fall after immediate enrollment (persisting into second year of college)	2008 and 2013
2-Year retention	Enrollment at same 4-year college or university the fall 2 years after immediate enrollment (persisting into third year of college)	2008
4-Year graduation	Graduation from the same institution by the end of August 4 years after immediate enrollment at a 4-year college or university	2008
6-Year graduation	Graduation from the same institution by the end of August 6 years after immediate enrollment at a 4-year college or university	2008

¹⁵ In addition, some students and some postsecondary institutions prohibit the NSC from releasing student enrollment data. The NSC provides a summary report that captures these enrollments, but these blocked enrollment records are not included in the returned data files. Of the nearly 78,000 IB submitted to the NSC from the 2008 and 2013 cohorts, 3.4% had blocked enrollment records. In other words, we know that we are missing enrolment data for just over 3% of DP students; we do not know if these students enrolled in a postsecondary institution immediately after high school.

In presenting the enrollment, retention and graduation rates for DP students in this section, we also provide national rates for comparison, including national rates of low-income students when available. These rates for US students nationally provide context, but in comparing them with those of DP students we cannot conclude that DP students' rates are higher *because* the students participated in the DP. The DP attracts strong students, students who may be more likely to enroll in, persist, and graduate from college at above-average rates even without the opportunity to participate in the DP. Similarly, below we present college outcomes for course students who participated in different DP subjects and for Diploma candidates who earned varying points toward the Diploma. Once again, we cannot attribute any differences in outcomes to DP participation because students enter the DP with different levels of academic preparation and motivation that are reflected in their course choices and their performance in the DP.

College Outcomes for Low-income Diploma Candidates

In this section, we examine the college enrollment, retention, and graduation rates for low-income Diploma candidates.

Regardless of whether they earn the IB Diploma, low-income Diploma candidates enroll in 4-year colleges and universities at high rates: In the class of 2013, more than three-quarters of low-income Diploma candidates enrolled in a 4-year college or university immediately after finishing high school.

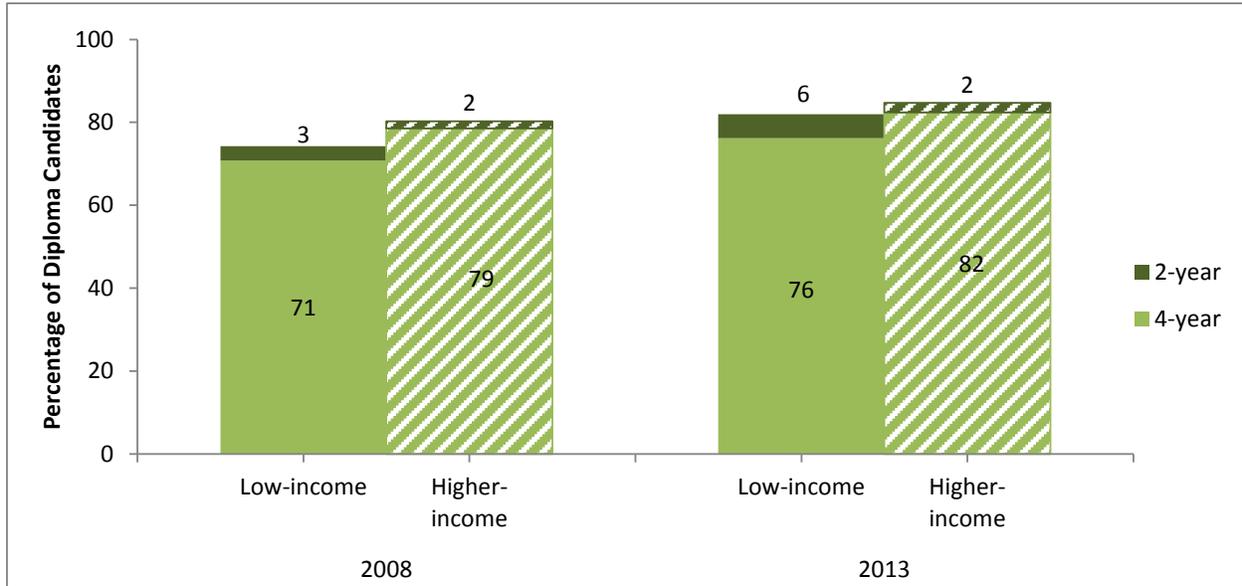
As discussed above, the number of low-income Diploma candidates doubled from 2008 to 2013, from 2,173 to 4,610. During this time, the percentage of these students who enrolled immediately in a 4-year college or university increased from 71% to 76% (Exhibit 19). These 4-year college enrollment rates were higher, but not dramatically so, for their higher-income peers: 79% and 82%, respectively. Only a small percentage of low-income Diploma candidates from these two cohorts enrolled in 2-year colleges (3% in 2008 and 6% in 2013), bringing the total college enrollment rate for low-income Diploma candidates to 74% in 2008 and 82% in 2013.

As context, 66% high school completers across the US enrolled in college immediately after high school in 2013, 24% at 2-year institutions, and 44% at 4-year institutions (Institute of Education Sciences, National Center for Education Statistics, 2014a).¹⁶ For low-income students, defined as those from families in the bottom 20% of family incomes, the 2- and 4-year college enrollment rate was 46% (Institute of Education Sciences, National Center for Education Statistics, 2014b).¹⁷

¹⁶ These rates were fairly constant from 2008 through 2012. For example, 66% of 2012 high school completers enrolled in college immediately after high school, 29% at 2-year institutions and 38% at 4-year institutions.

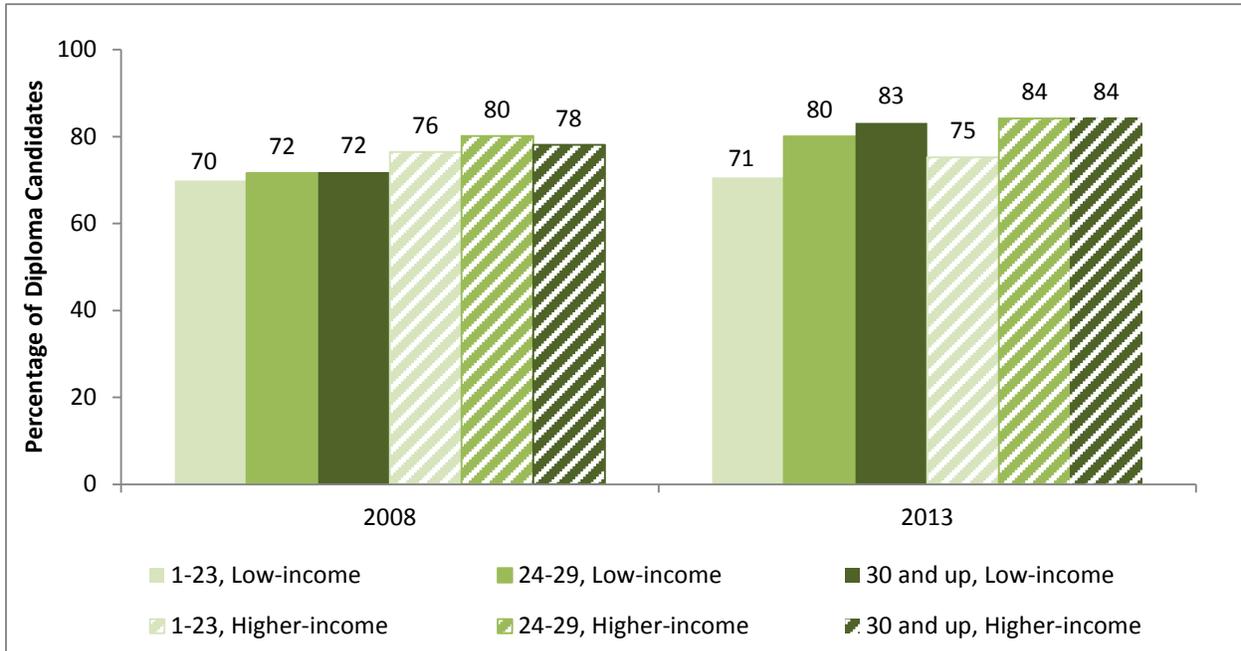
¹⁷ The threshold for the lowest income quintile was \$28,894 in 2013 (U.S. Census Bureau, Current Population Survey, n.d.). Eligibility for FRPM is based on an income of 185% of the poverty threshold, or approximately \$36,000 for a family of three in 2013.

Exhibit 19
Diploma Candidate Enrollment Rates at 2- and 4-year Postsecondary Institutions



Diploma candidates' college-going rates are high regardless of whether they earn the Diploma. For example, in 2008, 987 low-income students earned fewer than 24 total points toward the Diploma, and 70% of them enrolled directly in a 4-year college or university (Exhibit 20). In 2013, the comparable figures were 2,065 low-income Diploma candidates who earned fewer than 24 points toward the Diploma, of whom 71% enrolled immediately in a 4-year college. However, for the 2013 cohort, low-income Diploma candidates who earned 24 or more total points toward the Diploma were more likely to enroll directly in a 4-year college or university than their low-income peers who earned fewer than 24 total points. In this cohort, low-income Diploma candidates who earned 30 points toward the Diploma were just as likely as their higher-income peers to enroll immediately in a 4-year college (83% and 84%, respectively).

