Examining the COVID-19 Pandemic's Impacts on Native American Students' College and Career Readiness

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Executive Summary

The research summarized in this paper examines the effects of the COVID-19 pandemic on student performance on the ACT® test, focusing on students who are Native American. We compare outcomes during the three years preceding the pandemic (2018, 2019, and early 2020) to outcomes in 2021 and 2022 while accounting for changes in the tested population across years. We also compare college and career planning behaviors for students who are Native American relative to students from other racial and ethnic groups. The study's major findings include the following:

1. **Native American high school students were more likely to learn online.**
    - During the 2020–2021 school year, 10th-grade students who are Native American were more likely to learn online compared to students who are White but were less likely to learn online compared to students who are African American, Asian American, Hispanic, Native Hawaiian, or two or more races.
    - During the 2021–2022 school year, most 11th-grade students who are Native American returned to in-person learning. However, compared to students from all other racial/ethnic groups, students who are Native American were more likely to remain learning online.
2. **Significant ACT score declines were observed for students who are Native American.**
    - Native American ACT Composite scores declined by 0.45 score points for students in the 2021 cohort and declined by 0.58 score points for those in the 2022 cohort.
    - While Native American scores declined slightly from 2021 to 2022, scores for other racial/ethnic groups improved slightly. The continued decline for students who are Native American was most severe for math.
    - The decline in Composite scores for Native American students in the 2022 cohort is comparable to losing three months of instruction. In math, the decline is comparable to having 3% fewer students ready for college algebra.

3. **College and career planning behaviors were mostly similar for students who are Native American and students from other racial/ethnic groups.**

    - Students who are Native American are very similar to students from other groups in terms of how well their personal interests match the environment of their planned college major.

    - Relative to students from other racial/ethnic groups, students who are Native American are slightly less likely to send their ACT scores to prospective colleges.

    - Students who are Native American are slightly more likely to plan careers in the visual and performing arts; repair, production, and construction; and community, family, and personal services. Students who are Native American are slightly less likely to plan on careers in the health sciences, business, and education.

Introduction

The COVID-19 pandemic caused widespread disruptions to the educational system in the United States and across the world. At the onset of the pandemic in March 2020, schools were forced to replace on-site instruction with virtual instruction. During the 2020–2021 academic year, many students learned online or under hybrid learning formats. While the 2021–2022 academic year saw a return to traditional modes of classroom instruction with most students returning to on-site instruction, concerns about the pandemic's negative effects persist.

ACT enjoys an established partnership with the Tribal Education Departments National Assembly (TEDNA), and together they have collaborated on myriad projects to advance college and career readiness and increase access to choices in education among Native youth throughout the nation. This research represents the positive outcome of yet another TEDNA-ACT collaborative effort to increase our understanding of factors affecting the education and college and career readiness of Native youth and their families. This study, in particular, embraces the opportunity to engage a rigorous research methodology to determine and promote evidence-based practices that improve Native American education experiences and outcomes.

Dr. Michael Pavel, Tuwaduq Cultural and Research Institute

Many states and districts across the United States administer the ACT test to their 11th-grade student body during the school day. Using ACT test scores and other data collected from administering the ACT test, we address the following research questions:

1. Relative to students in other racial/ethnic groups, were Native American students more likely to participate in online/virtual instruction during the pandemic?

2. How was Native American students' college readiness, as measured by ACT test scores, impacted by the COVID-19 pandemic?

3. How do Native American students' college and career planning behaviors differ from those of students from other racial/ethnic groups? (We will examine college score sending, interest-major fit, and occupational plans).

Methods

Sample

We used ACT data from spring school-day testing programs for 11th-grade cohorts of 2018 through 2022. For each cohort, schools were included in the sample if they tested at least 75% of their 11th-grade student body. This ensures that the ACT data are more likely to be representative of the school population. Only schools that met the 75% threshold for at least one pre-pandemic cohort (2018, 2019, or 2020) and one pandemic cohort (2021 or 2022) were included. For the 2020 cohort, the ACT school-day tests occurred in February and early March, prior to school closures.

Table 1 provides the number of students for each cohort included in the analysis of ACT Composite scores. Students are grouped by gender, race/ethnicity, school type (public or private), and school locale (rural, town, suburb, or urban). The study included 123,108 students who are Native American: 71,106 tested prior to the pandemic and 52,002 tested during the pandemic.

