IES Institute of Education Sciences

APPENDIXES
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Regional Educational Laboratory Pacific
At McREL International

Demographic and Academic Characteristics Associated with College Readiness and Early College Success in the Republic of the Marshall Islands

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

Appendix A. Marshall Islands education system

The Republic of the Marshall Islands, which comprises 23 inhabited atolls and five islands, is in the northern Pacific Ocean—approximately 2,300 miles from Hawaii. Nearly 70 percent of the total student population live on the two urban atolls, Majuro and Kwajalein. The remaining students are spread across the other inhabited atolls (Marshall Islands Public School System, 2018a). The education system in the Republic of the Marshall Islands consists of elementary schools (grades K–8), high schools (grades 9–12), and college/universities. There are 80 public and 15 private elementary schools, 6 public and 11 private high schools, and 2 college-level institutions.

Elementary and high school education in the Republic of the Marshall Islands

During the 2017/18 school year the elementary and high schools in the Republic of the Marshall Islands served about 11,500 students. In elementary schools the core curriculum in the Republic of the Marshall Islands includes English language arts, Marshallese language arts, math, science, and social studies/Marshallese studies. To monitor elementary students' performance in these core areas, the Republic of the Marshall Islands Ministry of Education established education standards and benchmarks. They are assessed using the Marshall Islands Standards Assessment Test (MISAT) battery. Elementary students take this assessment in grades 3, 6, and 8 (Republic of the Marshall Islands Ministry of Education, 2014). Before students can progress from elementary to high school, students must pass the grade 8 MISAT (also called the High School Entrance Test) in English reading, Marshallese reading, math, science, and social studies. If students do not pass it, they must complete a pre–grade 9 program before enrolling in public high school, or they can complete an alternative program (that is, nonformal/workforce training or GED).

Like the elementary curriculum, the high school curriculum in the Republic of the Marshall Islands includes English language arts, Marshallese language arts, math, science, and social studies/Marshallese studies. Public high schools in the Republic of the Marshall Islands do not offer high-level math courses or Advanced Placement courses. While students are in high school, the Republic of the Marshall Islands Ministry of Education assesses their progress in math and English by administering the MISAT battery in grades 10 and 12. Performance on the MISAT is measured as the percentage of grade-level benchmarks that students meet. In 2018 grade 10 students

met an average of 10 percent of the math benchmarks and 27 percent of the English benchmarks. In the same year grade 12 students met an average of 18 percent on the math benchmarks and 32 percent of the English benchmarks (Marshall Islands Public School System, 2018b). About 70 percent of grade 12 students graduated from public high schools in the Republic of the Marshall Islands in 2018 (Marshall Islands Public School System, 2018a).

The College of the Marshall Islands

The College of the Marshall Islands and the University of the South Pacific are the two college-level institutions in the Republic of the Marshall Islands. The College of the Marshall Islands is the larger of the two. During the years examined in this study, the College of the Marshall Islands had an average enrollment of about 1,000 students each fall semester (College of the Marshall Islands, 2017). Most students enrolled at the college (89–94 percent in 2015–17) received Pell grant funding. Some 50 percent of students were female, and around half (54–57 percent in 2015–17) were younger than age 20. Nearly every student (99 percent) at the College of the Marshall Islands was classified as Hawaiian Native/Pacific Islander.

Before they can register for classes, students seeking to enroll as first-time students at the College of the Marshall Islands must take placement tests in math and English. Students who do not place into credit-bearing math or English courses must enroll in developmental or remedial courses, also known as non-credit-bearing courses. These are most often provided in reading, writing, and math (Parsad & Lewis, 2003). The college offers three levels of developmental placement for math and English. Students placing into developmental math and English coursework must successfully complete the courses before registering for credit-bearing courses. From 2011/12 to 2016/17, the college used placement exams to determine student course placement. During that time an average of 2 percent of enrollees placed into only credit-bearing math and English. The small percentage of students who placed into only credit-bearing courses suggests either low college readiness among many first-time College of the Marshall Islands students or potential flaws in the methods used to place students in math and English courses.

To improve math and English placement, the college began using multiple measures of academic performance to place students in the 2017/18 academic year. Rather than relying only on placement exams, it currently uses grade 11 and 12 math and English grades and cumulative high school grade point averages as well as placement exams to determine the course placement of new students (College of the Marshall Islands, n.d.; Pacific Postsecondary Education Council, 2019). Since the this placement system started, an average of 11 percent of students placed into only credit-bearing math and English courses, compared with the 2 percent average in previous years (College of the Marshall Islands, 2017).

Because of the changes in the placement system, the first and second cohorts included in this study were placed in math and English courses using different criteria than those used to place the third cohort. Students entering the College of the Marshall Islands in the 2015 and 2016 cohorts were placed in math and English courses based on placement exams, but students in the 2017 cohort were placed in math and English courses based on multiple measures of academic performance placement.

Additional changes to the placement system are under way. During the 2019/20 academic year the Marshall Islands Public School System piloted a math transition course for high school seniors in an effort to reduce the academic gap between the high schools and the college. The course is predominantly algebra II, and a statistics course might be added in future years. Students who earn a course grade of 70 percent or higher do not have to take the college placement test in math (Ostrow, 2019).

College readiness and early college success among students at the College of the Marshall Islands

Promoting college readiness and early college success is important to stakeholders in the Republic of the Marshall Islands because of the implications for the residents' vocational success and the national economy (Republic of the Marshall Islands Ministry of Education, 2014). In 2016 more than 75 percent of incoming College of the Marshall Islands students enrolled in developmental English and math courses (Vila, 2016). Because students enrolling in those courses must postpone enrollment in credit-bearing courses, they tend to earn fewer credits during their first year of college than their college-ready peers. In addition, the College of the Marshall Islands has experienced challenges in retaining its students through the first year. For example, the fall 2016 to fall 2017 retention rate was 56 percent for first-time students attending the College of the Marshall Islands (College of the Marshall Islands, 2017). The high enrollment in developmental courses among incoming College of the Marshall Islands students, combined with the low college retention rates, has created a growing concern that many Republic of the Marshall Islands high school graduates are academically unprepared for postsecondary institutions.

Factors associated with college readiness and early college success

Many factors, including the demographic characteristics and academic preparation of students, are associated with college readiness and early college success (Adelman, 2006). For example, studies from the United States indicate that such factors as race, socioeconomic status, or status as a first-generation college student (that is, someone whose parents did not attend college) are related to enrollment in credit-bearing courses and college persistence (Chen, 2016; Radford & Horn, 2012). Specifically, lower socioeconomic status and minority status are associated with higher enrollment in developmental coursework, lower college persistence, and lower average first-year college grades (Byun et al., 2012; Chen, 2016; Herman, Scanlan, & Carreon, 2017; Plucker et al., 2006; Wolniak & Engberg, 2010). Being a first-generation college student is associated with lower college persistence (Chen, 2016; Ishitani, 2006). Female students demonstrated higher achievement than male students at the conclusion of their first year of college (Wolniak & Engberg, 2010).

A previous Regional Educational Laboratory Pacific study examined relationships between student demographic and high school preparation factors and college readiness in the Commonwealth of the Northern Mariana Islands. The study found that students with better high school academic preparation—as measured by grade point average, enrollment in high-level math classes, enrollment in Advanced Placement classes, and standardized test scores—were more likely to place into credit-bearing math and English courses than their less-prepared peers. And among students who placed in developmental courses, those who were more academically prepared during high school were more likely to place into higher levels of developmental courses than those who were less prepared (Herman, Scanlan, & Carreon, 2017). That study focused on academic preparation, demographic characteristics, and college readiness in the Commonwealth of the Northern Mariana Islands, whereas no such research has been conducted in the Republic of the Marshall Islands.

Among College of the Marshall Islands students, one factor that might affect whether students enroll in credit-bearing English courses is the public school system's effectiveness at teaching students in their first language, which for most students in the Republic of the Marshall Islands is Marshallese, and then building second language abilities in English. The official languages of instruction in the Republic of the Marshall Islands in the K–12 system are English and Marshallese, though only a limited amount of instruction occurs in Marshallese. English proficiency among Republic of the Marshall Islands students is generally low, though English is the language of instruction at the College of the Marshall Islands. In 2018 an average of 27 percent of students in grades 10 and 12 were considered proficient in English (Marshall Islands Public School System, 2018b). Therefore, the college might have a misalignment between the language of instruction and the students' languages.

