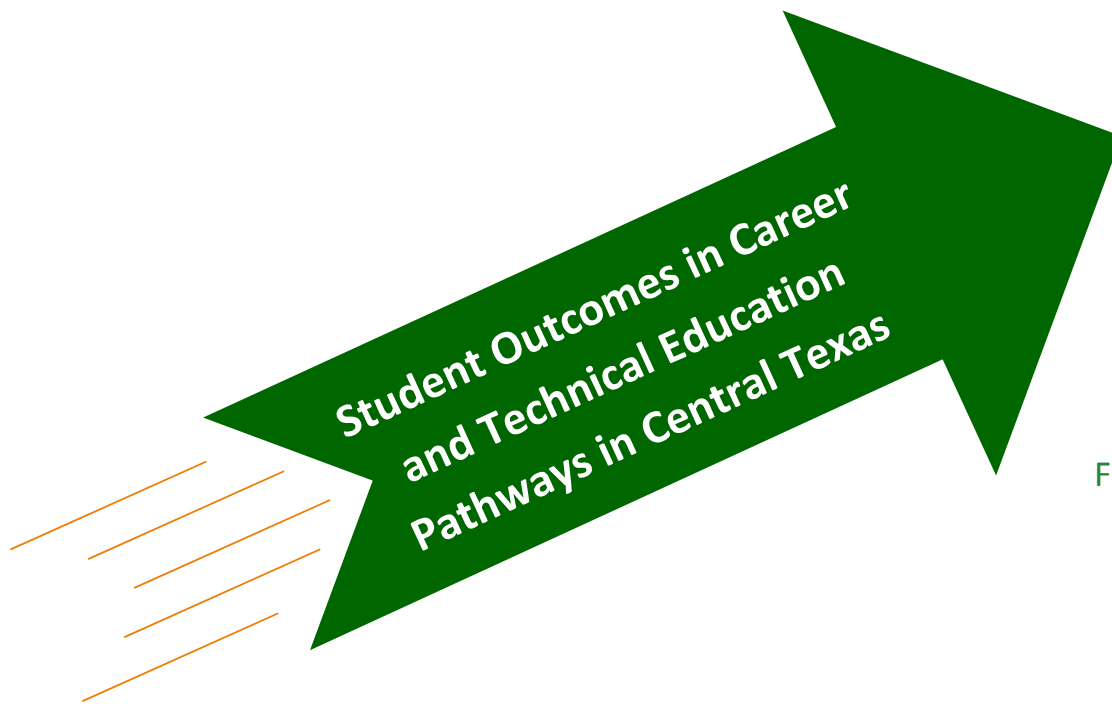




Pathways of Promise: Promoting HB 5 Success



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GREATER TEXAS FOUNDATION

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About E3 Alliance

E3 Alliance is a regional, data-driven education collaborative based in Austin, Texas. Serving the Central Texas community, we partner with districts, higher education, and industry to build the strongest educational pipeline in the country to drive regional economic prosperity. Founded in 2006 E3 Alliance acts as a catalyst for change, working to break-down barriers and build better alignment across the education continuum. Our name tells our story: *Education Equals Economics*. We believe that only through greater education achievement for our current and future generations of children, can Central Texas realize economic prosperity and a high quality of life for our community. Such education achievement requires systemic change from cradle to career, and that is our commitment to our community. www.e3alliance.org

Executive Summary

E3 Alliance facilitates **Pathways of Promise (PoP)**, a research and implementation initiative in Central Texas designed to *identify and scale Career and Technical Education (CTE) pathways for high school students leading to successful transitions to and completion of a postsecondary credential*. Partner school districts include: **Austin ISD, Bastrop ISD, Round Rock ISD and San Marcos CISD**. Below are the key research findings from the qualitative research, the baseline, CTE descriptive and CTE comparative analyses for Central Texas. Please review the final section for priority recommendations emerging from these findings.

Qualitative Findings: HB 5 Deployment Challenges

- Middle school preparation and counseling have become critically important to successful HB 5 high school pathways. However, MS exploration does not receive state weighted funding as do HS CTE courses.
- Pathway development depends on availability of qualified teachers at high school campuses rather than intentional design.
- Internal variation of course offerings and credits within and across districts complicate student counseling and pathway planning.
- Secondary counseling does not have the capacity for the type of advising now required under HB 5.
- Industry certifications and CTE dual credit offerings depend on qualifications of CTE teachers rather than workforce demand or clear degree pathways.

