

Using High School Data to Predict College Success in Palau

A Publication of the National Center for Education Evaluation and Regional Assistance at IES



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February 2021

The Palau Ministry of Education and Palau Community College are aligning their education systems to better prepare students for college. Research on the high school academic preparation variables that predict college success is limited for students in Palau. Using data from Palau’s Ministry of Education and Palau Community College, this study examined factors that predict early community college success and college completion. The study found that 60 percent of Palau High School graduates who enrolled in Palau Community College earned a grade point average of 2.0 or higher in their first year of college, 56 percent persisted to a second year, and 20 percent completed an associate degree or certificate within three years. Students with a higher grade point average and those with a higher math score on the grade 12 Palau Achievement Test in high school had better community college outcomes, after other academic preparation variables and student characteristic variables (gender and college cohort) were controlled for. In addition, students who earned a grade of C or higher in English I in grade 9 or in English IV in grade 12 had better community college outcomes, after the other variables were controlled for. In contrast, enrollment in the Construction Technology Career Academy in high school was a negative predictor of persisting to a second year of college and of earning an associate degree or certificate within three years.

Why this study?

The Palau Ministry of Education and Palau Community College are collaborating to improve students’ college readiness and success. The Palau Ministry of Education oversees and operates all prekindergarten to grade 12 public schools in the Republic of Palau. Approximately two-thirds of high school–age students attend Palau High School, the country’s only public high school (Palau Ministry of Education, 2017; Republic of Palau, 2019). A majority of its graduates go on to attend Palau Community College, which is the only postsecondary institution in the country.

To improve the college readiness and success of students, leaders at the Palau Ministry of Education and Palau Community College want to understand the experiences and background of Palau High School graduates who are better prepared to succeed at Palau Community College. However, research on predictors of college readiness and success that is relevant to Palau is limited. Most research on the topic was conducted in the United States, which differs from Palau in many ways, including political, cultural, demographic, and education contexts (Agarwal, 2013; appendix A includes an expanded review of the research on this topic). The current study, conducted in response to a request from the Palau Ministry of Education and Palau Community College, examined Palau High School academic preparation variables that predict success at Palau Community College, as measured by earning a grade point average of 2.0 or higher in the first year of college, persisting to a second year of college, and completing an associate degree or certificate within three years.

This study provides new evidence by identifying the high school academic preparation variables that predict success at Palau Community College. It will support the Palau Ministry of Education and Palau Community College in their strategic planning to ensure that public high school graduates are college and career ready.

For additional information, including background on the study, technical methods, supporting analyses, and other analyses, access the report appendixes at <https://go.usa.gov/xAH3n>.

Research questions

This study focused on students who graduated from Palau High School between spring 2013 and spring 2015 and enrolled as first-time students at Palau Community College in the fall semester following their high school graduation (fall 2013 through fall 2015). The study examined the relationship between Palau High School academic preparation variables and Palau Community College success outcomes.

The high school academic preparation variables were:

- High school grade point average.
- Standardized English language arts and math scores on the grade 12 Palau Achievement Test.
- Achievement (course grade) in English language arts courses.
- Achievement (course grade) in math courses.
- Choice of career academy.

The community college success outcomes were:

- Earning a grade point average of 2.0 or higher in the first year of college.
- Persisting to a second year of college.
- Completing an associate degree or certificate within three years of college enrollment.

The study explored the following two research questions among graduates of Palau High School who enrolled in Palau Community College:

1. What percentage of students achieved each community college success outcome?
2. Which high school academic preparation variables were statistically significant predictors of community college success, after other academic preparation variables and student characteristic variables were controlled for?

Key terms used in this study are defined in box 1. The study's data sources, sample, and methods are described in box 2 and discussed in detail in appendix B.

Box 1. Key terms

Community college success outcomes

The study examined three college success outcomes.

