

# From Learning to Teaching:

The Role of High School CTE Programs in Shaping Nevada's Educators



Megan Rauch Griffard, Ph.D.

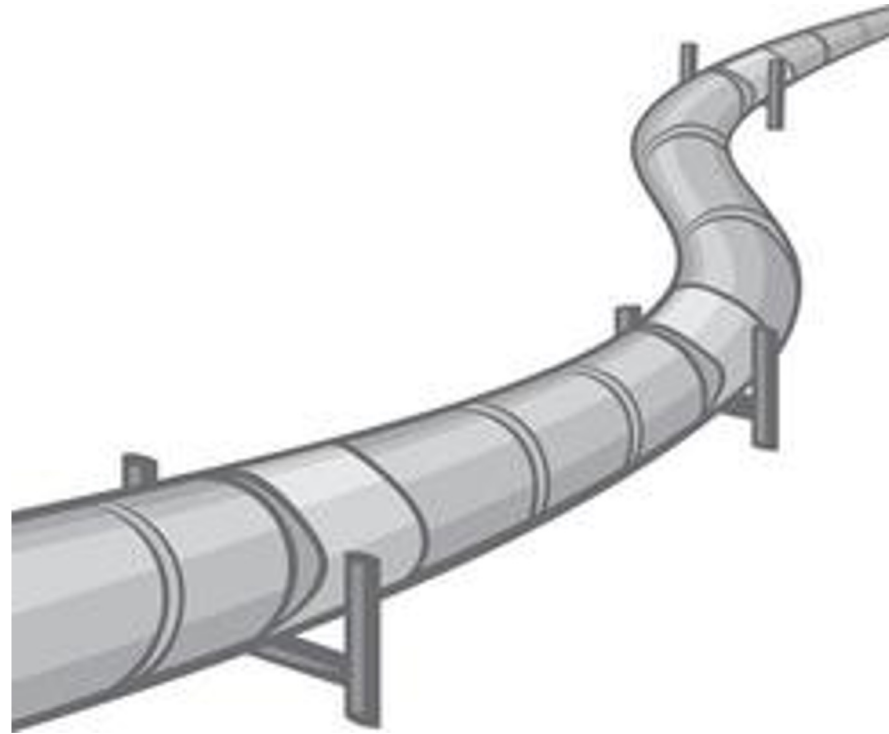
Assistant Professor, Educational Policy & Leadership

February 29, 2024

UNLV

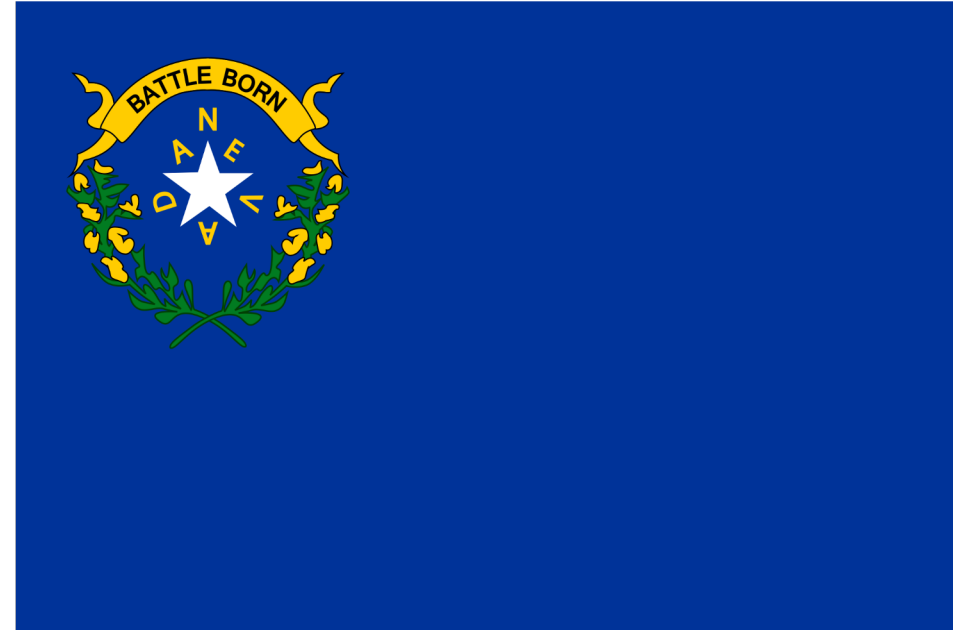
# Study Purpose

- To investigate the role of education CTE programs in high schools as a tool for strengthening the K-12 educator pipeline in Nevada.



