



GENERAL REPORT

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Postsecondary Technical Education for High School Students

Enrolling in technical education offers high school students a competitive edge in securing employment opportunities. Earning a technical education certificate in high school may lead to a livable wage immediately after graduation. The role of technical education enrollment in high school in earning certificates and postsecondary enrollment is explored using data from the Utah System of Higher Education. Most students enroll in at least one technical education course, but few earn certificates in high school.

Findings

- Students enrolled in technical education at degree-granting institutions trended upward.
- Students enrolling at a technical college trended downward.
- The highest geographic proportion of secondary students enrolling in technical education (62%) was in the suburbs.
- Most certificates earned while in high school are earned through the technical colleges (86%).
- Most high school certificates were one-year awards (84%).
- Most high school students enrolled in technical education courses enrolled in degree-granting institutions (61%).
- High school students who lived within 40 miles of a degree-granting institution were the most likely to seek postsecondary education.

Purpose

Middle-skill jobs, which require credentials that take between 1 and 24 months, can pave the way for a successful career and economic prosperity (Lamback et al. 2018). Such jobs include healthcare technicians, diesel mechanics, and animal science workers. Still, more workers with these skills are needed (Chumbley 2016; Holzer 2017; Spang 2014). Some have argued that the pipeline producing middle-skill workers is too narrow, resulting in labor shortages (Sublett and Tovar, 2021). Edmunds and colleagues found that in states like North Carolina, only 9% of students participated in technical education during high school (Edmunds et al. 2022). This affects future productivity and work quality and may result in a wage loss.

One option is to build momentum by enrolling students in technical education courses while they are in high school. Such courses influence students to pursue technical education pathways by linking school and workforce skills (Trimble-Washington 2021, 4). These efforts have been positive. Nationally, enrollment in community and technical colleges has increased over the last two years (National Student Clearinghouse 2024). However, questions remain as to whether local workforce needs are being met.

History

The Smith-Hughes Act was the first federal law to fund technical education in 1917, responding to rising international competition (Edmunds et al. 2022; Potter 2022). This law established the Federal Board for Vocational Education to assist low-income, immigrants, and other marginalized groups in developing their skills in agriculture, home economics, or industrial trades, primarily through courses offered in high schools (Friedel 2011). This focused approach later contributed to the perception that technical education was intended for a narrower segment of students (Dare 2006).

Access to technical education for high school students, postsecondary students, high school dropouts, and those who needed retraining was expanded in the 1963 amendment to the Smith-Hughes Act (Friedel 2011). Courses related to business and health occupations were added. To better address gender inequity, a focus was added to enroll more “single parents, homemakers, and displaced homemakers” in the 1976 reauthorization.

The Perkins Vocational Act of 1984, also known as Perkins I, expanded access to technical education by including individuals with disabilities, those with limited English proficiency, and those housed in correctional facilities (Potter 2022). Programs were retitled as technical preparation in the reauthorization of Perkins II (1990) to combat the stigma of vocational training (Friedel 2011). Associate degree pathways were created by aligning technical and academic courses (Potter 2022). Further collaborations between high schools, postsecondary colleges, and industry were promoted and developed. Also, accountability measures were adopted. The Perkins Vocational and Technical Education Act of 1998 (Perkins III) refined educational pathways and added additional accountability through performance-level reports (Friedel 2011).

Vocational and Technical Preparation was replaced with Career and Technical Education in the 2006 reauthorization (Perkins IV; Potter 2022). The focus was on employable outcomes with more rigorous standards (Friedel 2011), emphasizing high-demand, high-wage occupations. Each program of study included secondary and postsecondary courses with rigorous content and sequenced pathways leading to an industry-recognized credential. Finally, Perkins IV aligned with the Career and College-Ready philosophy.

Currently, the Strengthening Career and Technical Education Act for the 21st Century of 2018 (Perkins V) is the most recent authorization. This statute increases the focus on collaboration between educational institutions and industry. Furthermore, the law enhances integration in academic, technical, and career instruction (Perry 2019). Emphasis was placed on aligning programs of study with local needs, thus requiring a comprehensive regional needs assessment (Potter 2022). While local demand assessments may be completed, they do not dictate programs of study (Sublett and Tovar 2021). Still, institutions must demonstrate ongoing improvement in educational outcomes (Perry 2019). This includes granting more credentials to students while they are still in high school. Funding was available to local educators to reduce or eliminate tuition, fees, books, or necessary materials for disadvantaged populations.

The number of high school students participating in technical education has steadily risen over the last 100 years. Over the past decade, postsecondary technical education enrollment in high schools has grown substantially. This growing recognition is evident in the fact that 98% of US high schools now offer technical education courses, which primarily benefit male and low-income students (Gray et al. 2018; Phelps and Chan 2016).