General Baseline Analysis

- 31% of 2013 8th graders completed Algebra I by the end of 8th grade. Only 17% of low income 8th graders completed Algebra I compared to 43% of their non-low income peers.
- 1 in 5 2012 high school graduates enrolled in college part time. For low income students, half of those who enrolled did so part time.
- Full-time college students were far more likely to persist to second year than their part-time peers (89% vs 50%). 69% of all college enrollees also worked.
- 27% of 2012 HS graduates entered the workforce directly after graduation. 14% of HS graduates were not found in Texas colleges or workforce records.

CTE Baseline and Comparative Analysis

- Occupational Concentrators (OC)* in CTE pathways generally saw higher outcomes in high school graduation and college enrollment.
- The HS graduation rate for low income high school students who were Non CTE was far lower than the rate for OC. The graduation rate for low income and non-low income OC did not differ.
- Controlling for 9th grade TAKS performance, Black and Asian students enrolled in college at higher rates than their Hispanic and White peers.
- Although the analysis intended to focus on Education as one of the priority clusters, there was an insufficient number of OC students in the cluster for analysis.
- Half of all Health Science OC were low income, compared to 40% low income for IT and 31% for STEM.
- STEM and Health Science OC had higher college enrollment rates than IT.

*For a definition of categories of student participation in CTE pathways including “Occupational Concentrators,” please see page 8 of this report.

Pathways of Promise: A Report on Student Outcomes in Career and Technical Education Pathways

Pathways of Promise Overview

Pathways of Promise (PoP) is a two-phased research and implementation initiative in Central Texas, facilitated by E3 Alliance to *identify and scale Career and Technical Education (CTE) pathways for high school students leading to successful transitions to and completion of a postsecondary credential*. The focus of the research phase in 2014 was to identify a selection of CTE pathways in Education, Health Sciences, IT and STEM that increase the likelihood of priority student populations – those who are traditionally under-represented in higher education – for accessing and succeeding in their postsecondary experience and obtaining a credential with market value. The priority populations include: low income students, special education students, English language learners, Hispanic students and African American students. Primary partnerships for the initiative include Austin ISD, Bastrop ISD, Round Rock ISD and San Marcos CISD.

Beginning in 2015, the implementation phase will convert the findings from this *research into practical recommendations aligned to district strategies in support of HB 5 and offer critical professional development to teachers and counselors, and, as needed, curriculum content development to increase course relevance and alignment through college*. In total, this two year initiative stands to change practices in over 21 high schools that can improve education outcomes for close to 37,000 students, half of whom are low income.

E3 Alliance will also share findings with industry, institutions of higher education, and school districts throughout Central Texas and beyond. Our goal is to increase region-wide capacity for rigorous, market-driven high school-to-college and career pathways that lead to increased college completion and career entry in our region's high demand, high wage jobs – particularly for our priority populations.

This brief begins with the set of research questions related to CTE pathways and student outcomes associated with those pathways. The qualitative and quantitative methods used to answer these questions follow. Section 3 describes the findings related to the qualitative research and general baseline for students in Central Texas. Section 4 provides key findings related to the comparative analysis of CTE Pathways as well as an analysis of outcomes associated with the “intensity” of concentration during high school. The final section outlines the emerging recommendations arising from these findings, placed in the context of partner district and regional stakeholder priorities. The fuller report including related data tables will be published in the late spring of 2015.

Research Questions

- What do the school districts that partnered with E3 on this project have as their CTE offerings and articulated credit offerings, and how are these changing as a result of the Endorsement requirements of HB5?
- What are the most recent high school graduation rates, college and career readiness (CCR) rates, college enrollment rates, persistence rates and 2-to-4 year transfer rates?
- Which students are taking Algebra I by the end of 8th grade, and what is the relationship between taking Algebra I in 9th grade and CCR in 11th grade?
- What proportion of students are taking CTE courses, earning articulated credit or dual credit, and how does this vary by degree of concentration in CTE and by CTE career cluster designation?
- What are outcomes by degree of concentration in CTE for high school (graduation, CCR), college (enrollment, declaring major, persistence, 2-4 year transfer) and career entry?
- For students who took sufficient coursework in a particular CTE career cluster to be considered and Occupational Concentrator (OC), what are the high school and college outcomes by priority cluster?
- How do the different levels of CTE concentration and the career clusters compare on the likelihood of achieving these outcomes when prior performance is taken into account?