Besides demographic factors, academic factors have been examined in relation to students' college readiness. For example, standardized assessments and grade point average are among the most widely studied predictors (ACT, 2012; Allensworth & Easton, 2007; Covington, 1992; Gloudemans et al., 2012; Harackiewics et al., 2002; Karp et al., 2007; Kemple et al., 2013; Lavin, 1965; Willingham et al., 1990). High school graduates who enter college with higher standardized test scores and high school grade point averages tend to be more successful in college than their peers with lower high school performance (Geiser & Santelices, 2007; Harackiewics et al., 2002; Herman, Carreon, et al., 2017; Wiley et al., 2010). However, additional research warns about using standardized tests scores as an indicator of college readiness for nontraditional students and recommends using a combination of standardized tests and high school course grades (Muir, 2005; Sanchez, 2013).

The need for more research in the Pacific region

Research outside the Republic of the Marshall Islands shows that some demographic factors and the nature and quality of high school preparation relate to college readiness and early college success in some contexts. Since college preparedness tends to fluctuate by high school context, standards, and assessments (ACT, 2005), replicating these studies in the Republic of the Marshall Islands is key to learning more about college readiness and early college success in that context. Learning how demographic characteristics and academic preparation relate to college readiness and early college success among students who graduate from public high schools in the Republic of the Marshall Islands and enroll at the nation's largest college-level institution is also important.

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Appendix B. Methods

This appendix provides further details on the study's data sources, student demographic and academic preparation variables, indicators of college readiness and early college success, data processing and determination of the analytic sample, missing data, and analytic methods.

Data sources

The College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education provided all the data for the study. The college provided student demographic data (semester/term start, gender, race/ethnicity, primary language spoken at home, and Pell grant recipient status), student high school data (high school attended, high school graduation cohort, cumulative high school grade point average, grade 9–12 math and English grades), and all indicator data (placing into only credit-bearing math and English courses, earning all credits attempted during the first year of college, and persisting to a second year of college). The Ministry of Education provided Marshall Islands Standard Assessment Test (MISAT) performance data. The study team originally planned to use high school data from the Ministry of Education, but they were not available for all public high schools. Therefore, the study team used the high school transcript data that the College of the Marshall Islands transferred from paper transcripts to an electronic format and sent to the study team.

Student demographic and academic preparation variables

To answer the research questions on the demographic and academic preparation characteristics of students who graduated from Republic of the Marshall Islands high schools and enrolled at the College of the Marshall Islands, the study team used the variables and indicators described below. The study team had also planned to examine the following academic preparation characteristics: high school absences across all four years, Advanced Placement math and English enrollment, whether a student attempted at least one Advanced Placement exam, whether the student passed at least one Advanced Placement exam, and whether a student took high-level math. However, data on high school absences were available for only one high school, and no Advanced Placement courses or high-level math courses are taught in high schools in the Republic of the Marshall Islands.

The analyses included the following student demographic and academic preparation variables:

- *High school graduation cohort.* The year in which a student graduated high school: 2015, 2016, or 2017. For example, 2015 indicates the student graduated high school in spring 2015.
- *High school attended.* The Republic of the Marshall Islands public high school from which a student graduated. High schools included in this study are Jaluit High School, Kwajalein Atoll High School, Laura High School, Marshall Islands High School, and Northern Islands High School.[1]
- *College of the Marshall Islands semester/term start.* This indicates the semester of enrollment in the College of the Marshall Islands: fall, spring, or summer. For spring semester or summer term enrollments, the first year of the students' enrollment includes two full semesters and the summer term, if applicable. Courses in the traditional academic year fall within a semester (fall or spring), and summer courses fall within a term. For fall enrollments, students' first year includes fall and spring semesters. For spring enrollments, students' first year includes spring semester, summer term if applicable, and fall semester. For summer enrollments, students' first year includes summer term, fall semester, and spring semester.

[1] The sample excluded students from Life Skills Academy in the Marshall Islands Public School System. Students attending that school make up less than 3 percent of the total public high school student population (grades 9–12) of the Republic of the Marshall Islands (Marshall Islands Public School System, 2018). Consequently, the number of graduates from that high school is probably small.

- *Gender.* Whether a student is male or female.
- *Pell grant.* Whether a student received a Pell grant, which is an indicator of economic need, while enrolled at the College of the Marshall Islands.
- *Race/ethnicity.* All students in this study were classified as Hawaiian Native/Pacific Islander.
- *Primary language spoken at home.* A student's primary language spoken at home. Languages included Marshallese and Pohnpeian.
- *Cumulative high school grade point average (categorical).* A student's cumulative high school grade point average using the categories 0–0.99, 1.00–1.99, 2.00–2.99, 3.00–3.99, or 4.00. These are the categories used by Marshall Islands High School, the high school with the largest number of students in the study sample. The study's descriptive analyses used cumulative high school grade point average as a categorical variable so that stakeholders could see how many students fell into categories reflecting an A, B, C, D, or F average. For the descriptive analyses, a categorical grade point average was expected to provide stakeholders with more actionable information than examining grade point average as a continuous variable.
- *Cumulative high school grade point average (continuous).* The exact cumulative high school grade point average for each student. A third of the cumulative high school grade point averages in the final sample were based on a 100-point scale rather than a 4-point scale. The grade point average categories varied slightly across high schools in the Republic of the Marshall Islands. The models predicting whether students achieved indicators of college readiness and early college success included a large number of predictors. Therefore, grade point average was included as a continuous variable in these models to maximize the statistical power of the analyses, to use information about all values of grade point average along the continuous scale, and to avoid any loss of information that could occur by treating it as a categorical variable in these analyses.
- *Grade 9–12 math course grades.* The letter grade (A, B, C, D, or F) a student received in grade 9–12 math courses.
- *Grade 9–12 English course grades.* The letter grade (A, B, C, D, or F) a student received in grade 9–12 English courses.
- *Math and English performance on the grade 10 MISAT.* A battery of standards-based tests used as a summative assessment for grades 3, 6, 8, 10, and 12. It is administered at all public schools from March to May. The study examined students' math and English performance on the grade 10 MISAT. The test measures the percentage of benchmarks on which a student is proficient (meets grade-level expectations) or advanced (exceeds grade-level expectations; Marshall Islands Public School System, 2018).

Indicators of college readiness and early college succcess

The analyses used three indicators of college readiness and early college success and a composite of the three indicators:

- *Placing into only credit-bearing math and English courses at the College of the Marshall Islands.* Students who placed into only credit-bearing math and English courses—and no remedial or developmental math or English courses—during the semesters of their first year at the College of the Marshall Islands were classified as achieving this indicator. For the 2015 and 2016 cohorts, math and English course placement was determined through the College of the Marshall Islands placement exam. For the 2017 cohort, math and English course placement was determined based on placement exam scores, grade 11 and 12 math and English grades, and cumulative high school grade point averages. The difference in the way cohorts of students were placed into courses was due to changes in the process the college used to place students into math and English courses.

- *Earned all credits attempted.* Students who earned all credits they attempted during their first year at the College of the Marshall Islands were classified as achieving this indicator.
- *Persisted to a second year at the College of the Marshall Islands.* Students who entered the College of the Marshall Islands and persisted to a second year at the college, regardless of whether they attended semesters in between their first and second year, were classified as achieving this indicator.
- *College readiness and early college success by all indicators.* Students who achieved all three individual indicators were classified as achieving this indicator and demonstrating college readiness and early college success.