Local History

Before 1968, sub-baccalaureate credentials were acquired at Utah State University (USU) and three community colleges in Utah (Salt Lake Community College, Utah Valley Community College—now Utah Valley University, and Snow College). Today, only three degree-granting institutions maintain a technical education mission: Salt Lake Community College (SLCC), Snow College, and USU (URS 53 B-16, 2021).

The first technical college in Utah was Uintah Basin Technical College (UBTC), established in 1968 as part of the federal Vocational Education Board reauthorization. In 1971, Bridgerland Technical College and Ogden-Weber Technical College were established, followed by the creation of a state governing board in 1972. However, Bridgerland lacked dedicated facilities until 1984. At the same time, the Sevier Valley Applied Technology Center was established, but it was later incorporated into Snow College in 1998 (HB 114, 1998). The fifth institution, Davis Technical College, was created in 1978. Mountainland Technical College was established as part of Utah Valley Community College in 1989, but became an independent entity with its own campus in 1997. Three additional institutions were established in later decades: Southwest Technical College (1994), Dixie Technical College (2001), and Tooele Technical College (2009). Institutions with technical education missions currently include the eight technical colleges, the two community colleges, and USU. USHE presently governs all 11 institutions.

Following the construction of these final institutions, participation among high school students continued to grow. Over the last eight years, the most significant growth has occurred among ninth and 10th-grade students. Additionally, the pass rates of technical education courses stay close to 95%. This has led to an increase in the number of credentials earned over the last 15 years.

To address state and federal accountability requirements, technical education courses taught in high school were first reported in the 2008-09 academic year. At that time, 46% of all dual enrollment courses were TE; however, by the 2022-23 year, the proportion of technical education enrollments declined to 31%. This may be in response to an increase in the number of students enrolling in degree-granting concurrent enrollment courses. Technical education enrollment appears to be cyclical, but it does not align with economic cycles. Enrollment peaked in 2019, following a decline that began in 2014 (Utah System of Technical Colleges (USTC) 2020). The prior peak was in 2011.

Box 1. Brief key terms

Career and Technical Education: courses that provide skills and knowledge specific to a career. Such pathways are designed to be completed in under two years.

Certificate: A postsecondary award that takes less than two years to complete. Two certificates are available: those requiring less than 12 months and those requiring at least one but less than two years. Post-baccalaureate and post-graduate degree certificates are not examined in this project.

Community College: A postsecondary institution where a student can earn a certificate or an associate degree.

Dual Enrollment: A postsecondary course offered in high schools where students can receive high school and postsecondary credit.

Technical College: A postsecondary institution in Utah where a student can earn a certificate.

Prior Research

Nationally, 83% technical education courses are taught in comprehensive high schools rather than specialized high schools or college campuses (Gray et al. 2018). Of those, about one in three (32%) courses completed are part of a career pathway, and another third (33%) of courses align with a career pathway. These programs attract a more diverse student body, including those who are less academically prepared (Haag 2015). Of these courses taught in high schools, 30% are taught online.

High school staff are enthusiastic about offering more Postsecondary Technical College Enrollment (PTCE) courses, even as states mandate high school students to enroll in at least one technical education course (Gray et al., 2018). However, several barriers, including the need for more certified instructors, limited space for hands-on instruction, and recruitment challenges, impede their expansion (Harnish and Lynch 2005; Zinth and Barnett 2018). Other barriers include instruction and curriculum choices. Responses to these barriers, such as credentialed instructors and curricula that align with industry standards, have been successful (Zinth 2014).

Like other educational research, low-income and underrepresented students are less likely to participate (Estacion et al. 2011; Davis et al. 2018; Spencer et al. 2021; Steiger et al. 2023). Additionally,

Black/African American students who do enroll are less likely to persist or earn a credential (Burns et al. 2018; Ison 2021; Wang et al. 2015). This occurs even though students of color tend to enroll in technical education courses more often than in academic dual enrollment courses (Ositelu 2021; Zhang & Oymak 2012).

The most significant barrier may be financial (Lee and Suh 2024; Sparks et al. 2023). Zinth (2014) found that high schools that can avoid passing tuition and fees on to parents and students experience higher PTCE and postsecondary enrollments. Many have called on policymakers to address these financial obstacles to support students' academic and economic success (Spencer and Maldonado 2021; Taylor 2015; Xu et al. 2021).