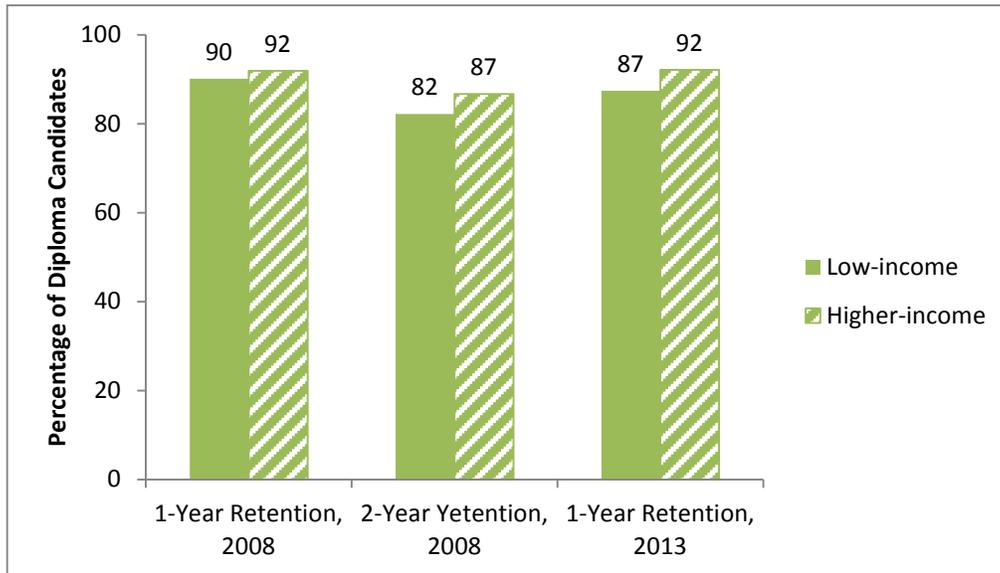
Exhibit 20
Diploma Candidate Enrollment Rates at 4-year Postsecondary Institutions,
by Total Points Earned



Retention rates for low-income Diploma candidates at 4-year colleges and universities are close to those of their higher-income peers.

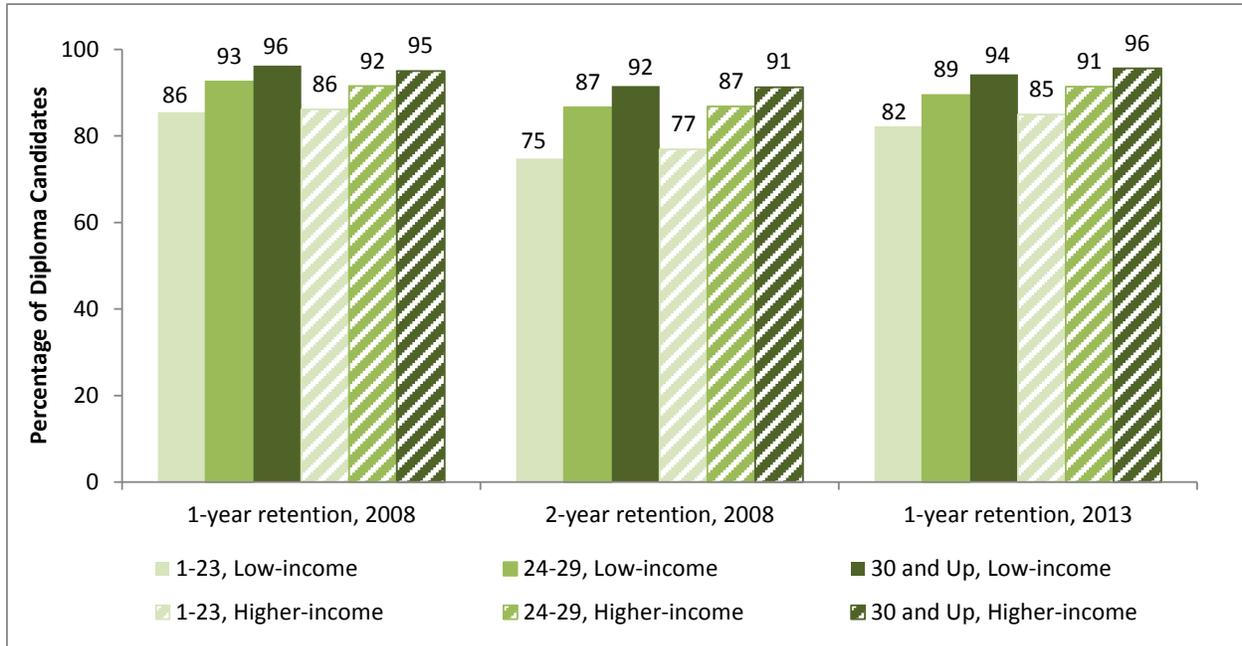
In 2008, 90% of low-income Diploma candidates who enrolled immediately in 4-year colleges persisted beyond their first year compared with 92% of their higher-income peers, and 82% persisted beyond their second year compared with 87% of their higher-income peers (Exhibit 21). Low-income Diploma candidates in the 2013 cohort enrolled at 4-year colleges at slightly higher rates than their low-income peers in the 2008 cohort (Exhibit 19) but were slightly less likely to persist beyond their first year than their peers in this earlier cohort (Exhibit 21). As context, for students beginning college in 2012, the 1-year retention rate at 4-year postsecondary institutions was 79% (Institute of Education Sciences, National Center for Education Statistics, 2014c).

Exhibit 21
Diploma Candidate Retention Rates at 4-year Postsecondary Institutions



Low-income Diploma candidates who earned more points toward the Diploma were more likely to persist in college. For example, in the 2013 cohort, 82% of low-income Diploma candidates who earned fewer than 24 points toward the Diploma persisted beyond the first year compared with 89% who earned between 24 and 29 points and 94% of those who earned 30 points or more (Exhibit 22). This positive relationship between total points earned and college retention held for low-income Diploma candidates in the 2008 cohort and for higher-income Diploma candidates in both cohorts.

Exhibit 22
Diploma Candidate Retention Rates at 4-year Postsecondary Institutions,
by Total Points Earned

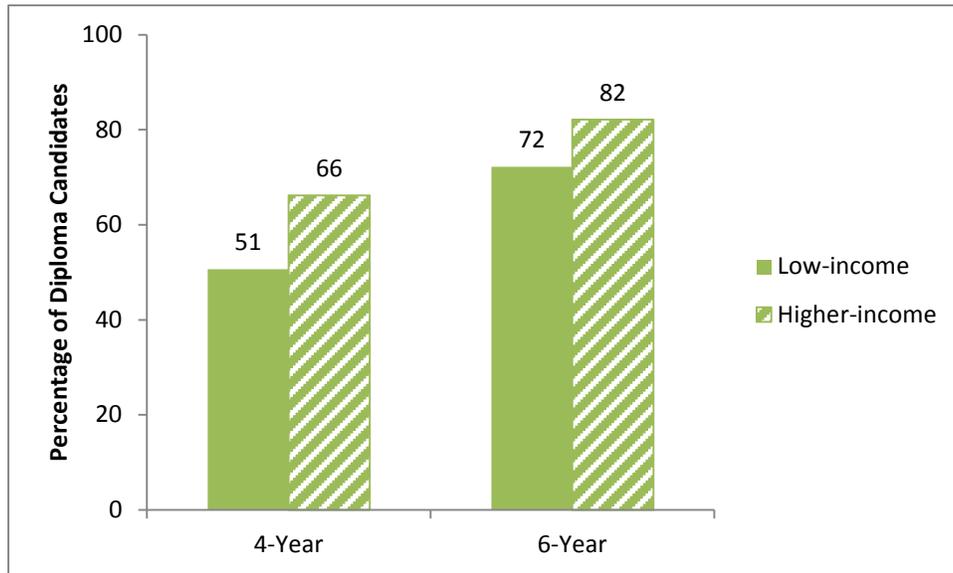


Low-income Diploma candidates who enroll at 4-year colleges and universities have 6-year graduation rates that are similar to the national average for all students, higher than the national average for low-income students, but lower than those of higher-income Diploma candidates.

For the 2008 cohort, 51% of low-income Diploma candidates graduated within 4 years compared with 66% of their higher-income peers (Exhibit 23). Six-year graduate rates were higher, with 72% of low-income Diploma candidates earning a bachelor’s degree within 6 years compared with 82% of their higher-income peers. As context, for students finishing high school in 2006, 39% graduated within 4 years, and 59% graduated within 6 years (Institute of Education Sciences, National Center for Education Statistics, 2013). Low-income students who enter 4-year colleges have lower graduation rates than these overall national rates. For example, 47% of students from families in the bottom income quartile nationally who enrolled in a 4-year college in 2003 earned a degree within 6 years compared to 77% of students from families in the top income quartile (Radford, Berkner, Wheelless, & Shepherd, 2010).¹⁸

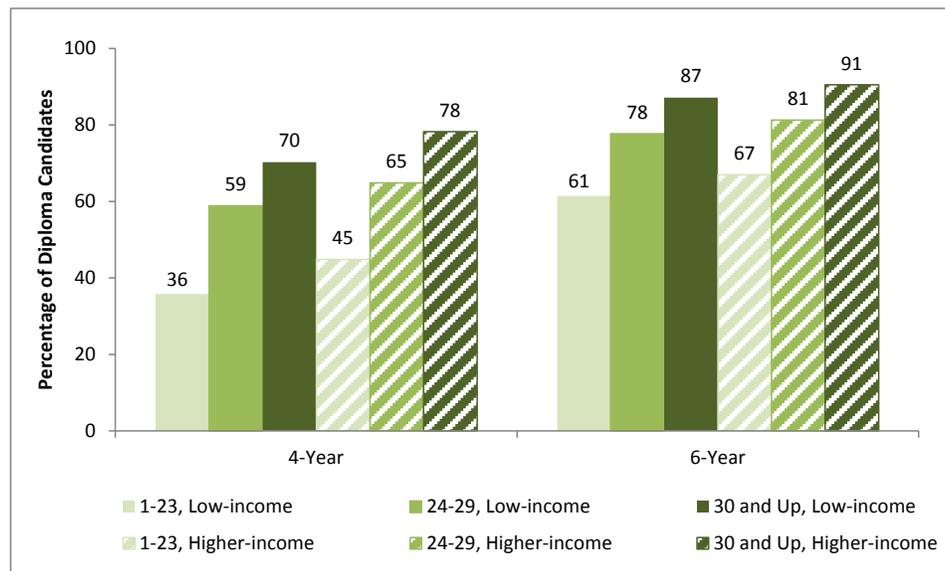
¹⁸ Low-income students defined as those from families in the bottom quartile families with first-time college going students, or less than \$32,000. Eligibility for FRPM is based on an income of 185% of the poverty threshold, or approximately \$28,000 for a family of three in 2003.

Exhibit 23
2008 Diploma Candidate Graduation Rates at 4-year Postsecondary Institutions



Six-year graduation rates from 4-year colleges and universities were particularly high for candidates who earned 30 or more total points toward the Diploma: Conditional on immediate college enrollment, 87% of low-income Diploma candidates who earned 30 or more total points graduated from a 4-year college or university within 6 years compared with 91% of their higher-income peers (Exhibit 24). For Diploma candidates who did not earn enough points to be awarded the Diploma, these rates were 61% for low-income candidates and 67% for their higher-income peers.