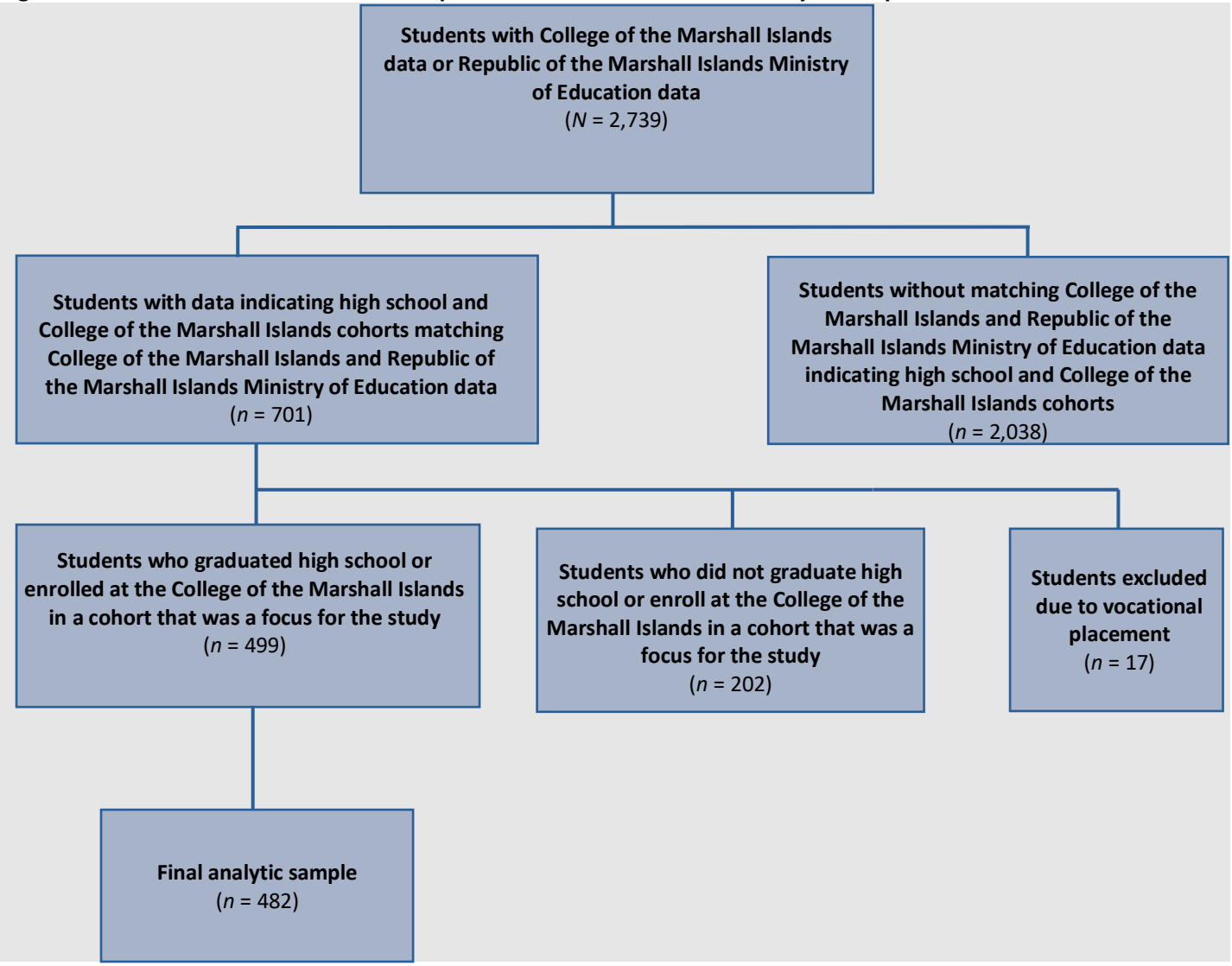
Data processing and determination of the analytic sample

The study team took several steps to process the data and determine the study's analytic sample, which included students who had both high school and college data, who graduated from Republic of the Marshall Islands high schools between spring 2015 and spring 2017, and who enrolled as first-time students at the College of the Marshall Islands between fall 2015 and fall 2017.

First, the study team cleaned data from the College of the Marshall Islands (high school transcript data and indicator data). Next, it merged this clean database with data from the Ministry of Education (MISAT data) using students' first and last names. Because some student names across the two datasets were not identical (due to misspellings or slight name changes from year to year), inexact matches that met a threshold of similarity were created using fuzzyjoin (Robinson, 2019). Fuzzyjoin, an R package (R Core Team, 2019), created a list of matched students based on first and last name (the only variables common to the two databases) using a probability of likely matches. The study team examined this list and compared students' name, gender, and high school name across the joined data sources to confirm that matches were correct. Incorrect matches—as indicated by a difference in at least two of the key variables (for example, student name, gender, or high school attended)—were removed, and the original unmatched pair of students was again considered for matching with other records from the opposite database. Students with missing MISAT data were kept in the dataset, and missing values were imputed as described below.

After combining the datasets from the College of the Marshall Islands and Ministry of Education, the study team identified 701 students with data indicating their high school graduation cohort and College of the Marshall Islands enrollment cohort. Some 499 of those 701 students were in the high school graduation cohorts and College of the Marshall Islands enrollment cohorts included in the study. The others were in cohorts beyond the focus of the study. The study team removed 17 students from the analysis dataset because they placed into vocational courses at the College of the Marshall Islands, indicating that they were non-degree-seeking students and therefore not aligned with the study's target sample. The study's final analytic sample included 482 students.

Figure B1. Number of students in each step of the determination of the analytic sample



Note: The sample excluded students from Life Skills Academy in the Republic of the Marshall Islands Public School System.
Source: Authors' compilation.

Missing data

Of the 482 students included in the final analytic sample, 336 had complete data and 146 had missing data for one or more academic preparation characteristics (table B1). No students had missing data for the indicators of college readiness and early college success.

Table B1. Percentage of missing records of demographic and academic preparation characteristics among spring 2015–17 high school graduates in the Republic of the Marshall Islands who enrolled as first-time students at the College of the Marshall Islands in 2015–17

Characteristic	Percent with missing data
High school attended	0.00
High school graduation cohort	0.00
College of the Marshall Islands semester/term start	0.00
Gender	0.00
Race/ethnicity	0.00
Primary language spoken at home	0.00
Received Pell grant	0.00
Cumulative high school grade point average (continuous)	0.62
Grade 9 math course letter grades	0.62
Grade 9 English course letter grades	0.62
Grade 10 math course letter grades	0.41
Grade 10 English course letter grades	0.41
Grade 11 math course letter grades	0.41
Grade 11 English course letter grades	1.24
Grade 12 math course letter grades	0.41
Grade 12 English course letter grades	0.41
Grade 10 MISAT math performance	26.76
Grade 10 MISAT English performance	26.35

MISAT is Marshall Islands Standards Assessment Test.
Source: Authors' compilation.

The study team conducted missing data analyses to determine whether students with missing data on demographic and academic preparation characteristics differed from those without missing data. The study team used chi-square tests to determine whether categorical characteristics were related to whether students had missing data (table B2) and used independent sample *t*-tests to determine whether continuous characteristics were related to whether students had missing data (table B3). These analyses showed that students with missing data differed from students without missing data in cumulative high school grade point average (categorical and continuous), grade 9 math letter grades, grade 10 math letter grades, grade 10 English letter grades, and grade 11 English letter grades. Specifically, compared with students without missing data, students with missing data had lower high school grade point averages, lower grade 9 math letter grades, lower grade 10 math and English letter grades, and lower grade 11 English letter grades.

Table B2. Chi-square results comparing the demographic and academic preparation characteristics of spring 2015–17 high school graduates in the Republic of the Marshall Islands who enrolled as first-time students at the College of the Marshall Islands in 2015–17 based on whether a student had missing data for 2015–17

Characteristic	Chi-square value
High school attended	5.484
High school graduation cohort	4.221
College of the Marshall Islands semester start	2.587
Gender	0.076
Primary language spoken at home	0.873
Received Pell grant	0.283
Cumulative high school grade point average (categorical)	9.259*
Grade 9 math course letter grades	15.860***
Grade 9 English course letter grades	5.012
Grade 10 math course letter grades	9.881*
Grade 10 English course letter grades	15.245***
Grade 11 math course letter grades	5.551
Grade 11 English course letter grades	10.913*
Grade 12 math course letter grades	2.820
Grade 12 English course letter grades	2.672

* Significant at $p < .05$; *** significant at $p < .001$.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table B3. Independent *t*-test results comparing characteristics of spring 2015–17 high school graduates in the Republic of the Marshall Islands who enrolled as first-time students at the College of the Marshall Islands in 2015–17 based on whether a student had missing data for 2015–17

Student demographic and academic preparation characteristics	Degrees of freedom	*t*-test
MISAT math performance	21.687	−0.547
MISAT English performance	353.000	−0.619
Cumulative high school grade point average (continuous)	477.000	−3.115**

** Significant at $p < .01$.
MISAT is Marshall Islands Standards Assessment Test.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

To preserve the study's sample size and allow students with missing data to be included in the analysis, the study team conducted multiple imputation using the *mice: Multivariate Imputation by Chained Equations* package (van Buuren & Groothuis-Oudshoorn, 2011) in R (R Core Team, 2019). Multivariate imputation by chained equations is appropriate for imputing continuous, binary, and ordered and unordered categorical data. The imputation models included student demographic and academic predictor variables as well as the indicators of college readiness and early college success examined in this study. The imputation procedures created 20 versions of complete datasets by using existing values to predict missing variables. Analyses were then performed across datasets and results were pooled to yield one set of results for each analysis. Findings from these analyses are presented in the main report. To determine whether the study findings differed based on methods used to address missing data, the study team conducted sensitivity analyses using the sample of 336 students with complete data. The findings from those analyses are in appendix D.

