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U.S. Department of Education
Opportunities for Connecting
Secondary Career and Technical
Education (CTE) Students and
Apprenticeship Programs

OPPORTUNITIES FOR CONNECTING SECONDARY CAREER AND TECHNICAL EDUCATION (CTE) STUDENTS AND APPRENTICESHIP PROGRAMS

Prepared for the
U.S. Department of Education
Office of Career, Technical, and Adult Education

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June 2017

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ABBREVIATIONS

CTE	career and technical education
CVCC	Catawba Valley Community College
DOL	U.S. Department of Labor
ED	U.S. Department of Education
ESSA	<i>Every Student Succeeds Act</i>
GPA	grade point average
MAP	Middle Apprenticeship Program
MC3	Multi-Craft Core Curriculum
OCTAE	Office of Career, Technical, and Adult Education
<i>Perkins</i>	<i>Carl D. Perkins Career and Technical Education Improvement Act of 2006</i>
RA	Registered Apprenticeship
RACC	Registered Apprenticeship-College Consortium
SCTCS	South Carolina Technical College System
TRACK	Tech Ready Apprentices for Careers in Kentucky
TTC	Trident Technical College
UVCC	Upper Valley Career Center
WBL	work-based learning
<i>WIOA</i>	<i>Workforce Innovation & Opportunity Act</i>



EXECUTIVE SUMMARY

Labor market projections indicate a growing gap in the supply of qualified employees for middle skills jobs—those that require training beyond high school but less than a four-year degree. Shortfalls are expected to be particularly acute in fields critical to our nation’s economic competitiveness, such as computer technology, nursing, and advanced manufacturing. Recognizing the contribution that apprenticeship can make in preparing a skilled workforce, the federal government has launched several initiatives to expand existing and launch new training programs in high-growth, high-tech industries.

The U.S. Department of Education’s Office of Career, Technical, and Adult Education (OCTAE) has supported these federal system-building efforts by identifying effective strategies to deepen and diversify the supply of qualified apprentices. In particular, OCTAE has sponsored research to explore the potential for connecting secondary career and technical education (CTE) students with apprenticeship training opportunities. This activity reflects the unique, yet crosscutting purposes of the two programs.

Both CTE and apprenticeship combine classroom instruction with workforce training—integrating rigorous academic, technical, and employability skills within a career context. Program curricula are vetted by employers to ensure that coursework prepares students for entry into in-demand fields and are aligned with current industry standards. Classroom instruction is reinforced by hands-on application to give learners a deeper understanding of the field. Students also may have options for earning college credits and industry-recognized credentials that will prepare them for immediate employment as well as postsecondary enrollment.

For this project, eight programs were selected for on-site visits with local program staff, industry and labor representatives, students and parents, state leaders, and other key stakeholders. Sites hosted a mix of programs, ranging from those relatively new to connecting CTE and apprenticeship programs to those with established programs, as well as those offering training in new industry fields.

This report profiles each program’s history, structure, and lessons learned. The report also synthesizes observations across the sites to support state and local leaders in connecting high school CTE students with apprenticeships.

STRATEGIES TO CONNECT CTE AND APPRENTICESHIP

The report focuses on three types of apprenticeship programs:

- **Apprenticeship**—a formal, on-the-job training program that typically has five components: 1) employer involvement; 2) on-the-job training; 3) related technical instruction; 4) paid work experience; and 5) award of a portable, nationally recognized industry credential. A subset of these programs, termed “registered apprenticeship,” additionally must meet national industry standards and be registered with the U.S. Department of Labor (DOL) (or a federally recognized state apprenticeship agency).
- **Youth Apprenticeship**—a program that is designed specifically for individuals aged 16–18, and is connected to an adult apprenticeship. These may be registered with the DOL (or federally recognized state apprenticeship agencies), and often include and demonstrate the five components of a registered apprenticeship. While the term “youth apprenticeship” is used by some states to describe other work-based learning programs, this report defines youth apprenticeship more specifically.
- **Pre-apprenticeship**—a program or set of strategies designed to prepare individuals for entry into an apprenticeship program. Instruction may vary in length and scope, and may include basic skills training, academic skills remediation, or an introduction to the industry. Completers may be accorded preferential

consideration for entry into an apprenticeship program and/or apply time served or credits earned toward fulfilling program requirements.

The eight selected programs are categorized broadly as follows:

Program Name	Location	Career Cluster(s)	Year Created	Participants (2014-15)
<i>Registered Apprenticeship</i>				
Apprenticeship Catawba	Hickory, North Carolina	Manufacturing	2013	26
<i>Youth Apprenticeship</i>				
Charleston Youth Apprenticeship	Charleston, South Carolina	Hospitality and Tourism	2015	13 (in 2015-16)
<i>Pre-apprenticeship</i>				
Bayless Floor Layers Middle Apprenticeship Program	St. Louis, Missouri	Architecture and Construction	2004	14
Edward J. Malloy Initiative for Construction Skills	New York City, New York	Architecture and Construction	2001	135
Green Academy at Salinas High School	Salinas, California	Architecture and Construction	2014 (when program started using union curriculum)	117
Puget Sound Skills Center Construction Technology Program	Seattle, Washington	Architecture and Construction	2006	24
Tech Ready Apprentices for Careers in Kentucky (TRACK) – Dr. Schneider Automotive Systems	Russell Springs, Kentucky	Manufacturing	2014	4
Upper Valley Career Center School-to-Apprenticeship	Piqua, Ohio	Architecture and Construction; Manufacturing	Late 1990s	24

A Continuum of Connections

Sites took various approaches in connecting secondary CTE to apprenticeship, with programs varying across two dimensions: the degree to which *secondary CTE students' instruction aligns with apprenticeship training* and the extent to which *programmatic requirements articulate with apprenticeship* to ease student entry into programs. Figure 1 places each study site along the continuum of approaches educators may take for *instructional alignment* and *program articulation*.

Instructional Alignment

The degree of instructional alignment varied across the study sites, with four distinct approaches observed.

- **Full**—Students receive instruction tailored to address the entry requirements of an apprenticeship, and coursework fulfills students' high school graduation requirements as well as the performance expectations of an entering apprentice.

- 
- **Embedded**—Apprenticeship skills training is integrated into a student’s CTE program and may be applied toward fulfilling course credit and high school graduation requirements. Students may also receive technical instruction that equips them for educational and career opportunities beyond apprenticeship.
 - **Substituted**—All apprenticeship training is delivered outside the secondary school setting, typically by a postsecondary education partner or program intermediary. Students may, however, receive some high school and/or early postsecondary credit within their CTE field of study, with the degree of recognition varying by site.
 - **External**—All apprenticeship instruction is delivered outside the secondary school setting. Students receive no educational credit, though they may apply hours worked toward fulfilling the entry requirements of an apprenticeship or be positioned for preferred entry.

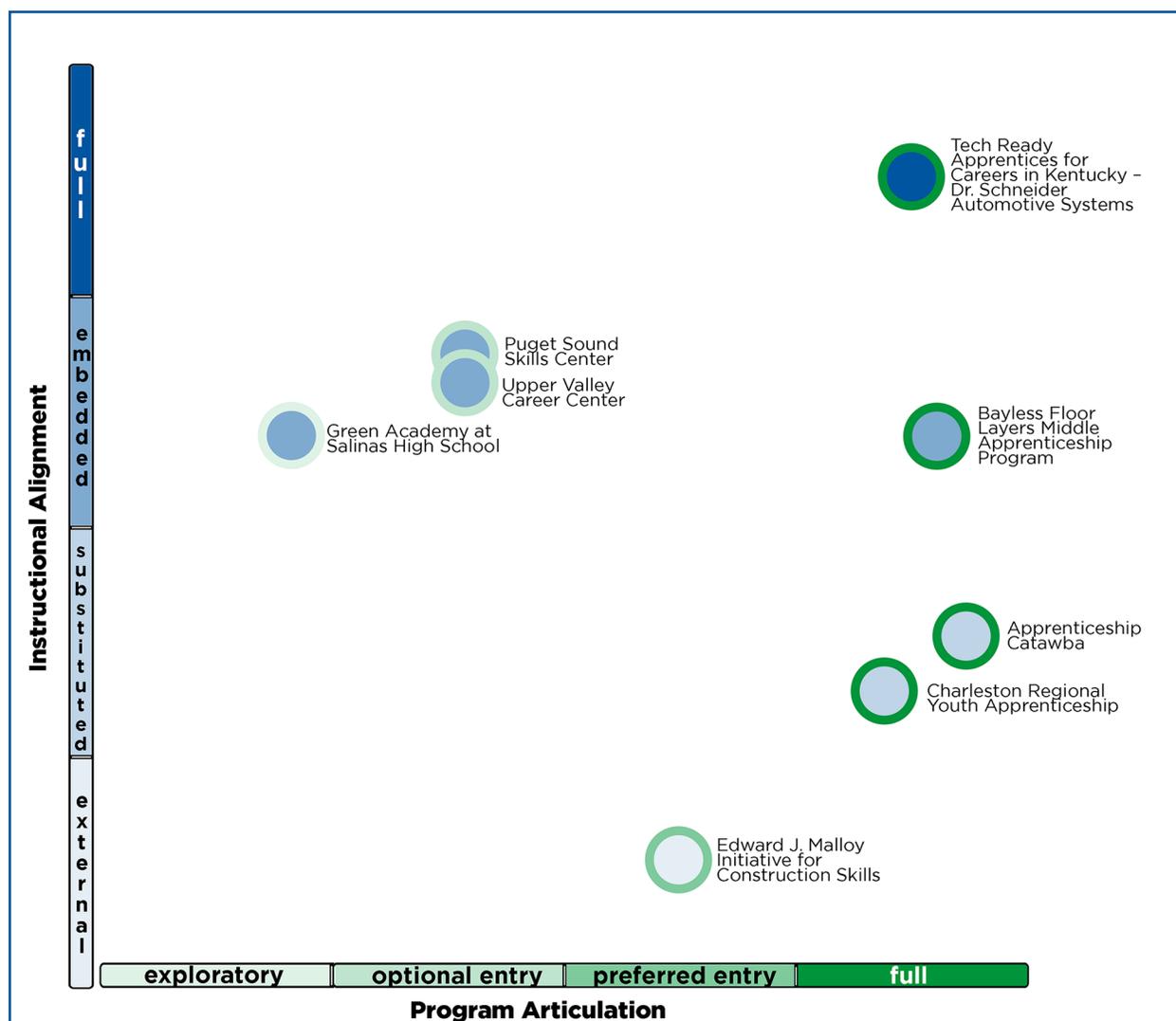
Program Articulation

The ease and seamlessness of students’ transition from secondary CTE to apprenticeship varied across the sites, driven by the programs’ goals and designs. Four degrees of articulation were observed across study states. These include:

- **Full**—There is no distinction between a CTE program and apprenticeship program. Students are fully enrolled as apprentices or pre-apprentices while in high school and, upon their graduation, continue on as apprentices, with all credits and hours counting toward full program completion.
- **Preferred Entry**—Students participate in programs that prepare them for entry into an apprenticeship, though they are not enrolled as apprentices. Per formalized agreements, referred entry may be granted to students who complete specific requirements, and may apply educational credits or hours worked toward an apprenticeship.
- **Optional Entry**—Students participate in programs that may prepare them for entry into an apprenticeship but are not formally enrolled. Programs typically do not guarantee students a direct pathway to an apprenticeship program but rather are designed to prepare students for multiple post-graduate opportunities, including apprenticeship.
- **Exploratory**—Students participate in programs that allow them to explore career options, which may include entry into a pre-apprenticeship or apprenticeship program, but they receive neither credit toward their program nor preferential consideration for entry.