# Presentation Overview

- Background on CTE programs and educator shortages
- Nevada High school CTE outcomes
- Outcomes for CTE students in NSHE
- Policy recommendations for Nevada
- Recommendations for NPWR



# Career and Technical Education

- Consists of programs and courses aimed at preparing secondary students for future careers and postsecondary education opportunities.
  - Student can earn college credit for participation in certain CTE programs and courses.
- Presents students with ways to personalize their learning opportunities based on their individual interests.
- Concentrations are offered across 16 federally-recognized industry clusters, including Human Services, which houses two education programs:
  - Early Childhood Education
  - Teaching and Training

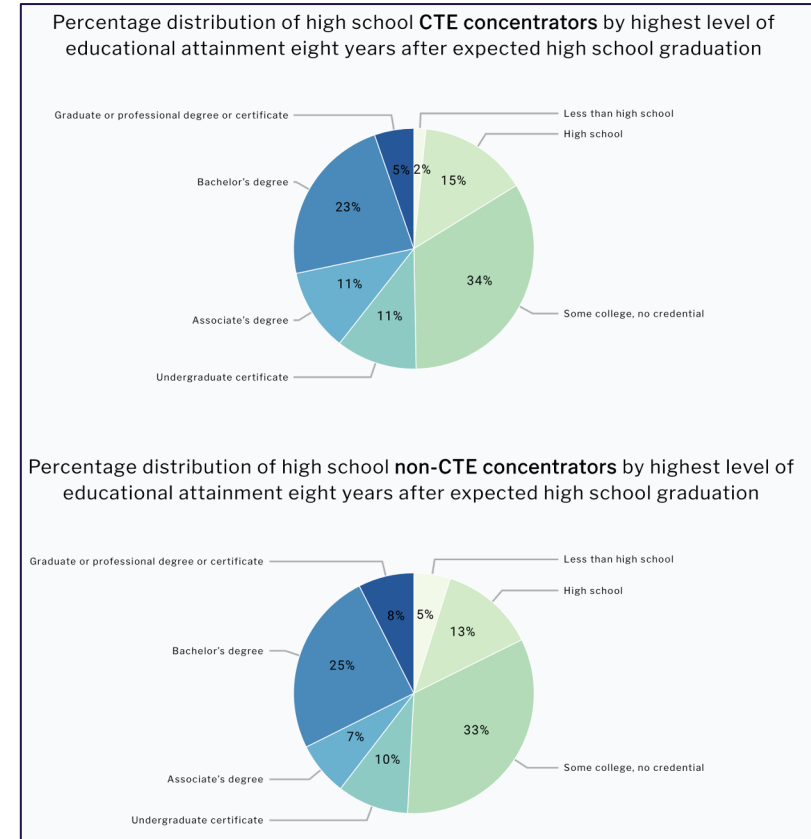


(U.S. Department of Education, 2019; Nevada Department of Education, 2023)

UNLV

# CTE Key Terms

- **Concentrator:** a student who takes two or more courses in a designated CTE program area.
- **Completer:** a student who completes the required coursework sequence in a CTE program area.
- **Certificate Earner:** a student who completed the required coursework sequence and passes the end-of-program assessments measuring skill attainment in a CTE program area.
  - Maximizes the benefits of participation in CTE.
  - Enables students to obtain college credit, postsecondary degrees or certificates, apprenticeships, and employment.





# CTE Success Stories

- CTE course-taking in high school has been shown to decrease the likelihood that a student will drop out of school and increased the likelihood of on-time graduation.<sup>1</sup>
- STEM experiences through CTE programs increased the likelihood that general education students would declare a college major in a STEM field.<sup>2</sup>
- Student participation in CTE dual enrollment programs is associated with student self-reports of feeling more prepared for the transition to college and greater confidence and satisfaction with choices about college and careers.<sup>3</sup>
- Among community college students, high school CTE participation are more likely to earn an associate's degree or certificate than students who did not participate in CTE.<sup>4</sup>

(1) Gottfried & Plasman, 2017; (2) Gottfried et al., 2014; (3) Bragg & Rudd, 2007; (4) Dietrich, 2016

# Educator Shortages

- Although the problem of K-12 teacher shortages has been described as a by-product of the Covid-19 pandemic, teachers have been exiting the profession at an alarming rate since long before 2020.<sup>1</sup>
- Shortages are also due to the declining popularity of education as a career and the subsequent decrease in enrollment in teacher preparation programs.<sup>2</sup>
- Nevada, in particular, has long been plagued by high numbers of vacant teaching positions.<sup>3</sup>
  - At the beginning of the 2023 school year, there were more than 1,100 vacant licensed teaching positions in CCSD alone.<sup>4</sup>



January 2023:



(1) García & Weiss, 2021. (2) Gross, 2023; National Center for Education Statistics, 2023; Will, 2022. (3) Nguyen et al., 2022. (4) Davis, 2023.

# Education CTE Programs in High School





# Data

- Nevada public and charter high school graduates who concentrated in at least one CTE program.
- Repeated cross section between the 2015-16 and 2020-21 school years.
- Merged with school- and district-level information from the National Center for Education Statistics.