Overview of Methods

In order to strengthen regional deployment of HB 5 pathways, E3 Alliance elected to conduct both qualitative and quantitative analyses of CTE coursework and career pathways in addition to establishing a general baseline to contextualize those findings within the contexts of overall student performance in Central Texas.

The questions focused on a specific subset of student populations including: African American students, English language learners, Hispanic students, Low Income students and students in Special Education. E3's research team defined English language learners as those students who at any point in middle school or high school were designated as "English language learner." Students were classified as low income if they received free lunch or reduced-price lunch at any time in high school. Special education students were defined as those with an Individual Education Plan.

In response to the expectation set in HB 5 that pathways customize their course offerings and curriculum based on regional industry priorities, this study focused on key CTE clusters considered as economic drivers in Central Texas: Education, Health Sciences, Information Technology (IT) and Science, Technology, Engineering and Mathematics (STEM). Both qualitative and quantitative research addresses all 16 clusters recognized by the State of Texas as well; those findings will be provided in the more comprehensive report slated publication for later this spring.

Central Texas refers to school districts in the geographic footprint of the Austin Community College Service District serving the following counties: Bastrop, Caldwell, Gillespie, Hays, Travis, Williamson and portions of Blanco and Gonzales.

The qualitative analysis included in-depth interviews with PoP partner districts (Austin ISD, Bastrop ISD, Round Rock ISD and San Marcos CISD) as well as data collection of current and projected programs of

study in each pathway and industry certifications (tested and completed). The interviews and partner meetings targeted a series of administrator levels that included campus principals, district-level CTE Directors, district executive administrators for secondary education, and college administrators charged with addressing college and career readiness standards.

The quantitative analysis took place at the Education Research Center at The University of Texas at Austin. Baseline analysis was conducted on the most recent data available for each individual outcome; the years used are listed in the results. All descriptive and statistical analyses conducted on the CTE-related research questions were based on longitudinal tracking of cohorts. First-time 9th graders in 2009 (class of 2012) were followed through higher education second year persistence and first-time 9th graders in 2007 (class of 2010) were followed specifically to address two to four year transfer rates by CTE level of concentration. This study intentionally omitted college completion because district partners noted that the high school experience dating back prior to 2009 would little resemble the current student high school experience and therefore be less relevant.

Multiple outcomes in high school, higher education and the workforce were utilized in this research. The first of these, high school graduation, was defined as *the proportion of students from the first-time freshman cohort who graduated within 4 years*. This definition is an attrition model which means it does not account for students leaving the Texas public school system for reasons other than dropping out. College and Career Readiness (CCR) was defined as the percentage of high school graduates that achieved the college readiness level on the 11th grade TAKS test.

Students were considered enrolled in higher education if they enrolled in either the fall or spring semester the year after high school graduation. They were considered enrolled full-time if they were enrolled for 12+ credit hours both semesters or if they only enrolled in the spring semester and had 12+ credit hours scheduled for that semester. Students were considered part-time enrolled if they did not meet the full-time definition.

If a student, who was enrolled as described above, was also enrolled in the fall of the second year after high school, that student was considered to be persisting into the second year of higher education. The proportion of students enrolling at a community college in the year after graduation who transfer to a four year higher education institution by the fall of their 4th year represents the 2-to-4 year transfer rate. Lastly, career entry was based on the fall, winter, and spring quarters after high school graduation. Researchers defined industry of employment as a snapshot selected from 2 to 4 quarters after graduation, with the highest paying employment in the quarter farthest from graduation.

Key Qualitative Findings Affecting High School Pathways

The purpose of the in-depth interviews was to better understand how districts were responding to the career pathway mandates of HB 5, and to identify regional assets and challenges related to successful implementation of those mandates. Representatives from Austin ISD, Bastrop ISD, Round Rock ISD and San Marcos CISD provided rich detail about the current and planned programs of study (POS) related to

the career pathways, district strategic priorities and concerns. The findings below represent common themes that emerged during those interviews.