Table 1. Sample Size, by Cohort Year and Student and School Group

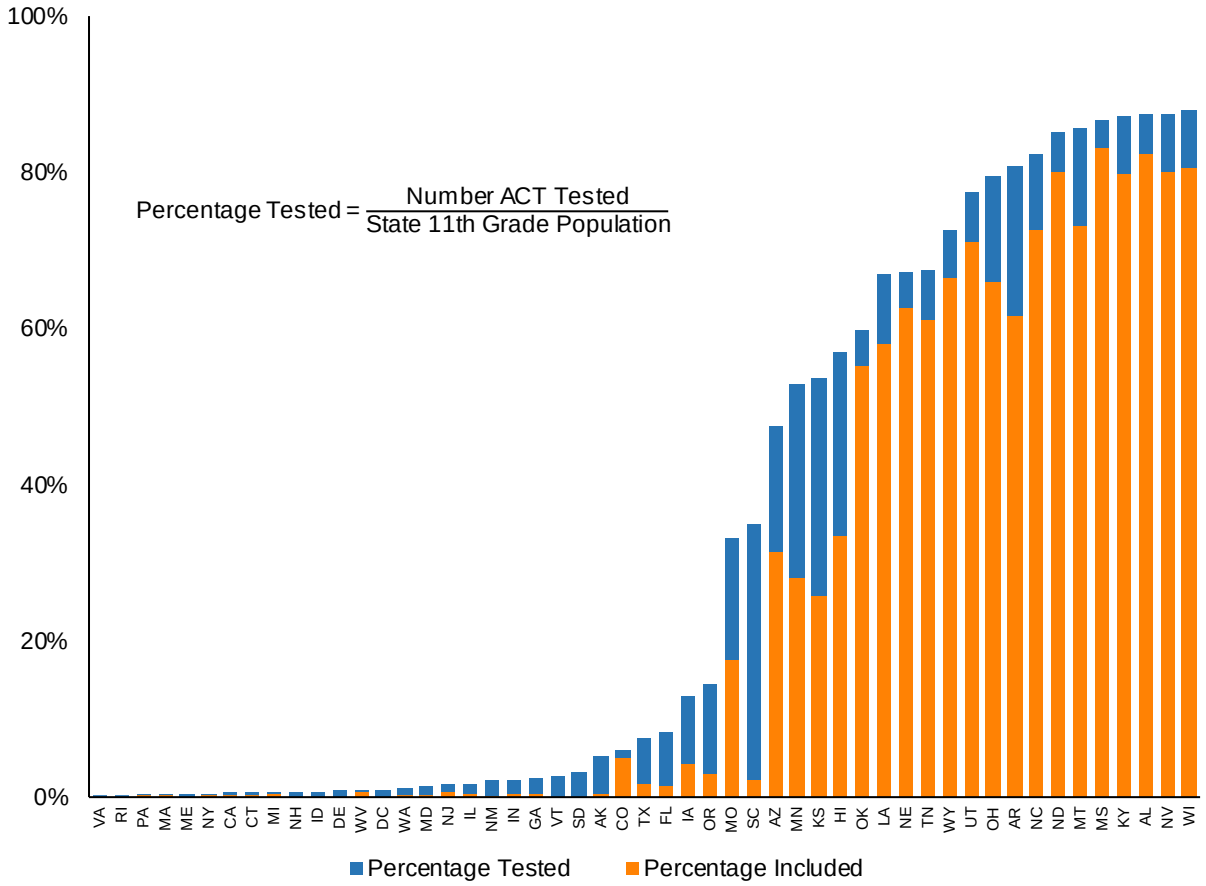
Group	11th-grade cohort year				
	2018	2019	2020	2021	2022
Total	756,344	767,256	491,747	654,376	725,241
Gender					
Female	376,740	383,634	244,146	325,364	359,029
Male	379,604	383,622	247,601	329,012	366,212
Race/ethnicity					
African American	104,157	105,118	64,944	78,728	95,183
Asian American	22,808	23,833	16,450	18,864	24,193
Hispanic	104,138	109,357	66,502	89,542	109,836
Native American	**27,982**	**28,759**	**14,365**	**24,010**	**27,992**
Native Hawaiian/OPI	2,591	2,687	1,841	1,703	2,640
Two or more races	25,972	26,583	18,327	26,175	28,626
White	468,696	470,919	309,318	415,354	436,771
School type					
Public	726,036	736,314	471,700	623,775	695,234
Private	30,308	30,888	19,977	30,431	29,636
School locale					
Rural	167,093	169,769	114,971	155,547	156,291
Town	123,320	125,285	77,604	113,986	116,105
Suburb	227,407	226,973	153,674	195,809	220,222
Urban	193,306	199,783	116,730	149,572	191,205

Note. OPI = other Pacific Islander.

Overall, the sample was 50% female and 50% male; 13% African American, 3% Asian American, 14% Hispanic, 4% Native American, <1% Native Hawaiian or other Pacific Islander, 4% two or more races, and 62% White. The sample was 96% from public and 4% from private schools; 22% of the schools were in rural areas, 16% in town settings, 30% in suburban settings, and 25% in urban settings (school locale was missing for 6% of the sample).

Across the five cohorts, over 4.4 million students took the ACT test, and nearly 3.4 million (76%) were enrolled at one of the 5,983 high schools that met the inclusion criteria. Figure 1 provides the percentage of each state's 11th-grade population that took the ACT test across the five cohorts, as well as the percentage that met the inclusion criteria. Schools from 42 states met the inclusion criteria.

Figure 1. Percentage Tested and Included, by State



Data

The ACT test includes four multiple-choice sections—English, math, reading, and science—as well as an optional writing test. Some states and districts administer the ACT during the school day through the ACT State and District testing programs. ACT scores are traditionally used for college entrance (e.g., admissions, scholarships, placement) and are also used for state and federal accountability and program evaluation. The ACT test is usually administered to students

in 11th grade but may also be administered in 10th and 12th grades. More detailed information about the test is provided in the *ACT Technical Manual* (ACT, 2020).

Racial/Ethnic Categories

ACT collects student race/ethnicity data in two steps: (a) Students indicate if they are of Hispanic or Latino background; (b) Students select all racial groups to which they belong, with options of American Indian/Alaska Native, Asian, Black/African American, Native Hawaiian/other Pacific Islander, White, and prefer not to respond or none of these apply.

Following federal guidelines for reporting a single racial/ethnic category, ACT classifies students as Hispanic if they indicate they are of Hispanic ethnicity, regardless of which racial groups they identify with. Otherwise, we put students in the "two or more races" category if they are not Hispanic and selected two or more of the race options. If neither of the first two conditions were true, we put students who selected one of the race options in that racial group. Therefore, under ACT's standard classification scheme, students are classified as Native American if they selected American Indian/Alaska Native, are not of Hispanic/Latino ethnicity, and selected no other racial group. However, because this paper focuses on Native American students, we used an alternative classification system where we classified students as Native American if they selected American Indian/Alaska Native, regardless of their ethnicity and regardless of any other races they selected. For students not classified as Native American, we followed the standard classification method. Race/ethnicity data were available for 88% of the sample. For the remainder, race/ethnicity was imputed on the basis of a student's school percentage in each racial/ethnic group.

School Characteristics

For each public school in the sample, data were obtained from the National Center for Education Statistics Common Core of Data (*https://nces.ed.gov/ccd/files.asp*), including 11th-grade class size, percentage of students eligible for free or reduced lunch, percentage of students who are Native American, percentage of students who are African American, and percentage of students who are Hispanic. For each private school in the sample, 11th-grade class size was estimated from the school's total enrollment obtained from a MDR school-level data set (*https://mdreducation.com/*). For both public and private schools, school locale (rural, town, suburb, or urban) was also obtained from the MDR data.

For each high school and each cohort year, percent tested was calculated as the number of 11th-grade students who took the ACT test divided by 11th-grade class size. Percent tested was used to determine whether each school met the 75% threshold, and it was also used for sample weighting and as a covariate in the statistical analysis (described later) to account for differences across cohorts in percent tested. Similarly, for each student, the number of days between September 1 and the ACT test date was also used for sample weighting and as a covariate in the statistical analysis to account for any differences in time spent in school prior to the ACT test.