Analytic methods

This section describes the analytic methods used to answer the research questions.

Descriptive analyses. For research question 1 the study team used IBM SPSS Statistics software, Version 24 to calculate means and percentages to describe the demographic and academic preparation characteristics of students who graduated from a public high school in the Republic of the Marshall Islands between spring 2015 and spring 2017 and enrolled as first-time degree-seeking students in the College of the Marshall Islands between fall 2015 and fall 2017. The variables included in these descriptive analyses are described in the measures section above.

For research question 2 the study team calculated means and percentages of students who graduated from a public high school in the Republic of the Marshall Islands between spring 2015 and spring 2017, enrolled as first-time degree-seeking students in the College of the Marshall Islands between fall 2015 and fall 2017, and demonstrated college readiness and early college success based on achieving the indicators examined in this study.

Multiple logistic regression analyses. For research question 3 the study team used R (R Core Team, 2019) to run logistic regression analyses, which are appropriate when examining categorical and continuous predictors of a binary outcome. One variable (race/ethnicity) was excluded from the multiple logistic regression analyses because it had no variability. Two others (primary language spoken at home and Pell grant status) were excluded because 98 percent or more of the students shared the characteristic. In addition, because course grades contribute to a student's cumulative high school grade point average, the analysis models excluded all course grades except grade 11 math and English. Course grades for grade 11 were included because they are used in the placement system at the College of Marshall Islands. The final regression models included the following predictor variables:

- High school attended.
- High school graduation cohort.
- Starting semester (fall, spring, or summer) at the College of the Marshall Islands.[2]
- Gender.
- Cumulative high school grade point average (continuous).
- Grade 11 math course grades.
- Grade 11 English course grades.
- Grade 10 MISAT math performance.
- Grade 10 MISAT English performance.

The continuous predictors did not have a meaningful value of 0. Therefore, each continuous predictor was centered around its mean in preparation for the multiple logistic regression analyses. In addition, the categorical predictors were deviation coded to support interpretation of findings. Specifically, with deviation coding, outcomes among students with specific characteristics are compared with the grand mean outcome rather than with outcomes for an arbitrary reference group. Therefore, as an example for findings regarding the year in which students graduated from high school, deviation coding permitted a comparison of outcomes for students who

[2] Students who did not immediately transition from high school to college (such as students who entered college more than one year after high school graduation) are included in the sample if the year they enrolled in college aligns with the years examined in this study (between fall 2015 and fall 2017).

graduated from high school in 2015 with outcomes for the average student who graduated from a Republic of the Marshall Islands high school between spring 2015 and spring 2017 and enrolled as a first-time student at the College of the Marshall Islands between fall 2015 and fall 2017.

After completing the final data preparations, the study team ran two binary multiple logistic regression models. The first regression model used student demographic and academic preparation characteristics to predict the log odds of a student all attempted credits during the first year at the College of the Marshall Islands. The second regression model used student demographic and academic preparation characteristics to predict the log odds of a student persisting to a second year of college. It was not feasible to run logistic regression analyses to predict the log odds of a student placing into only credit-bearing math and English courses during the first year at the College of the Marshall Islands or by achieving all three indicators of college readiness and early college success because there was too little variability in these outcomes. Specifically, 24 students (5 percent) placed into only credit-bearing math and English courses at the College of the Marshall Islands, and 14 students (3 percent) achieved the composite indicator of college readiness and early college success.

The multiple logistic regression models predicting the log odds of a student demonstrating each indicator of college readiness and early college success of interest given the predictors described above are summarized as follows:

$$ln\frac{P_i}{(1 - P_{i)}} = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} \ldots \beta_K X_{ki} + \theta$$

where P_i is the probability of demonstrating college readiness and early college success by achieving the indicator of interest, β_0 is the estimated log odds of achieving the indicator of college readiness and early college success of interest when the values of all demographic and academic preparation variables take a value of 0, β_{1-k} are the coefficients for capturing the relationships between the demographic characteristics and academic preparation variables and log odds of achieving the indicator of college readiness and early college success of interest, X_{1i-ki} are the values of the demographic characteristics and academic preparation variables, and θ is an indicator variable to account for cohort effects.

For each regression model the student demographic and academic preparation variables were entered simultaneously because it was unclear which predictor variables would be the best predictors of achieving each indicator of interest. After running these analyses, the study team examined the student demographic and academic preparation characteristics for evidence of multicollinearity. Multicollinearity occurs where there are correlations among predictor variables that can affect the results of the analysis. A common way to detect multicollinearity is to examine the variance inflation factors of predictor variables. A variance inflation factor estimates the extent to which a regression coefficient's variance is inflated because of multicollinearity among predictor variables. Variance inflation factors that are greater than 10 suggest high multicollinearity. None of the variance inflation factors was greater than 10 for variables included in the regression models. Because analyses were run on two related outcomes—earning all attempted credits during the first year at the College of the Marshall Islands and persisting to a second year at the college—the Benjamini-Hochberg correction was used to account for multiple comparisons.

The findings presented as statistically significant in the report and appendixes are those that remained significant after the correction was applied. When group differences on binary outcome variables were statistically significant and 10 percentile points or larger in magnitude, they were considered major. When they were statistically significant but less than 10 percentile points in magnitude, they were considered minor. For continuous variables, differences were considered major if they were statistically significant and the Hedge's *g* effect size corresponding to the group difference reflected at least a 10 percentile point difference. They were considered minor when

differences were statistically significant but the Hedge's *g* effect size corresponding to the difference reflected less than a 10 percentile point difference.

After running each logistic regression analysis, the study team calculated odds ratios for each demographic and academic preparation predictor variable. For categorical predictors the odds ratio reflects how the likelihood of achieving the indicator of interest changes—compared with the grand mean—because of having that particular characteristic. For continuous predictors the odds ratio reflects how a one-unit increase in the variable corresponds to a change in the likelihood of achieving the indicator of interest. Thus, the results from the regression models indicate when outcomes among students with specific demographic and academic preparation characteristics were significantly different from outcomes among the general population of students who graduated from Republic of the Marshall Islands high schools between spring 2015 and spring 2017 and enrolled as first-time students at the College of the Marshall Islands between fall 2015 and fall 2017.

Next, the study team used the emmeans package (Lenth, 2019) in the R program (R Core Team, 2019) to calculate estimated probabilities for each demographic and academic preparation predictor variable. After running these analyses, the study team used the multivariate *t* adjustment to account for multiple comparisons (Lenth, 2019). For categorical predictor variables the estimated probabilities reflect the predicted probability of demonstrating college readiness and early college success at each level of the predictor variable, while averaging across the levels of the other categorical predictor variables and holding other continuous variables at their average values. For continuous predictor variables the study team calculated estimated probabilities at specific levels of the predictor variable. Specifically, estimated probabilities were calculated for cumulative grade point averages of 1.00, 2.00, 3.00, and 4.00 and for the minimum, mean, and maximum values for MISAT math performance and MISAT English performance. Thus, the estimated probabilities for continuous predictor variables reflect the predicted probability that a student demonstrated college readiness and early college success at the specified level of that variable, while other predictor variables were held constant.

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Appendix C. Supporting analyses

This appendix details full results of the findings from the three research questions addressed in the study.

Detailed results of descriptive statistics

This section provides an overview of the final sample, as well as descriptive statistics (percentages, means, and standard deviations) across all cohorts of students in the final analytic sample for demographics, academic preparation characteristics, and college readiness and early college success (research questions 1 and 2) (tables C1–C3).

All students in the study were Hawaiian Native/Pacific Islands (100 percent), and nearly all spoke Marshallese as their primary language at home (99.6 percent). Approximately 50 percent of the students in the study were female, and 50 percent were male. Nearly all students in the study (98 percent) received a Pell grant. Students graduated from one of three high school cohorts, with 35 percent of students graduating in 2015, 32 percent in 2016, and 33 percent in 2017. The College of the Marshall Islands has fall, spring, and summer enrollment periods. Of the students who enrolled at the College of the Marshall Islands between fall 2015 and fall 2017, 81 percent started during the fall semester. The remaining students entered the College of the Marshall Islands during the spring semester (8 percent) or summer term (12 percent).