There are tradeoffs to each approach. Greater training specificity may narrow CTE students’ learning experience but increase their benefits and options in apprenticeships, which are occupationally specific. Students with broader skills training may have fewer post-program benefits directly aligned with apprenticeships but may have a better sense of the range of career options open to them, which may include apprenticeship. Readers are encouraged to use the taxonomy to direct their reading of site visit profiles and to consider the benefits and drawbacks of sites’ approaches to alignment and articulation.

Figure 1: Degree of instructional alignment and programmatic articulation between CTE and apprenticeship in study sites



CROSS-SITE TAKEAWAYS

Despite the unique features of each study site, some crosscutting takeaways were observed in program design, program effectiveness, student and parent engagement and communications, financing, and equity and access.

Program Design

There is no inherently “right” or “wrong” approach to connecting CTE students to apprenticeship programs. Study sites were located in communities with varying geographic, socioeconomic, and resource characteristics, and varying state administrative or legislative policies, all of which affected program structure.

- **Programs should be aligned to workforce demand**—Programs should account for state, regional, and local employment opportunities within in-demand fields for which there are sufficient employment options, be they in an apprenticeship program or related field.

- **Buy-in must come from all sides**—Effective programs require meaningful collaboration from all partners. Teachers, employers, parents, and students must see the value of their participation if the program is to persist over time.
- **Employers need to drive the process**—At most sites, the impetus for the program formation came from employers and/or labor associations seeking to bolster their pipeline of workers.
- **No one size fits all in designing partnerships**—There is no minimum or maximum number of students who should participate in a program. Program size is and should be a function of regional demand and available placements with apprenticeship sponsors, although some sites are leveraging employer consortia to offer more placements for students.

Program Effectiveness

Both qualitative and quantitative measures need to be considered when evaluating the success of programs' efforts to align CTE and apprenticeships.

- **Use both short- and long-term metrics to gauge program value and illustrate program effectiveness**—Beyond enrollment and general employer satisfaction, many sites had not yet developed the long-term metrics necessary to quantify the benefit of these connections. Additionally, for programs where apprenticeship was one of multiple pathways, the number of students who continued on in a chosen pathway was relatively low, although high school graduation and postsecondary placement rates were high.
- **Program enrollment alone is not an appropriate measure of effectiveness**—Sites' capacity to scale up enrollment often is dictated by the number of placements that employers are able to support. Therefore, it is important to analyze what happens to students once enrolled to determine how effectively programs are preparing them for apprenticeship and other post-program options.
- **There are challenges with collecting and sharing data across systems**—Sites often experience challenges collecting outcomes data for students, due in part to the lack of a single or connected reporting infrastructure connecting the kindergarten through 12th grade (K-12) and postsecondary education and workforce systems.

Student-Parent Engagement and Communications

Successful programs must engage a number of key audiences, including students and parents. The eight sites offered the following examples of different ways to engage students and parents through recruitment and marketing efforts:

- **Educate parents and students on participation benefits, including postsecondary opportunities**—Site leaders all reported the need to overcome negative perceptions connected to both CTE and apprenticeship. Strategies for addressing these challenges focused on publicizing program benefits through the creation of communications materials, and the hosting of public events, such as apprentice signing day celebrations and workplace tours.
- **Market postsecondary opportunities**—Messaging postsecondary connections helped to engage students and parents. Programs that included early postsecondary credit or delineated clear postsecondary pathways reported these were selling points with both parents and students.
- **Attract students to new fields/innovative programs**—Apprenticeship has the potential to work in many industries. Since CTE programs span industry fields, educators reported attracting new types of students in expanding opportunities into new, nontraditional fields such as hospitality and IT.



Financing

Securing stable resources is critical to maintaining program operations. Aligning CTE programs with apprenticeship entails leveraging public funding, as well as funding provided by employer sponsors and other partners. Examples of this are provided as follows:

- **Leverage existing educational resources**—Study sites used varying funding strategies to support their programs, including local contributions, state secondary and postsecondary education formulas, and federal *Carl D. Perkins Career and Technical Education Act of 2006* resources.
- **Higher wages can help attract students**—Students participating in apprenticeships often earned wages that exceeded the state minimum wage or early postsecondary credits that carried a financial benefit.
- **Offer financial incentives to employers**—While tax credits may not sway a larger company to participate, these and other financial incentives were seen as a successful way to convince management in smaller businesses that participation would be, at a minimum, cost neutral.

Equity and Access

All sites experienced challenges around recruiting and providing access for nontraditional students and removing access barriers, most notably transportation to and from work placements and employers' concerns about hiring minors. Following are some solutions to these challenges:

- **Remove barriers to access by offering transportation to and from the job site**—Nearly all sites, unless based in an urban center with access to ample public transportation, reported transportation to and from the work site as an ongoing challenge that kept some qualified students from participating in these opportunities.
- **Mitigate concerns about liability and youth labor laws**—Programs overcame legal barriers to work-based learning for students under 18 in a number of ways, including using their employer partners to help explain the relevant state and federal labor laws or extending school- or institution-based liability coverage for participants.

SUMMARY

The sites profiled in this report demonstrate a diversity of approaches that states and localities have used to create programs that both fit their needs and seek to address the persistent skills gap that leaves quality jobs with family-sustaining wages unfilled. The detailed profiles aim to provide state and local leaders with concrete examples and strategies to use when examining their own policies, infrastructure, and practices to consider how they can better connect secondary and postsecondary CTE students with apprenticeships. With the right partners, policies, programmatic elements, and support in place, aligned CTE-apprenticeship programs can both enrich CTE programs and increase the apprenticeship pipeline.



INTRODUCTION

High school career and technical education (CTE) programs and apprenticeship have much in common. Each combine classroom instruction with workforce training—integrating rigorous academic, technical, and employability skills offered within a career context. Program curricula are vetted by employers to ensure that coursework prepares students for entry into in-demand fields and is aligned with current industry standards. Classroom instruction is reinforced by hands-on application designed to give students a deeper understanding of the field and options for earning college credits and/or industry-recognized certificates or credentials that prepare them for immediate employment as well as continued enrollment in postsecondary education or training.

Changing labor market conditions suggest that there may be economic benefits to expanding high school students' access to high-quality apprenticeship offerings, including federally recognized registered apprenticeship programs that meet national standards established by the U.S. Department of Labor (DOL) or federally recognized state apprenticeship agencies. Workforce projections indicate a growing gap in the supply of workers for middle-skills jobs (those requiring more than a high school diploma but less than a four-year degree).¹ Continuing workforce shortages in critical fields, including computer technology, nursing, and advanced manufacturing, threaten the nation's global competitiveness and increase firms' incentive to offshore operations.² While the economic return on a four-year college education remains high, nearly half of recent college graduates (48 percent) are working in jobs that do not require a bachelor's degree, indicating a disconnect between students' education investment and workforce demand.³

Recognizing the economic imperative for expanding the supply of middle-skills workers, the federal government has committed to increasing the number of apprentices, as well as the industry fields in which training is offered. In 2015, DOL launched the American Apprenticeship Grants initiative to promote the creation of new training programs in high-growth, high-tech industries. To date, \$175 million has been awarded to 46 grantees who have committed to training and hiring over 34,000 apprentices within five years.⁴ In June 2016, DOL awarded \$10.4 million in ApprenticeshipUSA State Accelerator Grants to support 51 states, territories, and the District of Columbia in expanding the quality of existing registered apprenticeship programs and launching new opportunities in high-demand industries.⁵

Another strategy states and local communities are employing to expand the supply of apprentices and skilled labor is building opportunities for secondary students, particularly those enrolled in CTE, to prepare for or enroll in apprenticeship programs. CTE students complete foundational coursework as part of their high school studies, some of which may overlap with or fulfill the prerequisites for entry into high-quality apprenticeship programs. Since CTE students have demonstrated both an interest and an aptitude for learning about a given career, it is likely that they will persist and complete advanced technical education and training. These programs also can position students for preferred entry into an apprenticeship, as well as help them to complete it at a faster pace or younger age than traditional entrants.

The U.S. Department of Education's Office of Career, Technical, and Adult Education (OCTAE) is supporting federal system-building efforts by sponsoring research to identify effective strategies for connecting secondary CTE students to apprenticeship programs. In July 2016, OCTAE's National Center for Innovation in Career and Technical

¹ See <http://www.nationalskillscoalition.org/resources/publications/file/middle-skill-fact-sheets-2014/NSC-United-States-MiddleSkillFS-2014.pdf>.

² See <http://www.forbes.com/sites/michaelbernick/2016/09/28/career-technical-education-what-it-can-and-cannot-do-in-building-a-next-middle-class/#754797145062> and <https://hbr.org/2012/12/who-can-fix-the-middle-skills-gap/ar/1>.

³ See <https://cew.georgetown.edu/cew-reports/americas-divided-recovery/> and <http://centerforcollegeaffordability.org/research/studies/underemployment-of-college-graduates/>.

⁴ Due to funding streams, these programs were restricted from directly serving participants under 18. See <https://www.doleta.gov/OA/aag.cfm>.

⁵ See <https://www.dol.gov/featured/apprenticeship/grants>.



Education published a study of state-level efforts to align CTE with federally recognized apprenticeship offerings.⁶ Researchers examined the programmatic, administrative, and fiscal policies that six states have adopted to promote systematic efforts to connect CTE with apprenticeship and profiled noteworthy practices that states are using to expand student participation.

To expand upon this research base, OCTAE launched this effort to learn how high school CTE providers are preparing students to enter high-quality apprenticeship programs, including registered apprenticeship. This project focuses on eight programs using new or innovative instructional and/or programmatic designs to connect CTE with apprenticeship. A review of the literature and on-site interviews, conducted with industry and labor representatives and district administrators and instructors, were used to gather detailed information on program history, design, and operation. This report profiles study sites and synthesizes lessons learned across sites to support state and local leaders interested in aligning or strengthening existing connections between high school CTE programs and apprenticeship.

⁶ Rice et al. 2016. See <http://ctecenter.ed.gov/reports/apprenticeships>.



CLARIFYING TERMINOLOGY

While both secondary CTE and apprenticeship prepare individuals for career entry and success, each uses varying terminology to describe program components. Moreover, among the eight sites profiled in this report, a wide array of terminology was used to refer to their CTE and apprenticeship programs with, in some cases, different sites using the same terminology for programs with different structures and components. For consistency, this report refers to instructional offerings using language commonly used in the field, as defined below. Identifying a common understanding of key terms is critical if educators, employers, and other stakeholders are to collaborate successfully to align programs.