Cumulative grade point average of 2.0 or higher in the first year. Earning a cumulative grade point average of 2.0 or higher on a 4-point scale, coded yes/no. Grade point average was measured by averaging all course grades, including grades for elective courses, during a student's first two semesters of enrollment at Palau Community College. This cutpoint represents the minimum grade point average required to graduate with an associate degree or certificate from Palau Community College.

Persistence to a second year. Enrolling in the fall semester of the academic year immediately following the academic year of first enrollment at Palau Community College, coded yes /no.

Completion of an associate degree or certificate within three years. Completing an associate degree or certificate within three years (36 months) of the first date of enrollment, coded yes/no. Palau Community College offers only associate degrees and college certificates, which are nondegrees focused on vocational training that require 16–24 credit hours but do not require general education courses.

High school academic preparation variables

Nineteen Palau High School academic preparation variables were analyzed: achievement in five math courses and five English courses, high school grade point average, Palau Achievement Test scores, and enrollment in one of seven career academies.

High school grade point average. An unweighted, cumulative average of all grades received in completed courses in grades 9–12, whether required courses or electives, measured on a 4-point scale.

Standardized scores on the Palau Achievement Test. The percentages of questions answered correctly (ranging from 0 to 100) in English language arts and math on the Palau Achievement Test, a standardized test, in grade 12.

Achievement in English language arts courses. Palau High School students are required to complete English I (grade 9), English Reading and Writing (grade 9), English II (grade 10), English III (grade 11), and English IV (grade 12). Separate variables for each course were binary coded (yes/no) based on whether a student earned a grade of a C or higher (70 percent or higher in the local grading system).¹

Achievement in math courses. Palau High School students are required to complete Applied Mathematics (grade 9), Algebra I (grade 10), Algebra II (grade 10), and Geometry (grade 11). Students can also enroll in Trigonometry, the highest math course offered by Palau High School in 2015, as an elective. Separate variables for each course were binary coded (yes/no) based on whether a student received a grade of C or higher (70 percent or higher in the local grading system).

Choice of career academy. Selection of one of seven career academies Natural Resources–Agriculture, Health and Human Services–Health Pathway, Business Information, Industrial Engineering–Automotive Technology, Industrial Engineering–Construction Technology, Health and Human Services–Tourism and Hospitality, and Liberal Arts (college preparatory). Students at Palau High School are required to enroll in a career academy during grades 11 and 12.

Other student characteristics

Gender. The student’s gender (based on data provided by Palau High School).

College cohort. The cohort when a student first enrolled in Palau Community College (fall 2013, fall 2014, or fall 2015).

Analytical term

Predicted probability. The predicted probability (in percentages) of an outcome occurring for a given value of a predictor, with all other predictors held constant. For example, students in this study who have a high school grade point average of 4.0 are predicted to have an 87 percent average probability of earning a grade point average of 2.0 or higher in their first year of college, with other high school academic preparation variables and student characteristics held constant. (See appendix B for how the predicted probabilities were calculated.)

Note

1. A grade of D or higher is a passing grade at Palau High School.

Box 2. Data sources, sample, and methods

Data sources. The study findings are based on student-level data provided by the Palau Ministry of Education and Palau Community College. The Palau Ministry of Education provided high school course transcripts and data on student demographic characteristics, course enrollment, and graduation. Palau Community College provided college enrollment data for Palau High School graduates who enrolled in the college (see appendix B for more information on data sources).

The study team linked the data across the two institutions to examine which Palau High School academic preparation variables were predictive of success at Palau Community College. Whether students graduated from Palau High School between spring 2013 and spring 2015 and enrolled in Palau Community College was determined using high school graduation data and subsequent college enrollment data. Community college success outcomes were reported directly by Palau Community College. Completion of an associate degree or certificate within three years was determined using college transcript information.