All students in the analytic sample graduated from a public high school in the Republic of the Marshall Islands, with nearly half (45 percent) graduating from Marshall Islands High School. The remaining students graduated from Jaluit High School (22 percent), Northern Islands High School (16 percent), Laura High School (13 percent), or Kwajalein Atoll High School (5 percent). The public high schools included in this study varied by enrollment, student–teacher ratio, geographic location, and accreditation level. All the high schools follow the same curriculum and have similar student demographics. Specifically, enrollment at each high school ranges from 268 to 978 students, and student–teacher ratios range from 12:1 to 20:1 (Marshall Islands Public School System, 2018). Two of the schools included in this study (Marshall Islands High School and Laura High School) are in an urban area, and the others are on outer islands. Most teachers in outer islands schools teach in multigrade settings, in contrast to teachers in urban locations (Marshall Islands Public School System, 2018). Outer island high schools are boarding schools, unlike schools in Majuro and Kwajalein. Accreditation levels of each high school differ, with one school at the highest level (level 4) of the Marshall Islands accreditation standards (Jaluit High School) and two schools at level 3 (Kwajalein Atoll High School and Northern Islands High School). Finally, two schools (Laura High School and Marshall Islands High School) meet the accreditation standards of the Western Association of Schools and Colleges, a regional accrediting agency recognized by the U.S. Department of Education (Marshall Islands Public School System, 2018; Accrediting Commission for Schools, Western Association of Schools and Colleges, 2020).

Table C1. Percentages and numbers of students in the study's sample for each categorical demographic and academic preparation variable of interest, 2015–17

Characteristic	Percent	Number
High school attended		
Jaluit High School	21.6	104
Kwajalein Atoll High School	4.6	22
Laura High School	12.9	62
Marshall Islands High School	45.0	217
Northern Islands High School	16.0	77

Characteristic	Percent	Number
High school graduation cohort		
2015	35.3	170
2016	32.0	154
2017	32.8	158
College of the Marshall Islands semester/term start		
Fall	80.9	390
Spring	7.5	36
Summer	11.6	56
Gender		
Male	50.4	243
Female	49.6	239
Race/ethnicity		
Hawaiian Native/Pacific Islander	100.0	482
Cumulative high school grade point average (categorical)		
0.00–0.99	[a]	[a]
1.00–1.99	[a]	[a]
2.00–2.99	42.9	207
3.00–3.99	50.4	243
4.00	5.0	24
Grade 9 math course letter grades		
A	17.0	82
B	35.5	171
C	31.5	152
D	[a]	[a]
F	[a]	[a]
Grade 9 English course letter grades		
A	23.3	112
B	36.9	178
C	31.5	152
D	[a]	[a]
F	[a]	[a]
Grade 10 math course letter grades		
A	13.2	63
B	34.9	168
C	31.6	152
D	12.9	62
F	7.5	36
Grade 10 English course letter grades		
A	23.1	111
B	42.1	203
C	26.7	129
D	[a]	[a]
F	[a]	[a]

Characteristic	Percent	Number
Grade 11 math course letter grades		
A	20.6	99
B	32.4	156
C	27.8	134
D	14.7	71
F	4.4	21
Grade 11 English course letter grades		
A	21.6	104
B	46.6	224
C	24.5	118
D	[a]	[a]
F	[a]	[a]
Grade 12 math course letter grades		
A	14.9	72
B	36.2	174
C	37.6	181
D	[a]	[a]
F	[a]	[a]
Grade 12 English course letter grades		
A	20.9	101
B	47.1	227
C	27.4	132
D	[a]	[a]
F	[a]	[a]

MISAT is Marshall Islands Standards Assessment Test.
Note: *n* = 482. Primary language spoken at home and Pell grant status were excluded from the analysis because 98 percent or more of students in the study sample shared each characteristic. Percentages may not sum to 100 because of rounding.
a. Data are suppressed because of small sample size (*n* < 10) to protect student anonymity.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table C2. Means and standard deviations of continuous academic preparation variables for students in the study sample, 2015–17

Characteristic	Mean	Standard deviation
Average percentage of MISAT math benchmarks met or exceeded	30.96	0.08
Average percentage of MISAT English benchmarks met or exceeded	38.52	0.15
Cumulative high school grade point average (continuous)	2.97	0.53

MISAT is Marshall Islands Standards Assessment Test.
Note: *n* = 482.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table C3. Percentages and numbers of students in the study sample who met the indicators of college readiness and early college success, aggregated across the 2015–17 enrollment cohorts at the College of the Marshall Islands

Indicator	Percent	Number
Demonstrated college readiness and early college success (met all three indicators)		
Yes	2.9	14
No	97.1	468
Placed into only credit-bearing math and English courses		
Yes	5.0	24
No	95.0	458
Earned all attempted credits during the first year of college		
Yes	18.7	90
No	81.3	392
Persisted to a second year of college		
Yes	52.7	254
No	47.3	228

Note: *n* = 482.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Detailed results from logistic regression analyses

This section provides estimated coefficients, standard errors, *p*-values, and odds ratios for the logistic regression analyses examining demographic and academic preparation characteristics as predictors of two indicators of college readiness and early college success: earning all attempted credits during the first year at the College of the Marshall Islands and persisting to a second year at the college (tables C4 and C5).

When academic preparation characteristics are represented by continuous variables, each estimated coefficient reflects the expected change in the log odds of achieving the indicator of interest corresponding to a one-unit increase in the variable of interest, with other predictors in the model held constant. Each odds ratio reflects how a one-unit increase in the variable corresponds to a change in the likelihood of achieving the indicator of interest (compared with the average student in the population). For example, as the cumulative high school grade point average increases by 1.0, the log odds of earning all attempted credits during the first year at the College of the Marshall Islands is expected to increase by 1.5 (when compared with the average student in the population), and a student would be 4.6 times more likely than the average student in the population to earn all attempted credits during the first year at the college.

When demographic and academic preparation characteristics are represented by categorical variables, each estimated coefficient reflects the expected change in the log odds of achieving the indicator of interest (compared with the average student in the population) because of having that particular characteristic. Each odds ratio reflects how the likelihood of achieving the indicator of interest changes because of having that particular characteristic (compared with the average student in the population). For example, being in the 2015 graduation cohort is associated with a 0.02 decrease in the log odds of earning all attempted credits during the first year at the College of the Marshall Islands (when compared with the average student in the population), and a student who graduated in 2015 would be 0.98 times more likely than the average student to earn all attempted credits during the first year at the college.

Table C4. Coefficients, standard errors, statistical significance, and odds ratios for logistic regression models predicting earning all credits attempted during the first year of college, 2015–17

Characteristic	Coefficient	Standard error	Odds ratio
Constant			
Intercept	−1.639***	0.395	0.194
High school graduation cohort			
2015	−0.019	0.213	0.981
2016	0.191	0.201	1.210
2017	−0.172	0.217	0.842
High school attended			
Jaluit High School	0.027	0.344	1.027
Kwajalein Atoll High School	0.279	0.463	1.322
Laura High School	0.968*	0.353	2.632
Marshall Islands High School	−0.752**	0.264	0.472
Northern Islands High School	−0.522	0.367	0.593
College of the Marshall Islands semester/term start			
Fall	−0.209	0.244	0.811
Spring	−0.327	0.408	0.721
Summer	0.536	0.334	1.71
Gender			
Female	−0.093	0.14	0.911
Male	0.093	0.140	1.097
MISAT math performance			
Percentage of benchmarks met or exceeded	0.578	1.976	1.782
MISAT English performance			
Percentage of benchmarks met or exceeded	0.489	1.236	1.63
Cumulative high school grade point average			
Grade point average	1.522**	0.481	4.583
Grade 11 math course letter grades			
A	0.746	0.375	2.109
B	0.059	0.325	1.061
C	−0.102	0.327	0.903
D	0.032	0.497	1.033
F	−0.736	0.837	0.479
Grade 11 English course letter grades			
A	0.349	0.413	1.418
B	0.153	0.351	1.166
C	−0.629	0.417	0.533
D	0.554	0.543	1.741
F	−0.428	0.982	0.652

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
MISAT is Marshall Islands Standards Assessment Test.
Note: Analyses were run using the aggregate sample of the three student cohorts of interest. The Benjamini-Hochberg correction was used to account for multiple comparisons.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table C5. Coefficients, standard errors, statistical significance, and odds ratios for logistic regression models predicting persisting to a second year of college, 2015–17

Characteristic	Coefficient	Standard error	Odds ratio
Constant			
Intercept	0.048	0.262	1.049
High school graduation cohort			
2015	−0.175	0.147	0.84
2016	0.102	0.152	1.108
2017	0.073	0.156	1.075
High school attended			
Jaluit High School	0.103	0.254	1.108
Kwajalein Atoll High School	0.330	0.404	1.391
Laura High School	0.056	0.277	1.057
Marshall Islands High School	−0.237	0.197	0.789
Northern Islands High School	−0.251	0.269	0.778
College of the Marshall Islands semester/term start			
Fall	0.253	0.179	1.288
Spring	−0.160	0.284	0.852
Summer	−0.093	0.263	0.911
Gender			
Female	−0.273*	0.103	0.761
Male	0.273*	0.103	1.313
MISAT math performance			
Percentage of benchmarks met or exceeded	−1.501	1.638	0.223
MISAT English performance			
Percentage of benchmarks met or exceeded	1.348	0.927	3.85
Cumulative high school grade point average			
Grade point average	0.801*	0.331	2.229
Grade 11 math course letter grades			
A	0.605	0.281	1.831
B	−0.105	0.206	0.900
C	0.055	0.195	1.056
D	−0.550	0.293	0.577
F	−0.005	0.407	0.995
Grade 11 English course letter grades			
A	0.239	0.317	1.270
B	−0.162	0.242	0.851
C	0.031	0.242	1.032
D	0.229	0.397	1.257
F	−0.337	0.623	0.714

* Significant at $p < .05$.