Educational outcomes for technical education students are primarily positive. Participating in technical education increases the likelihood of earning a high school diploma (Karp et al. 2007, 26; Zinth 2014). Additionally, technical education students are more likely to enroll in two-year technical and community college programs and to do so immediately after high school (Edmunds et al. 2022; Harnish and Lynch 2005; Welch, 2018). Welch (2018) found that enrolling in a comprehensive high school, a traditional high school that serves all academic levels of student ability, was more predictive of postsecondary enrollment than participating on the college campus or enrolling online.

Participation in technical education leads students to enroll in four-year institutions as full-time students (Rodriguez et al. 2012; Zinth 2014). Students learn the same academic skills and expectations in academic dual enrollment courses, which better prepare them for degree programs (Edmunds et al. 2022; Kim and Bragg 2008). Relatedly, high school technical education students have higher GPAs than those who do not participate (D'Amico et al. 2013; Karp et al. 2007).

Educational dispositions improve with participation in technical education. Students who earn technical education credits in high school show greater persistence toward obtaining a credential (D'Amico et al. 2013; Karp et al. 2007, 65; Rodriguez et al. 2012). This results in more PTCE students earning a credential within 150% of the expected time or three years for a two-year program (Phelps and Chen 2016). Additionally, technical education participants are more likely to be employed.

In Utah, 73% of all certificate-seeking high school students earned their credentials, and some institutions' completion rates have reached as high as 90% (Campbell 2024). Equally positive, placement rates from the technical colleges range from 70% to 92% (NCES 2023). These credentials have led to successful careers, with graduates earning wages above the state median one year after graduation (USHE 2024a).

Nationally, fewer certificate earners are successful. Several short-term credentials do not lead to stable employment opportunities (Ositelu 2021). Examples of these credentials, which require less than 15 weeks to complete, include certified nursing assistant, child development associate, and commercial driver's license. Few of these graduates earn a salary above the poverty line. Between 40% and 50% of those with short-term credentials were unemployed, and those who were employed faced a higher risk of job

instability. Additionally, women and graduates of color earn between \$10,000 and \$20,000 less than their white counterparts.

Generally, technical education in high schools benefits some students and can serve as a launching pad for a career. What is needed is a more granular perspective than what is available with national statistics, and one that is broader than research at a single educational site. This project aims to provide an in-depth state-level perspective, which refines our understanding of technical education in high school.

Objectives

This study offers a state system perspective on (TE) enrollment during and after high school, as well as the credentials earned in high school. The goals are:

1. Identify the student characteristics of high school TE, including proportional representation.
2. Identify enrollment trends among PCTE students. Enrollments should be increasing in line with the national trend.
3. Identify which credentials PCTE students earn in high school.
4. Identify which postsecondary institutions PCTE students enroll in after high school.

Box 2. Data and methods

This study used high school student data from USHE between the 2015-16 and 2020-21 academic years. Courses were sponsored by the eight technical colleges and the three degree-granting institutions with technical education missions. The number of technical education credits and certificates earned in high school was identified. Finally, postsecondary enrollment was tracked through the 2023-24 academic year.

See the Appendix for a more detailed description of the research methods.

Results

Student Characteristics

Enrollment in PCTE courses is predominantly white, but Black/African American and Latinx/Hispanic students enroll at technical colleges in higher proportions than at degree-granting institutions. Female students accounted for 54% of total enrollment in technical education at the high school level, compared to 46% for male students. This is comparable to students enrolled in concurrent enrollment programs associated with degree attainment (Campbell 2024a). The difference was slightly larger at degree-granting institutions, with 58% of students being female and 42% male. However, slightly more adult male students (52%) enrolled at the technical colleges than female students (48%).

Differences were noticeable between those who enrolled in technical education at degree-granting institutions and those who enrolled at technical colleges. High school enrollment was also predominantly white: 83% of degree-granting technical education students and 79% of technical college students. Sixteen percent of technical college students identified as Latinx/Hispanic, but this percentage was lower, at 10%,

among degree-granting institutions. Students identifying with the remaining racial or ethnic categories comprised 6% of the technical colleges and 7% of the degree-granting institutions.

Table 1. The percentage of students enrolled in technical education courses by race and ethnicity*

	Degree-granting	Technical College	Public High Schools
Asian American	2.9	0.8	2.0
Black/African American	0.7	0.9	1.6
Latinx/Hispanic	9.5	16.0	17.1
Native American	0.6	1.5	1.3
Two or More	2.5	1.4	2.4
Pacific Islander	0.3	0.5	1.6
White	81.1	78.8	74.0

* Totals may not add to 100% due to rounding.