**NPWR**  
Climb Higher



**UNLV**

# Nevada High School CTE Programs

## By the Numbers



**69,284** graduates concentrated in at least one CTE program between 2016 and 2021.



**16** school districts and the State Public Charter School Authority (SPCSA) offered CTE.



**158** public and charter high schools offered at least one CTE program.

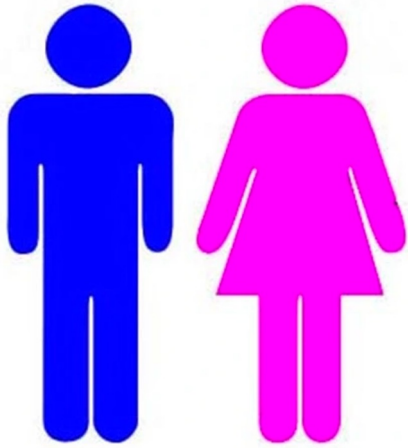


**64.50%** of CTE concentrators completed at least one CTE program.

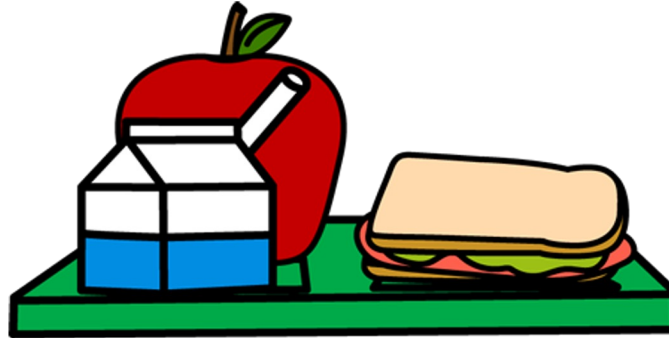


**31.19%** of CTE concentrators earned at least one certificate.

# CTE Student Demographics



46.92% were female.  
53.08% were male.

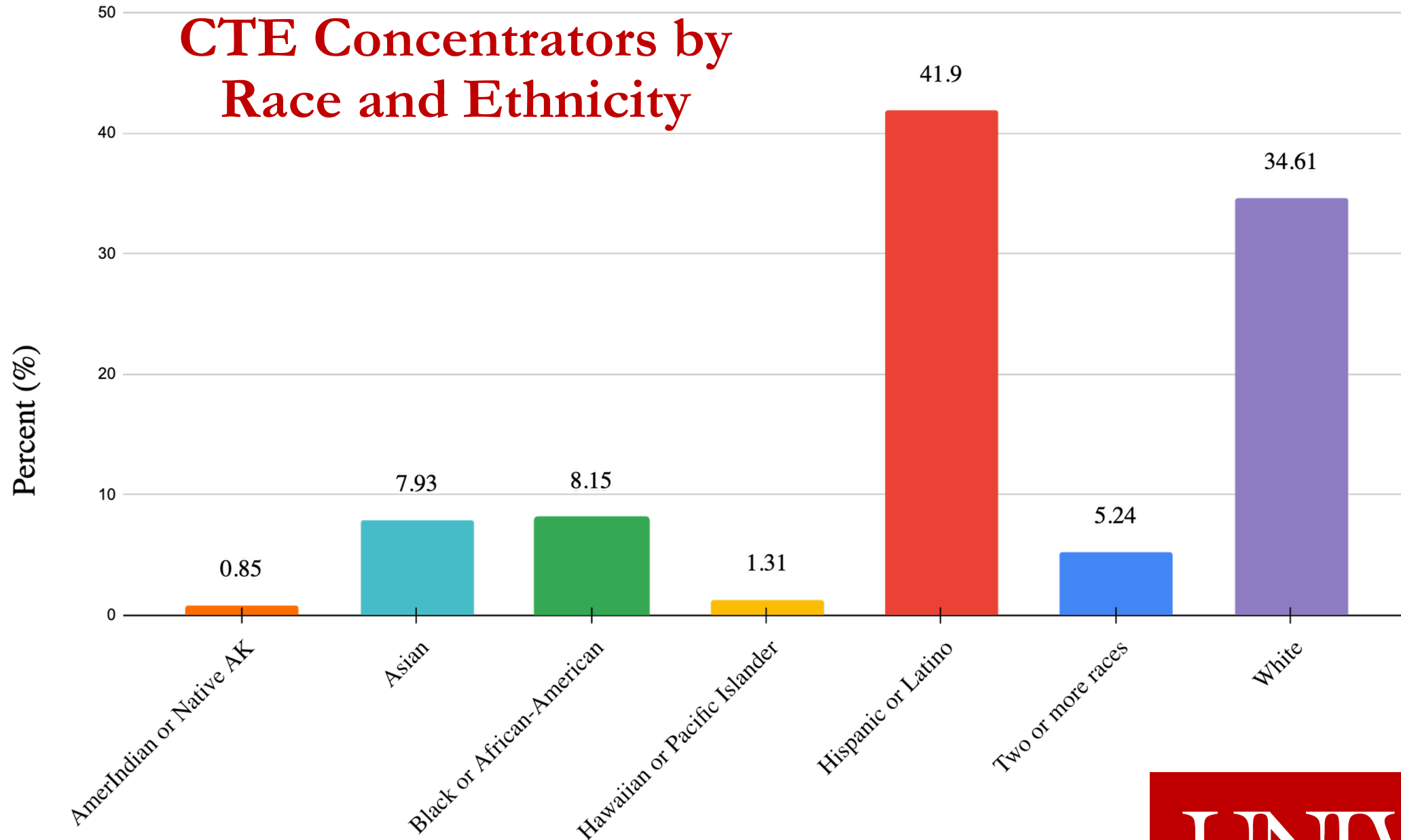


65.98% received free or  
reduced-price lunch.