CAREER AND TECHNICAL EDUCATION PROGRAMS

CTE programs are typically organized into 16 Career Clusters[®] that comprise groups of related industries and occupations, and may be found at the secondary and postsecondary learner levels. Within clusters, students may specialize in a career pathway that provides them with technical skills to prepare them to transition into postsecondary education and/or immediate employment. Programs usually consist of sequenced technical coursework that starts with an introductory, basic, technical skills instruction that progresses over time to more advanced skill training.⁷

APPRENTICESHIP

Apprenticeship is a training program that can be sponsored by employers, unions, colleges, or community-based organizations and combines paid, on-the-job training with classroom instruction that culminates in the award of a portable, nationally recognized industry credential.⁸ Apprenticeships may take many forms, and within the apprenticeship landscape there are three main types of programs:

- **Apprenticeship**—An on-the-job training program that typically has five components: 1) employer involvement; 2) on-the-job training; 3) related technical instruction; 4) paid work experience; and 5) award of a nationally recognized industry credential. A *registered apprenticeship* program meets national industry standards and is registered with the DOL (or federally recognized state apprenticeship agencies). Programs must include and be able to demonstrate that they address the five components listed above.⁹
- **Youth Apprenticeship**—A program that is designed specifically for individuals aged 16-18 that is registered with the DOL (or federally recognized state apprenticeship agencies). Youth apprenticeship programs must also include and demonstrate the five components of a registered apprenticeship.¹⁰
- **Pre-apprenticeship**—A program or set of strategies designed to prepare individuals for entry into an apprenticeship or registered apprenticeship program. Instruction may include basic skills training, academic skills remediation, or an introduction to the industry. Completers may be accorded preferential consideration

⁷ A CTE Program of Study describes a specialized CTE program designed to smooth high school students' transition into college and careers. These programs include technical and academic courses that span the secondary and postsecondary education levels, may offer options for students to earn college credit, and lead to an industry-recognized certificate or credential, or an associate or baccalaureate degree. Due to differences in site definitions and programming, this study does not differentiate between CTE programs and CTE Programs of Study. For more information on the difference between the two, see <http://cte.ed.gov/initiatives/programs-of-study>.

⁸ A nationally recognized industry credential is a portable certificate of completion awarded by the U.S. Department of Labor to participants that complete a registered apprenticeship. Across the country, programs use different terms to describe this certificate. For the purposes of this paper, the term "journey-level certificate" will be used throughout the site profiles to be consistent with how the visited programs most commonly described it.

⁹ See <https://www.doleta.gov/OA/apprenticeship.cfm>.

¹⁰ The term "youth apprenticeship" also is used by some states to describe a robust, paid, work-based learning experience for secondary students that is not registered with the DOL or connected to the broader apprenticeship system. These programs were not profiled as part of this report because at the time of site selection, no youth apprenticeship programs were identified that were connected to formal adult apprenticeship programs or pre-apprenticeship programs in terms of instructional alignment or program articulation (see Appendix A).



for entry into an apprenticeship program and/or apply time served or credits earned toward fulfilling program requirements. In some instances, state apprenticeship agencies have created a process to recognize pre-apprenticeship programs. At this time, there is no federal registration process for pre-apprenticeships, but the DOL has provided guidance on the quality components of pre-apprenticeship programs.¹¹

¹¹ See [Quality Pre-Apprenticeship Guidance, TEN, 13-12](#).



ABOUT THE STUDY SITES

After an extensive environmental scan of programs that connect high school CTE students to high-quality apprenticeship opportunities, eight programs were selected for on-site visits (see Appendix A for selection criteria). Sites were selected through a vetting process that included analyzing information gathered through a survey of state CTE directors, over a third of whom recommended CTE programs for consideration; input from an external advisory group, including national, state, and local leaders with expertise and insights on apprenticeships; an online review of the literature; and phone interviews with more than 30 state and local leaders. Criteria also were developed to ensure a diverse program representation, with factors including sites' geographic distribution, type of partnership, and Career Cluster® in which training was offered.

Site visits were used to meet with program staff to solicit their perceptions about program operation, observe educational and workplace instructional resources, and collect data and materials to identify common elements of success and common challenges across sites. Information was gathered through structured interviews with state and local secondary and postsecondary administrators, apprenticeship coordinators, CTE instructors, employer and/or labor sponsors, counselors, parents, and students. The eight sites selected for the study are

- Apprenticeship Catawba, North Carolina;
- Bayless Floor Layers Middle Apprenticeship Program, Missouri;
- Charleston Regional Youth Apprenticeship, South Carolina;
- Edward J. Malloy Initiative for Construction Skills, New York;
- The Green Academy at Salinas High School, California;
- Puget Sound Skills Center, Washington;
- Tech Ready Apprentices for Careers in Kentucky – Dr. Schneider Automotive Systems, Kentucky; and
- Upper Valley Career Center, Ohio.

Although apprenticeship has historically been offered in the construction and manufacturing sectors, efforts are underway to expand training options into emerging, high-growth industries. The selected sites represent a mix of established and new programs in order to reach a diversity of industry sectors and approaches. While information gathered from these newer sites offers important insights into how secondary CTE and apprenticeship programs may be launched in new fields, data on student outcomes was not yet available due to the early stage of program implementation.



STRATEGIES FOR ALIGNING CTE AND APPRENTICESHIP PROGRAMS

There are two general dimensions to consider when aligning programs that connect secondary CTE students with apprenticeship opportunities: the degree to which *secondary CTE students' instruction aligns with apprenticeship training* and the extent to which *this instruction articulates with apprenticeship* to ease student entry into programs. This section describes study sites' approaches on these two dimensions and places the sites profiled in this report within this taxonomy.

INSTRUCTIONAL ALIGNMENT

Sites seeking to connect secondary CTE students with high-quality apprenticeship programs take intentional steps to sequence and align instructional content, often with input from employer or labor sponsors. The project team found that the degree of instructional alignment varied in study sites, with four distinct approaches observed:

- **Full**—There is no distinction between the content taught in a secondary CTE program and the training offered to an apprentice. A fully aligned program provides students with focused skill instruction tailored to address the entry requirements of an apprenticeship. Coursework fulfills both the educational requirements necessary for students' high school graduation and the performance expectations of an entering apprentice, as well as other educational and career opportunities.
- **Embedded**—Apprenticeship skills training is integrated into a student's CTE program and may be applied toward fulfilling course credit and high school graduation requirements. Students also receive technical instruction that may go beyond the scope of the apprenticeship program and that is intended to prepare them for other educational and career opportunities.
- **Substituted**—All related technical instruction for apprenticeship is delivered outside of the secondary school setting, typically by a postsecondary education partner or established program intermediary. To increase access to apprenticeship opportunities, secondary students may not be required to have taken relevant CTE courses prior to entry. Those who are enrolled in a CTE program may be eligible to receive some high school and/or early postsecondary credit within their CTE field of study for the apprenticeship's related technical instruction, with the degree of recognition varying by site.
- **External**—Secondary students, who may be recruited from secondary CTE programs and other sources, participate in an apprenticeship program, with all instruction delivered outside the secondary school setting (during or after the school day). Students participating in such programs receive no educational credit, though they may apply some or all of the hours worked toward fulfilling the entry requirements of an employer- or union-sponsored apprenticeship or be positioned for preferred entry upon completion.

PROGRAM ARTICULATION

The ease and seamlessness of students' transition from secondary CTE to apprenticeship varied across the sites, driven by the programs' goals and designs. Four degrees of articulation were observed across study states:

- **Full**—There is no distinction between a CTE program and an apprenticeship program. Students are fully enrolled as apprentices or pre-apprentices while in high school and, upon their graduation, continue on as apprentices, with all credits and hours counting toward full program completion.
- **Preferred Entry**—Students participate in programs that may prepare them for entry into an apprenticeship, though students are not enrolled as apprentices. Apprenticeship and pre-apprenticeship sponsors formally



agree to offer preferred entry status into their programs to students who complete specific requirements, with the possibility of applying educational credits or hours worked toward an apprenticeship.

- **Optional Entry**—Students participate in programs that prepare them for entry into an apprenticeship, but are not formally enrolled as apprentices. Optional entry programs typically do not guarantee students a direct pathway to an apprenticeship program but rather are designed to prepare students for multiple post-graduate options, including employment and/or postsecondary education and training. Students opting to continue on in an apprenticeship may receive advanced credit for their experiences on a case-by-case basis.
- **Exploratory**—Students participate in programs that allow them to explore career options, which may prepare them for entry into a pre-apprenticeship or apprenticeship program, but they receive no credit toward their program nor preferential consideration for entry.

OVERVIEW OF SITES' ALIGNMENT

The eight sites profiled in this report connect secondary CTE students to apprenticeship programs in different ways, illustrating the many and varied approaches that sites may take to aligning programs. Figure 1 (next page) places each study site along the continuum of approaches educators may take for *instructional alignment* and *program articulation*.

As shown in figure 1, only one site, Tech Ready Apprentices for Careers in Kentucky—Dr. Schneider Automotive Systems, has program offerings that are aligned fully on both dimensions. Other sites tend to show stronger alignment on either one or the other dimension. For example, Salinas High School offers CTE instruction that is relatively closely aligned to existing pre-apprenticeship and apprenticeship opportunities but offers students few formal advantages toward entry into such a program.

In contrast, Catawba Valley Community College, Trident Technical College, and the Construction Skills program offer students coursework that is articulated to apprenticeship programming but outside of a secondary CTE program. Each provides opportunities for high school CTE students to enroll or be offered preferential consideration for entry to a registered apprenticeship program.

Finally, Upper Valley Career Center and Puget Sound Skills Center are situated in the middle, with apprenticeship training embedded within their broader secondary CTE programs. These sites offer students an array of post-high school transition options, with one option being advanced credit that may be applied toward a registered apprenticeship.

There are tradeoffs to each approach. Greater training specificity may narrow CTE students' learning experience, but increase their benefits and options in apprenticeships, which are occupationally specific. Students with broader skills training may have fewer post-program benefits directly aligned with apprenticeships but may have a better sense of the range of career options open to them, of which apprenticeship may be one. Readers are encouraged to use the taxonomy to direct their reading of site visit profiles and to consider the benefits and drawbacks of sites' various approaches to alignment and articulation.

Summary information about each program is provided in the chart that follows, with additional detail provided in the site profiles that follow. Sites are presented by program structure in both the table and profile section.

Figure 1: Degree of instructional alignment and programmatic articulation between CTE and apprenticeship in study sites