Those who enrolled at degree-granting institutions had a higher representation of white, Asian American, and multi-racial students compared to the state proportions. Latinx/Hispanic and Native American students enrolled at technical colleges were more closely aligned with state demographics. In contrast, Black/African American and Pacific Islander students were underrepresented at both degree-granting and technical colleges. The proportion of white students enrolling in technical education was parallel to that of students enrolling in degree-granting courses. However, the proportion of Latinx/Hispanic students was higher, with 10% enrolling in degree-granting concurrent enrollment programs (Campbell 2024b).

Enrollment Trends

Overall, high school technical education enrollment has decreased, on average, by one percentage point year-over-year over the last five years. In comparison, other dual enrollment courses, such as degree-granting general education courses, have grown by 15 points on average. The enrollment drop is most notable at technical colleges, while technical education headcounts have consistently increased at degree-granting institutions.

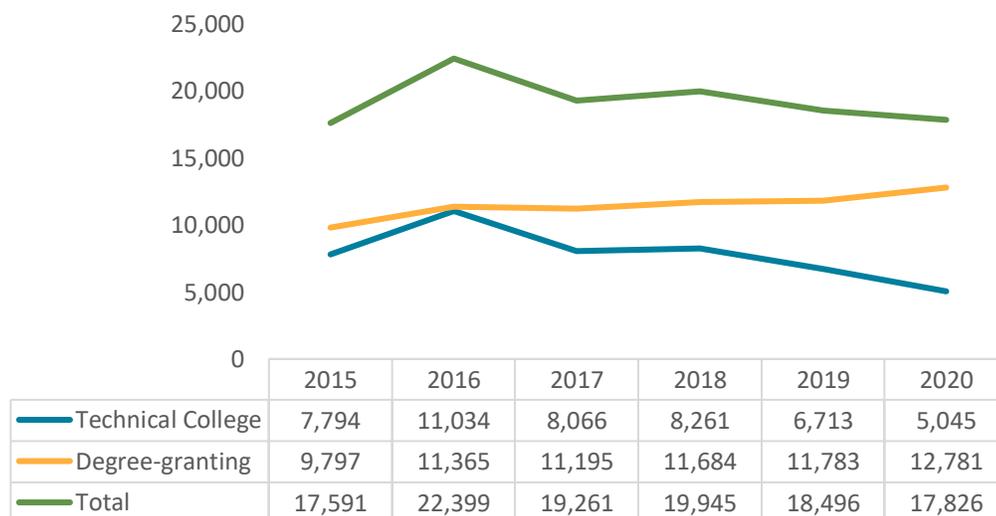


Figure 1. PCTE enrollment by institution type over time

The National Center for Educational Statistics (2025) categorizes high schools into four major geographic divisions: city, town, suburb, and rural. High school students enrolled in technical education primarily resided in suburban areas. The second and third largest groups were cities and towns, with those living in towns having a larger proportion than those living in cities. Rural student enrollments comprised the smallest percentage. Students enrolling at technical colleges were more evenly distributed across suburbs, towns, and cities. As a reference, technical college campuses are located chiefly in towns and suburbs. In contrast, the three degree-granting institutions with technical education missions are in cities or towns. As shown in Table 3, technical colleges have a higher representation, except in suburban areas, compared to the distribution of state public high schools. Students enrolling through degree-granting institutions have higher representation in towns and rural high schools, with a slightly higher proportion in suburbs.

Table 2. The proportion of technical education students by geographic location

	City	Rural	Suburb	Town
Degree-granting	10%	5%	64%	23%
Technical Colleges	28%	4%	34%	33%
All Public High Schools	20%	3%	62%	15%

High School Attainment

Only 5% of high school students enrolled in technical education earned a certificate during their high school years. Technical colleges awarded 84% of high school certificates, while degree-granting institutions awarded only 16%. Most of these certificates were one-year programs, accounting for 86%, while the remaining 14% were two-year programs. Almost all credentials from technical colleges were one-year certificates, accounting for 93%, while only 7% consisted of two-year certificates. High schools have a deadline by which a student may earn a credential. This explains why most certificates are earned in a shorter time span. If a student does not finish the technical education program by the time they earn their high school diploma, they must then matriculate to a technical college.