The average ACT score  
was **18.35**.

# CTE Concentrators by Race and Ethnicity



# Education CTE Programs

## By the Numbers



**3.50%** of graduates concentrated in an education CTE program.



**7** school districts and the SPCSA offered education CTE programs.



**74** public and charter high schools offered at least one education CTE program.

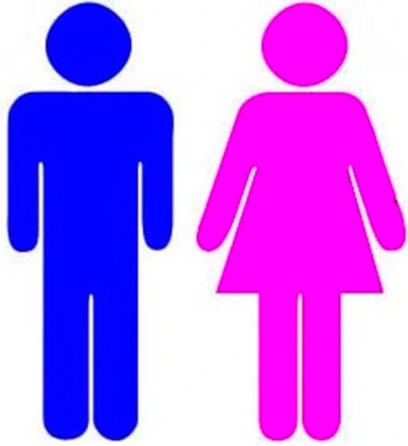


**66.49%** of education CTE concentrators completed their program.

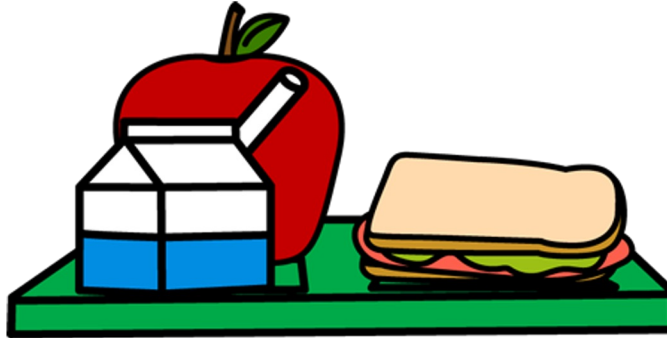


**38.05%** of CTE concentrators earned at least one certificate.

# Education CTE Student Demographics



88.40% were female.  
11.60% were male.