Exhibit 24
2008 Diploma Candidate Graduation Rates at 4-year Postsecondary Institutions, by Total Points



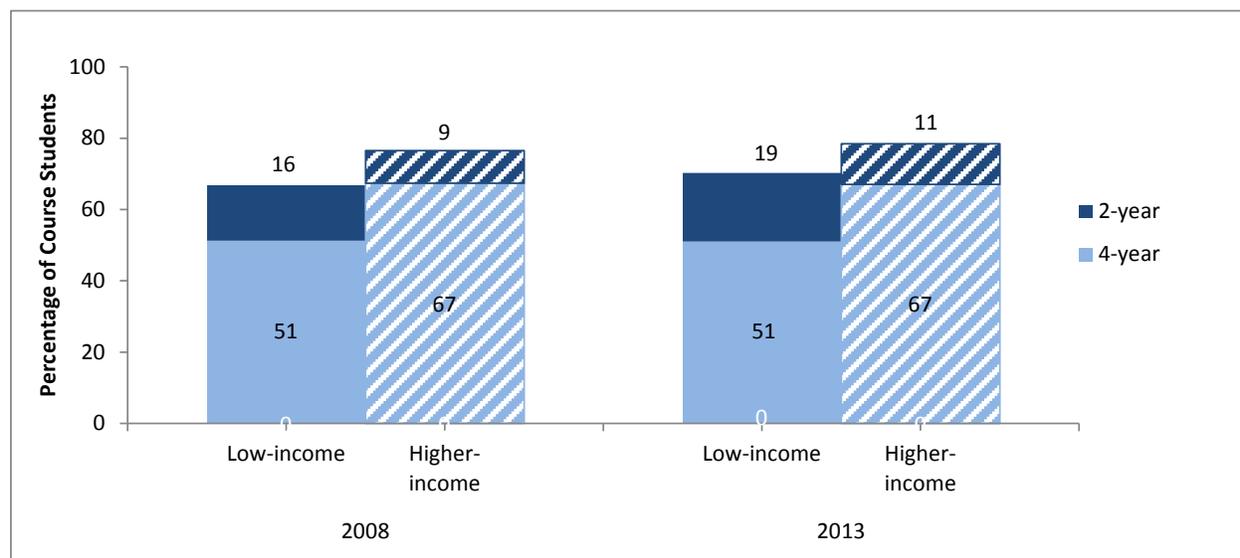
College Outcomes for Low-income Diploma Programme Course Students

Presented here are college enrollment, retention, and graduation rates for low-income DP course students, both overall and for students who took IB exams in both language and math.

Approximately half of low-income course students in the 2008 and 2013 cohorts enroll in a 4-year college and just under a fifth enroll in a 2-year college immediately after high school.

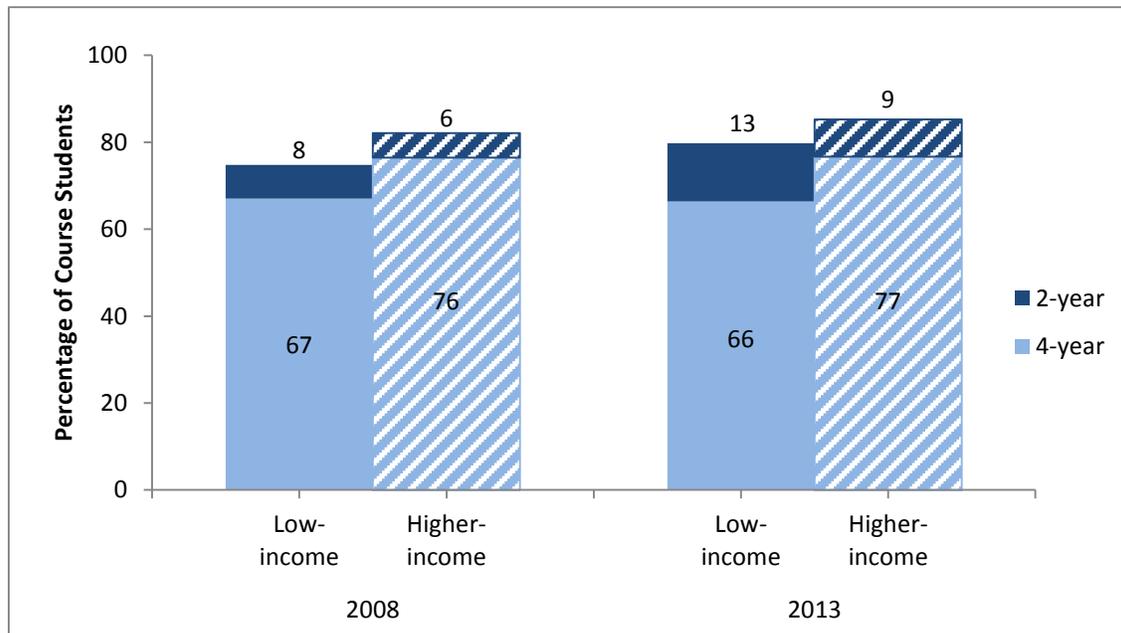
Immediate college enrollment rates for low-income course students were fairly constant from 2008 to 2013, with 51% of course students in both cohorts enrolling immediately in a 4-year college or university. An additional 16% enrolled immediately in a 2-year college in 2008 and an additional 19% in 2013 (Exhibit 25). The differential in 4-year college enrollment rates for low-income course students and their higher-income peers was 16 percentage points for both cohorts, approximately twice the differential between low-income and higher-income Diploma candidates (Exhibit 19).

Exhibit 25
Course Students Enrollment Rates at 2- and 4-year Postsecondary Institutions



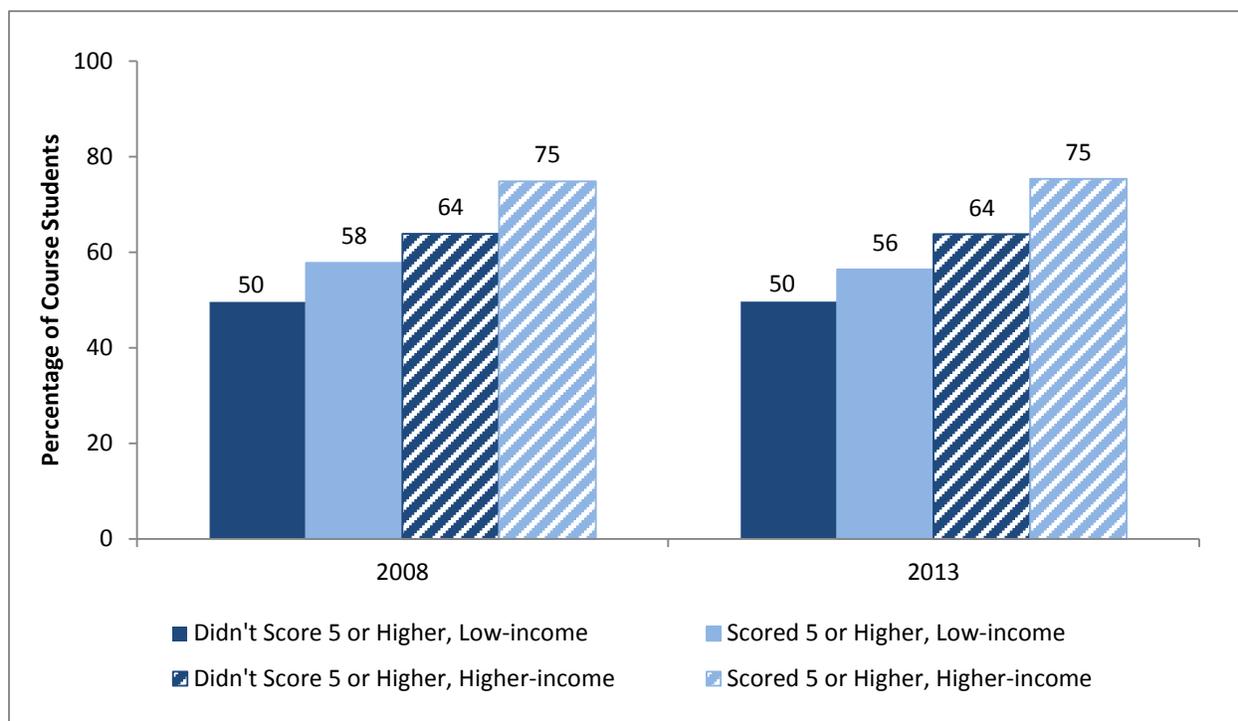
During this time, the 4-year immediate college enrollment rate for these students remained constant (67% for 2008 and 67% for 2013) (Exhibit 25). The difference in immediate 4-year college enrollment rate for low-income course students taking math and language and that of their higher-income peers was 10 percentage points (Exhibit 26), slightly less than the differential for course students overall. Immediate college enrollment rates for students who took IB exams in math, science, and individuals and societies are presented in Appendix B.

Exhibit 26
Enrollment Rates at 2- and 4-year Postsecondary Institutions for Course Students
Who Took Language and Math



Low-income course students who earned a score of 5 or higher on at least one DP exam were more likely to enroll in a 4-year college than those who did not earn a score this high (Exhibit 27). We saw the same positive correlation between exam achievement level and college enrollment level for higher-income course students as well. We cannot disentangle whether the higher college enrollment rates for students who score well on at least one DP exam reflect the greater follow-through on college aspirations from higher-achieving students, or if students who scored well were more likely to enroll in college because they performed well on DP exam.