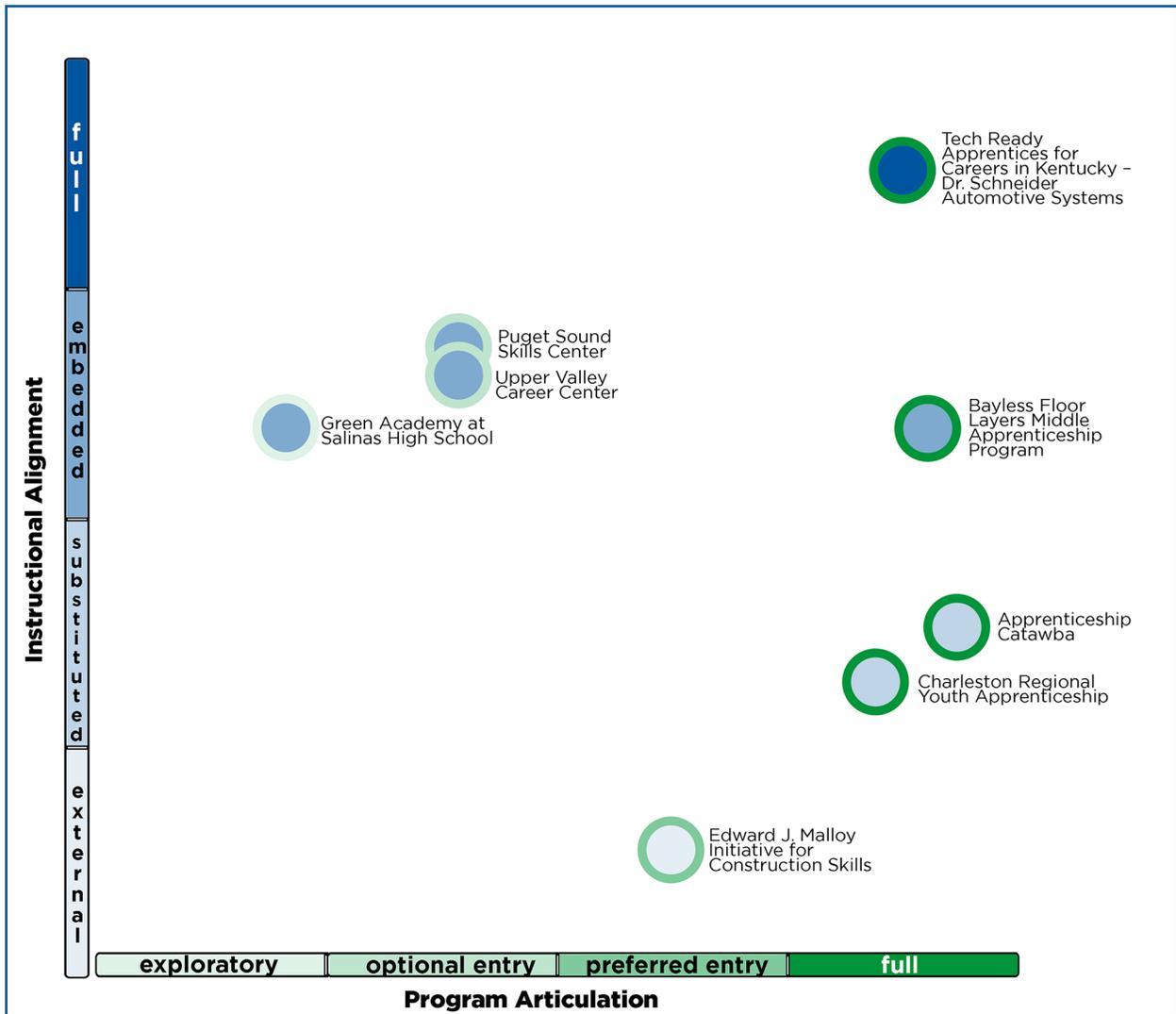


Figure 2: Summary of eight apprenticeship programs visited

Program Name	Career Cluster(s)	Year Created	Participants (2014-15)	Alignment Overview
<i>Registered Apprenticeship</i>				
Apprenticeship Catawba <i>Hickory, North Carolina</i>	Manufacturing	2013	26	<p>Substituted Instructional Alignment</p> <ul style="list-style-type: none"> • Technical instruction is provided at Catawba Valley Community College in two specializations (mechatronics engineering technology or computer-integrated machining technology), resulting in an associate of applied science degree. <p>Full Program Articulation</p> <ul style="list-style-type: none"> • Participants enroll in a four-year registered apprenticeship during their junior year of high school.
<i>Youth Apprenticeship</i>				
Charleston Youth Apprenticeship <i>Charleston, South Carolina</i>	Hospitality and Tourism	2015	13 (in 2015-16)	<p>Substituted Instructional Alignment</p> <ul style="list-style-type: none"> • Technical instruction provided at Trident Technical College in two specializations (culinary arts and hospitality management), taking place over two years, resulting in a postsecondary certificate that articulates into an associate of applied science degree. <p>Full Program Articulation</p> <ul style="list-style-type: none"> • Participants enroll in a registered youth apprenticeship as a junior, senior, or recent high school graduate, which culminates in a U.S. Department of Labor certificate.
<i>Pre-apprenticeship</i>				
Bayless Floor Layers Middle Apprenticeship Program <i>St. Louis, Missouri</i>	Architecture and Construction	2004	14	<p>Embedded Instructional Alignment</p> <ul style="list-style-type: none"> • Technical instruction provided at Bayless High School, beginning in the junior year of high school, resulting in a two-year CTE course of study. <p>Full Program Articulation</p> <ul style="list-style-type: none"> • Completers are awarded at least 800 contact hours toward the St. Louis Floor Layers Joint Apprenticeship, which is registered.
Edward J. Malloy Initiative for Construction Skills <i>New York City, New York</i>	Architecture and Construction	2001	135	<p>External Instructional Alignment</p> <ul style="list-style-type: none"> • Instruction is provided through Construction Skills, a nonprofit, for high school CTE students, beginning during the spring semester of their senior year and ending the summer after high school graduation. <p>Preferred-Entry Program Articulation</p> <ul style="list-style-type: none"> • Participants enroll in a 14-week pre-apprenticeship, resulting in preferred entry into a Registered Apprenticeship upon completion.

Figure 2: Summary of eight apprenticeship programs visited (continued)

Program Name	Career Cluster(s)	Year Created	Participants (2014-15)	Alignment Overview
Green Academy at Salinas High School <i>Salinas, California</i>	Architecture and Construction	2014 (when program started using union curriculum)	117	<p>Embedded Instructional Alignment</p> <ul style="list-style-type: none"> Multi-Craft Core Curriculum (MC3) is embedded throughout the secondary CTE program and prepares students for multiple pathways upon graduation, including apprenticeship. <p>Exploratory Program Articulation</p> <ul style="list-style-type: none"> MC3 ensures that students have obtained the necessary knowledge and skills to make them competitive for local unions' registered apprenticeships.
Puget Sound Skills Center Construction Technology Program <i>Seattle, Washington</i>	Architecture and Construction	2006	24	<p>Embedded Instructional Alignment</p> <ul style="list-style-type: none"> A CTE program of study uses a hybrid curriculum that is aligned to meet entrance requirements with union and nonunion apprenticeships; it begins in the junior year of high school, preparing students for multiple pathways upon graduation, including apprenticeship. <p>Optional-Entry Program Articulation</p> <ul style="list-style-type: none"> State-approved pre-apprenticeship program guarantees completers preferred consideration for entry into a local union registered apprenticeship.
Tech Ready Apprentices for Careers in Kentucky (TRACK) – Dr. Schneider Automotive Systems <i>Russell Springs, Kentucky</i>	Manufacturing	2014	4	<p>Full Instructional Alignment</p> <ul style="list-style-type: none"> A statewide pre-apprenticeship program is adapted by a local employer sponsor and embedded into a four-course CTE sequence, preparing students for multiple pathways upon graduation, including apprenticeship. <p>Full Program Articulation</p> <ul style="list-style-type: none"> The program begins junior year at an area technical center. After high school graduation, students have options to transition to the employer's registered apprenticeship and continue technical instruction at area community college to earn an associate of applied science degree.
Upper Valley Career Center School-to-Apprenticeship <i>Piqua, Ohio</i>	Architecture and Construction; Manufacturing	Late 1990s	24	<p>Embedded Instructional Alignment</p> <ul style="list-style-type: none"> A hybrid CTE curriculum is aligned to meet entrance requirements with union and nonunion apprenticeships, preparing students for multiple pathways upon graduation, including apprenticeship. <p>Optional-Entry Program Articulation</p> <ul style="list-style-type: none"> A state-approved pre-apprenticeship program guarantees completers preferred consideration for entry into a local union registered apprenticeship.

SITE PROFILES

APPRENTICESHIP CATAWBA HICKORY, NC



MANUFACTURING



INSTRUCTIONAL ALIGNMENT: SUBSTITUTED
PROGRAM ARTICULATION: FULL

BACKGROUND

Overview



Apprenticeship Catawba, a four-year registered apprenticeship for high school seniors, is operated as a partnership between Catawba Valley Community College (CVCC), area high schools, and seven manufacturers. CVCC serves as the lead organization for Apprenticeship Catawba, which is based about 45 miles outside of Charlotte, North Carolina. The program launched in 2013 and saw its first two apprentices graduate from high school in August 2016. Upon completion of the apprenticeship program, participants receive 8,000 hours of on-the-job training, an associate of applied science degree in either mechatronics engineering technology or computer-integrated machining technology, a journey-level certificate from the North Carolina Department of Commerce, and guaranteed employment with their employer sponsor with full benefits and four years of seniority.

History

During a visit to Europe in 2007, a CVCC administrator was introduced to the idea of high school apprentices. At CVCC, adult apprentices would often take classes while finishing up their apprenticeship requirements, but the college had no formal connections to apprenticeship as a provider for related technical instruction. However, nearby Central Piedmont Community College in Charlotte did have a long-running program, Apprenticeship 2000, which would later serve as a model for CVCC. Since 1995, Charlotte-area manufacturers had partnered with Central Piedmont and local high schools to offer a four-year apprenticeship, starting during students' senior year.¹²

Program Snapshot

- Participants (2014–15): 26
- High school graduation rate (2014–15): 100 percent
- Placement rate: First full cohort expected to complete apprenticeship in 2017

Several years later CVCC, found willing employer partners in the region and a mechanism for bringing them together. In 2012, the college received a grant from the Golden Leaf Foundation, a nonprofit organization in North Carolina that funds projects focused on agriculture, job creation and retention, and workforce preparedness.¹³ CVCC used

¹² Apprenticeship Catawba was selected to visit for this project to learn how and if the successful Apprenticeship 2000 model could be scaled.

¹³ The Golden Leaf Foundation was chartered in 1999 by the North Carolina legislature to administer half of the state's share of the Master Settlement Agreement with cigarette manufacturers. The foundation makes grants to government entities, educational institutions, economic development organizations, and nonprofits, and as of 2016, has funded 1,403 grants totaling more than \$664 million. See <http://www.goldenleaf.org>.

the Golden Leaf funding as a planning grant for what would become Apprenticeship Catawba. The first company to sign on was then-French-owned Technibilt, a manufacturer that produces shopping carts. Next came Sarstedt, a German-owned medical supply manufacturer. Sarstedt brought more to the table than their presence as an employer sponsor: the company also had been part of Apprenticeship 2000 for several years, and that experience would later be very useful as the employers and CVCC began to craft an apprenticeship program for high-school-age students. Within a year, two more employers—both European-based companies familiar with the apprenticeship model—had signed on to participate, and Apprenticeship Catawba was established. By the 2015–16 school year, a total of seven companies had agreed to participate.

CVCC leveraged its dual enrollment agreements with local school districts to entice students to participate. As part of the state’s Career and College Promise program, high school students can take postsecondary classes for free, including those offered as part of Apprenticeship Catawba. The first two apprentices, who were employed by Sarstedt when it was a part of Apprenticeship 2000, transferred to and completed Apprenticeship Catawba and became full Sarstedt employees in August 2016.

PROGRAM STRUCTURE

Apprenticeship Catawba is driven almost entirely by employers, with the college serving as an intermediary that facilitates the technical instruction and other administrative aspects. Employer sponsors and the college’s program coordinator meet monthly to make decisions collaboratively on all aspects of the program, including student recruitment, wages, and academic instruction.



Before a part-time coordinator was hired, the CVCC administrator who helped to establish the program also managed the administrative details, along with a human resources representative from one of the employer sponsors, Technibilt. The new coordinator helps high school students understand the responsibilities and professionalism required to be successful apprentices. The coordinator also tracks apprentices’ CVCC coursework to ensure that they are progressing appropriately and works with the high school contacts for recruitment and monitoring purposes.

Apprenticeship Catawba begins with a five-day orientation, held after school hours, for eligible students during the spring of their junior years. Students are then matched with employers for a summer internship. The six-week, full-time internship serves as a pre-apprenticeship—or trial placement—for the students and employers, during which students earn \$8 an hour for their internships. After the internship, employers make offers to qualified students to become an apprentice, and the hours from their summer internship are awarded as advance credit toward the 8,000-hour on-the-job requirement for the full apprenticeship.

Apprenticeship Catawba is a hybrid apprenticeship model and includes a mix of competency-based and time-based elements that allow participants to complete the apprenticeship in four years. Apprentices begin at \$9 an hour, and earn at least \$13.50 an hour by the end of four years, with the possibility for performance bonuses twice a year based on job and academic performance. Upon completing the apprenticeship program, graduates earn a base salary of \$34,000 a year and four years of seniority.