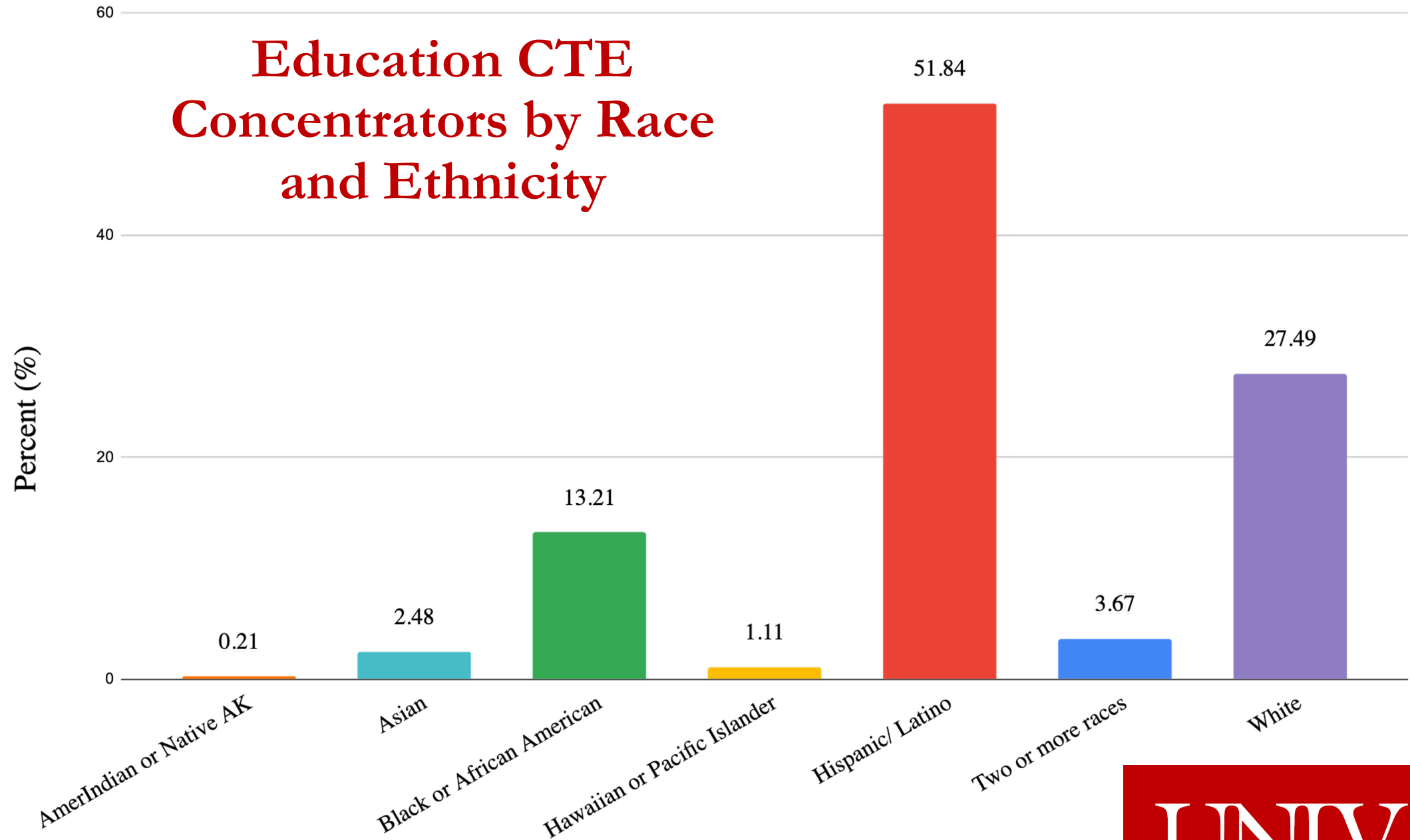


80.52% received free or  
reduced-price lunch.



The average ACT score  
was **16.87**.

# Education CTE Concentrators by Race and Ethnicity



# Who are Education CTE Students?

- **Because students can opt into concentrating in a CTE program, who are the students most likely to do so?**
- Linear probability model to predict the probability of a student:
  - (1) Concentrating in an education CTE program
  - (2) Completing an education CTE program
  - (3) Earning a certificate in an education CTE program
- Model includes controls for:
  - Student characteristics
  - School characteristics
  - A school fixed effect
  - A school by time fixed effect





**Predicted Characteristics of High School Education CTE Students**

	(1)	(2)	(3)
	Concentration in Education	Completion of an Education Program	Certificate in an Education Program
Male	-0.054*** (0.012)	-0.030*** (0.007)	-0.021*** (0.006)
Asian	-0.027** (0.009)	-0.021* (0.009)	-0.017* (0.007)
Black	0.029 (0.016)	0.011 (0.010)	-0.005 (0.005)
Hispanic/Latino	0.011 (0.007)	0.007 (0.005)	0.001 (0.003)
American Indian or Alaska Native	-0.043*** (0.012)	-0.023** (0.007)	-0.014* (0.006)
Two or more Races	-0.013 (0.009)	-0.011 (0.007)	-0.008 (0.006)
Native Hawaiian or Pacific Islander	-0.009 (0.017)	0.000 (0.013)	-0.009 (0.008)
Male x Asian	0.031*** (0.009)	0.020** (0.007)	0.015** (0.005)
Male x Black	-0.031 (0.024)	-0.013 (0.015)	0.004 (0.007)
Male x Hispanic/Latino	-0.014 (0.012)	-0.012 (0.009)	-0.004 (0.007)
Male x American Indian or AK Native	0.051*** (0.012)	0.031*** (0.008)	0.021*** (0.006)
Male x Two or more races	0.015 (0.010)	0.012 (0.007)	0.007 (0.005)
Male x Native Hawaiian or Pac. Isl.	0.003 (0.018)	-0.003 (0.013)	0.008 (0.008)
ACT Composite Score	-0.002*** (0.000)	-0.001** (0.000)	0.000* (0.000)
Whether the Student is FRL	0.004 (0.003)	0.004 (0.002)	0.005* (0.002)
Schoolwide % of Students who are FRL	-0.040*** (0.009)	-0.023*** (0.006)	-0.017*** (0.005)
Whether the School Receives Title I Money	-0.026*** (0.006)	-0.016*** (0.004)	-0.011** (0.003)
Schoolwide % of Students who are not white	0.084*** (0.019)	0.052*** (0.013)	0.038** (0.011)
School District is Urban	0.005** (0.002)	0.003** (0.001)	0.000 (0.001)

# Who are Education CTE Students?

Note. N = 53,732. Constant (1) 0.037\*\*\* (0.010), (2) 0.014\*\* (0.005), (3) -0.002 (0.003); Standard errors in parentheses.  
\* p<0.05, \*\* p<0.01, \*\*\* p<0.001



# Key Findings

Predicted Characteristics of High School Education CTE Students			
	(1)	(2)	(3)
	Concentrate	Complete	Certificate
Male	-0.054*** (0.012)	-0.030*** (0.007)	-0.021*** (0.006)
Asian	-0.027** (0.009)	-0.021* (0.009)	-0.017* (0.007)
AmerIndian / AK Nat.	-0.043*** (0.012)	-0.023** (0.007)	-0.014* (0.006)
ACT Composite Score	-0.002*** (0.000)	-0.001** (0.000)	0.000* (0.000)

Students who are *less likely* to concentrate, complete, or earn a certificate in an education CTE program are:

- Male
- Asian
- American Indian or Alaska Native

Students who are *more likely* to concentrate, complete, or earn a certificate in an education CTE program:

- Scored lower on the ACT.