Mode of Learning Data

For students in the 2022 cohort, additional data were collected from students on their mode of learning during the school years 2020–2021 (their 10th-grade year) and 2021–2022 (their 11th-grade year). On the ACT student questionnaire administered on the MyACT platform, students were asked two questions:

1. This school year, are you attending school online, in person (at school), or a mix of the two (hybrid)?

2. Last school year, did you attend school online, in person (at school), or a mix of the two (hybrid)?

Students were given the following response options: online only, mostly online, about the same online and in-person, mostly in person, and in person only. Students were not required to respond to the questions, and in some states, the questions were not included on the ACT student questionnaire. Therefore, the mode of learning data is not available for the entire sample. Of the students in the 2022 cohort who were enrolled at schools meeting the inclusion criteria, 43.7% provided responses to the mode of learning questions, 24.3% did not provide responses, and 32.0% were from states that did not include the questions on the ACT student questionnaire.

The mode of learning data is used to address Research Question 1—**Relative to students in other racial/ethnic groups, were Native American students more likely to participate in online/virtual instruction during the pandemic?**

College and Career Planning Data

As part of the ACT testing experience, students have the option to complete the ACT Interest Inventory and a questionnaire about their college and career plans. Holland's theory of vocational choices (1997) proposed there are six work environments that correspond to six personality types: realistic, investigative, artistic, social, enterprising, and conventional. The ACT Interest Inventory (ACT, 2009) is a 72-item instrument that measures the six dimensions corresponding to Holland's personality types. Each item describes an activity (e.g., "Explore a science museum"), and students are asked to indicate if they like, dislike, or are indifferent to doing the activity. Table 2 provides the names and descriptions of the six scales, and the items are available online (ACT, 2009, p. 53).

Using the interest inventory scale scores, students' planned college major, and Holland-type profile for each college major, we calculated a measure of **interest-major fit**, based on the correlation of the students' interest inventory scores and the interest profile of their planned major. Interest-major fit scores range from 0 (lowest possible fit) to 99 (highest possible fit), and scores of 80 and higher are classified as high.

Table 2. ACT Interest Inventory Scales

ACT Interest Inventory scale (corresponding Holland type)	Description (ACT, 2009, p. 3)
Science & technology (Investigative)	Investigating and attempting to understand phenomena in the natural sciences through reading, research, and discussion
Arts (Artistic)	Expressing oneself through activities such as painting, designing, singing, dancing, and writing; artistic appreciation of such activities (e.g., listening to music, reading literature)
Social service (Social)	Helping, enlightening, or serving others through activities such as teaching, counseling, working in service-oriented organizations, and engaging in social/political studies
Administration & sales (Enterprising)	Persuading, influencing, directing, or motivating others through activities such as sales, supervision, and aspects of business management
Business operations (Conventional)	Developing and/or maintaining accurate and orderly files, records, accounts, etc.; following systematic procedures for performing business activities
Technical (Realistic)	Working with tools, instruments, and mechanical or electrical equipment: Activities include building, repairing machinery, and raising crops/animals.

We also examined whether students sent their ACT scores to colleges and the students' planned occupations. As part of ACT school-day testing programs, students may send their ACT scores to up to four colleges or scholarship agencies at no additional charge. We examined the number of scores sent (0–4), as well as whether at least one score was sent and whether all four scores were sent. Students were asked to provide their planned occupation, choosing from a list of 294 possible occupations that can be grouped into 18 occupational categories.

The measure of interest-major fit, score-sending data, and occupational plans were used to address Research Question 3—**How do Native American students' college and career planning behaviors differ from those of students from other racial/ethnic groups?** Because the method for collecting college and career planning data changed in 2021, it is difficult to attribute the differences across years to the pandemic. Therefore, instead of testing for pandemic effects on college and career planning behaviors, we made comparisons across racial/ethnic groups.

Statistical Models for Analysis of ACT Test Scores

To address Research Question 2—**How was Native American students' college readiness, as measured by ACT test scores, impacted by the COVID-19 pandemic?**—analysis of ACT test scores was conducted for each section (English, mathematics, reading, and science), as well as for the Composite score.

We fit weighted hierarchical linear regression models in order to estimate the adjusted difference in average test scores across years for each section test and the Composite score. (Later, we describe the sample weighting procedure.) The models included a random intercept for the school effect and included student gender, race/ethnicity, number of days from September 1 to the ACT test date, and school percent tested as covariates. The general form of the regression model is test score = cohort group + covariates + school effect.

The model is a special case of an analysis of covariance (ANCOVA) model where cohort group (2018–2020, 2021, or 2022) is the categorical variable of interest. From the model, we estimated the COVID-19 impact for the 2021 cohort as $\mu_{2021} - \mu_{2018-2020}$ where μ_{Cohort} is the estimated adjusted mean ACT test score for the cohort. Similarly, we estimated the COVID-19 impact for the 2022 cohort as $\mu_{2022} - \mu_{2018-2020}$. Therefore, the COVID-19 impact is measured as the adjusted mean ACT score for each pandemic year relative to the average over the three most recent pre-pandemic years. We refer to the estimates of the COVID-19 impact as the **adjusted score difference**.

The hierarchical linear regression models were also used to estimate the adjusted score differences for different racial/ethnic groups, including African American, Asian American, Hispanic, Native American, Native Hawaiian/other Pacific Islander, White, and two or more races. Group-specific estimates were obtained by fitting the hierarchical linear regression model with interactions between the cohort (year) and the group indicator.

The adjusted score differences can be expressed using other metrics to help us understand the magnitude of the score declines:

- **Instructional months** expresses the score declines in terms of comparable number of months of schooling. A prior ACT research study (Allen et al., 2020) found that ACT test scores increase when students are in school by 0.218 Composite score points per month. The per-month increases for the section test scores are 0.310 (English), 0.193 (math), 0.182 (reading), and 0.186 (science). So, for example, an ACT Composite score decline of 0.60 points is comparable to 2.8 (0.60/0.218) fewer months of instruction.

- **College ready per 100** estimates how many fewer students (per 100) are ready for success in first-year credit-bearing college courses. Prior research by ACT has established the probability of earning B or higher grades in first-year college courses for each possible ACT score (Allen et al., 2017). To estimate how many fewer students are ready for success in first-year college courses, we transformed each ACT score to the probability of success associated with that score and then fit the same hierarchical linear

regression models described earlier. The estimates relate to the following college courses: English composition I (ACT English), college algebra (ACT math), social science courses (ACT reading), and biology (ACT science).