For new apprentices, the structure of their first year of participation—which coincides with their senior year of high school—depends on how many graduation requirements they still need to earn. Some, for example, will spend their mornings at their high school completing courses. Those who are closer to meeting the state’s graduation requirements may take some classes at their high school and be dually enrolled in courses at CVCC. Apprentices then spend their afternoons at their worksites to complete on-the-job training hours. At this time, there is no articulation or credit awarded for any relevant high school CTE coursework through Apprenticeship Catawba, as the related technical instruction begins once participants enter CVCC as a cohort.



After high school graduation, apprentices work four days a week and take two CVCC summer classes and a safety and information technology course. Apprentices begin their related technical instruction in the fall—a two-year CTE program offered at CVCC in either mechatronics engineering technology or computer-integrated machining technology—and take classes one day a week. They spend the rest of the time working at the company, and are paid whether they are on the job or in class to equal 40 hours of work each week.

On-the-Job & Classroom Instruction

The employers, and in particular Sarstedt, which had extensive experience based on its participation in Apprenticeship 2000, worked closely with CVCC to build a comprehensive program that met the employers' workforce needs while also balancing the needs of CVCC. Given that CVCC is a small community college with finite resources, scheduling the apprentices' classes as a cohort required particular attention because the college is unable to offer multiple class times.

Over the course of the apprenticeship, participants complete rotations in various departments as they build their skills and competency. For example, at Sarstedt, apprentice rotations include the tool and die, maintenance, and quality assurance departments. On the job, the apprentices' progress is supervised by journey-level or experienced employees and monitored through the completion of the apprenticeship task lists, which were established in the process to register the apprenticeship with the state.

The partners are working to develop a more regular, formalized feedback loop between the employers and the CVCC instructors. Currently, CVCC instructors complete quarterly reviews of each apprentice's progress in their CVCC coursework, but employers noted in interviews that the reviews do not necessarily provide much relevant information for the workplace.

Curriculum & Assessment

The mechatronics engineering technology program at CVCC was originally the only CTE program that was offered for Apprenticeship Catawba. Some employers, however, needed apprentices with skills more aligned to the computer-integrated machining technology program, and CVCC decided to allow apprentices to be assigned to either program. Although having two program options makes it challenging for CVCC to create a cohort, the college agreed to the change to meet the employers' request. Participant enrollment in one program or another is dictated by the employers' workforce needs. In the 2015–16 school year, for example, most apprentices were in the mechatronics program.

After meeting with the employers, faculty in the CVCC engineering technology department found they did not need to change the curriculum much to match their needs but did work with Sarstedt to tweak the programs' sequence. Now the programs are reviewed annually with the employers to ensure they remain current. Apprenticeship Catawba has impacted other CVCC CTE programs as well. For example, employer sponsors have been integrated into the CTE program's advisory committee, instead of convening separately to review program curricula and offerings.

Program Funding

Apprentices' course work at CVCC is paid for by the employer sponsors unless an apprentice qualifies for free dual enrollment through the state's Career and College Promise program. Most apprentices take at least one dual enrollment course at CVCC during their senior year of high school. Employers prefer that apprentices take as many dual credit courses as possible, because doing so reduces the number of courses the employer pays for and accelerates the apprentices' time to degree. Once the apprentices graduate from high school, their CVCC tuition and fees are funded by their employer sponsors until they obtain their associate degree. Given the newness of the program, no apprentices have yet completed their associate degree, so employers are unable to report an exact investment per apprentice.

The CVCC CTE programs are supported through institutional funding, tuition, and fees. In 2015–16, CVCC was awarded a short-term grant from the North Carolina Community College System financed with *Perkins* leadership funds. This grant enabled Apprenticeship Catawba to hire a part-time program coordinator position.

KEY PARTNERS



Employers & Labor

Every decision for Apprenticeship Catawba is informed by employers. Employer sponsors meet monthly at CVCC to discuss the administration of the program, make key decisions about the next year's recruiting plans, and offer support to one another as they sort through various program issues they may be facing. During the 2015–16 school year, seven companies participated as sponsors, including AptarGroup, a U.S.-owned plastics company; GKN Driveline, a British-owned automotive parts manufacturer; and five German-owned companies, including Continental, an automotive tire manufacturer; Sarstedt, a medical device manufacturer; Technibilt, a grocery cart manufacturer; Tenovo, Inc., an automotive textiles manufacturer; and ZF, an automotive parts manufacturer.

Sarstedt has taken on the most apprentices under Apprenticeship Catawba—a total of 12 as of the 2015–16 school year. Sarstedt, which is located about 45 miles from Charlotte, North Carolina, had been an employer sponsor with the Apprenticeship 2000 program since the late 1990s, but the distance from Charlotte to Sarstedt required apprentices to travel as much as an hour and a half for instruction. By the 2000s, leaders at Sarstedt were looking for a new solution to reduce the burden on apprentices. With this Apprenticeship 2000 experience, Sarstedt played a large role in helping to shape Apprenticeship Catawba, along with input from Technibilt, the first employer to agree to participate. Sarstedt leadership estimates that 15 percent of its 3,000-person workforce were once apprentices, especially given that it is headquartered in Germany.

Secondary Institutions

Four school districts—Catawba County, Hickory Public Schools, Newton-Conover, and Alexander County Schools—participate in Apprenticeship Catawba. Of these districts, Catawba County Schools is the primary feeder and also has the most CTE program offerings.

Students from Catawba County Schools were eligible to participate in Apprenticeship 2000, but as noted by Sarstedt, the drive to and from Charlotte was too long for high school students. The school district, which enrolled about 7,000 students in 2015–16, has a robust work-based learning program that awards credit to participating students. In 2015–16, 730 high school students participated in work-based learning experiences with 134 employers, all within 30 minutes of the high school. Adding Apprenticeship Catawba to the list of offerings was an easy fit for the school district, but also means that the program competes with many other options for student interest, including other apprenticeships.

The work-based learning options, including Apprenticeship Catawba, are coordinated by district-level career-development coordinators who act as intermediaries to broker and monitor work-based learning placements. In the case of Apprenticeship Catawba, these school-based coordinators help CVCC recruit applicants.

In other school districts, especially where fewer CTE programs are offered, the school counselors said they struggled to get the message across to students and parents about the value of apprenticeships. They reported that most parents preferred for their children to pursue a four-year university degree.

STUDENT RECRUITMENT AND SUPPORTS



Entrance Requirements

Students who wish to participate in Apprenticeship Catawba must go through a multitiered selection process. It starts at the beginning of students' junior year, when the CVCC coordinator visits participating high schools to meet with school counselors, CTE teachers, and administrators, and to hold information sessions for students. Interested students and their parents are invited to attend open house events hosted by each employer in January and February.

Eligible students apply for Apprenticeship Catawba and are invited to participate in a weeklong after-school orientation, which gives them an opportunity learn more about the companies and work on a project to demonstrate their technical and employability skills. Throughout the week, employers, who take turns leading each night of the orientation, observe and evaluate the students.

At the end of the orientation, students and employers submit their top two choices. The employers gather together to choose—and sometimes compete with one another for the new apprentices. One employer likened the process to a fantasy football draft with a twist, because companies can only choose from students who have chosen them as their first or second choice. This also means that a company may not be chosen by any students and thus not receive an apprentice. Once the matches are made, students must complete a paid six-week internship with the company. During this time, students spend three days a week working at the company and two days at the community college. The internship serves as a trial run for both the employer and the student as they each determine if this will be a successful match. At end of the summer, employers offer the positions to select students, who begin as apprentices during the fall of their senior year.

Eligibility Requirements

- Minimum 3.0 GPA
- Excellent math/technical skills
- Good attendance record

The internship is not a guarantee of placement into the apprenticeship. Those students who are unsuccessful are eligible to reapply the following spring. During interviews, several apprentices reported that they were not selected for full positions after their first internship. However, they said that this rejection gave them the motivation and determination to work hard during their senior year of high school and try again.

Recruitment Challenges

The program's primary recruitment challenge is breaking down stereotypes around CTE, community colleges, manufacturing, and apprenticeships. The program is working to overcome these misunderstandings by bringing school counselors on company tours, giving students and parents more time to interact with employers, and working with a local state university to create an articulation agreement for its engineering technology program to provide participants with more postsecondary options.

PROGRAM BENEFITS

By the end of the four-year apprenticeship, participants have completed 8,000 hours of on-the-job training and receive a journey-level certificate from the state Department of Commerce, an associate of applied science in either mechatronics engineering technology or computer-integrated machining technology, and guaranteed employment with four years of seniority.



STATE SUPPORT

Administrative & Financial



The North Carolina Apprenticeship Council is operated by the state's Department of Commerce, which manages the registered apprenticeship system in the state. This council's composition is dictated by state statute, and includes representatives from employers and labor as well as two nonvoting members from the state Department of Public Instruction and the community college system. This intentional inclusion has helped make connections across agencies and initiatives as the council makes plans to strengthen its apprenticeship system.

The state has also played an influential role in creating policies, such as Career and College Promise, established by law in 2011, which directed the state Board of Education and community college system to collaborate to offer seamless dual enrollment opportunities at no cost to eligible high school students.¹⁴ In 2013–14, Career and College Promise cost the state about \$57 million for 11,389 full-time students during its first academic year.¹⁵ Since the dual enrollment courses are free to students, it both accelerates the students' time to degree in Apprenticeship Catawba and creates a cost savings for the employer sponsors.

The Apprenticeship Catawba model, which was first pioneered in the state by Apprenticeship 2000, has been part of a replication effort across the state, with seven high school apprenticeship programs either in operation or currently under development.

Though not necessarily an explicit state initiative, the work has been driven at the local level and supported by cross-agency collaboration at the state level. For example, in 2016, one of the leading programs, North Carolina Triangle Apprenticeship Program, hosted the first-ever statewide Apprenticeship Summit, a gathering to share best practices about manufacturing apprenticeships.¹⁶ The summit attracted leaders from state agencies, state legislators, and other leading apprenticeship experts.

North Carolina programs replicating the Apprenticeship 2000 model:

- Apprenticeship 321
- Apprenticeship Catawba
- Apprenticeship Charlotte
- Career Accelerator Program
- Central Carolina Apprenticeship Works
- Guilford Apprenticeship Partners
- North Carolina Triangle Apprenticeship Program

OUTCOMES

The first two apprentices, who transferred from Apprenticeship 2000, transitioned to full-time employment with Sarstedt in August 2016. The first full cohort is expected to finish the four-year apprenticeship program in 2017.



LESSONS LEARNED

Program staff and partners identified some lessons learned, including the following:

- Allow employers to drive the program's design, which helps earn their trust and commitment to the partnership.
- Build an apprenticeship that acts as a comprehensive benefits package (graduated wages, employment, and postsecondary education), which helps make such a program an attractive postsecondary pathway among both students and parents.



¹⁴ See <http://www.ncleg.net/sessions/2011/bills/house/pdf/h200v9.pdf>.

¹⁵ See <http://www.ncleg.net/documentsites/committees/JLEOC/Reports%20Received/2015%20Reports%20Received/Career%20and%20College%20Promise%20Report-2015.pdf>.

¹⁶ See http://www.waketech.edu/news/wake-tech-and-nctap-host-first-state-wide-apprenticeship-summit#.V_65m-ArK02.