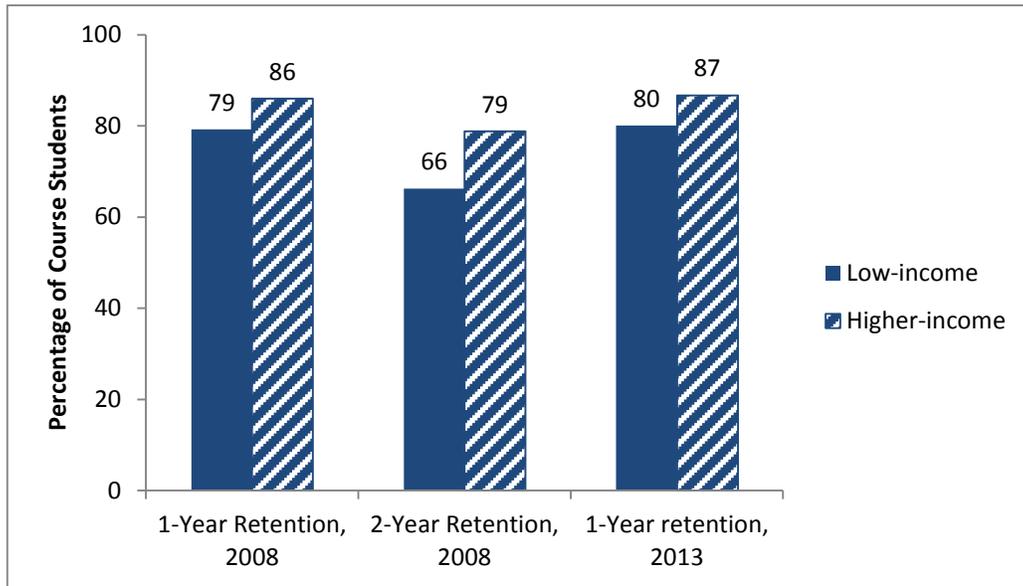
Exhibit 27
Enrollment Rates at 2- and 4-year Postsecondary Institutions for Course Students
by Achievement Level



Although the gap between low-income course students and their higher-income peers is only 6 percentage points for 1-year retention rates, this increases to 12 percentage points for 2-year retention.

In the 2008 cohort, 79% of low-income course students who enrolled immediately in a 4-year college were retained 1 year compared with 86% of their higher-income peers, and these numbers remained constant for the 2013 cohort (Exhibit 28). However, 2-year retention rates dropped 13 percentage points to 66% for low-income students in the 2008 cohort and 7 percentage points to 79% for their higher-income peers. Retention rates at 4-year colleges and universities for low-income course students who took IB exams in both English and math and immediately enrolled in a 4-year institution were similar to those of immediately enrolled course students overall. For example, 1-year retention rates were 79% and 2-year retention rates 66% for these low-income students. See Appendix B for retention rates for students who took IB exams in other subjects.

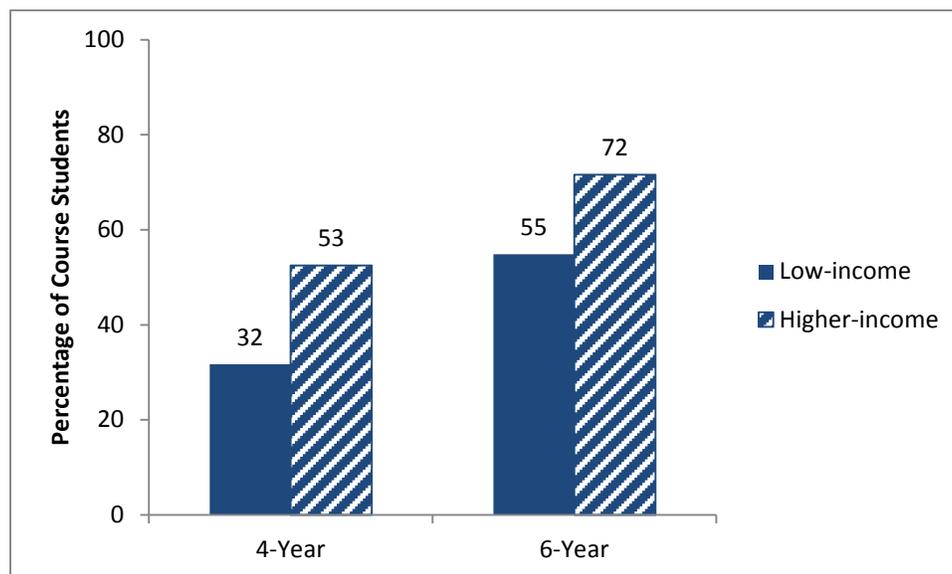
Exhibit 28
Course Student Retention Rates at 4-year Postsecondary Institutions



Less than a third (32%) of low-income course students in the 2008 cohort who immediately enrolled in college graduated within 4 years, although 6-year graduation rates are higher (55%).

For the 2008 cohort, low-income course students were 21 percentage points less likely to graduate from college in 4 years than their higher-income peers, although this gap decreased to 17 percentage points for graduation in 6 years (Exhibit 29). Graduation rates for low-income course student who took IB exams in language and math were only slightly higher: 35% graduated within 4 years and 59% graduate within 6 years. See Appendix B for graduation rates for students who took IB exams in other subjects.

Exhibit 29
2008 Course Student Graduation Rates from 4-year Postsecondary Institutions



* * *

The IB Diploma Programme intends to prepare students to enroll in and graduate from college. As IB has grown in US public schools and participating students have become more diverse, college enrollment and 1-year retention rates for course students and Diploma candidates have remained remarkably constant. Regardless of whether they earned the Diploma, low-income Diploma candidates enrolled in 4-year colleges and universities at high rates. Their 6-year graduation rates were similar to the national average for all students, higher than the national average for low-income students, but lower than those of higher-income Diploma candidates.

Among low-income course students, approximately half the 2008 and 2013 cohorts enrolled in a 4-year college and just under a fifth enrolled in a 2-year college immediately after high school. For students in the 2008 cohort, the gap in 1-year retention rates (at 4-year colleges) between low-income course students and their higher-income peers was only 6 percentage points, but it increased to 12 percentage points for 2-year retention and 21 percentage points for college graduation in 4 years; the gap decreased to 17 percentage points for graduation in 6 years. Just over half (55%) of low-income DP course students in the 2008 cohort who immediately enrolled in college graduated within 6 years.

IV. Local Efforts to Support Low-income Students' Participation and Performance in IB and Postsecondary Education

Whereas low-income students' participation in IB's DP is increasing in US public schools, the national trends document the need to intensify efforts to close the gap between their DP participation and performance and that of higher-income students by better preparing them for postsecondary enrollment and graduation. To better understand the factors that support and hinder low-income students' participation and success in the DP, SRI researchers conducted interviews and focus groups at five schools selected on the basis of their enrollment of low-income students in the DP.

We identified US public high school schools where at least 35% of all students were FRPM eligible, where low-income students' IB participation rates mirrored those of the total school population, and where programs were well enough established to serve a sizeable student population (that is, schools with very small programs were not considered). We also sought to identify schools that varied in geographic location. In the end, we visited schools in California, Colorado, Maryland, Oregon, and Texas. Exhibit 30 presents basic demographic information for the five schools.

Exhibit 30
Overview of Demographic Characteristics at Five Schools Selected for Site Visits

	School Enrollment	FRPM (%)	Race/ethnicity			
			Asian (%)	Black (%)	Hispanic (%)	White (%)
School 1	2,395	52	13	14	40	15
School 2	2,071	75	5	15	64	13
School 3	3,269	47	4	29	37	28
School 4	1,424	50	10	38	35	14
School 5	1,310	79	0	2	78	20

Source: Common Core of Data 2012-13

All selected schools serve a mix of Diploma and course students, with combined 2014 numbers ranging from 106 to 545 students participating in the DP. Low-income students' participation rates in the full Diploma ranged from 15% to 100%, while low-income students' participation in DP courses ranged from 45% to 99%.

During school visits, we conducted in-person interviews with the school leader, the IB coordinator, and three IB teachers. We also conducted two student focus groups—one of 10th-grade potential DP students and one of 12th-grade students enrolled in IB courses or pursuing the full IB Diploma.

Our visits to IB schools serving large numbers of low-income students revealed efforts to increase their participation—as well as persistent challenges. The schools established a variety of systems and practices aimed at fostering the success of low-income students enrolled in IB and supporting their transition to college. Although our research design did not enable us to assess the efficacy of these efforts, we report on educators’ and students’ perceptions of practices that may be making a difference. We first describe school practices intended to increase and broaden participation in IB. Then we discuss teacher practices that support students in mastering the IB curriculum. Next are described school-wide support systems in place at schools with a significant proportion of low-income students participating in DP courses and in the full DP. The section concludes with an examination of the schools’ efforts to prepare students for college enrollment and success.

IB Outreach and Admission

The schools we visited serve large populations of low-income students in their IB programs—as full Diploma candidates or as course students. The high numbers reflect the fact that these schools serve large numbers of low-income students overall, pointing to one clear strategy for expanding low-income student participation: increase the number of low-income schools offering the DP. In addition, although they have had varying degrees of success, leaders at all the schools expressed a desire to reflect their overall school populations in their IB programs. Described here are some of the proactive steps these schools were taking in their attempts to accomplish this goal.

Making IB the default pathway. At several of the schools visited for this research, educators made concerted efforts to expand their IB programs and attract a broader base of students who reflect overall school or district demographics. Schools relied on several strategies, one being to remove various barriers to entry (e.g., prerequisite courses, formal applications, and teacher recommendations). Some of the schools also were moving to opt out rather than opt in policies. For example, in a high-poverty school with a large English learner population, the percentage of low-income students participating in IB exceeded the school-wide percentage of low-income students (approximately 80% of students in the school qualify for FRPM). At that school, all students in one of the academies (with an international and ESL focus) were automatically enrolled in IB History of the Americas in 11th grade; in addition, students are strongly encouraged to take IB Spanish. This practice of auto-enrollment ensured broad participation of low-income students. A principal at another school shared that the philosophy has changed from, “Here it is, and if you want education come and get it,” to “We think you are capable students. This is what we expect you to do, and we will come after you to do it.” This principal went on to explain, “The students have no idea when they walk in what doors the IB Diploma can open for them and neither do their families,” indicating that a more passive approach will not lead to the participation of all students who could benefit from the program.

Active recruiting. Teachers and counselors play a critical role in increasing low-income student participation by actively reaching out to a broad cross-section of students, including those who do

not pursue participating in IB on their own initiative. Rarely do these efforts specifically target low-income students or programs designed to serve them. For example, at one school teachers referred all high-performing students who were not in IB to the IB Coordinator to learn more about it. Another approach involved IB teachers visiting 10th-grade classes to talk specifically about their IB courses and ensure that all students felt welcome (e.g., the IB individuals and societies teachers visited 10th- grade social studies classes to talk with the students about IB courses). In one case, we learned about AVID¹⁹ teachers promoting IB courses—a strategy that directly targeted low-income students. Students at these schools took note of their teachers’ efforts. As a 10th-grade student explained, “Our teachers and administrators really try to get us to apply ourselves and get us to go into advanced classes.”