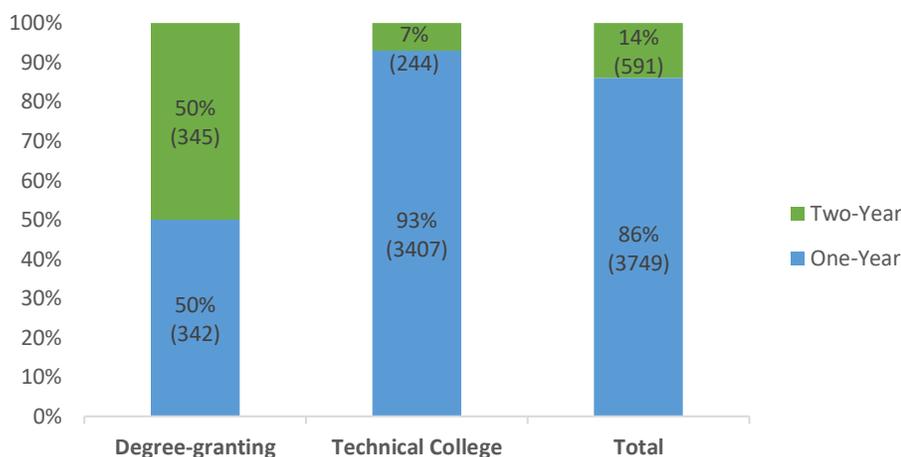


Figure 2. Certificates earned while in high school by certificate classification

Among those enrolled in degree-granting institutions, only 3% of technical education students earned a certificate in high school. An equal proportion of students earned one-year (50%) and two-year certificates (50%) at the degree-granting institution. Technical college students had higher completion rates, with 21% earning a certificate. Ninety-three percent of all technical college credentials were certificates that took less than a year, and only 7% took more than one year.

Female high school students earned 70% of the certificates, with 94% being one-year certificates and 6% two-year certificates. Male high school students earned the remaining 30%; 91% held one-year certificates, and 9% held two-year certificates. The highest number of certificates was awarded to both men and women in the health professions. The second most popular certificate for women was culinary, entertainment, and personal services at 8%. This includes the cosmetology industry. The second most popular certificate for male students was mechanics (20%), followed by precision production (8%).

Table 3. Counts and percentages of high school certificates earned by gender

	Degree-granting		Technical College		Full Sample	
	n	%	n	%	n	%
One-Year Awards						
Female	268	39	2,429	67	2,697	62
Male	74	11	978	27	1,052	24
Two-Year Awards						
Female	234	34	151	4	385	9
Male	111	16	93	3	204	5
Total	687	100	3,651	100	4,338	100

Eighty-two percent of the high school certificates were awarded to white students, who earned 85% of all one-year certificates and 81% of all two-year certificates. Latinx/Hispanic students earned 14% of all certificates, 14% of the one-year certificates, and 11% of the two-year certificates. The remaining 4% were awarded to Black/African American, Native American, and Pacific Islander students, earning 5% of the one-year certificates and 4% of the two-year certificates.

Table 4. Certificates awarded to high school students from technical colleges by CIP family

CIP	Title	% Female	% Male	% Total
11	Computer/Information Sciences	< 1	5	2
12	Culinary/Cosmetology	8	2	7
14	Engineering	< 1	2	1
15	Engineering Technology	< 1	2	1
43	Law Enforcement	< 1	1	< 1
46	Construction	< 1	3	1
47	Mechanic	< 1	20	5
48	Precision Production	< 1	8	2
49	Transportation	-	< 1	< 1
51	Health Professions	90	58	82
52	Business	< 1	< 1	< 1

One in 10 high school students enrolled in the technical colleges earned a certificate. Almost all (94%) were certificates that took less than a year, and only 6% took more than one year. Women represented 70% of certificate earners at the technical colleges, with 94% earning one-year certificates and 6% earning two-year certificates. Men earned the remaining 30%, with 91% holding one-year certificates and 9% holding two-year certificates. White students earned 82% of the high school technical education certificates, 85% of all one-year certificates at technical colleges, and 81% of the two-year certificates. Latinx/Hispanic students earned 14% of all certificates, 14% of the one-year certificates, and 11% of the two-year certificates. The remaining 4% were awarded to Black/African American, Native American, and Pacific Islander students who earned 5% of the one-year certificates and 4% of the two-year certificates.

Eighty-two percent of certificates earned were in health professions. Of those, 90% of certificates earned by female students were in health professions, while for male students, health professions accounted for 58%. Most certificates earned by female students were as Nursing Assistants, followed by Emergency Care Attendants, or EMTs, and Pharmacy Technicians. Certificates in the health professions were awarded to individuals across all racial and ethnic identities. Still, 77% of those certificates were awarded to white students, with Latinx/Hispanic students earning 16%. Three percent were awarded to Native American students, with Black/African American, Native American, and Pacific Islander identities comprising 4%.