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- Hire a program coordinator, which is essential in order to manage the complex needs of partners, apprentices, and program administration.
 - Leverage state policies, such as dual enrollment, to benefit the apprentices, education institution, and employers.
 - Build on lessons learned from similar programs that have been successful.

CHARLESTON YOUTH APPRENTICESHIP PROGRAM

CHARLESTON, SC



HOSPITALITY & TOURISM



INSTRUCTIONAL ALIGNMENT: SUBSTITUTED
PROGRAM ARTICULATION: FULL

BACKGROUND

Overview

The Charleston Youth Apprenticeship Program, coordinated by Trident Technical College (TTC) in Charleston, South Carolina, is a two-year youth apprenticeship that is registered with the U.S. Department of Labor (DOL). Launched in 2014, the program enrolls 52 participants in multiple Career Clusters, including manufacturing, information technology, health science, contracting services (i.e., construction), and hospitality and tourism. Although this profile primarily focuses on the hospitality and culinary youth apprenticeship program, the core design elements are largely the same across all five industry areas.



Program Snapshot

- Participants (2015–16): 18
- Placement rate: First cohort expected to complete in 2017

The Charleston Youth Apprenticeship Program is open to juniors, seniors, and recent high school graduates from 26 high schools located throughout the Charleston metropolitan area. All related technical instruction for the youth apprenticeship is delivered at TTC, and the college's program can serve as a substitute for secondary CTE programs, particularly for students who do not have access to such programs at their high schools. Students who complete the two-year program earn their high school diploma, a technical certificate from TTC that articulates with a TTC associate of applied science degree, and a national journey-level certificate from DOL. After completing the program, employers may choose to offer youth apprentices the opportunity to transition into either an adult apprenticeship program, if available at the company, or a full-time position. Additionally, employers with adult apprenticeships decide whether and how much advance credit the youth apprentices are awarded once they matriculate.

History

TTC has offered and supported adult registered apprenticeship programs since 2007. In 2013, TTC was approached by German-based automotive parts manufacturer IFA Rotorian about the possibility of partnering to create a youth apprenticeship program for high school students. That year, leaders from TTC and IFA Rotorian hosted a meeting with other manufacturing companies in the region to determine the level of interest in such a program. TTC also engaged the Charleston Metro Chamber of Commerce, which had an existing career education-focused initiative—Accelerate Greater Charleston 2.0—that aligned well to the youth apprenticeship concept, and they agreed to provide scholarships to cover students' TTC tuition and supplies.¹⁷ In the 2014-15 school year, TTC launched the first youth apprenticeship program in manufacturing with a total of six local manufacturers and 13 high school students.

Soon after the launch of the manufacturing program, employers from other sectors across the Charleston metropolitan area approached TTC for guidance in replicating the youth apprenticeship program in new Career Cluster fields. As of 2016, just two years after its launch, the youth apprenticeship program has expanded to nine pathways across five

¹⁷ See <http://www.charlestonchamber.net/accelerate-greater-charleston/>.

Career Clusters—manufacturing, information technology, health science, contracting services (i.e., construction), and hospitality and tourism (see text box). Across all of the pathways, as of April 2016, a total of 30 employers were providing training to 52 youth apprentices drawn from a pool of 26 area high schools.

The successful implementation and expansion of the youth apprenticeship program was due, in part, to existing organizational capacity within TTC. The college’s Office of Apprenticeship Programs conducts outreach to secure employer engagement and coordinate adult apprenticeships. The Office of High School Programs, also housed within TCC, is responsible for building relationships with the region’s high schools to offer students opportunities for dual enrollment and college visits. After being approached by IFA Rotorian to launch the youth apprenticeship program, leaders from these two TTC offices decided to partner to combine and leverage resources to design, deliver, implement, and scale the youth apprenticeships.

Implementation was reinforced by the engagement of TTC’s president, who was an early champion of the youth apprenticeship program. Under her leadership, the college has built administrative capacity to expand the existing apprenticeship and high school partnerships necessary to grow this program. For example, the Office of High School Programs has since added another full-time employee, paid through institutional funding, who is dedicated to supporting the youth apprenticeship program. At the direction of the college leadership, the youth apprenticeship program also was added to the college’s existing insurance policy to circumvent any legal or liability issues that might undermine high school students’ involvement.

PROGRAM STRUCTURE

The hospitality and culinary youth apprenticeship program, which was visited for this project, partners with local restaurants and major hotels to provide a pipeline of qualified employees for Charleston’s in-demand hospitality industry. The program, which began in the 2015–16 school year with 18 students and 14 employers, offers students training in two pathways: hospitality management and culinary. Program participation is open to junior and senior high school students, and recent high school graduates from throughout the Charleston metropolitan area. During their two-year youth apprenticeship, students work for an employer part-time, between five and 15 hours each week, with participation differing by pathway focus and based on the agreement between the employer and student. Youths still enrolled in high school take classes at their home high school to finish their graduation requirements, attending TTC for their related technical instruction. Students also participate in two full-time paid summer internships.



Trident Technical College Youth Apprenticeship Programs (as of 2015-16 school year)

Career Cluster: Hospitality and Tourism
Pathways: Culinary Arts, Hotel Operations
Established: 2015-16 school year

Career Cluster: Architecture and Construction (“Contracting Services”)
Pathway: Air Conditioning and Refrigeration/HVAC
Established: 2015-16 school year

Career Cluster: Information Technology
Pathways: Computer Networking, Junior Computer Programming
Established: 2015-16 school year

Career Cluster: Health Sciences
Pathway: Medical Office Assistant
Established: 2015-16 school year

Career Cluster: Manufacturing
Pathways: Industrial Mechanics, Machine Tool Technology, Fiberglass Finisher/Boat Manufacturing
Established: 2014-15 school year

“Too often, we get students ready for anything anywhere, but fail to provide meaningful futures. We are able to correct that with the youth apprenticeship program. . . So rarely do we get something completely right in terms of education, but this is one thing we have gotten completely right.”

Mary Thornley, President, Trident Technical College, Charleston, South Carolina



Generally, students take their academic requirements at their home high schools in the morning and then either attend TTC or go to their worksite for on-the-job training in the afternoon. At TTC, participants take classes as a cohort, although those classes may also include full-time TTC students who are not in the youth apprenticeship program.

While the hospitality and culinary coursework at TTC is standardized for all students, the on-the-job experiences and expectations are personalized based on the employers' needs. As a competency-based program, there is no set number of required hours that youth apprentices must clock on the job. Rather, each sponsoring employer designs their own task lists of competencies, which are approved as part of the process of registering the youth apprenticeship. When apprentices demonstrate proficiency in all of the required competencies, as validated by their employer sponsors, they have completed the on-the-job component of the youth apprenticeship. All sponsoring employers within the Career Cluster have agreed to a consistent wage structure for youth apprentices, starting at \$8 an hour, which is above South Carolina's minimum wage of \$7.25 an hour. After approximately six months or 200 hours of work, the wage increases by 50 cents.

Most youth apprentices who are also enrolled in an associated high school culinary or hospitality program of study are able to place out of specific courses within the TTC certificate program. This allows them to start the program with up to six postsecondary credits, which accelerates their progress toward an associate degree. The educational component extends over two years and bridges secondary and postsecondary education, culminating in the award of a postsecondary certificate and credits that articulate toward an associate of applied science degree.

On-the-Job & Classroom Instruction

As a registered youth apprenticeship program, employers develop training plans that are approved by the DOL. Each industry has its own set of employer-identified task or competency lists, which are tailored to the employer and registered with the DOL by Apprenticeship Carolina, a statewide intermediary that is operated by the South Carolina Technical College System.

These lists, which are often drawn from actual job descriptions that are used for hiring in the field, document what apprenticeship program completers should be able to demonstrate upon completion of their apprenticeship. As noted above, every placement is different based on the employers' needs and opportunities. However, all apprentices do complete rotations—be it a rotation of different prep stations at a restaurant or departments within a hotel—so that they understand all facets of the particular business. Sponsoring employers are required to assign students an individualized mentor. This mentor acts as their supervisor, creating their rotation schedule, overseeing their day-to-day work, and validating students' competencies on the task lists.

The youth apprentices benefit from being enrolled fully at TTC and taking the same instructional coursework as adult students. That coursework is largely informed by TTC's advisory committee members for their certificate and degree programs, some of whom also serve as sponsors for the youth apprenticeship program. One outcome of such overlap: Employers, faculty, and students interviewed all noted that classroom instruction was reflective of and reinforced the on-the-job experience, and vice versa.

Curriculum & Assessment

In both pathways—hospitality management and culinary—apprentices earn a postsecondary certificate, which counts toward an associate of applied science degree at TTC. Both programs are structured so that all students, regardless of their participation as a youth apprentice, earn stackable credentials that culminate in an associate degree.

In the culinary program, students earn 27 credits to receive their culinary arts certificate as well as the ServSafe industry credential, which is a food and beverage safety training and certification administered by the National Restaurant Association. In the hospitality management program, students earn a 27-credit hotel operations certificate as well as additional credits toward other relevant certificates, such as event management or food and beverage.



TTC is currently working with some four-year colleges to create “2+2 programs” that allow students to transfer into a four-year program with two full years’ worth of credit earned through the associate degree. Postsecondary faculty and program administrators encourage youth apprentices to complete the full associate degree after finishing the apprenticeship, with the stackable credential format being one way that the college is supporting efforts to help students finish. The first hospitality and culinary youth apprenticeship cohort had not yet graduated at the time of the site visit, so none of the students have yet completed their associate degree.

TTC also is working to formalize articulation agreements with secondary schools. At this time, there are no formalized articulation agreements between the sending high schools with relevant CTE programs and TTC that automatically award CTE students postsecondary credit for the introductory courses taken in high school, such as Introduction to Hospitality or Introduction to Culinary Arts. Despite the lack of a formalized policy, some students who had successfully passed certain culinary courses at their high schools were granted up to six credits for the introductory postsecondary courses because the TTC instructors were familiar with the high school’s curriculum. The future goal is to make these dual credit articulations automatic.

Program Funding

The hospitality and culinary program is funded through a range of sources. The administration of the program is largely managed by TTC, with staffing supplied by the offices of apprenticeship and high school programs.

The region’s Chamber of Commerce provides funding for all youth apprentices’ college tuition, books, and other supplies, which totaled \$208,050 over the first two years of the program for the 52 students enrolled across all of the youth apprenticeship programs. For the hospitality and culinary program alone, the chamber has provided more than \$35,000 to cover tuition, textbooks, and supplies for the 18 students during 2014–15.

South Carolina provides additional program funding to Apprenticeship Carolina, a statewide intermediary organization housed within the South Carolina Technical College System that helps employers across the state register their programs and develop their competency task lists. The state also offers a \$1,000 tax credit for companies for each apprentice they hire each year, irrespective of whether the individual is a youth or an adult.¹⁸ Altogether, the state provides approximately \$1 million annually in support of Apprenticeship Carolina and the employer tax credit.

KEY PARTNERS

Employers

All of Charleston’s youth apprenticeship programs are employer-driven—a key element repeatedly cited by TTC leaders, high school staff, community leaders, and the employers themselves. Employers initially approached TTC to develop the program, helped recruit other employers to join the effort, created the task lists used to structure curriculum, set the number of open apprenticeship positions for students, and collaborated to take on students as youth apprentices.

The number of employers who have signed on to take youth apprentices as well as the breadth of industries represented is one of the program’s early strengths, especially given that TTC is not actively recruiting employers in new industries, but rather working with existing partners. TTC has used a sector partnership strategy—working with groups of employers representing an industry—which has proven to be replicable. In fact, some of the participating manufacturing employers were the ones to jumpstart the information technology youth apprenticeship program, citing a need to fill those positions, as well as machinists and technicians, within their companies.