Counselors also play an important role in encouraging students to enroll in DP courses. At one school, counselors told students who were getting A’s in “regular” 9th- and 10th-grade classes that they needed to do more and moved them into honors/pre-DP courses. At another school, the counselors reviewed student progress at the end of each semester and encouraged students to move up to advanced classes, even if the change involved a midyear switch. Counselors can also make it difficult for students to drop IB courses. A teacher at a school in which leaders decided to make it difficult to drop classes explained, “In all advanced classes, the kids sign up and in the first week, they want to drop. We stopped allowing them to get out.”

Teaching and Learning

In several of the schools we visited, IB classes used to be composed of relatively homogeneous groups of students in terms of academic preparation and learning styles, but classes were becoming more heterogeneous—a result of program expansion. A school leader noted, “Teachers in the past thought they were getting a certain type of kid. You [now] have kids who run the gamut. Your job is to differentiate and provide support.” In this section, we describe teachers’ efforts to provide instruction that supports diverse learners with the IB curriculum, including implementing innovative approaches to instruction, focusing on deeper learning and mastery over “coverage,” providing flexible options to fulfill course requirements, using data to identify and minimize academic barriers, and developing the academic and study skills needed to succeed in college.

Implementing innovative instructional strategies. At the schools we visited, some teachers reported that using innovative instructional practices helped engage more diverse learners. For example, a science teacher asked students to demonstrate their understanding of biology concepts throughout the year using drama. Students in one class performed skits, complete with costumes and props, to represent cellular respiration. Educators also emphasized the importance of choice. One IB teacher shared that after discussing poetry by various American authors, “Students could choose to write their own poetry, write a letter home (similar to a soldier), or perform a song. I

¹⁹ Advancement Via Individual Determination (AVID) is a program schools can implement to help close the achievement gap by preparing all students for college and other postsecondary opportunities. Through AVID, educators are trained to use proven practices in order to prepare students for success in high school, college, and a career, especially students traditionally underrepresented in higher education.

always allow for choice.” He also noted that the IB curriculum lends itself to projects and learning tasks that engage diverse learners because all the main topics in the IB individuals and societies curriculum incorporate arts and literature that students can relate to.

Aiming for mastery with the DP curriculum. Teachers at several schools noted that the IB curriculum provides opportunities to deeply engage students in the content and for students to demonstrate mastery. For example, at one school in which nearly all DP students are low income and English learners, all SL courses were offered over 2 years, a practice recommended by IB, but not always taken up in U.S. schools. Likewise, a science teacher emphasized the importance teaching at a pace that allows students to learn content more deeply:

Some people are going to say there’s a lot to get through so I have to rush. I am going to teach some content. You do the best you can. I can’t set the goal that I’m going to get through the content. I don’t think they expect all of content to be reached. Only about 5% of kids who take the exam get a 7. So clearly that’s not the goal. It’s that kids have a more enriching physics experience, and I think they are getting a more enriching experience.

Allowing for flexible deadlines, increasing scaffolding, and rethinking homework. Students who participated in our focus groups described the workload for IB as very heavy and indicated that stress and heavy workload may contribute to students’ decisions to drop out of IB (see sidebar). In response to these concerns, some teachers developed strategies to support students in meeting the multiple demands of the full DP in particular. At one school, the teachers established internal benchmarks to enable students to meet IB deadlines but then provided students with additional time to ensure quality products. As one teacher shared,

I am not getting on them when they are not being successful or not turning things in. I am thinking about the positive. “Can you get this in to me?” “What can I do to help you?” Sometimes they aren’t doing things for a legitimate reason, like they have to work. You give them a lot of extended time to turn things in.”

At two of the schools, teachers provided students with time to complete their homework during the school day, recognizing the external responsibilities facing many low-income students (e.g., employment, family commitments) as well as challenges low-income students may encounter doing homework (e.g., no quiet place to study).

Perceptions About Heavy Workload Can Impact Low-income Student Participation and Persistence

While the program's positive reputation is generally a draw, some students and educators indicated that IB's reputation for a heavy workload may adversely affect participation and persistence in it. Students recognized that IB courses were preparing them for college, appreciated the dedication of their teachers, and found the course content engaging. However, they also spoke at length about the stress and heavy workload of IB. For example, at one school, students and teachers alike noted that the heavy workload of the full Diploma Programme is the primary reason students drop out. One student described the workload as follows:

It just seems like it's always one too many things, just one too many I[nternal] A[ssessment]s, just that extended essay that's at the top of that already massive iceberg of work that we have to go through, and it just sends me over the edge. I mean, I love knowledge and I love learning, and sometimes it just seems like if you throw so much work on us, then you lose appreciation for the things that we are learning. It's just like, 'How much can you shoot out? How much can you do and write?' before we break down. We lose what we're supposed to be appreciating. It's a lot of work to shove into one life.

Reconsidering workload (e.g., homework policies), improving academic preparation, enhancing supports, and educating students and parents about the benefits of engaging in a rigorous academic curriculum may help to counter some of these perceptions.

Examining student performance to identify barriers to success. Educators used data to help identify barriers that could prevent low-income students from being successful in IB courses. The principal at one school shared that each year,

We look at how many kids are being successful with DP, look at what percent of the senior class is earning the DP, who sat for DP and did not earn it, what is our attrition rate, and then we sit down and talk about why, what changes or what tweaks do we need to make to drive those numbers higher. Are there barriers we need to address? Are there incentives that we need to put in place to address the barriers?

At one school with a large English learner population, educators observed that passing the English HL exam was a challenge. To support students, the English HL teacher adjusted her instruction (e.g., by focusing on drama within the curriculum because "plays were more digestible" and engaging than novels for her students). The teacher also extensively concentrated on detailed study during the first half of the course that culminated in an oral commentary to provide a strong basis for the HL exam. In another school, the principal requested that teachers anonymously identify 10 African American male students and closely track their performance on assessments and attendance in comparison with the overall class average. Through this lens, teachers maintained a focus on improving outcomes for some of their most underrepresented students.

Developing academic and study skills to prepare students for college success. At the visited schools, many teachers noted that the study skills developed in IB courses serve students well in handling the demands of the college workload. Teachers at several schools pointed to time management and organization in particular. Teachers also remarked on IB's writing requirements, noting that IB's emphasis on writing helps students develop essential skills for success in college.

According to one teacher, developing “writing is the biggest thing that will prepare students.” Likewise, a principal said, “Whether [the DP students] actually pass the tests or not, that experience is preparing them for college.” Alumni at several schools who either returned to high school or communicated informally with teachers via social media about their college experience overwhelmingly believed they were much better prepared for rigorous college curriculum than their peers who did not take IB. One school’s administrators found the IB alumni feedback so compelling they hosted an annual panel so 9th- and 10th-grade students who might enroll in DP could hear directly from alumni about their academic success in college.

School-wide Student Supports

To varying degrees, the schools we visited worked to facilitate low-income student success in IB courses by establishing school-wide tutoring programs and formalizing peer support, providing wraparound services to address social and emotional needs, proactively identifying students who need additional support outside of class, and establishing a staff culture of shared responsibility for the success of all students. As one principal observed, “As we push more students [academically], there needs to be more support.”

Establishing extensive opportunities for tutoring. Schools established a variety of support structures to ensure that all students could access academic support, such as tutoring, at some point during the day. In one school, tutoring was available for 12 hours—from 6:30 a.m. to 6:30 p.m.—daily, enabling students to seek tutoring assistance before school or after school. In another school, tutoring was offered daily during the lunch period so students could seek help from teachers during the school day. At the same school, at least once every 6 to 8 weeks, classes were shortened so that students could make up work and get help from teachers.

Formalizing peer supports. Educators at several schools recognized high school students’ preference to seek assistance from peers first and created structures to encourage and facilitate students’ reliance on each other. In one school, students were encouraged to form study groups with IB classmates at the beginning of the year. For example, IB teachers in each class directed students to identify one or two peers whom they would feel comfortable asking for assistance and obtain their contact information. Where present, the cohesiveness of peer support minimized students’ sense of isolation in meeting IB requirements. As one student shared, “We all know [physics] is not an easy subject. We all prepare together—we are unified to raise our grades.” At another school, teachers reported creating study groups so students could learn from each other across skill levels. Students appreciated these opportunities to collaborate with their peers, with one student noting, “In IB classes, you get other people’s point of view.”

Establishing wraparound services. Educators also sought to support students in addressing external challenges that could interfere with their ability to focus on academics. One school that served a diverse student population, including children living in seven homeless shelters, established a center that offered academic, social, and emotional supports in one location and was staffed with a variety of support personnel, including social workers. By having all supports in one place, the center provided anonymity to students and enabled guidance counselors to focus on academic concerns. The school also worked extensively with community partners to support

students and their families on a variety of issues (e.g., homelessness, depression). Another school with a high proportion of Latino students offered a variety of targeted programs to help with self-esteem and other personal issues. A teacher told us, “Our kids don’t leave here at the end of the day. The building is full until 7 p.m., with students receiving extra support emotionally and academically.”

Proactive and ongoing monitoring of individual student progress and tailored interventions.

At several schools, the IB coordinator closely monitored student performance and ensured that students received academic support when necessary. Some of the schools made use of small-group advisories to ensure at least one adult in the school was aware of each student’s academic challenges and could make sure students received the appropriate supports. One school established a tiered support system to provide teachers with different options to help keep students on track. For example, if a student needed more academic assistance than could be provided in class or was falling behind with homework, teachers could complete an academic referral so that students received support outside class time until they completed all missing assignments. Sometimes this monitoring revealed that whole groups of student needed support and led to targeted interventions. For example, in the school with a large English learner population in which students were struggling with the HL English exam, the 11th-grade IB teacher ran her class as a “boot camp” to help students develop strong thinking and writing skills to prepare them for the rigor of the HL exam; she also took them on a field trip to a Shakespeare festival.