Table 5. First certificates in health professions awarded by technical colleges to high school students

CIP	Title	% Female	% Male	% Total
510601	Dental assistant	2	0	2
510713	Medical Insurance Specialist	< 1	0	< 1
510716	Medical Administration	< 1	0	< 1
510801	Medical Assistant	2	1	2
510805	Pharmacy Technician	6	11	7
510810	Emergency Care Attendant (Ambulance)	7	37	12
510904	Emergency Medical Technician	0	2	< 1
510907	Radiology Tech	< 1	-	< 1
511009	Phlebotomist	3	3	3
512602	Home Health Aide	1	2	1
513902	Nursing Assistant	79	44	73

Postsecondary enrollment

Sixty percent of technical education students enrolled in postsecondary education after high school. However, the credentials they sought were inconsistent with the technical education intent. Of those, 95% attended a degree-granting institution, while 5% continued their education at technical colleges. Eighty-eight percent of those who continued at a postsecondary institution had started technical education at a degree-granting institution. Those enrolled in technical education at Salt Lake Community College, Snow College, and Utah State University had postsecondary enrollment rates exceeding 45%. Dixie Technical College had the highest postsecondary rate among the technical colleges at 50%. While most students

continued their education, the location of their technical education courses during that time may have influenced their decision to pursue further education.

Most high school technical education students choose to enroll at the closest degree-granting institution for postsecondary studies (see Table 6). This pattern was robust at Ogden-Weber, Southwest, and Dixie Technical Colleges. These institutions reside in the same municipal area as the nearest university. However, less than 50% of students enrolled at the three degree-granting institutions remained at those institutions for their postsecondary studies.

The two technical colleges with the lowest proportion of postsecondary enrollees were Uintah Basin Technical College and Tooele Technical College. Approximately one in four students at these two institutions continue their education at these colleges after high school. These two institutions are the furthest from any degree-granting main campus, with distances of at least 40 miles. Both technical colleges have a USU Extension campus nearby, and both have higher enrollment rates at USU than at the geographically closest degree-granting institution. However, the low participation rates may indicate that the extension offices are not meeting the needs of these students, as well as those of the technical colleges.

Table 6. Total postsecondary enrollment rates and rates by postsecondary institutions

Institution	Postsecondary Rate	Technical College	Closest Degree-Granting	Community College	Other Degree-Granting
Ogden-Weber	32	3	76	4	16
Bridgerland	39	2	51	9	37
Uintah Basin	25	17	13	11	58
Davis	42	9	55	7	29
Mountainland	47	9	46	12	33
Southwest	36	12	63	5	20
Tooele	27	15	6	21	58
Dixie	50	2	62	4	32
Utah State	71	10	46	10	35
Salt Lake Community	67	5	37	3	55
Snow College	63	2	34	3	61

Several factors influence whether a high school student with technical education credits enrolls in postsecondary education. For students who attended a technical college while in high school, those who identified as male, Native American, or Pacific Islander were less likely to enroll after high school. High school students in a city, town, or rural area were less likely to enroll in a postsecondary institution than those in a suburb. Finally, earning a credential while in high school decreased the likelihood of pursuing further education. Detailed analytical information supporting these conclusions is provided in the Appendix.

Male students, Native Americans, and Pacific Islanders were less likely to enroll in postsecondary institutions after completing technical education credits from a degree-granting institution. However, Asian Americans were more likely to enroll in degree-granting institutions. Another factor was where students lived. High school students in cities were less likely to enroll in postsecondary institutions. Earning a certificate in high school influenced whether they would enroll in a postsecondary institution after high school. Eighty-one percent of those who earned a certificate in high school enrolled in a postsecondary institution. Specific analyses are in the Appendix.

Students who enrolled in technical colleges after high school focused on five CIP categories: Computer and Information Sciences, Culinary and Cosmetology, Mechanics, Precision Production, and Health Professions. In contrast, those attending degree-granting institutions enrolled in a wider range of programs. Across all 16 institutions, less than 1% pursued a one-year certificate. Eighteen percent of students aimed for two-year certificates, while the remaining 82% enrolled in associate or bachelor’s degree programs. As seen in Table 7, a substantial number of students are enrolled in Humanities and Liberal Arts. This equates to the General Studies associate degree.

Table 7. Percentage of postsecondary enrollment in certificate programs by CIP families for high school technical education students

CIP Family	Title	One-Year	Two-Year	Total
1	Agricultural Science	-	< 1	< 1
9	Communication	< 1	-	< 1
10	Communication Technologies	< 1	< 1	< 1
11	Computer/Information Sciences	26	1	2
12	Culinary/Cosmetology	-	< 1	< 1
13	Education	-	< 1	< 1
15	Engineering Technologies	6	< 1	< 1
19	Family Sciences	-	< 1	< 1
24	Humanities/Liberal Arts	-	89	87
43	Law/Firefighting	-	< 1	< 1
45	Social Sciences	< 1	-	< 1
46	Construction Trades	< 1	< 1	< 1
47	Mechanics	-	< 1	< 1
48	Precision Production	-	< 1	< 1
50	Visual and Performing Arts	< 1	< 1	< 1
51	Health Professions	62	4	5
52	Business	3	2	2

Limitations

The goal of this project was to focus on high school students who start their postsecondary education in high school. It should be noted that a substantial percentage of the technical college student population (42%) comprises adult learners aged 25 or older. Further research is needed to deepen the understanding of the technical college ecosystem.