MISAT is Marshall Islands Standards Assessment Test.

Note: Analyses were run using the aggregate sample of the three student cohorts of interest. The Benjamini-Hochberg correction was used to account for multiple comparisons.

Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Detailed results from calculation of estimated probabilities

This section provides the estimated probabilities, standard errors, and statistical significance for the demographic and academic preparation characteristics examined in the logistic regression analyses examining demographic and academic preparation characteristics as predictors of two indicators of college readiness and early college success: earning all attempted credits during their first year at the College of the Marshall Islands and persisting to a second year at the college (tables C6 and C7). For the MISAT math and English performance, estimated probabilities are presented at the maximum, mean, and minimum scores. For cumulative high school grade point average, the estimated probabilities are presented at various levels (4.00, 3.00, 2.00, 1.00, and 0.00). For these continuous variables the estimated probabilities reflect the instantaneous rate of change in the predicted probability that a student achieved the indicator of interest at specific levels of each continuous predictor variable, while other predictor variables are held constant. For example, a student with an average cumulative high school grade point average of 4.00 would have a 48 percent probability of earning all attempted credits during the first year at the College of the Marshall Islands when all other variables are held constant. When demographic and academic preparation characteristics are represented by categorical variables, estimated probabilities are presented at each level of the predictor variable and represent the predicted probability that a student achieves the indicator of interest while other predictor variables are held constant. For example, students who graduated from high school in 2015 would have a 16 percent probability of earning all attempted credits during the first year at the College of the Marshall Islands when all other variables are held constant.

Table C6. Estimated probabilities, standard errors, and statistical significance for demographic and academic preparation predictors of earning all attempted credits during their first year of college, 2015–17

Characteristic	Estimated probability	Standard error
High school graduation cohort		
2015	0.160***	0.059
2016	0.190**	0.069
2017	0.140***	0.054
High school attended		
Jaluit High School	0.166**	0.068
Kwajalein Atoll High School	0.204	0.109
Laura High School	0.338	0.096
Marshall Islands High School	0.084***	0.035
Northern Islands High School	0.103**	0.055
College of the Marshall Islands semester/term start		
Fall	0.136***	0.044
Spring	0.123**	0.069
Summer	0.249	0.094
Gender		
Female	0.150***	0.053
Male	0.175**	0.062
MISAT math performance		
Maximum percentage of benchmarks met or exceeded (64%)	0.190	0.119
Mean percentage of benchmarks met or exceeded (32%)	0.162***	0.054
Minimum percentage of benchmarks met or exceeded (6%)	0.144*	0.076
MISAT English performance		
Maximum percentage of benchmarks met or exceeded (86%)	0.196	0.112
Mean percentage of benchmarks met or exceeded (41%)	0.163***	0.054
Minimum percentage of benchmarks met or exceeded (5%)	0.141**	0.069

Characteristic	Estimated probability	Standard error
Cumulative high school grade point average (categorical)		
4.00	0.482	0.167
3.00	0.169***	0.056
2.00	0.042***	0.023
1.00	0.010***	0.009
Grade 11 math course letter grades		
A	0.290	0.088
B	0.171**	0.058
C	0.149***	0.056
D	0.167*	0.086
F	0.085	0.084
Grade 11 English course letter grades		
A	0.216*	0.069
B	0.184***	0.052
C	0.094***	0.041
D	0.252	0.128
F	0.112	0.123

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
MISAT is Marshall Islands Standards Assessment Test.
Note: Analyses were run using the aggregate sample of the three student cohorts of interest. The multivariate *t* adjustment was used to account for multiple comparisons.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table C7. Estimated probabilities, standard errors, and statistical significance for demographic and academic preparation predictors of persisting to a second year of college, 2015–17

Characteristic	Estimated probability	Standard error
High school graduation cohort		
2015	0.468	0.076
2016	0.537	0.074
2017	0.530	0.076
High school attended		
Jaluit High School	0.537	0.080
Kwajalein Atoll High School	0.593	0.133
Laura High School	0.526	0.080
Marshall Islands High School	0.453	0.071
Northern Islands High School	0.449	0.101
College of the Marshall Islands semester/term start		
Fall	0.574	0.058
Spring	0.472	0.107
Summer	0.488	0.096
Gender		
Female	0.444	0.069
Male	0.579	0.069
MISAT math performance		
Maximum percentage of benchmarks met or exceeded (64%)	0.390	0.146
Mean percentage of benchmarks met or exceeded (32%)	0.512	0.066
Minimum percentage of benchmarks met or exceeded (6%)	0.604	0.114

Characteristic	Estimated probability	Standard error
MISAT English performance		
Maximum percentage of benchmarks met or exceeded (86%)	0.664	0.113
Mean percentage of benchmarks met or exceeded (41%)	0.512	0.066
Minimum percentage of benchmarks met or exceeded (5%)	0.399	0.099
Cumulative high school grade point average (categorical)		
4.0	0.705	0.100
3.0	0.518	0.066
2.0	0.325*	0.078
1.0	0.178*	0.092
Grade 11 math course letter grades		
A	0.657	0.075
B	0.485	0.073
C	0.525	0.078
D	0.377	0.096
F	0.510	0.135
Grade 11 English course letter grades		
A	0.571	0.078
B	0.471	0.062
C	0.519	0.070
D	0.568	0.122
F	0.428	0.192

* Significant at $p < .05$.
MISAT is Marshall Islands Standards Assessment Test.
Note: Analyses were run using the aggregate sample of the three student cohorts of interest. The multivariate *t* adjustment was used to account for multiple comparisons.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

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Appendix D. Sensitivity analyses

This appendix details results of the findings from the sensitivity analyses for the three research questions addressed in the study. The sensitivity analyses were run to test the robustness of the study findings to the methods used to handle missing data. The analyses presented in the main report were run across the 20 imputed datasets, and results were pooled to yield one set of results for each analysis. The analyses presented here were run on the dataset that included only students who had complete data (*n* = 336).

The findings for all the study's research questions were sensitive to the methods used to handle data. For research questions 1 and 2 the characteristics of the samples were different from the main analysis due to the inclusion of students with missing data. For research question 3 the findings also differed for students who placed into only credit-bearing math and English courses and students who persisted to a second year of college. Specifically, for each of these indicators, in the main analyses gender was associated with achieving each indicator. But in the sensitivity analysis gender was not significantly associated with any indicator. In the main analyses, after other characteristics were accounted for, cumulative high school grade point average predicted both earning all attempted credits and persisting to a second year of college. In addition, the high school that students attended predicted earning all attempted credits, and gender predicted persisting to a second year of college. In the sensitivity analyses, after other characteristics were accounted for, the only student characteristic that predicted either of the indicators was earning an A in grade 11 math, which predicted persisting to a second year of college.

Because the main analyses included more students, the samples for the main and sensitivity analyses were different. This could have contributed to how some of the findings differed based on the methods used to address missing data. In addition, due to the larger sample, the main analyses had more statistical power to detect potential relationships between student characteristics and indicators of college readiness and early college success, and the sensitivity analyses had less statistical power to detect potential relationships. For research question 3 the coefficients generated from the main analyses are within two standard errors of the coefficients generated from the sensitivity analyses. Therefore, the differences across analyses are within an expected range given the standard errors. A relationship that was not significant in the sensitivity analyses might still be important for stakeholders to consider when trying to understand college readiness and early college success, particularly if it was significant in the main analyses. The multiple imputations were based on specific assumptions, including that data were missing at random. The missing data for each variable were found to have nonsignificantly different distributions of values for the study's outcome variables than the nonmissing data. The missing data were, therefore, determined to be missing at random. Because the missing values may correlate with the study's predictor variables or combinations of predictor variables, missing completely at random was not assumed, and the missing data were therefore imputed using multiple imputation.