Sample. The main analysis included 234 Palau High School graduates (spring 2013 through spring 2015) who enrolled as first-time students at Palau Community College in the fall semester following their high school graduation. Supplementary analyses in appendix C include all Palau High School graduates, including those who did not enroll in Palau Community College, to determine whether they differed significantly from each other.¹

Methods. Logistic regression was used to identify the high school academic preparation variables that were statistically significant predictors of the three community college success outcomes, after other academic preparation variables and student characteristics (gender and college cohort) were controlled for. Predicted probabilities were then calculated from the logistic regression models. More details on the methods and the results of the logistic regression analyses are in appendixes B and C.

Note

1. The only statistically significant difference between students who enrolled in Palau Community College and those who did not is that enrollees were more likely to have earned a grade of C or higher in English IV at Palau High School.

Findings

This section contains the findings related to each of the research questions. Additional results are in appendixes C and D.

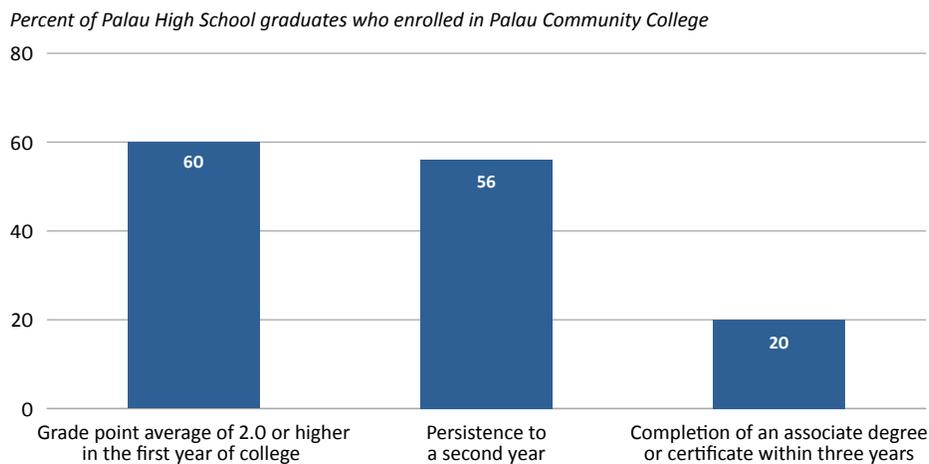
More than half of Palau High School graduates who enrolled in Palau Community College earned a grade point average of 2.0 or higher in their first year and persisted to a second year, but less than 20 percent completed an associate degree or certificate within three years

About 60 percent of Palau High School graduates who enrolled in Palau Community College earned a grade point average of 2.0 or higher in their first year, and 56 percent persisted to a second year (figure 1). Less than 20 percent completed an associate degree or certificate within three years of their date of first enrollment.

Early college success did not always translate into later college success

Among students who earned a grade point average of 2.0 or higher in their first year at Palau Community College, 78 percent persisted to a second year. Of students who persisted, 39 percent completed an associate degree or certificate within three years. Put differently, less than one-third of students with a grade point average of 2.0 or higher in their first year completed an associate degree or certificate within three years. Students with a grade

Figure 1. More than half of Palau High School graduates who enrolled in Palau Community College in spring 2013 through spring 2015 earned a grade point average of 2.0 or higher in their first year and persisted to a second year, but less than 20 percent earned an associate degree or certificate within three years



Note: *n* = 234. The sample included Palau High School graduates in spring 2013 through spring 2015 who enrolled in Palau Community College in the following fall.

Source: Authors' analyses of data from the Palau Ministry of Education and Palau Community College.

point average below 2.0 were even less likely to persist to a second year (23 percent) or to complete an associate degree or certificate within three years (14 percent).