Specific demographic data, socio-economic, and first-generation status were not available. These factors influence participation and completion in postsecondary pathways, whether during high school or after (Collier and McMullen 2023; Kamer and Ishitani 2024; Perna and Thomas 2008; Pratt et al. 2019). Such information would be necessary to provide the needed clarity on enrollment and attainment. Analysis of these factors may reveal how local populations compare with students outside Utah.

Many of the results presented were descriptive. Causal relationships were not identified nor analyzed. Graphs and tables may imply causal relationships; however, such analyses were not conducted to confirm them. Further research is necessary to investigate any potential causality.

Conclusions

More technical education (TE) courses were taught at the three degree-granting institutions than at the technical colleges. Further, enrollment at the three degree-granting institutions trended upward, while enrollment at the technical colleges declined. While some technical education courses are counted as both technical education and general education credits, only 26% of enrollments meet these criteria. The enrollment trends may reflect changes in course enrollment at Salt Lake Community College, which sponsored the highest number of technical education courses among the eleven institutions. SLCC sponsors almost every concurrent enrollment or technical education course in Salt Lake County, with the highest number of high school students.

Students of color are not enrolling in technical education at the same proportions as degree-seeking concurrent enrollment students. Low enrollment rates at technical colleges are consistent with other studies across the U.S. (Spencer et al. 2021; Steiger et al. 2023) and at degree-granting institutions (Ositelu 2021; Zhang & Oymak 2012). Higher enrollment is expected because Utah does not burden technical education students with tuition and fees to the same extent as other states. Unidentified barriers may be at play.

On the other hand, students of color are more likely to earn certificates in high school, proportional to the high school population. Additionally, students of color in Utah are more likely to earn a certificate after high school than white students (Campbell 2024, 12 - 14). This finding contradicts prior research indicating that Black/African Americans are less likely to earn a technical education credential (Burns et al. 2018; Ison 2021). However, this finding did not apply to Asian American and Pacific Islander students.

Most credentials were in the health professions or culinary arts/cosmetology, both of which were dominated by female students. Men were represented in the health professions, mechanics, precision production, and computer and information sciences. Male students participated in a broader variety of programs. Most of these awards occurred at the technical colleges, despite more students enrolling in the degree-granting institutions. The fact that women graduate from a limited number of programs warrants further investigation. Women may be directed into these small groups of programs, either tacitly or explicitly.

One explanation for low postsecondary enrollment rates may be the distance to a degree-granting institution. Proximity to a degree-granting institution is a factor in postsecondary enrollment (Andres 2001; Carales 2020). Students residing more than 40 miles from a degree-granting campus were less likely to enroll in postsecondary institutions. Satellite campuses had a small mediating effect on this finding.

Finally, few enrolled in technical colleges after high school, contrary to some prior research (Edmunds et al. 2022; Welch 2018). Few students were enrolling in technical colleges, nor were they enrolling immediately after high school. Those who continued participated in a two-year program that they did not complete when they graduated from high school. While other research outlines how technical education, such as concurrent enrollment in general education, prepares students for postsecondary expectations, Utah's culture may be different enough that high school students do not perceive those skills as applicable in their immediate future. It is possible that having earned a certificate in high school, participants may see themselves as ready to enter the workforce.

An alternative explanation may be that many students cannot, or do not know how to, pay for postsecondary tuition after high school. Some research supports this explanation (Gray et al. 2018; Phelps and Chan 2016). When Utah's high school graduates enroll in a technical college, they typically do so at a much older age. The two primary groups at Utah's technical colleges are high school students and adult learners (25 years and older). This may indicate that funding for tuition and fees was acquired later in life. Further research is needed to clarify this finding.

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Appendix: Methodology and Results

Variables

Career and Technical Education: one or more courses that provide skills and knowledge specific to a career. Such pathways are designed to be completed in under two years.

Certificate: A postsecondary award that takes less than two years to complete. Two certificates are available: those requiring less than 12 months, and those requiring at least one but less than two years. Post-baccalaureate and post-graduate degree certificates are not examined in this project.

Community College: A postsecondary institution where a student can earn a certificate or an associate degree.

Dual Enrollment: A postsecondary course offered in high schools where students can receive high school and postsecondary credit.

Technical College: A postsecondary institution in Utah where a student can earn a certificate.