Detailed results of descriptive statistics

This section provides descriptive statistics (percentages, means, and standard deviations) across all cohorts of students who had complete data (research questions 1 and 2).

Table D1. Percentages of students in the study's sensitivity analyses sample with each categorical demographic and academic preparation variable of interest, 2015–17

Characteristic	Sensitivity analyses	Main analyses
High school attended		
Jaluit High School	21.0	21.6
Kwajalein Atoll High School	5.5	4.6
Laura High School	13.0	12.9
Marshall Islands High School	47.3	45.0
Northern Islands High School	14.3	16.0
High school graduation cohort		
2015	33.6	35.3
2016	34.8	32.0
2017	31.6	32.8
College of the Marshall Islands semester/term start		
Fall	81.6	80.9
Spring	6.3	7.5
Summer	12.2	11.6
Gender		
Female	50.0	49.6
Race/ethnicity		
Hawaiian Native/Pacific Islander	100.0	100.0
Cumulative high school grade point average (categorical)		
0.00–0.99	[a]	[a]
1.00–1.99	[a]	[a]
2.00–2.99	39.0	42.9
3.00–3.99	54.2	50.4
4.00	5.7	5.0
Grade 9 math course letter grades		
A	20.8	17.0
B	35.4	35.5
C	31.0	31.5
D	[a]	[a]
F	[a]	[a]
Grade 9 English course letter grades		
A	20.8	23.3
B	35.4	36.9
C	31.0	31.5
D	[a]	[a]
F	[a]	[a]
Grade 10 math course letter grades		
A	15.2	13.2
B	36.3	34.9
C	31.3	31.6
D	11.0	12.9
F	6.3	7.5

Characteristic	Sensitivity analyses	Main analyses
Grade 10 English course letter grades		
A	22.6	23.1
B	46.1	42.1
C	25.9	26.7
D	[a]	[a]
F	[a]	[a]
Grade 11 math course letter grades		
A	20.5	20.6
B	34.5	32.4
C	28.6	27.8
D	12.8	14.7
F	3.6	4.4
Grade 11 English course letter grades		
A	22.9	21.6
B	47.3	46.6
C	24.1	24.5
D	[a]	[a]
F	[a]	[a]
Grade 12 math course letter grades		
A	16.1	14.9
B	36.6	36.2
C	36.6	37.6
D	[a]	[a]
F	[a]	[a]
Grade 12 English course letter grades		
A	22.0	20.9
B	46.7	47.1
C	27.1	27.4
D	[a]	[a]
F	[a]	[a]

Note: *n* = 336 for the sensitivity analysis, and *n* = 482 for the main analysis. Primary language spoken at home and Pell grant status were excluded from the analysis because 98 percent or more of students in the study sample shared each characteristic. Percentages may not sum to 100 because of rounding.
a. Data are suppressed because of small sample size (*n* < 10) to protect student anonymity.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table D2. Means and standard deviations of continuous academic preparation variables for students in the study's sensitivity analysis sample, 2015–17

	Sensitivity analyses		Main analyses	
Characteristic	Mean	Standard deviation	Mean	Standard deviation
Average percentage of MISAT math benchmarks met or exceeded	31.52	0.08	30.96	0.08
Average percentage of MISAT English benchmarks met or exceeded	41.64	0.14	38.52	0.15
Cumulative high school grade point average (continuous)	3.02	0.51	2.97	0.53

MISAT is Marshall Islands Standards Assessment Test.
Note: *n* = 336 for the sensitivity analysis, and *n* = 482 for the main analysis.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table D3. Percentages of students in the study's sensitivity analysis sample who met the indicators of college readiness and early college success, aggregated across the 2015–17 enrollment cohorts at the College of the Marshall Islands (percent)

Indicator	Sensitivity analyses	Main analyses
Demonstrated college readiness and early college success (achieved all three indicators)		
Yes	3.9	2.9
No	96.1	97.1
Placement into only credit-bearing math and English courses		
Yes	5.4	5.0
No	94.6	95.0
Earned all attempted credits during the first year of college		
Yes	19.9	18.7
No	80.1	81.3
Persisted to second year of college		
Yes	54.8	52.7
No	45.2	47.3

Note: *n* = 336 for the sensitivity analysis, and *n* = 482 for the main analysis.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Detailed results from logistic regression analyses

This section provides estimated coefficients, standard errors, *p*-values, and odds ratios for the logistic regression analyses examining demographic and academic preparation characteristics as predictors of two indicators of college readiness and early college success: earning all attempted credits during the first year at the College of the Marshall Islands and persisting to a second year at the college. These analyses included the 336 students who had complete data.

Table D4. Coefficients, standard errors, and statistical significance for logistic regression models from the study's sensitivity analyses predicting earning all credits attempted during the first year of college, 2015–17

	Sensitivity analyses		Main analyses	
Characteristic	Coefficient	Standard error	Coefficient	Standard error
Constant				
Intercept	−7.473	320.05	−1.639***	0.395
High school graduation cohort				
2015	0.115	0.248	−0.019	0.213
2016	0.091	0.235	0.191	0.201
2017	−0.207	0.260	−0.172	0.217
High school attended				
Jaluit High School	0.197	0.414	0.027	0.344
Kwajalein Atoll High School	0.585	0.513	0.279	0.463
Laura High School	0.477	0.426	0.968*	0.353
Marshall Islands High School	−0.692	0.311	−0.752**	0.264
Northern Islands High School	−0.567	0.439	−0.522	0.367

Characteristic	Sensitivity analyses		Main analyses	
	Coefficient	Standard error	Coefficient	Standard error
College of the Marshall Islands semester/term start				
Fall	−0.274	0.291	−0.209	0.244
Spring	−0.325	0.503	−0.327	0.408
Summer	0.599	0.413	0.536	0.334
Gender				
Female	−0.003	0.166	−0.093	0.14
Male	0.003	0.166	0.093	0.140
MISAT math performance				
Percentage of benchmarks met or exceeded	0.807	2.112	0.578	1.976
MISAT English performance				
Percentage of benchmarks met or exceeded	0.77	1.337	0.489	1.236
Cumulative high school grade point average				
Grade point average	1.22	0.556	1.522**	0.481
Grade 11 math course letter grades				
A	3.66	207.937	0.746	0.375
B	3.223	207.937	0.059	0.325
C	2.778	207.937	−0.102	0.327
D	2.745	207.938	0.032	0.497
F	−12.406	831.748	−0.736	0.837
Grade 11 English course letter grades				
A	3.682	243.299	0.349	0.413
B	3.036	243.299	0.153	0.351
C	2.522	243.299	−0.629	0.417
D	3.504	243.300	0.554	0.543
F	−12.744	973.195	−0.428	0.982

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
MISAT is Marshall Islands Standards Assessment Test.
Note: $n = 336$ for the sensitivity analysis, and $n = 482$ for the main analysis. Analyses were run using the aggregate sample of students with complete data from the three student cohorts of interest. The Benjamini-Hochberg correction was used to account for multiple comparisons.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table D5. Coefficients, standard errors, and statistical significance for logistic regression models predicting persisting to a second year of college among students in the study's sensitivity analysis sample, 2015–17

Characteristic	Sensitivity analyses		Main analyses	
	Coefficient	Standard error	Coefficient	Standard error
Constant				
Intercept	0.073	0.342	0.048	0.262
High school graduation cohort				
2015	−0.192	0.183	−0.175	0.147
2016	0.099	0.183	0.102	0.152
2017	0.094	0.196	0.073	0.156