1. **Middle school preparation and counseling has become critically important to successful deployment of HB 5 high school pathways. However, middle school exploration does not receive incentivizing weighted funding from the state as do HS CTE courses.**
2. Without deep programming support from district Central Administration (enhanced teacher resources, professional development, HR recruiting & compensation strategies), **pathway development remains contingent upon availability of qualified teachers at each high school campus.** For smaller and more rural districts, teacher recruitment and retention remains their greatest vulnerability.
3. Internal variation in course offerings and the credits they earn within and across districts complicate student counseling and pathway planning.
4. **Secondary counseling does not have the capacity for the type of advising now required under HB 5.**
5. Advanced 4th year CTE courses to “complete” Programs of Study have not been developed across most districts, in part, because they are focused on successful launch of lower-level courses for the first 9th grade cohort. In Central Texas, districts are also looking to the leadership of regional higher education to co-develop these courses.
6. There is a desire to increase CTE dual credit offerings, but very few CTE high school teachers meet the qualifications to teach dual credit and the community college faces capacity challenges in developing an appropriate shared revenue model and in providing faculty qualified and interested in teaching at the high school level.
7. There is an expectation under HB 5 that high schools will increase the availability of industry certifications that can be conferred during high school. The inventory of industry certifications completed in Central Texas indicated that in 2012-2013:
 - a. 7622 certifications were issued
 - b. 58% were in 5 areas (CPR Certification with Defibrillator, Office Proficiency Assessment Certification, Office Proficiency Power Point, Adobe Photoshop and Occupational Health and Safety Certification).
 - c. 5% were in the priority career pathways selected for this study: Education, Health Sciences, IT and STEM.
8. **Decisions to offer industry certifications were determined campus-to-campus and based on qualifications of CTE Teachers** and cost to administer assessment rather than on whether the certifications had market or academic value for the high school students.

Key Findings Related to Regional Baseline Data

In order to contextualize the findings related to the Career and Technical Education descriptive and comparative analyses, E3 Alliance baselined Central Texas high school student outcomes with particular attention to our priority populations (low income, special education, English language learner, African American and Hispanic students). Below are a selection of findings related to the Central Texas baseline data.

1. **Overall, 31% of 2013 8th graders completed Algebra I by the end of 8th grade, however the income disparity was substantial. Only 17% of low income students versus 43% of non-low income students completed Algebra I by the end of 8th grade.**
2. One in two students who took and passed Algebra I in 9th grade in 2010 were college and career ready by the end of 11th grade, as determined by state assessment standards.
3. There were wide disparities in college and career readiness rates based on both ethnicity and income.
4. **1 in 5 of all Central Texas 2012 high school graduates enrolled in college part-time. For low income students, half of those who enrolled did so part-time.**
5. **Full-time college students were far more likely to persist to second year than their part-time peers (89% versus 44%).** While the rates vary, the same trend holds true for low income students and across ethnicities.
6. For Central Texas 2010 high school graduates who enrolled full-time in community college, 38% transferred to a 4-year college or university within three years.
7. Only 13% of part-time community college students transferred in that same time period. Notably, 61% of high school graduates who enrolled in community college did so part-time.
8. **In Central Texas, 27% of high school graduates entered the workforce within a year of graduation, without taking college coursework.**
9. About 14% of graduates have no reportable job and are not enrolled in college in Texas by a year after graduation.
10. **In Central Texas, 69% of college enrollees for the high school graduating class of 2010 also worked while attending college.**
11. Employment patterns varied little between those working while pursuing postsecondary education and those entering the workforce only. 60% were in either food service or retail. Much of the remaining 40% were in other service industries.

Key Findings: Career and Technical Education Baseline

The definitions selected to describe the “intensity” of CTE course-taking patterns derived from a 2012 study by the National Research Center for Career and Technical Education that organized student outcomes based on the amount of coursework and credits conferred within CTE generally and then within a specific CTE cluster.¹ Below are the categories E3 Alliance defined to describe degree of CTE concentration that align to this typology and used in all the subsequent comparative analyses:

1. **Occupational Concentrator (OC):** Student has taken 5 or more semesters in one CTE cluster.
2. **Concentrator (C):** Student has taken 5 or more semesters of CTE courses across clusters (note: districts subsequently informed E3 that these students may be OC depending on how a district designated a course that may be related but not in a given cluster according to AchieveTexas).²
3. **Explorer (E):** Student has taken 3 or 4 semesters of CTE courses

¹ Aliaga, Oscar A., Kotamraju, Pradeep, Stone, James R. *A Typology for Understanding The Career and Technical Education Credit-Taking Experience of High School Students*. National Research Center for Career and Technical Education (October 2012). <http://www.nrccte.org/resources/publications/typology-understanding-career-and-technical-education-credit-taking>.