High school grade point average positively predicted whether Palau High School graduates earned a grade point average of 2.0 or higher in their first year at Palau Community College and whether they completed an associate degree or certificate within three years

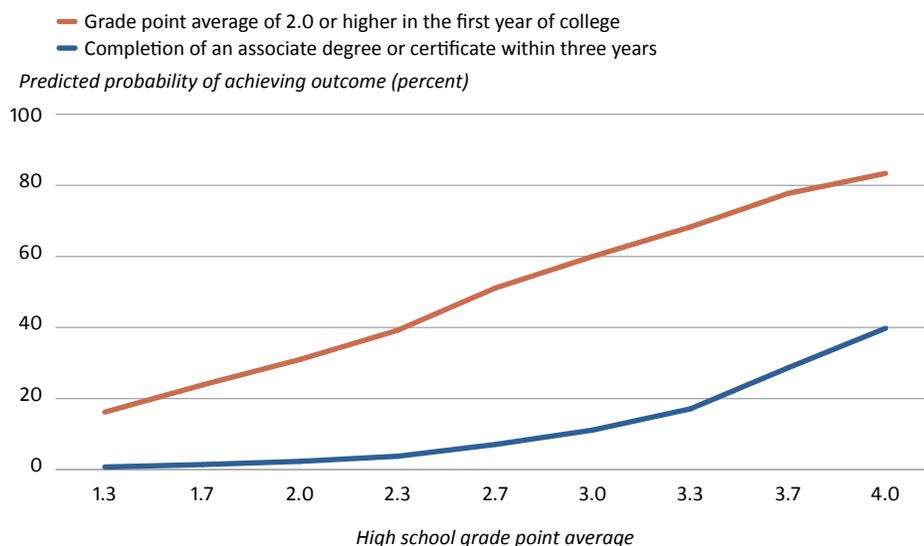
Palau High School graduates with higher high school grade point averages had a higher probability of earning a grade point average of 2.0 or higher in their first year of college and were more likely to complete an associate degree or certificate within three years, after other academic preparation variables and student characteristics were controlled for (figure 2; see also tables C3 and C5 in appendix C).

The probability of completing an associate degree or a certificate within three years increased with high school grade point average but was nonetheless low for all high school graduates (see figure 2). For example, graduates with a high school grade point average of 2.0 had a 2 percent probability of completing an associate degree or certificate. The probability increased to 11 percent for graduates with a 3.0 high school grade point average and to 40 percent for graduates with a 4.0 high school grade point average. High school grade point average was not a statistically significant predictor of persistence to a second year at Palau Community College (see table C4 in appendix C).

Math scores on the grade 12 Palau Achievement Test positively predicted whether Palau High School graduates earned a grade point average of 2.0 or higher in their first year at Palau Community College

Palau High School graduates with higher math scores on the grade 12 Palau Achievement Test were more likely to earn a grade point average of 2.0 or higher in their first year at Palau Community College (figure 3). Graduates with

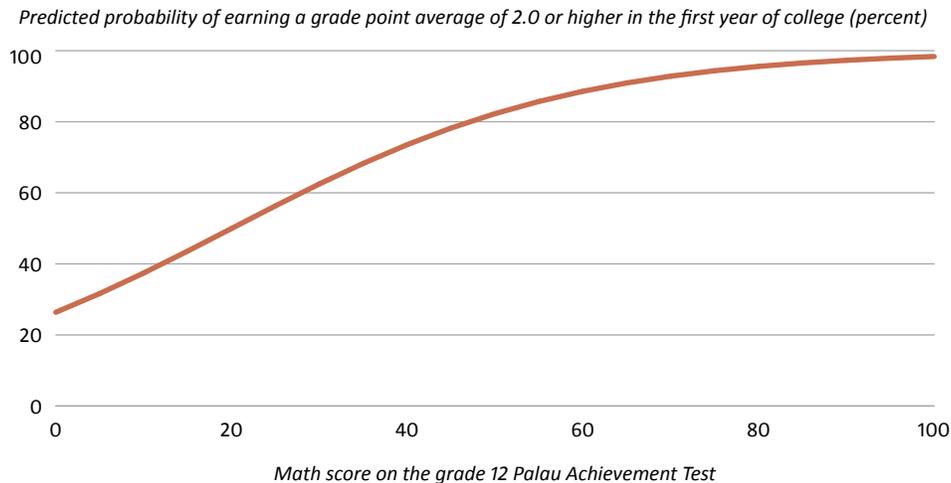
Figure 2. Palau High School graduates’ high school grade point average was a significant predictor of earning a grade point average of 2.0 or higher in the first year at Palau Community College and of completing an associate degree or certificate within three years