- ***d***, which equals the adjusted score difference divided by the standard deviation of the test score, represents the adjusted score difference. The *d* statistic is a common effect size measure used in many areas of research to describe the size of a difference with a standardized metric.

- **Percentile change** expresses the adjusted score differences on the percentile scale. For example, a percentile change of –4.0 suggests that average performance during the pandemic was 4 percentile score points below what it was before the pandemic.

Sample Weighting

As described earlier, mode of learning data were collected for some but not all students in the 2022 cohort. Weights were applied to the 2022 data to make the sample with mode of learning data available more comparable to the total sample. We used propensity score weighting (Austin, 2011) to weight each racial/ethnic group. The procedure used logistic regression to estimate each student's propensity for having mode of learning data on the basis of their gender, ACT Composite score, and school characteristics (percent in each racial/ethnic group, 11th-grade enrollment size, percent eligible for free or reduced lunch, and public/private status). Similarly, for the analysis of interest-major fit and occupational plans, data were not available for all students. Using the same general procedure, we applied weights to the data to make the samples comparable to the total sample.

To analyze ACT scores, we weighted the sample to ensure that the five cohorts were similar in terms of demographic characteristics, percent tested, and test date. We used propensity score weighting to weight each group to be similar to the pooled data set, which combines the data across the five cohorts. The procedure used logistic regression to estimate each student's propensity for being in each cohort based on gender, race/ethnicity, school percent tested, and number of days between September 1 and the ACT test date. Note that the variables used for weighting were also used as covariates in the hierarchical regression models. By weighting the sample and using covariates, we are more confident that differences in ACT scores across cohorts are not due to differences in the populations tested or when they tested.

Results

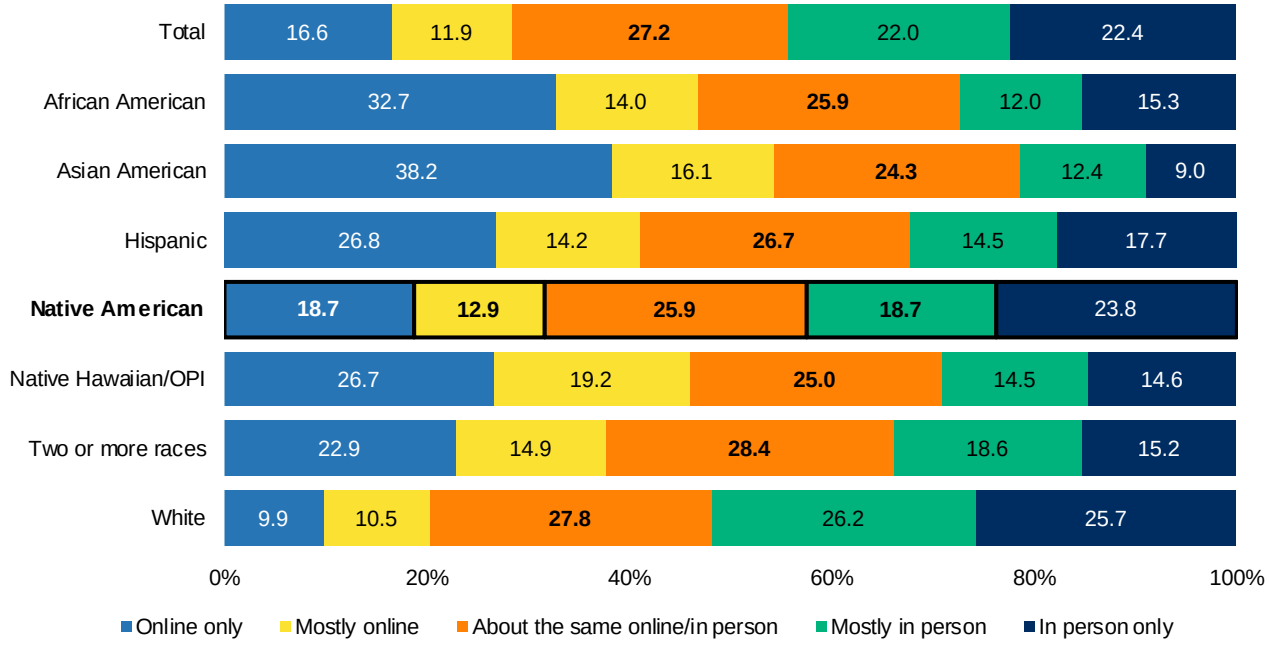
Mode of Learning

Of the 725,241 students in the 2022 cohort who attended schools meeting the inclusion criteria, 316,076 provided responses to the mode of learning questions, 232,497 students were from states that chose not to administer the mode of learning questions, and 176,668 students did not respond to the questions.

The relative frequencies of each mode of learning category are provided in Figure 2 for the 2020–2021 school year (when the students were in 10th grade) and in Figure 3 for the 2021–2022 school year (when the students were in 11th grade).

For the 2020–2021 school year, 17% of the sample learned exclusively online, 12% learned mostly online, 27% learned about the same amount online and in person, 22% learned mostly in person, and 22% learned in person only. The percentage who learned exclusively online varied dramatically across racial/ethnic groups, from 38% for students who are Asian American, 33% for students who are African American, and 10% for students who are White. Among the students who are Native American, 19% learned exclusively online, 13% learned mostly online, 26% learned about the same amount online and in person, 19% learned mostly in person, and 24% learned exclusively in person. Relative to students from some racial/ethnic groups (including African American, Asian American, Hispanic, Native Hawaiian/other Pacific Islander, and two or more races), students who are Native American were less likely to learn online. But relative to students who are White, students who are Native American were more likely to learn online.