Note. Standard errors are in parentheses. \* p<0.05, \*\* p<0.01, \*\*\* p<0.001



# Education CTE Students in NSHE



# Data

- Narrowed the high school NDE/ NCES data to students who subsequently enrolled in an NSHE institution
- NSHE data includes demographics, enrollment information, course completions, degrees awarded, etc.
- Panel by semester, beginning August 2016 and ending August 2022.
  - 207,340 student per term observations
  - An individual may appear in the panel in year  $t$  but not year  $t+1$  if the student did not enroll in an NSHE institution or work in Nevada in year  $t+1$ .
- Merged with institution-level information from the Integrated Postsecondary Education Data System.



**NPWR**  
Climb Higher



**NEVADA SYSTEM OF  
HIGHER EDUCATION**



**IPEDS**

**NCES**  
National Center for  
Education Statistics

**UNLV**

# NSHE Matriculation


## By the Numbers




56.74% of CTE graduates in Nevada enrolled in an NSHE institution.




38.67% of CTE graduates in NSHE enrolled in a four-year institution.



8.13% took at least one course in education-related program area.

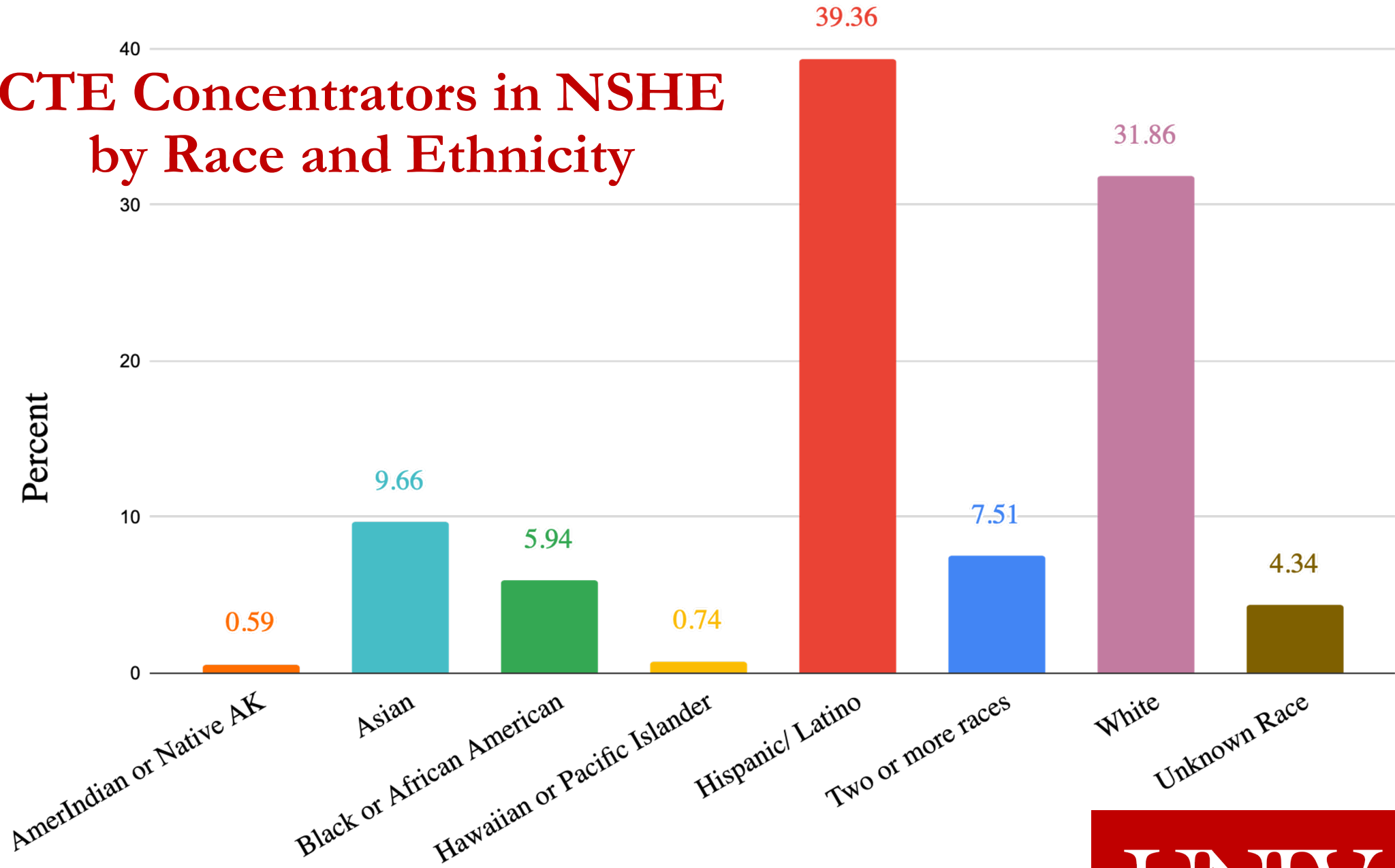


3.83% declared a major in education at some point while enrolled in NSHE.