Note: $n = 234$. The sample included Palau High School graduates in spring 2013 through spring 2015 who enrolled in Palau Community College in the following fall. Probabilities (in percentages) are estimated from logistic regression models (see appendix C for details). These probability values may differ from the range of observed values but are included to depict a wider range of possible values. The results of the logistic regression models indicate that high school grade point average was a statistically significant ($p < .05$) predictor of the two outcomes displayed in the figure after other high school academic preparation and student characteristic variables were controlled for. See tables C3, C5, and C7 in appendix C for detailed regression results.

Source: Authors’ analyses of data from the Palau Ministry of Education and Palau Community College.

Figure 3. Palau High School graduates' math score on the grade 12 Palau Achievement Test was a significant predictor of earning a grade point average of 2.0 or higher in the first year at Palau Community College



Note: $n = 234$. The sample included Palau High School graduates in spring 2013 through spring 2015 who enrolled in Palau Community College in the following fall. Probabilities (in percentages) are estimated from logistic regression models (see appendix C for details). These probability values may differ from the range of observed values but are included to depict a wider range of possible values. The results of the logistic regression models indicate that math score on the grade 12 Palau Achievement Test was a statistically significant ($p < .05$) predictor of earning a grade point average of 2.0 or higher in the first year of college, after other high school academic preparation and student characteristic variables were controlled for. See tables C3 and C7 in appendix C for detailed regression results.

Source: Authors' analyses of data from the Palau Ministry of Education and Palau Community College.

a math score of 30 (approximately the average score for all graduates) had a 62 percent probability of earning a grade point average of 2.0 or higher compared with 89 percent for graduates with a math score of 60 (the highest score recorded in the dataset).

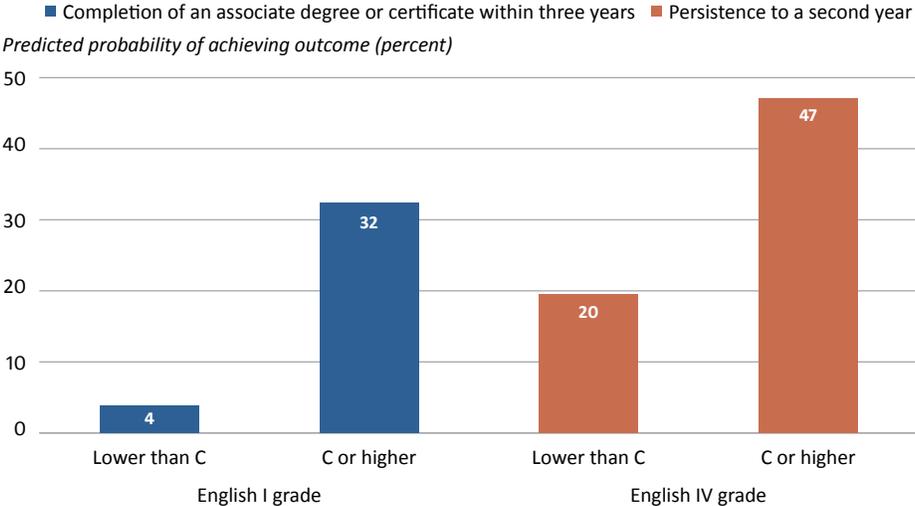
English language arts scores on the grade 12 Palau Achievement Test were not a statistically significant predictor of earning a grade point average of 2.0 or higher in the first year of college (see table C3 in appendix C). Neither the math nor the English scores predicted persistence to a second year of college or completion of an associate degree or certificate within three years (see tables C4 and C5).