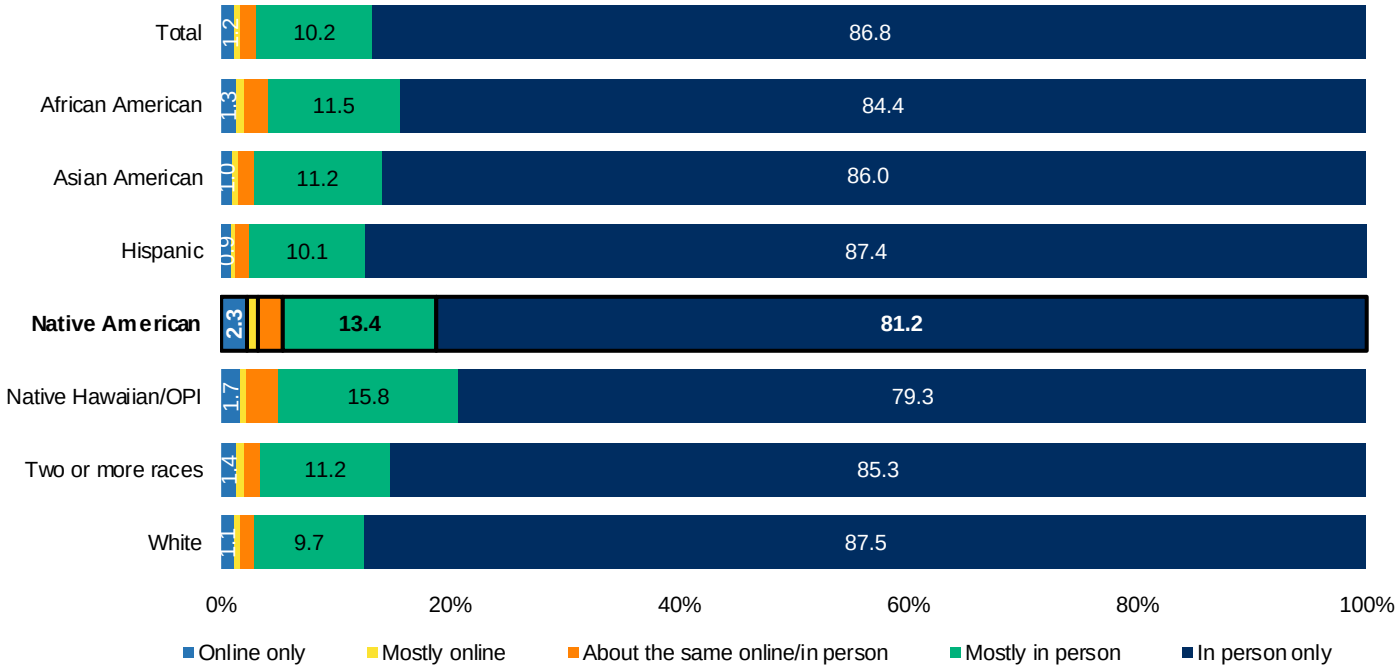
Figure 2. Percentage in Each Mode of Learning Category During 2020–2021 School Year for 2022 Cohort, by Race/Ethnicity



For the 2021–2022 school year, the overwhelming majority of students returned to in-person learning: 1.2% of the sample learned exclusively online, 0.5% learned mostly online, 1.3% learned about the same amount online and in person, 10% learned mostly in person, and 87% learned in person only. Students who are Native American were less likely to return to in-person schooling: Only 81% learned in person only, compared to 84% African American, 86% Asian American, 87% Hispanic, and 87.5% White students. During the 2021–2022 school year, 2.3%

of students who are Native American learned exclusively online, which was the highest percentage of the various racial/ethnic groups.

Figure 3. Percentage in Each Mode of Learning Category During 2021–2022 School Year for 2022 Cohort, by Race/Ethnicity



Note. Data labels are only shown for three categories: online only, mostly in person, and in person only.

Analysis of ACT Scores

Table 3 provides the estimated ACT Composite score declines for 2021 for each group. The table shows the average ACT Composite score for the pre-pandemic years (2018–2020), the average score for 2021, the raw difference, and the adjusted difference. The adjusted difference incorporates the sample weighting and hierarchical regression model and represents the estimate of the pandemic's effect on ACT test scores. Table 3 also includes the standard error of the adjusted score difference and the standardized effect size measure (*d*).

The decline in ACT Composite scores for 2021 was mostly consistent across the different groups, with all groups except Asian American students showing significant score declines. ACT Composite scores only declined by 0.04 points for students who are Asian American but declined by 0.45 score points for students who are Native American and by 0.66 score points for the total group. The score declines for students who are female (–0.68) was similar to those for students who are male (–0.63). The score declines were also similar for students attending private schools (–0.72) and those attending public schools (–0.66). The score declines were also consistent across different school locales.

Table 3. Average ACT Composite Score Changes for the 2021 Cohort, by Group

Group	Average Composite score					
	2018–2020	2021	Diff.	Adj. diff.	SE adj. diff.	*d*
Total	19.17	18.71	–0.46	–0.66	0.01	–0.12
Female	19.39	18.91	–0.48	–0.68	0.01	–0.13
Male	18.95	18.52	–0.43	–0.63	0.01	–0.12
African American	15.92	15.43	–0.49	–0.66	0.02	–0.13
Asian American	21.62	22.02	0.40	–0.04	0.04	–0.01
Hispanic	17.21	16.84	–0.38	–0.56	0.02	–0.11
Native American	**17.70**	**17.24**	**–0.46**	**–0.45**	**0.03**	**–0.08**
Native Hawaiian/OPI	16.46	16.15	–0.30	–0.57	0.11	–0.11
Two or more races	19.44	18.84	–0.60	–0.72	0.03	–0.14
White	20.28	19.68	–0.60	–0.71	0.01	–0.13
Public School	19.04	18.57	–0.47	–0.66	0.01	–0.12
Private School	22.38	21.73	–0.64	–0.72	0.03	–0.14
Rural	18.40	17.89	–0.51	–0.61	0.01	–0.12
Town	18.61	18.00	–0.61	–0.67	0.02	–0.13
Suburb	19.92	19.56	–0.36	–0.65	0.01	–0.12
Urban	19.34	19.02	–0.32	–0.69	0.01	–0.13

Note. Diff. = difference; Adj. = adjusted; SE = standard error; *d* = adjusted difference in standard deviation units; OPI = other Pacific Islander.

Table 4 reports the same results for the 2022 cohort. The decline in ACT Composite scores was similar for 2022 (–0.59) and 2021 (–0.66), suggesting that academic performance has not rebounded much for the 2022 cohort. The 2022 cohort suffered the same interruptions as the 2021 cohort, so this result is not surprising.