Building a culture of high expectations for all students. At the visited schools, teachers played a vital role in supporting their students, starting with setting high expectations for students in their classes and then supporting them to reach postsecondary goals. School leaders stressed the need to hire teachers who believe everyone can be successful and understand that “there is not one type of IB student.” Principals even communicated to prospective hires the type of role teachers are expected to play, sharing with them “a fair statement at the end of the year will be, ‘Boss, I am exhausted, I worked myself to the bone, and I love these kids.’ If you are ready for that challenge, this is the place for you.” Teachers in general had high expectations for all their students and often accepted additional responsibilities to support them. One teacher shared, “Teachers are very supportive [of students]...we give them the feeling that they are college bound. We tell them, ‘Work with us and we will get you there.’ We let students know that, as long as they try, they will be eligible for the state’s 4-year university system.” Another teacher underscored the important role she plays with low-income students in particular, saying,

I can really influence what students do after school, careerwise. Often students don’t see their potential. I can help by showing them and telling them about their options. Many don’t have adults out of school [who can do that]. I see them as the people they can grow into as adults. I tell them one day they will run the world. You can really have an impact on how they see themselves and what their goals could be. I can open their eyes to their potential.

Students understood and appreciated teachers’ commitment to their success. One student noted, “It is impossible to fail. The teachers don’t let you.”

Postsecondary Supports

Among the schools we visited, IB staff also focused on the larger goal of preparing students for postsecondary success. School staff understood that students, especially low-income students, could benefit from assistance in exploring and identifying available postsecondary opportunities. In this section, we describe the schools' efforts to establish systems to support students and their families in planning and accessing various college and career opportunities.

Creating systematic college planning processes. Schools established a variety of support structures to facilitate students' college enrollment. Some schools fostered a college-going culture by requiring all students to take college entrance exams. One school additionally created a system to improve the performance of students on the college entrance exams: Once SAT or ACT scores were received, the counselors identified students who might need assistance and put interventions in place to help improve their scores on subsequent test administrations. Schools also created opportunities to increase students' exposure to college and career planning experiences. For example, at several schools, college/career counselors arranged college tours and provided students with internship opportunities to expose them to potential career options. Finally, at one school the counseling office worked closely with first-generation college students to help them chart a pathway to postsecondary opportunities (see sidebar).

Differentiating College Planning Supports for Students

The counseling office at one large comprehensive school with a high proportion of IB and first-generation college students provides differentiated support for college planning based on students' achievement level. The counselors historically found that students in the top 50th percentile tended to be more self-directed and actively sought their support as needed so the counseling department developed specific strategies to support the bottom 50th percentile. For students in the 25th to 50th percentile, the counseling department relies on parent volunteers to have initial meetings with students to ensure they are completing all the college-application requirements. Students needing additional assistance in completing and submitting college applications and completing the Free Application for Federal Student Aid (FAFSA) work closely with a counselor to complete the application process. Through this process, the counseling office can ensure that all seniors apply to the local community college and complete the FAFSA. Additionally, the counseling department cross-references students' income level with achievement level to identify a core group of low-income students, many of whom are Latino, who would benefit from targeted mentoring and support. One key strategy to better support these students was hiring a Spanish-speaking counselor who meets regularly with students in small groups and serves as a parent liaison.

Identifying resources to facilitate college access for low-income students. School staff and students reported multiple efforts to increase college access and affordability for low-income students. Across the schools, IB students reported that staff members consistently provided scholarship information, often identifying scholarships designed for low-income and first-generation college-going students. For example, at one school, DP seniors noted that counselors regularly shared information about scholarships so that they did not have to investigate opportunities on their own. At another school, the college counselor connected students with a regional nonprofit organization that provides substantial wraparound services for a 5-year period, beginning in students' senior year of high school and continuing through college and into the workforce. Services include college readiness support, tutoring, paid summer internships, career

coaching, job training, and financial assistance. The students benefited from the support of a paid advisor and an adult volunteer mentor. Staff at the same school also connected students with a local TRIO-funded program that helps first-generation college students navigate the college application and financial aid processes. Across the schools, staff identified colleges that have particularly favorable policies to support low-income students. For example, one school provided a list of colleges that have taken steps to significantly reduce or eliminate the self-help level or eliminate loans from the aid packages for lower income students. Additionally, the counselors hosted an “on-the-spot admissions day” where six colleges visited the school so students did not have to arrange campus visits to meet with admission officers. Interested seniors completed an application, obtained teacher recommendations, provided their transcripts to the colleges, and then met with admission officers. Students who met a college’s admission criteria were admitted to the college that day. Finally, staff widely communicated favorable state policies to ensure DP students took advantage of available state funding of DP. For example, some state’s university systems have policies to ensure that students who earn an IB Diploma can earn their college degree at no cost.

Proactively providing information to parents. Schools developed many strategies to engage and guide parents in supporting their children’s postsecondary endeavors. For example, the guidance counselor at one school offered 35 college nights for parents throughout the year. Topics varied depending on grade level but ranged from sessions on applying to private colleges to one that detailed the college application process for juniors. Several schools provided parents with information about navigating the financial aid system. At one school, IB staff hosted meetings throughout the year to inform parents about financial aid and scholarships opportunities. At another school, families could attend financial aid nights where they learned about college financing options. Despite these efforts, the principal at one school noted that connecting with students was the critical place to start: “I have found the bang for the buck is with the student. Once we convince the kids [to attend college], they convince their parents.”

* * *

Looking across the various systems and practices at the schools serving significant numbers of low-income students in the DP, the most promising intentionally and proactively support the students—students who are often the first in their families to go to college. These practices reflect a broader school culture that emphasizes high expectations for all students. The schools have removed barriers to entry in the DP and actively recruit low-income students who might otherwise conclude that IB is not for them. The teachers who are having success with diverse students in their classrooms are focusing on fewer topics in more depth and are creating multiple and diverse opportunities for students to demonstrate understanding. They are providing ample scaffolding and carefully considering homework, while simultaneously ensuring that students are developing the academic and study skills they will need to be successful in college. But individual teachers cannot provide all the supports low-income students need. When students need additional support—whether academic, social/emotional, or other—their schools have the systems in place to provide assistance and access external resources. And when the time comes to begin planning for college, these schools expect all students to take the steps to enroll in college and provide the requisite support to do so. All along the way, educators examine data, at the student and system level, to understand progress and make adjustments as needed to improve performance.

V. Conclusion

This analysis of trends in participation and performance of low-income students in the DP and postsecondary education reveals much that is promising in terms of low-income students' access to and performance in the DP and postsecondary education. The findings also point to areas for improvement.

From 2008 to 2014, the number of low-income course students in US public schools rose by 144%, and the number of low-income Diploma candidates increased 148%, well outpacing overall growth in DP participation over this time period. As a result, the percentage of low-income Diploma candidates grew from 15% in 2008 to 23% in 2014 and the percentage of low-income course students increased from 18% to 26%. During this period marked by greater access to the DP for low-income students, performance in the DP remained fairly constant. Moreover, higher percentages of low-income students did not translate into lower performing low-income students. Whether we look overall or by exam subject, we see no particular downward trend in the mean scores of low-income Diploma candidates or course students from 2008 to 2014. Finally, a high percentage of low-income Diploma candidates enrolled in a 4-year college immediately after high school, and 1-year retention rates for these students approached those of their higher-income peers.

The story is not all bright, however. In 2014, low-income students made up a quarter of DP students in US high schools nationally (24% of Diploma candidates and 26% of course students), while in recent years low-income students made up nearly 40% of all US public high school students.²⁰ And across all US public schools, a total of only 5,394 low-income students attempted the full Diploma and 6,155 took any DP course without attempting the Diploma, revealing substantial room for growth. In addition, the gaps in performance between low-income students and their higher-income peers are large and persistent. In 2014, less than half of low-income Diploma candidates earned the Diploma compared with three-quarters of their higher-income peers. Low-income Diploma candidates and course students scored on average a half point lower on DP exams than their higher-income peers, with mean scores closer to 3.5 than 4.0 for low-income course students. Longer term college outcomes such as 2-year retention and graduation rates for low-income DP students, particularly for low-income course students, lagged behind those of their higher-income peers.

From our visits to five US public high schools with high percentages of FRPM students in the DP, we identified several promising strategies for increasing access to the DP for low-income students and ensuring their success both in the DP and in transitioning to postsecondary education, although we were not able to evaluate the efficacy of these strategies. Looking ahead, IB is building its capacity to support schools to expand access to the DP and improve low-income student performance in high school and beyond. In 2014, IB launched the Bridging the Equity Gap project, piloting a model

²⁰ Nationally, 38% of students in U.S. public high schools were eligible for FRPM in 2009-10, the most recent year for which data are available (Institute of Education Sciences, National Center for Education Statistics, n.d.).

to support schools in developing and implementing systems and strategies to increase the participation and performance of low-income students in the DP and postsecondary education. This project and its accompanying evaluation will help further identify and document promising means of ensuring the academic success of low-income students through the DP.