Methods

To assess postsecondary enrollment, students enrolled in high school technical education courses sponsored by USHE institutions between 2015-16 and 2020-21 were tracked for four years. A total of 94,111 students were included, 58,789 from degree-granting institutions and 35,322 from technical colleges. Fifty-four percent of the total sample were female, and 46% were male. Seventy-four percent identified as white, 18% as Latinx/Hispanic, and 8% as Black/African American, Native American, and Pacific Islander.

Results

Table A 1. Closest degree-granting institution to a technical college by miles

Technical College	Nearest Degree-granting Institution	Average Miles
Bridgerland Tech	Utah State University	2
Davis Tech	Weber State University	23
Dixie Tech	Utah Tech University	3
Mountainland Tech	Utah Valley University	2
Ogden-Weber Tech	Weber State University	7
Southwest Tech	Southern Utah University	1
Tooele Tech	University of Utah	40
Uintah Basin Tech	Utah Valley University	123

Two logistic regression models were analyzed to examine potential factors associated with enrolling in a postsecondary institution. The first model examined those who enrolled in technical colleges, and the second model examined those at the three degree-granting institutions. Work in the classroom and internships are tracked and examined separately by the technical colleges. The baseline categories for comparison were female, white students, and attending high school in a city.

Three variables predicted postsecondary enrollment for those whose technical education occurred through technical colleges: being a male student, participating in an internship, and attending a high school located in a town.

The logistic regression model predicting enrollment at a technical college was significant, $\chi^2 = 282.83$, $p < .001$, Nagelkerke $R^2 = .02$. All significant factors suppressed postsecondary enrollment after high school. These include identifying as male, Native American, or Pacific Islander. Male students were 0.21 times less likely to reenroll. Native American students were 0.57 times less likely to be enrolled, and Pacific Islanders were 0.53 times less likely to be enrolled. Compared to attending high school in a suburb, high schools in cities, towns, and rural areas also suppressed enrollment. Finally, earning a certificate in high school decreased the likelihood of enrolling at a postsecondary institution.

Table A 2. Model weights for logistic regression predicting postsecondary enrollment for students who started at technical colleges

Variable	B	SE	p	OR	CI LL	CI UL
Male	-.48	.04	.02	.79	.73	.85
Asian American	.09	.19	ns	1.09	.75	1.59
Black/ African American	-.33	.23	ns	.72	.46	1.12
Latinx/ Hispanic	.07	.05	ns	1.08	.97	1.19
Native American	-.85	.22	< .001	.43	.28	.65
Two or More	-.09	.16	ns	.92	.67	1.26
Pacific Islander	-.75	.35	.03	.47	.24	.93
City	-.65	.10	< .001	.52	.43	.64
Rural	-.48	.04	< .001	.62	.57	.68
Town	-.52	.05	< .001	.60	.54	.65
High School Certificate	-.25	.05	< .001	.78	.71	.86
Constant	-1.46	.04	< .001			

The logistic regression model predicting enrollment in technical education at the three degree-granting institutions was also significant, $\chi^2 = 824$, $p < .001$, Nagelkerke $R^2 = .01$. Only students enrolled in city high schools were more likely to enroll in a postsecondary institution. Urban students were 0.10 times more likely to enroll. Other contributing factors were suppressants. Individuals identifying as Asian Americans were 0.71 times more likely to enroll in postsecondary education. The remaining contributors were male, Latinx/Hispanic, Native American, or Pacific Islander. Male students were 0.25 times less likely to enroll. Students of color were between 0.20 and 0.41 times less likely to be enrolled.

Earning a credential in high school did not predict postsecondary enrollment when starting at a degree-granting institution compared to starting at a technical college. Fewer students at degree-granting institutions earned a certificate than those in technical college programs.

Table A 3. Model weights for logistic regression predicting postsecondary enrollment for students who started at degree-granting institutions

Variable	B	SE	p	OR	CI LL	CI UL
Male	-.29	.02	< .001	.75	.73	.77
Asian American	.53	.05	< .001	1.71	1.53	1.90
Black/ African American	.11	.08	ns	1.12	.95	1.32
Latinx/ Hispanic	-.22	.02	< .001	.80	.77	.84
Native American	-.20	.08	.009	.82	.71	.95
Two or More	-.05	.05	ns	.95	.87	1.04
Pacific Islander	-.53	.09	< .001	.59	.49	.70
City	.10	.03	< .001	1.10	1.05	1.16
Rural	-.01	.04	ns	.99	.92	1.06
Town	.02	.02	ns	1.02	.98	1.06
High School Certificate	20.48	806.47	ns	1.00	0.00	1.00
Constant	.83	.01	< .001			