For the hospitality and culinary youth apprenticeship, there are 14 employer partners representing local restaurants and groups, as well as local resorts and a national hotel chain. Although not all of the employers were ready to take



¹⁸ See <http://www.apprenticeshipcarolina.com/resources.html>.



on apprentices in the first program year, all wanted to help inform the program as it began and are likely to hire youth apprentices in future years.

Hall Management Group, which operates six fine dining restaurants in downtown Charleston, was the first local restaurant group to sign on. In its first year, the company took on two high school-aged youths as apprentices. The state's youth apprenticeship coordinator worked directly with the executive chef at Hall Management Group to create the competency task lists for its youth apprenticeship. These task lists have since become a template for other culinary youth apprenticeships in the state. The involvement of Hall Management Group offered students a unique opportunity to gain work-based experience, since many of the company's higher-end restaurant kitchens are staffed with graduates of prestigious culinary schools. For the company's leadership as well as head chef, the reasons for participating in the youth apprenticeship were twofold: Leaders wished to be good community partners and to provide interested youths with an opportunity to explore a career in the culinary field.

Secondary Partners

Through TTC's Office of High School Programs, TTC partners with 26 high schools from across five districts, as well as a few local charter and private schools, to recruit potential youth apprentices. The five districts are Dorchester 2, Dorchester 4, Charleston County, Berkeley County, and South Carolina Public Charter School District.

Career advisers and CTE teachers both play a role in students' applications for the youth apprenticeship by writing the required letters of recommendation and reviewing the applications before submission. The participating districts' CTE directors also play a key role in promoting and recruiting for the youth apprenticeship program, particularly providing information to teachers and career advisers across the 26 public high schools in the region.

As noted during interviews, the high school CTE teachers and career advisers' knowledge of and ability to promote the youth apprenticeship program is continuing to evolve as the program becomes more established. However, the previously existing relationship between these schools and TTC provided a strong foundation for communications. For example, many TTC instructors and administrators in the culinary and hospitality management programs regularly partner with high schools—from serving on advisory committees to being teacher or student mentors. At least one of the region's high school culinary arts teachers serves as an adjunct at TTC.

South Carolina does not have statewide articulation agreements between its secondary and postsecondary systems, let alone formalized articulation agreements between TTC and the various culinary and hospitality programs across the region. To support the youth apprenticeship, district leaders negotiate dual enrollment and articulation agreements individually with TTC for the necessary courses.

Community Partners

In 2012, the Charleston Metro Chamber of Commerce in South Carolina launched Accelerate Greater Charleston, an initiative to ensure that the region's employers had a skilled workforce. The chamber began with a major investment in high school career academies, which use a school-within-a-school model to deliver college preparatory instruction along a career-oriented theme. When the youth apprenticeship program was being created, the chamber recognized how the program fit well within its Accelerate Greater Charleston 2.0 scholarship program and agreed to give participating students a full scholarship covering all of their classes, fees, and textbooks, for a total of \$383,250 since 2014.¹⁹ In 2015, SunTrust Bank contributed an additional \$25,000 to help expand the program. Notably, these investments contribute to all of TTC's youth apprenticeship programs, not just hospitality and culinary.

¹⁹ See https://issuu.com/charlestonmetrochamber/docs/2016_cmcc_annual_report_final/1.

Program leaders called the Chamber’s commitment a “game-changer,” because otherwise students would have been required to pay the cost of the dual enrollment courses, books, and other supplies, such as costly knife sets, but now can complete the program debt free.

STUDENT RECRUITMENT AND SUPPORTS



Entrance Requirements

Students interested in the youth apprenticeship program must meet TTC’s existing placement requirements, which differ by program area. For the culinary arts program, students must achieve minimum scores in reading and math (including pre-algebra and algebra) on college placement exams. For the hotel operations program, students must meet score thresholds in English or reading on the COMPASS, Accuplacer, SAT, or ACT. The cut scores align with the institution’s placement requirements for any individual wanting to participate in the program.

For enrollment consideration, students must complete and submit an application packet to TTC, which includes

- a cover letter describing the student’s interest in the youth apprenticeship program and how their career interests align with the opportunity;
- a resume;
- two recommendations from school-based or community-based individuals;
- a release form signed by the student and his/her parent or guardian;
- a media consent form; and
- evidence of qualifying placement scores.²⁰

TTC reviews the applications, screens them, and refers qualified applicants to employers with whom they have indicated an interest in working. Employers then decide if they want to schedule interviews, either in person or by phone. Employers will make offers to the students they wish to hire. Students may have multiple interviews, making placements competitive. Ultimately, students with multiple offers will select the place where they would like to work.

Recruitment Challenges

The youth apprenticeship program is completely employer-driven, meaning TTC will continue to recruit students as long as there are open positions. Since students begin their youth apprenticeships at the beginning of the school year, TTC has established an application deadline in April of the preceding school year. However, in practice, the college continues to recruit students so long as youth apprenticeship openings exist. As one program leader noted, “the deadline is when the last position is filled.”

The hospitality and culinary youth apprenticeship program had a pretty even supply of interested and eligible students and open positions in its first year. Most of the employers hired one or two apprentices each. For other TTC youth apprenticeship programs, however, there are more open positions than students that apply, something TTC is working hard to overcome through outreach with high schools.

“I didn’t see much use for apprenticeships initially—I didn’t see the value beyond what we were already doing with internships and externships. My ‘aha moment’ was when they introduced youth apprenticeships and their connection to high schools.”

Mike Saboe, dean of Culinary Institute of Charleston, Trident Technical College

²⁰ See http://www.tridenttech.edu/files/pdf/career/Youth_Apprenticeship_Application_Packet.pdf.

To help recruit students, TTC organizes information nights at area high schools, typically in the winter of each year. These events are designed to provide information to parents and students who may wish to know more about the program. Employers often participate in these events and will offer interested students tours of their work sites.

TTC, program leaders, and the Chamber of Commerce host an annual “signing day” to celebrate the newest youth apprentices across all of the industry sectors. The ceremony brings together students, employers, parents, and even the media to create a sense of accomplishment and excitement about the event.²¹ Many of those interviewed during site visits—including college faculty, students, parents, and employers—said the signing day was a special event that helped bolster pride and prestige in the youth apprenticeship program. For the college and its employer partners, the signing day also serves as one of its most successful recruitment activities. The visibility of these signing days not only helps efforts to recruit students but also attracts the attention of other employers, some of whom have subsequently involved themselves in the program.

The most significant barrier to student participation is the requirement that students provide their own transportation. The size of the Metro Charleston region and distribution of schools and employers can complicate placements. Sponsoring employers may be located downtown or as much as a 45-minute drive away, often in locations without access to public transportation. Consequently, it can be difficult for students to arrange transportation to the worksite.

Another barrier has been the strict placement requirements, primarily because first-year students did not receive information in time, missed the deadline, or failed to achieve the minimum requirements for program entry. To combat this, TTC has ramped up its communications about the college’s placement tests and cut scores, and offers the opportunity for students to take these tests on campus on a rolling basis. A number of high schools also offer this testing one day each month, with no restrictions on who takes them.

PROGRAM BENEFITS

The overall benefit for students is the ability to simultaneously earn a high school diploma, a postsecondary certificate that articulates into an associate degree, and a journey-level certificate while being gainfully employed and earning an above minimum wage salary.



Because the coursework is offered through the postsecondary institution, participation in the youth apprenticeship program is not contingent on students being involved in CTE at their home high schools. By offering a sequenced concentration of CTE coursework at the community college, TTC is opening access for more secondary students who did not take—or did not have the opportunity to take—a concentration of culinary arts, hospitality, or other CTE courses at their home high school. One student interviewed had decided to attend an early college high school, which did not offer CTE courses, but was able to gain access to CTE courses through the youth apprenticeship.

However, one current policy barrier is that South Carolina does not recognize dual enrollment credits toward a secondary student’s CTE concentration, and only one work-based learning credit can apply toward high school graduation requirements. This means students participating in the youth apprenticeship program are not able to be counted by their sending districts as “CTE completers.” The local CTE directors are advocating to the state to change this policy.

²¹ Video of a signing ceremony for the manufacturing youth apprenticeship program: <https://www.youtube.com/watch?v=hGxvAtfkcSo>.

STATE SUPPORT



The primary way in which the state provides support is through Apprenticeship Carolina, which is part of the South Carolina Technical College System. Apprenticeship Carolina acts as the intermediary to broker relationships with employers and help them establish apprenticeship and youth apprenticeship programs. Once TTC recruits a new employer, TTC connects it with Apprenticeship Carolina to help the business through the registration process, including creating training plans, providing, and helping complete the paperwork to establish a registered apprenticeship with DOL. In some instances, Apprenticeship Carolina will help address legal concerns, such as liability and insurance, although TCC is actually carrying participating students under its workman's compensation policy.

The goal of Apprenticeship Carolina is to make employers' participation as easy as possible and at no cost to the employers. As of 2016, there are over 100 youth apprenticeship programs established in more than half of the state's counties, including the Charleston youth apprenticeship programs, all of which receive support from Apprenticeship Carolina.

Administrative

The youth apprenticeship program is largely administered at the local level and works within the state's established policy environment. One key area where the state provided policy support was by removing an unintentional barrier: South Carolina used to limit the number of dual credits high school students could earn, but because of the growth of youth apprenticeship and early college high schools, the state now allows students to earn unlimited dual credits.

Financial

South Carolina offers a \$1,000 tax credit for every apprentice an employer takes on each year. While tax credits may not sway a larger company to participate, this strategy was cited as a successful way to convince management in smaller businesses that participation would be, at a minimum, cost neutral.²²

OUTCOMES



Given that the program is so new, there are limited outcomes data to report at this time. Students participating in the hospitality and culinary youth apprenticeship program were in their first year when the site visit was conducted. TTC is currently collecting data and will be able to report on students' completion and post-program placements for the hospitality and culinary youth apprenticeship with its first graduating cohort in 2016–17.

LESSONS LEARNED



Program staff and partners identified some lessons learned, including the following:

- Use intermediaries to be the connectors between schools, students, and employers, and make their entry into the programs as smooth as possible.
- Leverage sector partnerships, or groups of employers within an industry, as a strategic way of recruiting smaller companies to participate in a youth apprenticeship program.
- Build and leverage existing relationships between secondary and postsecondary education in developing and scaling the youth apprenticeship program.

²² See <http://www.apprenticeshipcarolina.com/downloads/Apprenticeship-Tax-Credit-Form.pdf>.

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- Have a supportive administration that is willing to be flexible to make the program work by tackling issues such as scheduling and advisement, providing financial support, and removing barriers such as insurance coverage for students.
 - Use public events like the signing day to celebrate the students and sponsoring employers and to recruit future participants.

BAYLESS FLOOR LAYERS MIDDLE APPRENTICESHIP PROGRAM ST. LOUIS, MO



ARCHITECTURE AND CONSTRUCTION



INSTRUCTIONAL ALIGNMENT: EMBEDDED
PROGRAM ARTICULATION: FULL

BACKGROUND

Overview

The Bayless Floor Layers Middle Apprenticeship Program (MAP) is a collaboration between the St. Louis Floor Layers Joint Apprenticeship Program and St. Louis County Public Schools. The program was established for three primary purposes: to provide an accelerated bridge to the floor layers apprenticeship program at the local level, to create an alternative path to postsecondary education and training for off-track or at-risk students, and to offer an in-house CTE program to students at a local school district.