² AchieveTexas website. AchieveTexas College and Career Initiative. http://www.achievetexas.org/POS_Covers1.htm. Accessed February 2015.

4. **Non-CTE (NC):** student has taken 2 or fewer semesters of CTE (Note: Districts indicated there could be wide variation in student course-taking patterns for this category in particular, with student choice ranging from IB, AP to band or other extracurricular to remediation).

The following key findings relate to the descriptive analysis of categories of CTE intensity for Central Texas High school students:

1. There was no discernable difference by income in the share of students who fell into OC or C. A higher percent of low income students were NC and a lower percent were E compared to non-low income students.
2. A lower percentage of African American students were OC than other ethnicities when accounting for their proportion of the Central Texas population.
3. **Based on an attrition model, graduation rates for low income NC were far lower than any other category (45%).**
4. Overall CCR rates for NC graduates demonstrated wide variation, with 79% for non-low income (the highest across all CTE categories) compared to 42% for low income.
5. **For low income high school graduates, OC demonstrated the highest rates of college enrollment at 56% versus 48%, 47% and 43% for C, E, and NC respectively.**
6. Overall 68% of low income OC persisted to second year versus 59% NC.

The following key findings relate to the descriptive analysis of OC students in specific career clusters:

1. Of the 2000+ OC across 16 clusters, only 34 students (2%) completed a sequence of courses in the Education cluster, whereas STEM, Health Sciences and IT accounted for 13%, 28%, and 8%, respectively.
2. Proportionately more Asian and Hispanic students concentrated in Health Sciences, and more White students focused on STEM.
3. Half of Health Sciences OC were low income. 40% of IT OC were low income. 31% of STEM OC were low income.
4. The highest rates of CCR among OC graduates occurred in STEM (80%), Business (75%) and Health Sciences (74%). The lowest CCR rates occurred in Transportation, Distribution and Logistics (33%), Human Services (42%) and Law, Public Safety, Corrections and Security (48%). IT OC were college and career ready at a rate of 58%, Education at 65%.
5. Clusters with OC that showed the highest college enrollment rates include: Health Sciences (78%), and STEM (77%). Education OC enrolled at a rate of 71%, IT at 61%.
6. Top clusters for 2nd year college persistence rates include: Hospitality (85%), STEM (84%), Health Sciences (80%). Education OC persisted at a rate of 79% overall and IT at a rate of 71%.

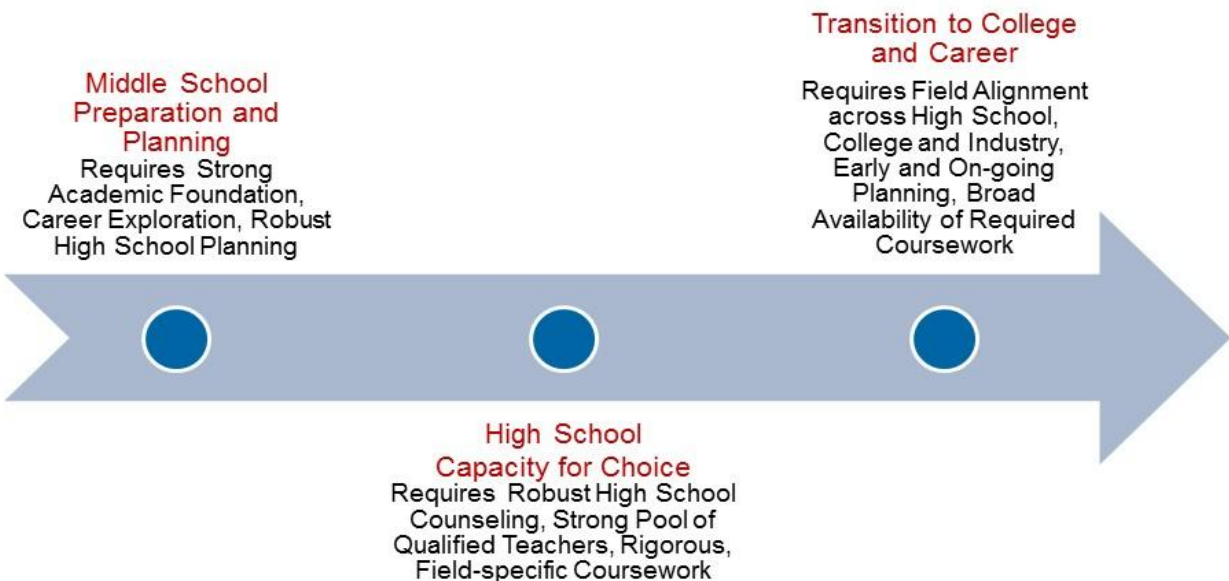
Key Findings: Career and Technical Education Comparative Analysis