Palau High School graduates who earned a grade of C or higher in English I were more likely to complete an associate degree or certificate within three years at Palau Community College, and graduates who earned a grade of C or higher in English IV were more likely to persist to a second year

Palau High School graduates who earned a grade of C or higher in English I had a 32 percent probability of completing an associate degree or certificate within three years at Palau Community College compared with 4 percent for graduates who earned a grade lower than C (figure 4). In addition, graduates who earned a grade of C or higher in English IV had a 47 percent probability of persisting to a second year at Palau Community College compared with 20 percent for graduates who earned a grade lower than C in English IV.

High school English language arts course grades were not a statistically significant predictor of earning a grade point average of 2.0 or higher in the first year of college (see table C3 in appendix C).

Figure 4. Palau High School graduates who earned a C or higher in English I were more likely to complete an associate degree or certificate at Palau Community College within three years, and graduates who earned a C or higher in English IV were more likely to persist to a second year



Note: $n = 234$. The sample included Palau High School graduates in spring 2013 through spring 2015 who enrolled in Palau Community College in the following fall. Probabilities (in percentages) are estimated from logistic regression models (see appendix C for details). The values for a grade of C or higher for each English language arts course also included students who did not enroll in the course. Results are statistically significant at $p < .05$. See tables C4, C5, and C7 for detailed regression results.

Source: Authors’ analyses of data from the Palau Ministry of Education and Palau Community College.

Palau High School math course grades were not statistically significant predictors of Palau Community College success outcomes

Grades in high school math courses were not statistically significant predictors of any of the three community college success outcomes (see tables C3–C5 in appendix C).

Palau High School graduates in the Construction Technology Career Academy were less likely than graduates in the other career academies to achieve two of the community college success outcomes

Palau High School graduates who had enrolled in the Construction Technology Career Academy had a 15 percent probability of persisting to a second year at Palau Community College and a 3 percent probability of completing an associate degree or certificate within three years, the lowest of all career academies. Enrollment in any of the other six career academies was not a statistically significant predictor of these two community college success outcomes (see tables C4 and C5 in appendix C).

Enrollment in any of the career academies was not a statistically significant predictor of earning a grade point average of 2.0 or higher in the first year of college (see table C3 in appendix C).

Limitations

The study had four main limitations. First, the study was correlational, so causal inferences should not be drawn from the results. While the study found that variables such as math scores on the grade 12 Palau Achievement Test and performance in high school courses showed patterns related to community college outcomes, it should

not be inferred that other Palau High School graduates with these characteristics will be more successful at Palau Community College.¹

Second, Palau has only one public high school, Palau High School, which graduates an average of 130 students a year, and only one public postsecondary institution, Palau Community College. Among Palau High School graduates for which study data were available, approximately 61 percent enrolled in Palau Community College. Between fall 2013 and fall 2015 Palau Community College had 580 first-time students (U.S. Department of Education, 2018). This study examined outcomes for 39 percent of Palau Community College's first-time students during the same period. The small number of students included in the study reduces the likelihood of accurately predicting outcomes.

In addition, the study did not examine the outcomes for Palau High School graduates who did not enroll in Palau Community College. It is possible that those high school graduates were employed or that they had enrolled in colleges abroad, such as the College of Micronesia–Federated States of Micronesia, the University of Guam, Guam Community College, and the University of Hawaii. Similarly, Palau High School graduates who had completed the Construction Technology Career Academy and who dropped out of Palau Community College before completing their degree might have gotten a job aligned with their construction training. Given these possibilities, the Palau Ministry of Education might want to conduct other studies to better understand whether Palau High School graduates are experiencing postsecondary success unrelated to Palau Community College enrollment.

Finally, the generalizability of the study results is limited. The results apply only to the students who graduated from Palau High School between spring 2013 and spring 2015 and enrolled in Palau Community College in the fall semester following their high school graduation. In 2015 approximately 38 percent of secondary students in Palau were enrolled in private high schools, and data on these students were not available for the study. Additionally, this study examined only high school variables as predictive of early college success. Students might have other education experiences or supplemental supports in the community that might correlate with college success that this study did not account for.