Relative to pre-pandemic scores, the score declines were least severe for students who are Asian American (–0.11). Similar to what was observed for the 2021 cohort, the ACT Composite score declines are similar across the other racial/ethnic groups. For the 2022 cohort, ACT Composite scores declined by 0.58 points for students who are Native American, a slight worsening of the decline observed for the 2021 cohort (–0.45). A slight gender difference persisted for the 2022 cohort, with scores dropping by 0.61 points for students who are female and by 0.57 points for students who are male. The public/private school difference was larger than for the 2022 cohort, with scores dropping by 0.58 points for students from public schools and by 0.79 points for students from private schools. Similar to what was observed for the 2021 cohort, the score declines were very consistent across different school locales.

Table 4. Average ACT Composite Score Changes for the 2022 Cohort, by Group

Group	Average Composite score					
	2018–2020	2022	Diff.	Adj. diff.	SE adj. diff.	*d*
Total	19.17	18.61	–0.56	–0.59	0.01	–0.11
Female	19.39	18.81	–0.58	–0.61	0.01	–0.11
Male	18.95	18.41	–0.54	–0.57	0.01	–0.11
African American	15.92	15.49	–0.43	–0.56	0.02	–0.11
Asian American	21.62	21.54	–0.08	–0.11	0.04	–0.02
Hispanic	17.21	16.55	–0.67	–0.64	0.02	–0.12
Native American	**17.70**	**17.08**	**–0.62**	**–0.58**	**0.03**	**–0.11**
Native Hawaiian/OPI	16.46	15.62	–0.84	–0.80	0.11	–0.15
Two or more races	19.44	18.89	–0.55	–0.56	0.03	–0.11
White	20.28	19.74	–0.54	–0.60	0.01	–0.11
Public School	19.04	18.48	–0.55	–0.58	0.01	–0.11
Private School	22.38	21.52	–0.86	–0.79	0.03	–0.15
Rural	18.40	17.97	–0.44	–0.56	0.01	–0.11
Town	18.61	18.05	–0.56	–0.61	0.02	–0.11
Suburb	19.92	19.34	–0.57	–0.56	0.01	–0.11
Urban	19.34	18.63	–0.71	–0.62	0.01	–0.12

Note: Diff. = difference; Adj. = adjusted; SE = standard error: *d* = adjusted difference in standard deviation units; OPI = other Pacific Islander.

Table 5 shows the results for each ACT section test score, in addition to the Composite score, for the Native American group. For math, the score decline for Native American students is considerably more severe for the 2022 cohort (–0.74) than it is for the 2021 cohort (–0.49). For English, reading, and science, the score declines are somewhat more severe for the 2022 cohort.

From Table 5, we find that the ACT score declines for Native American students in 2022 are comparable to receiving at least two fewer months of instruction. For math, the score declines are comparable to 2.6 fewer months of instruction for the 2021 cohort and 3.8 fewer months of instruction for the 2022 cohort.

Translated to the number of students who are ready for first-year college courses, the Native American group's score declines are comparable to between 1.1 (reading, 2021 cohort) and 2.7 (math, 2022 cohort) fewer students (per 100) who are college-ready. The Native American group's score declines corresponded to *d* statistics ranging from –0.07 to –0.15 and percentile changes ranging from –2.6 to –5.9.

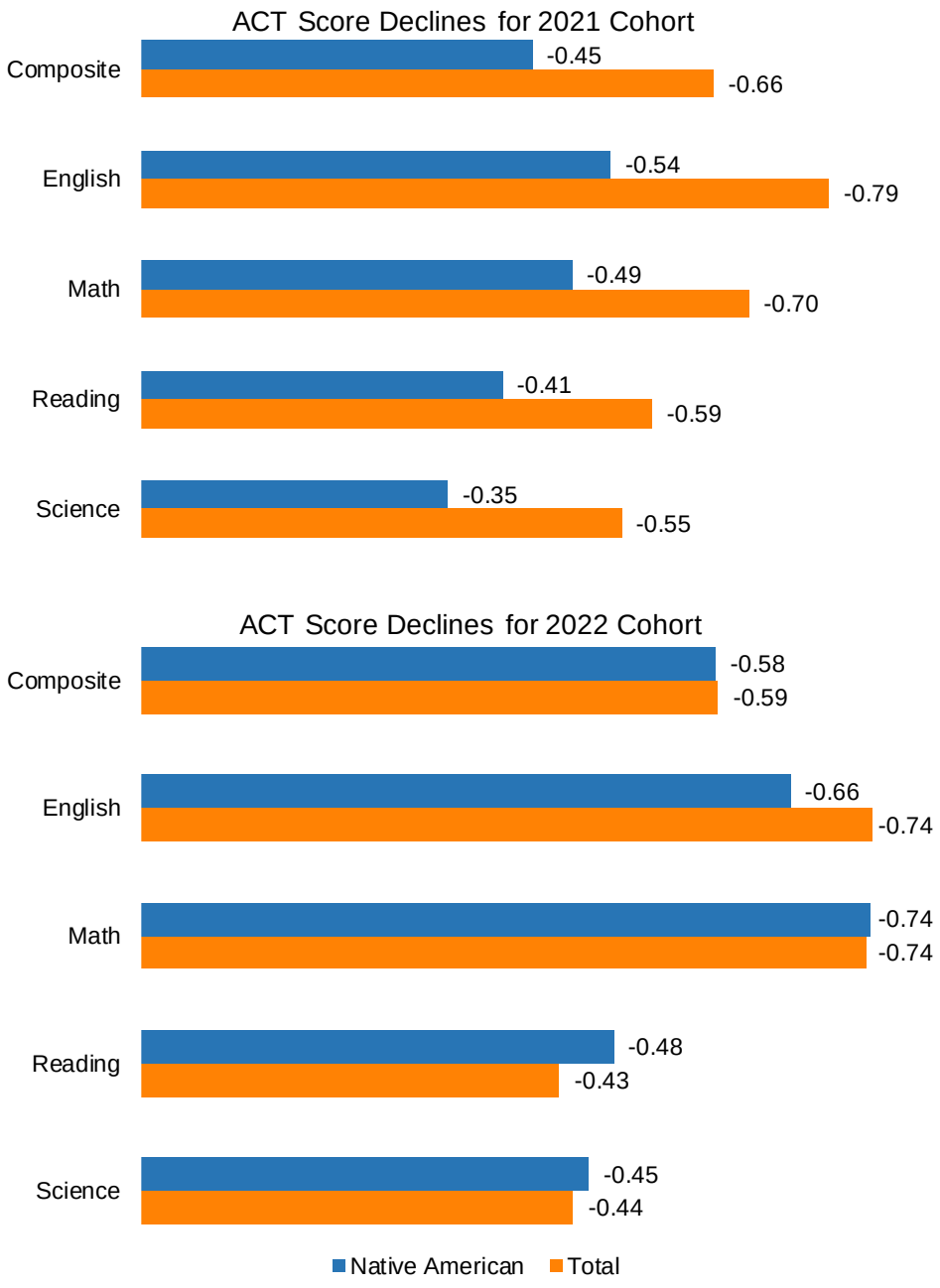
Table 5. Native American ACT Score Changes, by Cohort and Score