4.78% of degree-earners had majored in an education field.

# CTE Concentrators in NSHE by Race and Ethnicity




# Matriculation for Education CTE Graduates


## By the Numbers




61.33% of education CTE concentrators enrolled in NSHE after graduation.




42.68% of education CTE concentrators in NSHE enrolled in a four-year institution.



36.92% took at least one course in education-related program area.

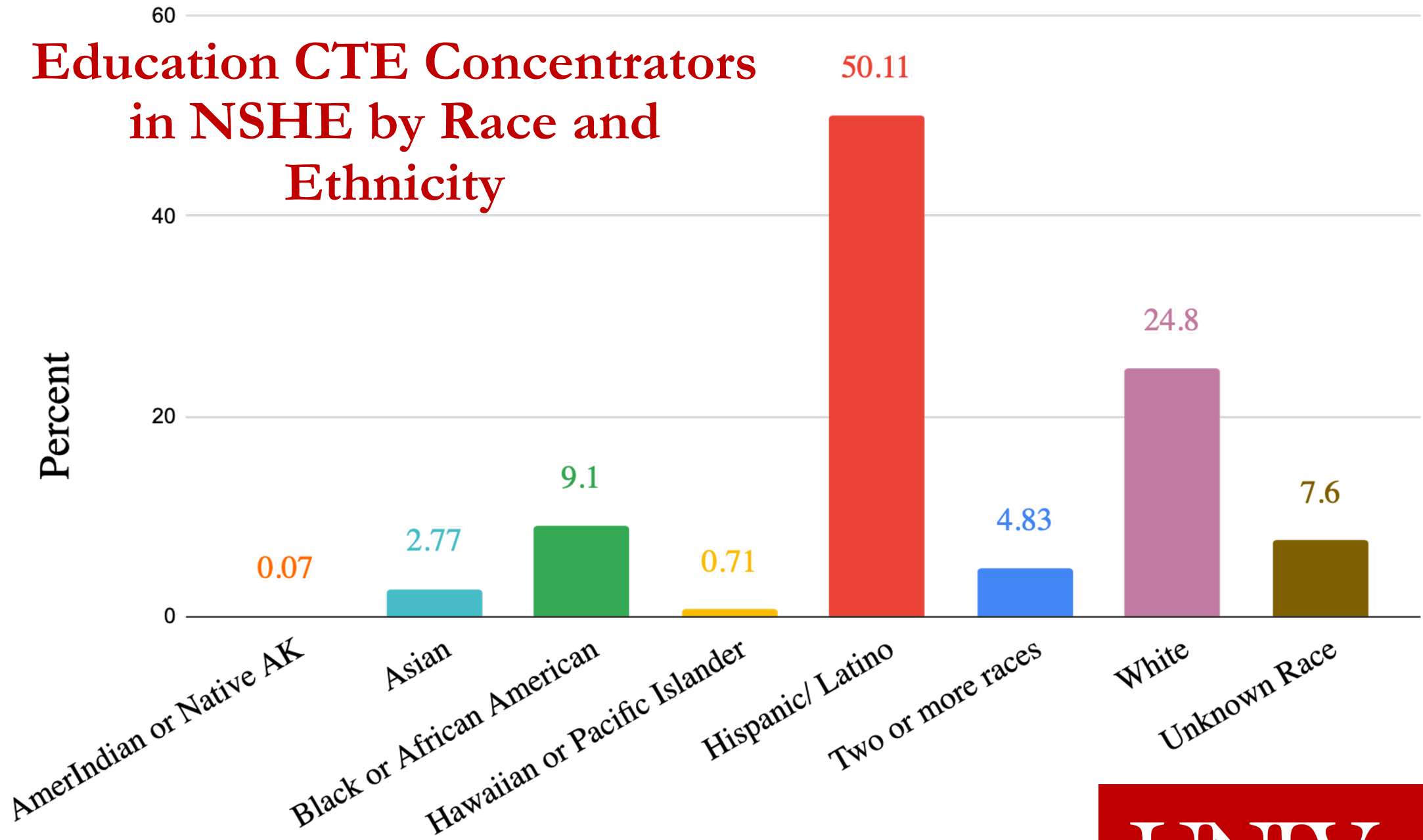


22.13% declared a major in education at some point while enrolled in NSHE.



22.67% of degree-earners had majored in an education field.