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Appendix A—Data Tables Supporting the National Trends Brief Exhibits

Table A-1: Growth in Number of Diploma Programme Students

	2008	2009	2010	2011	2012	2013	2014
All Diploma candidates	14,498	15,299	16,636	18,053	19,331	20,966	23,232
Low-income Diploma candidates	2,173	2,568	3,092	3,781	4,111	4,610	5,394
Higher-income Diploma candidates	12,323	12,727	13,543	14,271	15,220	16,356	17,836
All course students	14,158	14,944	17,365	18,662	20,487	22,135	23,356
Low-income course students	2,527	2,817	3,706	4,387	4,981	5,542	6,155
Higher-income course students	11,598	12,126	13,659	14,275	15,506	16,593	17,201

Note: Supports Exhibit 1

Table A-2: Low-income Course and Diploma Candidate Breakdown (percent)

	2008	2009	2010	2011	2012	2013	2014
Diploma candidates	15.0	16.8	18.6	20.9	21.3	22.0	23.2
Course students	17.9	18.9	21.3	23.5	24.3	25.0	26.4

Note: Supports Exhibit 2

Table A-3: Number of US Public Schools Offering the DP

	2008	2009	2010	2011	2012	2013	2014
Number of schools	476	510	555	594	624	654	679

Table A-4: Mean Exam Scores for Diploma Candidates and Course Students, Overall and by Income Status

	2008	2009	2010	2011	2012	2013	2014
All Diploma candidates	4.46	4.42	4.39	4.38	4.39	4.43	4.42
Low-income Diploma candidates	3.99	3.91	3.91	3.93	3.93	3.96	4.00
Higher-income Diploma candidates	4.55	4.51	4.50	4.50	4.51	4.55	4.54
All course students	4.00	3.97	3.95	3.91	3.90	3.95	3.94
Low-income course students	3.59	3.53	3.52	3.49	3.50	3.59	3.59
Higher-income course students	4.09	4.07	4.07	4.04	4.04	4.07	4.07

Note: Supports Exhibits 3 and 4

Table A-5: Percentage of Diploma Candidates Earning the Diploma

	2008	2009	2010	2011	2012	2013	2014
All Diploma candidates	69.7	68.2	66.8	66.3	66.2	67.4	67.7
Low-income	47.4	44.9	44.1	44.7	44.0	45.7	48.5
Higher-income	73.7	72.9	71.9	72.0	72.1	73.5	73.5

Note: Supports Exhibit 5

Table A-6: Percentage of Diploma Candidates Passing (Earning a D or Above) Extended Essay and Theory of Knowledge

	2008	2009	2010	2011	2012	2013	2014
Low-income extended essay pass rate	80.9	86.4	90.3	89.0	88.1	88.4	90.1
Higher-income extended essay pass rate	89.2	94.5	95.9	95.4	95.3	95.3	96.1
Low-income theory of knowledge pass rate	96.3	95.6	96.3	96.4	95.2	95.8	96.4
Higher-income theory of knowledge pass rate	98.7	98.3	98.9	98.8	98.7	98.5	98.7

Note: Supports Exhibit 6

Table A-7: Mean Total Points, Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
All Diploma candidates	27.4	27.2	27.1	27.0	27.0	27.2	27.2
Low-income	24.1	23.6	23.8	23.9	23.9	24.0	24.3
Higher-income	28.0	27.9	27.8	27.9	27.9	28.1	28.1

Note: Supports Exhibit 7

Table A-8: Mean Exam Score by Subject, Low-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	3.24	3.18	3.20	3.27	3.33	3.30	3.29
Math	3.97	3.89	3.93	3.88	3.90	3.87	3.95
Individuals & societies	4.05	3.99	3.85	3.75	3.79	3.87	3.88
Language	4.39	4.27	4.33	4.33	4.27	4.36	4.44
Language acquisition	4.50	4.37	4.39	4.59	4.52	4.61	4.65
Art	3.84	3.82	3.88	3.88	3.82	3.82	3.90

Note: Supports Exhibit 8

Table A-9: Number of Exams Taken by Low-income Diploma Candidates, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	2,664	3,104	3,699	4,467	4,772	5,340	6,315
Math	2,154	2,551	3,085	3,764	4,088	4,577	5,335
Individuals & societies	3,173	3,699	4,491	5,435	5,953	6,558	7,772
Language	2,156	2,556	3,069	3,753	4,103	4,602	5,429
Language acquisition	2,241	2,653	3,218	3,896	4,226	4,707	5,492
Art	750	890	1,116	1,510	1,627	1,869	2,052

Note: Supports Exhibit 8

Table A-10: Mean Exam Score by Subject, Higher-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	3.97	3.97	3.96	4.11	4.18	4.15	4.08
Math	4.67	4.68	4.69	4.60	4.62	4.61	4.58
Individuals & societies	4.64	4.60	4.47	4.38	4.38	4.44	4.46
Language	4.81	4.74	4.79	4.79	4.74	4.88	4.92
Language acquisition	4.79	4.68	4.69	4.76	4.76	4.85	4.84
Art	4.43	4.57	4.58	4.51	4.47	4.45	4.46

Note: Supports Exhibit 8

Table A-11: Number of Exams Taken by Higher-income Diploma Candidates, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	15,704	16,138	17,005	17,873	19,167	20,540	22,794
Math	12,397	12,827	13,656	14,327	15,310	16,444	17,919
Individuals & societies	18,323	18,654	19,996	20,919	22,197	23,783	25,736
Language	12,302	12,719	13,490	14,229	15,200	16,397	17,936
Language acquisition	12,943	13,471	14,332	15,049	16,147	17,363	18,986
Art	3,841	4,048	4,161	4,587	4,754	5,110	5,442

Note: Supports Exhibit 8

Table A-12: Percentage of Diploma Candidates Earning a Total of 30 Points or More

	2008	2009	2010	2011	2012	2013	2014
All Diploma candidates	36.1	34.8	33.6	34.0	34.2	35.7	35.8
Low-income	19.0	16.5	16.4	16.2	16.7	16.7	18.6
Higher-income	39.1	38.5	37.6	38.7	38.9	41.0	41.0

Note: Supports Exhibit 9

Table A-13: Percentage of Diploma Candidates Earning a 5 or Higher on At Least 1 HL Exam

	2008	2009	2010	2011	2012	2013	2014
All Diploma Candidates	76.4	74.0	73.1	73.5	71.4	74.3	74.6
Low-income Diploma Candidates	60.6	56.5	56.4	59.5	56.1	59.2	60.1
Higher-income Diploma Candidates	79.2	77.5	77.0	77.2	75.5	78.6	78.9

Note: Supports Exhibit 10

Table A-14: Percentage HL Participation by Subject, Low-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	60.9	57.6	56.5	52.8	50.8	50.2	51.5
Math	7.2	7.0	5.7	5.7	5.8	5.5	5.1
Individuals & societies	92.2	92.3	92.4	93.9	92.5	91.3	91.5
Language	97.3	98.3	98.0	97.9	98.0	98.0	98.0
Language acquisition	24.3	23.9	25.2	25.8	25.5	23.2	23.2
Art	14.2	13.6	15.0	18.6	18.9	20.4	19.1

Note: Supports Exhibit 11

Table A-15: Percentage HL Participation by Subject, Higher-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	64.4	62.7	61.0	59.3	59.7	60.4	60.2
Math	13.6	13.5	13.9	13.7	13.4	12.7	13.2
Individuals & societies	92.3	91.1	91.8	91.1	90.5	90.1	89.6
Language	98.5	98.3	97.8	98.3	97.8	97.7	97.4
Language acquisition	16.5	16.9	17.1	17.4	18.2	16.5	16.8
Art	15.6	15.7	16.3	17.3	16.6	17.3	16.9

Note: Supports Exhibit 11

Table A-16: HL Participation by Subject, Number of Low-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	1,323	1,479	1,748	1,996	2,089	2,316	2,777
Math	156	181	176	215	238	252	276
Individuals & societies	2,003	2,369	2,856	3,550	3,803	4,211	4,933
Language	2,115	2,525	3,031	3,700	4,030	4,516	5,285
Language acquisition	527	614	780	976	1,047	1,068	1,252
Art	308	348	465	702	775	939	1,030

Note: Supports Exhibit 11

Table A-17: HL Participation by Subject, Number of Higher-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	7,935	7,983	8,266	8,456	9,093	9,873	10,737
Math	1,677	1,721	1,885	1,952	2,037	2,085	2,359
Individuals & societies	11,370	11,370	11,370	11,370	11,370	11,370	11,370
Language	12,135	12,515	13,246	14,026	14,884	15,974	17,376
Language acquisition	2,033	2,157	2,318	2,490	2,771	2,692	3,001
Art	1,926	1,999	2,205	2,464	2,521	2,828	3,008

Note: Supports Exhibit 11

Table A-18: Mean HL Score by Subject, Low-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	3.24	3.18	3.20	3.27	3.33	3.30	3.29
Math	3.97	3.89	3.93	3.88	3.90	3.87	3.95
Individuals & societies	4.05	3.99	3.85	3.75	3.79	3.87	3.88
Language	4.39	4.27	4.33	4.33	4.27	4.36	4.44
Language acquisition	4.50	4.37	4.39	4.59	4.52	4.61	4.65
Art	3.84	3.82	3.88	3.88	3.82	3.82	3.90

Note: Supports Exhibit 12

Table A-19: Number of HL Exams Taken by Low-income Diploma Candidates, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	1,346	1,504	1,799	2,042	2,138	2,365	2,855
Math	156	181	176	215	238	252	281
Individuals & societies	2,181	2,622	3,168	3,921	4,331	4,855	5,698
Language	2,122	2,529	3,036	3,710	4,038	4,543	5,327
Language acquisition	534	620	788	982	1,049	1,072	1,259
Art	308	348	465	702	776	940	1,032

Note: Supports Exhibit 12

Table A-20: Mean HL Score by Subject, Higher-income Diploma Candidates

	2008	2009	2010	2011	2012	2013	2014
Science	3.97	3.97	3.96	4.11	4.18	4.15	4.08
Math	4.67	4.68	4.69	4.60	4.62	4.61	4.58
Individuals & societies	4.64	4.60	4.47	4.38	4.38	4.44	4.46
Language	4.81	4.74	4.79	4.79	4.74	4.88	4.92
Language acquisition	4.79	4.68	4.69	4.76	4.76	4.85	4.84
Art	4.43	4.57	4.58	4.51	4.47	4.45	4.46

Note: Supports Exhibit 12

Table A-21: Number of HL Exams Taken by Higher-income Diploma Candidates, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	8,233	8,362	8,644	8,839	9,626	10,399	11,385
Math	1,679	1,721	1,885	1,953	2,038	2,086	2,389
Individuals & societies	12,623	13,043	14,002	14,714	15,703	16,900	18,405
Language	12,136	12,517	13,246	14,026	14,885	16,031	17,437
Language acquisition	2,069	2,186	2,354	2,524	2,797	2,727	3,042
Art	1,929	2,011	2,209	2,467	2,526	2,837	3,014

Note: Supports Exhibit 12

Table A-22: Percentage Exam Participation by Subject, Low-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	35.5	37.6	34.9	35.0	35.3	32.4	33.6
Math	31.9	34.0	34.3	33.8	38.3	38.7	36.6
Individuals & societies	44.8	44.8	45.6	46.8	44.8	42.9	44.1
Language	38.3	39.6	39.8	37.7	42.5	47.0	46.9
Language acquisition	34.3	34.2	35.5	32.0	32.9	31.7	29.9
Art	14.6	14.1	15.0	14.5	16.0	14.5	14.3