The following are findings for high school and higher education outcomes based on how students compared by CTE category or how OC students compared by cluster. Outcomes were compared after adjusting for education performance as measured by 9th Grade TAKS scores. Several of the descriptive analysis findings were validated in these analyses. Further:

1. Among female OC, graduation rates were higher in STEM and HS than in IT, whereas rates for males did not differ across these clusters.
2. CCR rates were higher for female OC than for male OC. CCR did not differ for males across CTE category (OC, C, E, NC) but for females, OC CCR was higher than for C and NC.
3. **Overall OC and C saw higher college enrollment rates than E, who had higher enrollment rates than NC.**
4. **African American and Asian graduates had higher college enrollment rates than Hispanic and white graduates.**
5. **STEM and Health Sciences had higher college enrollment rates than IT.**
6. Low income Asian students persisted at the same rate as non-low income Asian students. In contrast, low income African American, Hispanic and white students had lower persistence rates than their non-low income peers.
7. It is important to note that the comparative analysis could detect no discernable effect of CTE intensity or OC CTE cluster on persistence rates.

Emerging Recommendations from Findings and Stakeholder Priorities

Capacity Building Across the Secondary Pipeline



The findings emerging from this research were shared with partner districts as well as strategic stakeholders such as higher education, service providers for professional development, education preparation programs, industry representatives and community organizations.

Partner organizations have prioritized the following recommendations:

1. **Strengthen Middle School Foundations:** The critical disparity in mathematics in combination with the struggle districts face to support middle school career exploration indicate a strong need to provide professional development in the following ways:
 - a. Improve mathematics teacher content mastery and pedagogy.
 - b. Increase support to both middle and high school counselors in sharing Labor Market Information and degree mapping.
2. **Develop 4th-year CTE Courses Aligned to College Majors and Develop Transition- Supporting Coursework:** Develop 4th year courses for district Programs of Study that offer dual credit opportunities with 2- and 4-year colleges that align to both degree pathways and prioritized industry certifications. This may include a variety of practices ranging from increasing district access to UT On-Ramps, to creating a regional Computer Science Curriculum, to the development of an inter-district CTE Hub.
3. **Build an Educator Pipeline:** The key finding related to the Education CTE cluster is that there are virtually no students who opted to take CTE coursework in this pathway. Yet, teaching (particularly secondary education in STEM, bilingual instruction, as well as Pre-K) are in great demand and will continue to be for the foreseeable future. As districts cultivate strong HB 5 pathways, developing course concentrations and degree plans for an education pipeline may help to increase the number of students intentionally focusing college and career choices in education.
4. **Partner with Industry for Targeted Work-Based Learning:** Given the low percentage of both high school graduates and college students who are working in the industry of their career interests, as identified by CTE cluster concentration, connecting to business systemically to provide work-based learning through both traditional modes as well as innovative project-based strategies will help to cultivate local talent for our high-demand, high-wage jobs.
5. **Define Content and Framework of HB 5 College Prep course and other TSI Support Models:** Although not directly related to CTE findings, this issue has emerged particularly for our smaller district partners, given the mandate in HB 5 to offer a TSI preparatory course in both mathematics and English language arts.
6. **Identify and Focus on High Demand Industry Certifications that Align to Higher Education Fields of Study:** Historically, schools offer certifications based on the availability of a qualified teacher and if there is additional funding to cover the cost of the test. Industry, higher education and districts are all seeking a more strategic approach to industry certifications designed to increase student employability or advance postsecondary degree aspirations.