Characteristic	Sensitivity analyses		Main analyses	
	Coefficient	Standard error	Coefficient	Standard error
High school attended				
Jaluit High School	0.111	0.324	0.103	0.254
Kwajalein Atoll High School	0.726	0.505	0.330	0.404
Laura High School	−0.366	0.353	0.056	0.277
Marshall Islands High School	−0.278	0.249	−0.237	0.197
Northern Islands High School	−0.194	0.335	−0.251	0.269
College of the Marshall Islands semester/term start				
Fall	0.361	0.23	0.253	0.179
Spring	−0.569	0.384	−0.160	0.284
Summer	0.209	0.34	−0.093	0.263
Gender				
Female	−0.229	0.126	−0.273*	0.103
Male	0.229	0.126	0.273*	0.103
MISAT math performance				
Percentage of benchmarks met or exceeded	−2.357	1.775	−1.501	1.638
MISAT English performance				
Percentage of benchmarks met or exceeded	1.832	1.121	1.348	0.927
Cumulative high school grade point average				
Grade point average	0.896	0.414	0.801*	0.331
Grade 11 math course letter grades				
A	0.827*	0.364	0.605	0.281
B	−0.066	0.26	−0.105	0.206
C	0.089	0.245	0.055	0.195
D	−0.841	0.393	−0.550	0.293
F	−0.008	0.547	−0.005	0.407
Grade 11 English course letter grades				
A	0.341	0.396	0.239	0.317
B	−0.279	0.307	−0.162	0.242
C	0.122	0.307	0.031	0.242
D	0.398	0.599	0.229	0.397
F	−0.581	0.738	−0.337	0.623

* Significant at $p < .05$.
MISAT is Marshall Islands Standards Assessment Test.
Note: $n = 336$ for the sensitivity analysis, and $n = 482$ for the main analysis. Analyses were run using the aggregate sample of students with complete data from the three student cohorts of interest. The Benjamini-Hochberg correction was used to account for multiple comparisons.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Detailed results from the calculation of estimated probabilities

This section provides the estimated probabilities, standard errors, and statistical significance for the demographic and academic preparation characteristics in the logistic regression analyses examining them as predictors of two indicators of college readiness and early college success: earning all attempted credits during the first year at the College of the Marshall Islands and persisting to a second year at the college. For Marshall Islands Standards Assessment Test math and English performance, estimated probabilities are presented at the maximum, mean,

and minimum scores. For cumulative high school grade point average, estimated probabilities are presented at various levels of cumulative high school grade point average (4.00, 3.00, 2.00, 1.00, and 0.00). For these continuous variables the estimated probabilities reflect the instantaneous rate of change in the predicted probability that a student achieved the indicator of interest as the given predictor changes, while other predictor variables are held constant. For example, a student with an average cumulative high school grade point average of 4.00 would have a 0.2 percent probability of earning all attempted credits during the first year at the College of the Marshall Islands when all other variables are held constant. When demographic and academic preparation characteristics are represented by categorical variables, estimated probabilities are presented at each level of the predictor variable and represent the predicted probability that a student achieves the indicator of interest while other predictor variables are held constant. For example, students who graduated from high school in 2015 would have a 0.1 percent probability of earning all attempted credits during the first year of college when all other variables are held constant.

Table D6. Estimated probabilities, standard errors, and statistical significance for demographic and academic preparation predictors of earning all attempted credits during the first year of college among students in the study's sensitivity analysis sample, 2015–17

	Sensitivity analyses		Main analyses	
Characteristic	Estimated probability	Standard error	Estimated probability	Standard error
High school graduation cohort				
2015	0.001	0.204	0.160***	0.059
2016	0.001	0.199	0.190**	0.069
2017	0.000	0.148	0.140***	0.054
High school attended				
Jaluit High School	0.001	0.221	0.166**	0.068
Kwajalein Atoll High School	0.001	0.326	0.204	0.109
Laura High School	0.001	0.292	0.338	0.096
Marshall Islands High School	0.000	0.091	0.084***	0.035
Northern Islands High School	0.000	0.103	0.103**	0.055
College of the Marshall Islands semester/term start				
Fall	0.000	0.138	0.136***	0.044
Spring	0.000	0.131	0.123**	0.069
Summer	0.001	0.330	0.249	0.094
Gender				
Female	0.001	0.181	0.150***	0.053
Male	0.001	0.182	0.175**	0.062
MISAT math performance				
Maximum percentage of benchmarks met or exceeded (64%)	0.001	0.235	0.190	0.119
Mean percentage of benchmarks met or exceeded (32%)	0.001	0.182	0.162***	0.054
Minimum percentage of benchmarks met or exceeded (6%)	0.000	0.147	0.144*	0.076
MISAT English performance				
Maximum percentage of benchmarks met or exceeded (86%)	0.001	0.255	0.196	0.112
Mean percentage of benchmarks met or exceeded (41%)	0.001	0.182	0.163***	0.054
Minimum percentage of benchmarks met or exceeded (5%)	0.000	0.137	0.141**	0.069

Characteristic	Sensitivity analyses		Main analyses	
	Estimated probability	Standard error	Estimated probability	Standard error
Cumulative high school grade point average (categorical)				
4.00	0.002	0.599	0.482	0.167
3.00	0.001	0.177	0.169***	0.056
2.00	0.000	0.052	0.042***	0.023
1.00	0.000	0.015	0.010***	0.009
Grade 11 math course letter grades				
A	0.022	5.144	0.290	0.088
B	0.014	3.374	0.171**	0.058
C	0.009	2.185	0.149***	0.056
D	0.009	2.115	0.167*	0.086
F	0.000	0.000	0.085	0.084
Grade 11 English course letter grades				
A	0.022	4.489	0.216*	0.069
B	0.012	2.403	0.184***	0.052
C	0.007	1.451	0.094***	0.041
D	0.019	3.785	0.252	0.128
F	0.000	0.000	0.112	0.123

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
MISAT is Marshall Islands Standards Assessment Test.
Note: $n = 336$ for the sensitivity analysis, and $n = 482$ for the main analysis. Analyses were run using the aggregate sample of students with complete data from the three student cohorts of interest. The multivariate t adjustment was used to account for multiple comparisons.
Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.

Table D7. Estimated probabilities, standard errors, and statistical significance for demographic and academic preparation predictors of persisting to a second year of college among students in the study's sensitivity analysis sample, 2015–17

Student demographic and academic preparation characteristic	Sensitivity analyses		Main analyses	
	Estimated probability	Standard error	Estimated probability	Standard error
High school graduation cohort				
2015	0.470	0.097	0.468	0.076
2016	0.543	0.095	0.537	0.074
2017	0.542	0.098	0.530	0.076
High school attended				
Jaluit High School	0.546	0.103	0.537	0.080
Kwajalein Atoll High School	0.690	0.148	0.593	0.133
Laura High School	0.427	0.105	0.526	0.080
Marshall Islands High School	0.449	0.092	0.453	0.071
Northern Islands High School	0.470	0.130	0.449	0.101
College of the Marshall Islands semester/term start				
Fall	0.607	0.073	0.574	0.058
Spring	0.378	0.136	0.472	0.107
Summer	0.570	0.120	0.488	0.096
Gender				

Student demographic and academic preparation characteristic	Sensitivity analyses		Main analyses	
	Estimated probability	Standard error	Estimated probability	Standard error
Female	0.461	0.089	0.444	0.069
Male	0.575	0.090	0.579	0.069
MISAT math performance				
Maximum percentage of benchmarks met or exceeded (64%)	0.336	0.150	0.390	0.146
Mean percentage of benchmarks met or exceeded (32%)	0.518	0.085	0.512	0.066
Minimum percentage of benchmarks met or exceeded (6%)	0.665	0.126	0.604	0.114
MISAT English performance				
Maximum percentage of benchmarks met or exceeded (86%)	0.707	0.121	0.664	0.113
Mean percentage of benchmarks met or exceeded (41%)	0.518	0.085	0.512	0.066
Minimum percentage of benchmarks met or exceeded (5%)	0.353	0.127	0.399	0.099
Cumulative high school grade point average (categorical)				
4.00	0.721	0.121	0.705	0.100
3.00	0.514	0.085	0.518	0.066
2.00	0.301	0.097	0.325*	0.078
1.00	0.150	0.103	0.178*	0.092
Grade 11 math course letter grades				
A	0.711	0.089	0.657	0.075
B	0.502	0.093	0.485	0.073
C	0.540	0.098	0.525	0.078
D	0.317	0.115	0.377	0.096
F	0.516	0.182	0.510	0.135
Grade 11 English course letter grades				
A	0.602	0.098	0.571	0.078
B	0.449	0.079	0.471	0.062
C	0.548	0.086	0.519	0.070
D	0.616	0.180	0.568	0.122
F	0.376	0.218	0.428	0.192

* Significant at $p < .05$.

MISAT is Marshall Islands Standards Assessment Test.

Note: $n = 336$ for the sensitivity analysis, and $n = 482$ for the main analysis. Analyses were run using the aggregate sample of students with complete data from the three student cohorts of interest. The multivariate t adjustment was used to account for multiple comparisons.

Source: Authors' analysis of data from the College of the Marshall Islands and the Republic of the Marshall Islands Ministry of Education.