Note: Supports Exhibit 13

Table A-23: Percentage Exam Participation by Subject, Higher-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	36.5	37.5	35.5	34.3	34.0	34.1	34.9
Math	30.6	29.1	30.2	30.5	31.5	31.3	32.4
Individuals & societies	45.9	45.5	47.0	47.3	49.1	48.0	47.8
Language	42.4	40.5	40.0	39.4	40.2	42.0	42.1
Language acquisition	30.4	29.9	28.7	28.3	28.5	26.6	28.2
Art	15.8	16.1	15.8	16.0	15.6	14.7	13.9

Note: Supports Exhibit 13

Table A-24: Mean Score by Subject, Low-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	2.65	2.55	2.62	2.64	2.70	2.67	2.67
Math	3.42	3.40	3.39	3.28	3.30	3.43	3.40
Individuals & societies	3.37	3.43	3.20	3.17	3.12	3.26	3.28
Language	3.98	3.93	3.97	3.99	3.90	3.92	3.94
Language acquisition	4.63	4.45	4.47	4.57	4.66	4.76	4.76
Art	3.67	3.74	3.73	3.65	3.65	3.67	3.85

Note: Supports Exhibit 14

Table A-25: Number of Exams Taken by Low-income Course Students, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	897	1058	1,292	1,537	1,757	1,794	2,069
Math	805	958	1,272	1,482	1,909	2,146	2,250
Individuals & societies	1,133	1,263	1,690	2,051	2,230	2,377	2,716
Language	967	1114	1,474	1,653	2,115	2,603	2,886
Language acquisition	866	963	1,317	1,404	1,639	1,754	1,838
Art	370	398	554	637	795	806	877

Note: Supports Exhibit 14

Table A-26: Mean Score by Subject for Higher-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	3.31	3.31	3.36	3.43	3.52	3.47	3.45
Math	4.29	4.27	4.30	4.12	4.16	4.13	4.07
Individuals & societies	4.00	4.00	3.88	3.77	3.75	3.84	3.85
Language	4.48	4.43	4.46	4.48	4.40	4.48	4.49
Language acquisition	4.45	4.40	4.40	4.49	4.50	4.55	4.54
Art	4.26	4.37	4.44	4.37	4.29	4.32	4.35

Note: Supports Exhibit 14

Table A-27: Number of Exams Taken by Higher-income Course Students, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	4,238	4,552	4,852	4,895	5,269	5,653	6,008
Math	3,546	3,526	4,125	4,347	4,887	5,198	5,575
Individuals & societies	5,328	5,522	6,422	6,748	7,610	7,956	8,221
Language	4,914	4,915	5,467	5,617	6,232	6,975	7,249
Language acquisition	3,531	3,622	3,917	4,039	4,415	4,412	4,849
Art	1,833	1,946	2,155	2,280	2,418	2,433	2,387

Note: Supports Exhibit 14

Table A-28: Percentage of Course Students Earning a 5 or Higher on At Least One HL Exam

	2008	2009	2010	2011	2012	2013	2014
Low-income course students	19.5	19.8	19.5	18.9	20.3	20.2	20.0
Higher-income course students	31.8	28.8	28.9	28.7	27.3	28.1	28.2

Note: Supports Exhibit 15

Table A-29: Percentage HL Participation by Subject, Low-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	12.8	14.0	12.5	11.0	12.6	12.3	12.3
Math	1.4	1.1	0.7	1.4	1.1	1.0	1.0
Individuals & societies	27.2	28.8	28.6	27.5	27.9	25.1	26.7
Language	36.4	37.5	38.4	36.7	41.8	43.6	43.4
Language acquisition	13.3	12.6	12.6	11.3	12.5	10.3	10.4
Art	4.0	4.7	5.3	4.8	5.8	5.4	5.7

Note: Supports Exhibit 16

Table A-30: Percentage HL Participation by Subject, Higher-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	15.7	15.5	14.1	13.8	15.1	13.9	14.2
Math	2.4	2.3	2.6	2.4	2.6	2.6	2.6
Individuals & societies	32.4	30.6	30.8	29.2	30.7	28.1	28.4
Language	40.7	38.9	38.2	37.4	38.2	38.6	38.1
Language acquisition	7.3	7.7	7.9	7.4	7.2	6.4	7.2
Art	7.7	6.9	6.6	7.2	7.1	6.4	6.4

Notes: Supports Exhibit 16

Table A-31: HL Participation by Subject, Number of Low-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	324	393	465	483	626	683	759
Math	36	32	27	60	53	54	62
Individuals & societies	687	810	1,061	1,206	1,392	1,391	1,642
Language	921	1,056	1,424	1,612	2,080	2,417	2,671
Language acquisition	335	355	466	495	621	571	638
Art	100	131	196	211	291	302	353

Note: Supports Exhibit 16

Table A-32: HL Participation by Subject, Number of Higher-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	1,824	1,874	1,932	1,967	2,343	2,309	2,448
Math	273	277	356	349	403	424	441
Individuals & societies	3,753	3,715	4,213	4,174	4,756	4,655	4,886
Language	4,722	4,713	5,219	5,333	5,924	6,407	6,550
Language acquisition	848	932	1,077	1,062	1,119	1,068	1,240
Art	891	891	891	891	891	891	891

Note: Supports Exhibit 16

Table A-33: Mean HL Score by Subject for Low-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	2.71	2.61	2.72	2.86	2.85	2.79	2.78
Math	2.89	2.34	2.89	2.52	2.72	2.71	2.85
Individuals & societies	3.38	3.54	3.26	3.21	3.12	3.24	3.19
Language	3.95	3.92	3.95	3.99	3.89	3.94	3.96
Language acquisition	5.20	5.02	5.16	5.31	5.40	5.53	5.33
Art	3.98	3.94	3.87	3.86	3.91	3.88	4.01

Note: Supports Exhibit 17

Table A-34: Number of Exams Taken by Low-income Course Students, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	324	393	465	483	626	683	759
Math	36	32	27	60	53	54	62
Individuals & societies	687	810	1,061	1,206	1,392	1,391	1,642
Language	921	1,056	1,424	1,612	2,080	2,417	2,671
Language acquisition	335	355	466	495	621	571	638
Art	100	131	196	211	291	302	353

Note: Supports Exhibit 17

Table A-35: Mean HL Score by Subject, Low-income Course Students

	2008	2009	2010	2011	2012	2013	2014
Science	3.25	3.33	3.46	3.51	3.63	3.54	3.49
Math	3.53	3.48	3.49	3.30	3.29	3.42	3.46
Individuals & societies	4.13	4.07	3.93	3.83	3.81	3.86	3.86
Language	4.49	4.44	4.47	4.47	4.41	4.50	4.51
Language acquisition	4.72	4.67	4.75	4.77	4.77	4.81	4.64
Art	4.37	4.44	4.47	4.53	4.41	4.41	4.48

Note: Supports Exhibit 17

Exhibit A-36: Number of Exams Taken by Higher-income Course Students, by Subject

	2008	2009	2010	2011	2012	2013	2014
Science	1,824	1,874	1,932	1,967	2,343	2,309	2,448
Math	273	277	356	349	403	424	441
Individuals & societies	3,753	3,715	4,213	4,174	4,756	4,655	4,886
Language	4,722	4,713	5,219	5,333	5,924	6,407	6,550
Language acquisition	848	932	1,077	1,062	1,119	1,068	1,240
Art	891	836	897	1,024	1,101	1,066	1,103

Note: Supports Exhibit 17

Appendix B—College Enrollment, Retention, and Graduation Rates

Table B-1: College Enrollment Rates for Course Students Taking IB Math and English

	2008		2013	
	4-year	2-year	4-year	2-year
Low-income	67.1	7.8	66.4	13.4
Higher-income	76.5	5.7	76.8	8.5

Table B-2: College Enrollment Rates for Course Students Taking IB Math

	2008		2013	
	4-year	2-year	4-year	2-year
Low-income	59.9	12.4	58.0	16.5
Higher-income	72.1	7.0	70.8	10.1

Table B-3: College Enrollment Rates for Course Students Taking IB Science

	2008		2013	
	4-year	2-year	4-year	2-year
Low-income	59.3	11.0	60.6	16.1
Higher-income	70.8	7.9	71.5	9.6

Table B-4: College Enrollment Rates for Course Students Taking IB Individuals & Societies

	2008		2013	
	4-year	2-year	4-year	2-year
Low-income	57.5	13.9	57.6	16.3
Higher-income	71.3	7.4	70.3	10.2

Table B-5: Retention at 4-Year Institutions for Course Students Who Took IB Math and English

	2008		2013
	1-year	2-year	1-year
Low-income	79.3	69.4	82.4
Higher-income	88.5	83.0	88.1

Table B-6: Retention at 4-Year Institutions for Course Students Who Took IB Math

	2008		2013
	1-year	2-year	1-year
Low-income	79.5	69.3	81.0
Higher-income	86.9	81.3	87.7

Table B-7: Retention at 4-year Year Institutions for Course Students Who Took IB Science

	2008		2013
	1-year	2-year	1-year
Low-income	79.1	67.7	81.4
Higher-income	87.0	79.8	87.7

Table B-8: Retention at 4-Year Institutions for Course Students Who Took IB Individuals & Societies

	2008		2013
	1-year	2-year	1-year
Low-income	81.3	67.3	80.2
Higher-income	86.5	79.0	86.7

Table B-9: Four- and 6-Year Graduation Rates from a 4-Year Institution for Course Students Who Took IB Math and English

	2008	
	4-year	6-year
Low-income	34.5	59.1
Higher-income	58.6	76.1

Table B-6: Four- and 6-Year Graduation Rates from a 4-Year Institution for Course Students Who Took IB Math

	2008	
	4-year	6-year
Low-income	34.4	57.5
Higher-income	53.9	73.1

**Table B-9: Four- and 6-Year Graduation Rates from a 4-year Institution for Course Students
Who Took IB Science**

	2008	
	4-year	6-year
Low-income	31.6	55.1
Higher-income	52.5	72.4

**Table B-12: Four- and 6-Year Graduation Rates from a 4-Year Institution for Course Students
Who Took IB Individuals & Societies**

	2008	
	4-year	6-year
Low-income	31.9	55.2
Higher-income	53.9	72.0