Cohort	Score	Adjusted difference		Instructional months	College ready per 100	*d*	Percentile change
		EST	SE				
2021	Composite	–0.45	0.03	–2.1	—	–0.08	–3.4
	English	–0.54	0.04	–1.7	–1.6	–0.08	–3.4
	Math	–0.49	0.03	–2.6	–1.9	–0.10	–3.9
	Reading	–0.41	0.04	–2.3	–1.1	–0.07	–2.6
	Science	–0.35	0.04	–1.9	–1.3	–0.07	–2.6
2022	Composite	–0.58	0.03	–2.7	—	–0.11	–4.4
	English	–0.66	0.04	–2.1	–2.0	–0.10	–4.1
	Math	–0.74	0.03	–3.8	–2.7	–0.15	–5.9
	Reading	–0.48	0.04	–2.6	–1.3	–0.08	–3.0
	Science	–0.45	0.03	–2.4	–1.6	–0.08	–3.4

Note. EST = estimate; SE = standard error; *d* = adjusted difference in standard deviation units.

Figure 4 shows how the Native American group's score declines compared to the total group's score declines for the 2021 and 2022 cohorts. For each subject area, the Native American group's score declines are less severe than the total group's score declines for the 2021 cohort. (Note that the total group includes students who are Native American). For the 2022 cohort, the Native American group's score declines are very similar to the total group's score declines.

Figure 4. Comparing the Native American and Total Groups' ACT Score Declines



College and Career Planning Behaviors

Table 6 summarizes interest-major fit for students from different racial/ethnic groups, combining data across the five cohorts. Because students are not required to complete the ACT Interest Inventory or to provide their planned college major, the samples for this analysis are much smaller than the samples for the analysis of ACT test scores.

The average interest-major fit score varied across racial/ethnic groups, ranging from 60.6 for students who are African American to 68.9 for students who are Asian American. For students who are Native American, the average score was 66.0, which was close to the average score for the total group (66.8). Among students who are Native American, 34% had high fit, indicating a strong correlation between their personal interests and the interest profile of their planned college major. The percentage of students with high interest-major fit ranged from 25% for students who are African American to 39% for students who are Asian American.

Table 6. Interest-Major Fit, by Race/Ethnicity

Race/ethnicity	N	Average interest-major fit score	Percentage with "high" fit (%)
Total	674,261	66.8	35.2
African American	79,841	60.6	25.1
Asian	21,480	68.9	38.6
Hispanic	74,606	65.3	32.6
Native American	**25,831**	**66.0**	**34.2**
Native Hawaiian/OPI	2,161	62.3	26.9
Two or more races	22,617	66.4	34.5
White	447,725	68.2	37.5

Note. OPI = other Pacific Islander.

Relative to the total group, students who are Native American were less likely to send their ACT scores to colleges and scholarship organizations, though the differences were not large (Table 7). Across the five cohorts, students who are Native American sent 1.71 of their four possible scores, compared to 1.93 for the total group. For the total group, 59% sent at least one score and 38% sent all four scores, compared to 55% and 33% for students who are Native American. Across all racial/ethnic groups, students who are Hispanic were the least likely to send at least one score.

Table 7. College Score Sending, by Race/Ethnicity

Race/ethnicity	N	Average number of scores sent	Percentage sending at least 1 score (%)	Percentage sending all 4 scores (%)
Total	3,394,964	1.93	59.2	38.2
African American	448,130	1.93	57.6	39.6
Asian American	106,148	1.83	55.0	36.6
Hispanic	479,375	1.72	53.4	33.5
Native American	**123,108**	**1.71**	**54.8**	**32.7**
Native Hawaiian/OPI	11,462	1.74	54.4	34.4
Two or more races	125,683	1.82	54.7	36.7
White	2,101,058	2.00	61.6	39.6

Note. OPI = other Pacific Islander.

The ACT registration platform (MyACT) asks students to share their occupational plans, choosing one of 294 occupations or "undecided." The 294 occupations can be grouped as shown in Table 8. Because students are not required to provide their occupational plans, the sample size for examining occupational plans (n = 1,337,048 for the total group; n = 49,564 for the Native American group) is smaller than the total sample size shown in Table 1.

Generally, the percentage of students choosing each occupation group are similar for students who are Native American and students who are not Native American. The largest occupation group is undecided, with 19.1% of students who are Native American and 18.7% of students who are not Native American. The next largest group is health sciences and technology, with 16.3% of students who are Native American and 18.6% of students who are not Native American.

The occupation groups with the largest differences between Native American and non-Native American students include the visual and performing arts (+1.6%); repair, production, and construction (+0.9%); community, family, and personal services (+0.5%); education (–0.7%); business (–1.2%); and health sciences and technology (–2.3%).

Table 8. Occupational Plans, by Native American Status

Occupation group	Native American (%)	Not Native American (%)	Difference (%)
Agriculture & natural resource conservation	2.9	2.5	0.4
Architecture	1.5	1.4	0.1
Area, ethnic, & multidisciplinary studies	0.3	0.1	0.2
Arts: visual & performing	8.8	7.2	1.6
Business	8.0	9.2	–1.2
Communications	1.2	1.2	–0.1
Community, family, & personal services	4.7	4.2	0.5
Computer science & mathematics	2.7	3.2	–0.5
Education	4.3	4.9	–0.7
Engineering	7.3	7.5	–0.2
Engineering technology & drafting	2.3	2.0	0.3
English & foreign language	0.8	0.8	0.1
Health administration & assisting	4.5	4.0	0.5
Health sciences & technology	16.3	18.6	–2.3
Philosophy, religion, & theology	0.5	0.4	0.2
Repair, production, & construction	4.9	4.1	0.9
Sciences: biological & physical	3.7	3.8	–0.1
Social sciences & law	6.2	6.3	–0.1
Undecided	19.1	18.7	0.4

Discussion

Revisiting the Research Questions

Relative to students in other racial/ethnic groups, were Native American students more likely to participate in online/virtual instruction during the pandemic?