Implications

This is the first study examining the association between high school academic preparation variables and early college success and college completion for Palau High School graduates who attended Palau Community College. Stakeholders in Palau could use the findings of this study to identify students who might not be prepared for college when they graduate from high school. Identifying clear predictors of early college success and college completion can help turn college aspirations into college success by enabling educators to assess where students currently stand, track their progress, and provide supports as soon as risk factors emerge.

Examine supports available for English language learning at Palau High School

Because Palau High School graduates' grade in English I (in grade 9) was a significant predictor of Palau Community College completion and their grade in English IV (in grade 12) was a significant predictor of college persistence, the Palau Ministry of Education might want to review the supports available to help students succeed in English language arts courses in high school. Because English is a second language for many students at Palau High School, they might need additional supports to help them succeed academically (United Nations Educational, Scientific and Cultural Organization, 2016). Because students' second language abilities develop from their first language abilities (García, 2009; May 2014), the Palau Ministry of Education might consider providing more materials and instruction in all grade levels, including high school, in Palauan, the home language of 88 percent of students (Palau Office of Planning and Statistics, 2015).

1. The grade point average measure might capture grades in courses other than English language arts and math. Summary grade point average measures for English language arts and math courses might have shown different results than those reported.

Provide additional supports for students in college

Palau High School graduates with lower high school grade point averages and math scores on the grade 12 Palau Achievement Test were less likely than their peers to succeed in college. Palau Community College might consider providing such students with additional services to support their transition to college, such as academic and career counseling services or summer bridge programs. These services are intended to support students in understanding their college readiness, identifying appropriate courses, and building learning skills conducive to coursework completion. College and career counseling services and summer bridge programs are associated with increased student persistence and graduation from college (Murphy et al., 2010; Turner & Berry, 2000). Moreover, as only 20 percent of Palau High School graduates who enroll in Palau Community College complete a degree or certificate within three years, the college might consider expanding these services to all incoming first-time students.

Investigate factors that Palau Community College can control to help their students succeed

This study found that achievement of community college success outcomes was low for most Palau High School graduates. Investigating the college-level factors, such as course sequencing or academic counseling services, that contribute to college success is crucial for understanding how to support students in completing their college degree or certificate. Palau Community College might want to consider future studies that examine the association between college-level factors and community college success outcomes.

Review the alignment between the Palau High School Construction Technology career academy and the needs of students planning to attend college

High school graduates enrolled in the Construction Technology Career Academy were less likely than their peers who enrolled in the other career academies to persist to a second year of college or complete an associate degree or certificate within three years. One possibility is that these students decided not to continue into their second year or earn a degree from Palau Community College because they had learned work skills that helped them get a job. A future study could investigate this possibility.

It also is possible that courses in the Palau High School Construction Technology Career Academy are not aligned with courses at Palau Community College and that students in that career academy might have greater difficulty with Palau Community College courses. Given the joint focus of the Palau Ministry of Education and Palau Community College on improving students' success in high school and college, Palau's education leaders might want to review the courses in the Construction Technology Career Academy to determine whether they need to be adjusted to better prepare students for courses at Palau Community College. Stronger alignment between courses might better prepare graduates of Palau High School's Construction Technology Career Academy to succeed in college coursework and, therefore, to continue to the second year and graduate with an associate degree or certificate from Palau Community College.

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REL 2021–059

February 2021

This report was prepared for the Institute of Education Sciences (IES) under Contract ED-IES-17-C-0010 by the Regional Educational Laboratory Pacific administered by McREL International. The content of the publication does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

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Rentz, B., Holquist, S. E., Arens, S. A., Stuit, D., Rhinesmith, E., Nicotera, A., & Plotz, M. (2021). *Using high school data to predict college success in Palau* (REL 2021–059). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Pacific. Retrieved from <http://ies.ed.gov/ncee/edlabs>.

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