# Education CTE Concentrators in NSHE by Race and Ethnicity





# Who Studies Education?

- **Does concentration in an education CTE program predict that a student will declare a major in education at some point while enrolled in an NSHE postsecondary institution?**
- Linear probability model to predict the probability of a student from a high school that offered CTE programs declaring a major in education given that they
  - (1) Concentrating in an education CTE program
  - (2) Completing an education CTE program
  - (3) Earning a certificate in an education CTE program
- Model includes controls for:
  - Student characteristics
  - Postsecondary institution characteristics
  - A postsecondary institution fixed effect
  - A postsecondary institution by term fixed effect



**Predicted Characteristics of Postsecondary Students in Education**

	(1)	(2)	(3)	(4)	(5)	(6)
	Took at least 1 course in Education	Declared Major in Education	Took at least 1 course in Education	Declared Major in Education	Took at least 1 course in Education	Declared Major in Education
HS Education CTE Concentrator	0.246923** (0.060)	0.193129*** (0.031)				
HS Education CTE Completer			0.309102** (0.064)	0.227022*** (0.029)		
HS Education CTE Certificate Earner					0.321850*** (0.051)	0.246881*** (0.023)
Male	-0.054080** (0.012)	-0.045839*** (0.004)	-0.056544** (0.012)	-0.048400*** (0.004)	-0.057722** (0.012)	-0.049045*** (0.004)
Asian	-0.049770*** (0.007)	-0.056125*** (0.006)	-0.050073*** (0.007)	-0.056936*** (0.006)	-0.050541*** (0.008)	-0.057113*** (0.006)
Black	-0.028044* (0.010)	-0.040928** (0.010)	-0.026011* (0.009)	-0.039349** (0.010)	-0.025281* (0.009)	-0.038562** (0.010)
Hispanic / Latino	-0.020386** (0.005)	-0.021739** (0.005)	-0.021551** (0.005)	-0.022779** (0.004)	-0.020771** (0.005)	-0.022129** (0.005)
American Indian or Alaska Native	-0.017816 (0.014)	-0.054094** (0.010)	-0.019430 (0.015)	-0.055785** (0.010)	-0.021584 (0.014)	-0.057148** (0.010)
Two or more races	-0.021561** (0.004)	-0.029628*** (0.005)	-0.022261** (0.004)	-0.030765*** (0.005)	-0.022779** (0.006)	-0.031077*** (0.005)
Native Hawaiian or Pacific Islander	-0.051364* (0.015)	-0.075341** (0.015)	-0.049755* (0.015)	-0.074446** (0.014)	-0.049567* (0.016)	-0.074627** (0.014)
N	207340	183792	207340	183792	207340	183792

Note. Constant (1) 0.138827\*\*\* (0.014), (2) 0.078144\*\*\* (0.007), (3) 0.142588\*\*\* (0.014), (4) 0.082380\*\*\* (0.007), (5) 0.148653\*\*\* (0.018), (6) 0.085764\*\*\* (0.008). Standard errors in parentheses. ="\* p<0.05 \*\* p<0.01 \*\*\* p<0.001"



# Key Findings

- The probability that an education CTE student will declare a major in education at some point in their postsecondary career increases based on how far the student progressed in an education CTE program in high school.
  - 19.31% for concentrators
  - 22.70% for completers
  - 24.69% for certificate earners
- The probability that an education CTE student will take at least one course in education also increases based based on how far the student progressed in an education CTE program in high school.
- Males and people of color are less likely to take an education course or declare a major in education.
  - The relationship is negative and significant across all six models.

# Additional Analyses

- Between spring term 2019 and fall term 2022, 38,053 bachelor's degrees were awarded to high school CTE concentrators by the NSHE System.
  - Of these, 1,531 were in education.
- The probability that an education CTE student will earn a bachelor's degree in education increases based on how far the student progressed in an education CTE program in high school.
  - 15.03% for concentrators
    - 22.33% for completers
    - 22.78% for certificate earners
- Males and people of color are less likely to take an education course or declare a major in education.
  - The relationship is negative and significant across all three models.

# Discussion

- Students who participate in education CTE programs in high school are more likely to pursue education in NSHE postsecondary institutions.
  - The further a student progresses through an education CTE program the more likely the student will study education in the postsecondary setting.
- The educator pipeline developed through education CTE programs is predominantly composed of non-male and non-people of color.
  - Put another way, white females are more likely to study education in CTE programs and in postsecondary institutions.



# Policy Recommendations



1. Expand access to and appeal of education CTE programs to attract a more diverse student population.
  - A more diverse CTE population is one potential way to introduce more diversity to the educator workforce.
2. Identify the critical points in time when aspiring and current educators leave the pipeline.
  - Uncovering when and why educators are leaving the pipeline to determine ways to prevent their exits.
3. Develop more incentives for NSHE education graduates to teach in Nevada.

# NPWR Recommendations

- More detail in the data dictionary about the meaning of variables
- Have variable names match publicly available data and common terms
  - For example, rename subjectcode to Course Prefix Code



QUESTIONS?



# Thank you

---

Megan Rauch Griffard, Ph.D.

Assistant Professor of Educational Policy & Leadership

University of Nevada, Las Vegas

[megan.griffard@unlv.edu](mailto:megan.griffard@unlv.edu) | (702) 895-4013