During the 2020–2021 school year, 10th-grade students in the study sample were nearly as likely to participate in online/virtual mode as they were to participate in person: 17% of the sample learned exclusively online, 12% learned mostly online, 27% learned about the same amount online and in person, 22% learned mostly in person, and 22% learned in person only. Relative to the total group, students who are Native American were more likely to participate in online/virtual modes of instruction, with 32% learning mostly or entirely online, compared to 28% for the total group.

Although most students returned to in-person instruction during the 2021–2022 school year, 3% of the Native American sample remained learning mostly or entirely online, higher than any

other racial/ethnic group. There may have been a greater hesitancy to return to in-person instruction for students who are Native American, which could be due, in part, to the higher COVID-19 fatality rate among the Native American population relative to the general population (Truman et al., 2022).

How was Native American students' college readiness, as measured by ACT test scores, impacted by the COVID-19 pandemic?

Native Americans' ACT test scores from 11th-grade State and District testing programs declined during the pandemic years of 2021 and 2022. The analysis adjusted for changes in the tested population across years. Because of the adjustments, the declines in average ACT scores are not attributed to changes in the tested population, which suggests that they can be attributed to the pandemic.

The decline in ACT Composite scores of Native American students was slightly more severe for the 2022 cohort relative to the 2021 cohort, with scores declining by 0.45 points for the 2021 cohort and by 0.58 points for the 2022 cohort. For the total group, the score decline was slightly less severe for the 2022 cohort relative to the 2021 cohort. This suggests that the pandemic's negative effects on college and career readiness have persisted for Native Americans, especially in math. One negative consequence of the continued score decline in math is that fewer students will be ready for STEM-related coursework, which could lead to fewer Native American students pursuing careers in STEM fields.

The ACT score declines of Native American students are generally comparable to losing two to four months of instruction, with the effect most severe in math for the 2022 cohort. The score declines translate to fewer students being ready for first-year college courses. For the 2022 cohort, 2.0 fewer Native American students (per 100) are ready for English composition, and 2.7 fewer Native American students (per 100) are ready for college algebra.

Overall, the results show that the pandemic's negative effects on college and career readiness are mostly similar across different racial/ethnic groups, but there is some evidence that the effects have worsened somewhat from 2021 to 2022 for students who are Native American. It's also important to understand that, even before the pandemic, college readiness rates were lower for students who are Native American. Of the Native American students included in the study, only 37% and 18% met ACT's College Readiness Benchmarks in English and math, respectively, during the three pre-pandemic years. In comparison, among all students (including Native American students), 49% and 29% met ACT's College Readiness Benchmarks in English and math, respectively, during the three pre-pandemic years.

How do Native American students' college and career planning behaviors differ from those of students from other racial/ethnic groups?

College and career planning behaviors were mostly similar for students who are Native American and those for all students. We used a measure of interest-major fit to quantify how well students' personal interests match the environment of their planned college major, finding

that students who are Native American are very similar to students from other groups in interest-major fit. About 34% of the Native American sample had high fit, indicating that their personal interest profile was similar to that of their planned college major. Prior research has found that higher interest-major fit is predictive of college major stability and timely degree attainment (Allen & Robbins, 2010).

Sending ACT scores to colleges is recommended to help students signal their interest in postsecondary opportunities and to make their scores available to prospective colleges. Compared to students from other racial/ethnic groups, students who are Native American were slightly less likely to send their ACT scores to prospective colleges, with Native American students sending 1.7 of the four scores, on average. Relative to students from other racial/ethnic groups, students who are Native American are less likely to enroll in college the first year after high school.[1] It is possible that students who are Native American are less likely to send their scores because college is less likely to be in their immediate plans.

The occupational plans for students who are Native American were not drastically different from those who are not Native American. Students who are Native American are slightly more likely to plan on careers in the visual and performing arts; repair, production, and construction; and community, family, and personal services. Students who are Native American are slightly less likely to plan on careers in the health sciences, business, and education.

Conclusion and Recommendations

Because they have the same meaning across years and are predictive of college and career success, ACT scores are useful indicators of academic progress. As states face the challenges of the pandemic and its aftermath, ACT scores can help us understand how much student learning and preparation for college and careers have been affected. Data from 2022 State and District testing programs suggest that the Composite score declines for students who are Native American are comparable to losing about three months of instruction and, depending on the subject area, 1–3% fewer students ready for college coursework. By continuing to monitor ACT scores, we can better understand whether the loss in achievement will persist for future cohorts.

Understanding differences across racial and ethnic groups can help stakeholders meet the unique needs of different groups. One way that stakeholders can help meet the needs of Native American students is by providing access to rigorous and engaging coursework both online and in person. States and districts should not only provide access to rigorous courses but also monitor participation and success rates. Then, efforts should be made to reduce or eliminate participation and success gaps across student groups.

[1] From ACT's Enrollment Management Database, we found that the rate of college enrollment the year after high school graduation in ACT's 2020 high school graduating class was 39% for Native American students, compared to these percentages for other students: 53% African American, 74% Asian American, 53% Hispanic, 64% White, and 58% two or more races (*https://public.tableau.com/app/profile/act2044/viz/EnrollmentManagementDatabase/StudentBackground*).

Most students who are Native American report having no or very few Native American teachers at their school.[2] Therefore, another recommendation is to increase the representation of Native Americans among teachers. As shown in this study, students who are Native American are slightly less likely to plan on a career in education, which presents additional challenges for increasing the representation of Native American teachers. Colleges and universities may need to enact special recruitment efforts to bolster the Native American educator pipeline.

A final recommendation is to provide multiple avenues for supplemental instruction and tutoring support for Native American students in need—both online and in person. Counseling services can help students prepare for college and work, particularly in high-growth, high-demand occupations that are conducive to higher living wages and a better quality of life. A good practice that can help students from all racial and ethnic groups is to encourage them to explore careers that are a good fit for the student and that have high demand in the job market, particularly in the state or region where the student lives.

[2] 29% of surveyed 8th-grade Native American students reported the percentage of Native American teachers at their school as being 0%; 26% reported the percentage at 1–5% (Rampey et al., 2021, Table 12).

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