The two-year program covers the same competencies required during the first year of the four-year St. Louis Floor Layers Joint apprenticeship. Bayless MAP graduates who choose to continue on in the full apprenticeship are eligible to receive a minimum of 800 hours toward the 6,000-hour apprenticeship and a U.S. Department of Labor journey-level certificate. In 2014–15, MAP served 14 students in grades 11 and 12, and continues to be supported by strong local organized labor partners and innovative school district superintendents, despite student recruitment challenges.

History

The Bayless MAP program began in 2004 at Bayless High School in St. Louis, Missouri, with seed funding from DOL's High Growth Jobs Training Initiative. MAP is the only two-year CTE program offered at Bayless High School, which is located in South St. Louis County. In St. Louis, all other CTE programs are delivered through the county's two technical high schools.

After the St. Louis Floor Layers Joint Apprenticeship Program relocated to a larger facility in nearby Affton, Missouri, in 2002, a local school superintendent approached the St. Louis-Kansas City Carpenters Regional Council about the possibility of partnering to connect high school graduates with careers. As the plans progressed, Bayless School District joined the partnership and offered an unused wood shop at Bayless High School to house the program. Around the same time, talks began with the St. Louis Special School District, which manages the majority of CTE programs in the county. The Special School District was considering shifting its CTE delivery model from the city's two regional CTE schools to some of the comprehensive high schools. This plan never materialized, however, and Bayless MAP, given the solid community and employer support it receives, remains the only CTE program offered at Bayless High School and one of the few offered outside of the regional CTE schools. The Special School District maintains oversight of Bayless MAP.



Program Snapshot

- Participants (2014–15): 14
- High school graduation rate (2015–16): 100 percent
- Placement rate (2015–16): 100 percent
 - Apprenticeship: 0 percent
 - Postsecondary: 80 percent
 - Workforce or military: 20 percent

Another factor in the program’s development was the influx of Bosnian immigrants and refugees that settled in St. Louis in the 1990s after the breakup of the former Yugoslavia. According to the 2010 U.S. Census, St. Louis has the largest number of Bosnian immigrants of any metropolitan region in the country, with the group comprising the third largest ethnic cohort in the city.²³ Many settled in the neighborhoods of South St. Louis County, where the Bayless School District is located.²⁴ The founders of Bayless MAP and the former school superintendent noted in interviews that students from the Bosnian community had a higher-than-average dropout rate, and they saw the Bayless MAP program as a way to potentially help them engage and succeed.

As the program began to take shape, Bayless MAP’s primary founder, Dr. John Gaal, drew inspiration from the role of apprenticeships in high-performing European vocational education systems, such as those in Germany and Switzerland, as well as the middle college high school model.²⁵ The result was what he called a “middle apprenticeship,” which is essentially a two-year pre-apprenticeship that provides completers with guaranteed entry into the related adult apprenticeship as well as substantial advanced standing and opportunities to earn postsecondary credits. Additionally, the program was designed to provide a sustained talent pipeline for local industry. In 2012, the U.S. Department of Labor awarded Bayless MAP the Office of Apprenticeship 21st Century Registered Apprenticeship Trailblazer and Innovator awards.²⁶ Today, the program is led by a CTE instructor who also graduated from Bayless MAP.

PROGRAM STRUCTURE



Bayless MAP is a pre-apprenticeship program that takes place during students’ junior and senior years of high school. Participants learn the tools and techniques of the floor-laying trade and gain industry experience working with union members and instructors. The program’s curriculum was drawn from the four-year floor-layers apprenticeship and co-designed by organized labor and the instructional support staff from the Special School District. Closely aligned to the initial years of the four-year Floor Layers Joint Apprenticeship Program, Bayless MAP is designed to have students to progress in their studies from a more exploratory junior year experience to an increasingly specific technical instruction experience during their senior year. The program also provides opportunities for a range of work-based learning experiences, including industry mentoring, career exploration, and an optional summer internship.

The two-year program was designed as a coordinated sequence of courses that doubles as students’ high school CTE program at Bayless High School. Since the program uses the existing curriculum of the four-year St. Louis Floor Layers Joint Apprenticeship Program, completers of Bayless MAP who choose to transition to the full apprenticeship upon graduation are awarded 800 hours of credit toward the 6,000-hour requirement for their journey-level certificate. Bayless MAP participants who choose to complete an optional internship with local floor layer employers and contractors during the summer of their senior year may also apply those hours toward the 6,000-hour requirement. Bayless MAP graduates who choose to go on to the apprenticeship can also complete an optional associate of applied science degree from Indiana-based Ivy Tech Community College, in which apprentices may enroll and complete online coursework.

CTE in St. Louis County is designed with a “hub-and-spoke” model of delivery. All CTE programs are located at either North or South Technical High School, which are under the jurisdiction of the St. Louis Special School District that oversees both special and technical education. Students who choose a focused CTE pathway in high school spend part of their day at the technical high schools for their CTE classes and the remaining time completing academic

²³ See <http://www.iistl.org/PDF/Economic%20impact%20study%20-%20Immigration1.pdf>.

²⁴ See http://www.stltoday.com/news/multimedia/special/making-st-louis-home-the-bosnian-resettlement-years-later/html_dafa620f-9408-5daf-b123-1b2ee29fda56.html.

²⁵ Middle College High Schools are secondary schools that are located on a college campus. The model uses small learning communities—around 100 students or fewer per grade level—and offers a rigorous academic curriculum and the opportunity to take some college classes at no cost. See <http://mcnc.us/about/faq/#difference>.

²⁶ See <http://tinyurl.com/ybsw6g9p> and <https://archive.ibjonline.com/pdf/sept12pages22-24.pdf>.



requirements at their home school. The Bayless MAP, however, is distinct from all other CTE programs in the St. Louis area in that it is co-located within Bayless High School.

The unique structure of how CTE is delivered in St. Louis County requires an ongoing formal partnership between the Special School District, which provides funding, curriculum, and instructional support, and Bayless School District, where the program is housed. These school districts operate as co-sponsors of the program, with funding coming from the Special School District and instruction offered at the local high school. While this organizational structure allows for some degree of flexibility, it also has drawbacks. For example, because it is not located within one of the CTE high schools, the program is not part of the annual tour of middle school students who visit the CTE high schools to learn more about the program opportunities. This can have an adverse effect on student recruitment.

On-the-Job & Classroom Instruction

By design, simulated work-based learning is infused into Bayless MAP. Students, starting in their junior year, are provided with a half-day immersion curriculum that prepares them for working in the industry and provides the foundational learning and hours required to transition with advance standing into the full apprenticeship program. Program instruction is delivered in a contextualized format, with instructors making connections to academic subjects through simulated workplace activities. Students work on group and individualized projects, explore various types of flooring materials and environments, and practice installation in an in-class lab.

Bayless MAP students are eligible to participate in a summer work experience with local employers and contractors. The Floor Layers Joint Apprenticeship works with employers from the city's Flooring Industry Council to source summer placements and match students to them. Employers generally hire students for entry-level positions, such as working in a warehouse as a helper. In this instance, tasks could include counting, lifting, sorting, bar coding, and learning to operate basic equipment. Employers agree to pay students "prevailing entry-level wages," though exact wages are set by individual employers. In addition, the hours worked during the summer, which fluctuate based on the agreement between the individual students and employers, count toward the on-the-job hours required to complete the floor layers apprenticeship. Students, parents, and employers all sign an agreement that stipulates that students will return to school for their senior year following the summer work experience. These agreements were instituted in order to ensure that the summer work experience would not encourage students to continue to work in industry before completing high school.

Curriculum & Assessment

The Bayless MAP curriculum is designed to align with and award advanced credit toward the Floor Layers Joint Apprenticeship Program. To do this, MAP leaders adapted the full apprenticeship's curriculum to fit the high school context, using materials provided by the union trainers. The union, as well as local employers and contractors, provided input and validation on the curriculum redesign effort to ensure that classroom instruction was closely sequenced to the floor layers' apprenticeship program.

The St. Louis Special School District was instrumental in helping to adapt the curriculum for high school students and in providing instructional coaching to help the union trainers adapt their teaching styles to meet the needs of high school students. For example, curriculum and instruction staff from the Special School District worked one-on-one with the first Bayless MAP teacher to help develop teaching competencies to complement his expertise in floor laying.

Bayless MAP's curriculum enables students to learn about a variety of floor laying environments. This range of exposure is critical within the floor laying industry and as a result has helped Bayless MAP students be better prepared to work in the industry once they move into the full apprenticeship. Program completers earn an OSHA 10 certificate and a United Brotherhood of Carpenters' INSTALL certificate.

Program Funding

The Bayless MAP is funded through Special School District dollars. The Special School District continues to provide support to Bayless MAP by way of funding, instructional coaching, and curriculum development assistance.

KEY PARTNERS

From its very beginnings, partnerships were a critical component to establishing the Bayless MAP. Bayless MAP continues to be supported by strong partnerships and broad community support, as well as clear support from leadership within the Bayless School District.



Though many of the original key figures have changed over the years, program partnerships continue to be held together due in large part to the program's founding partner at the St. Louis - Kansas City Carpenters Regional Council. Dr. Gaal, the program's chief architect and champion, leads workforce development and training for the council and plays an unofficial but critical role in providing the Bayless MAP with guidance and fundraising, as well as helping navigate the needs of the various program partners. Bayless MAP's foundation is built upon partnerships, many of which were forged and fostered through Gaal's personal relationships and extensive years in the region's construction and floor laying industry. The partnerships continue to be built on personal, not institutional, relationships, and many retirees and founding members continue to be engaged.

These partnerships were most prevalent in the crosscutting governing committees that featured organized labor, contractors and employers, and school leaders and instructors. During the program's early years, these committees steered the program's design and implementation, and continue to serve in an advisory capacity. The union leadership, most notably Gaal and the Carpenters' District Council of Greater St. Louis and Vicinity, spearheads much of this committee work.

Employers & Labor

Partnerships with local labor provide the backbone for the Bayless MAP. The local floor layers and carpenters unions provide instructors and instructional materials, help connect with other employers, and offer general oversight and leadership on the program's advisory committee. The union oversees ongoing curricular alignment between the Bayless MAP and floor-layers apprenticeship to ensure MAP participants are prepared to matriculate into the full apprenticeship upon completion. These partners anchor the program and provide the pathway to apprenticeship, as well as champion the program more broadly. Bayless MAP boasts significant support from local employers, who noted repeatedly in interviews the importance of a local, quality training pipeline and MAP's role in it. The partners reported that they are committed to providing work-based learning opportunities and input into training curricula. Employers also serve on steering and advisory committees, and provide in-kind support by way of training materials and tools. An industry sector association, the Flooring Industry Council, is also a partner in Bayless MAP. Council members agree to provide summer work experience to students in the program and also advise on the curriculum. While no student from the 2015-16 cohort ended up entering into an apprenticeship program, MAP does provide benefits to partnering employers. For example, one of the largest employer partners reported hiring five Bayless MAP graduates throughout the program's tenure.

Postsecondary Institutions

Bayless MAP participants do not take postsecondary classes while in high school because none of the coursework offered qualifies for dual enrollment. Online postsecondary credit is offered to MAP graduates who enroll in the Floor Layers Joint Apprenticeship Program through a partnership with Ivy Tech Community College in Indiana. At this time, apprentices must pay for their participation. Ivy Tech offers similar online programs in partnership with a number of building trades unions, such as the National Joint Apprenticeship Committee of the United Brotherhood of Carpenters and Joiners.

Ivy Tech Community College Courses

- IVYT 109 Online Learning Technology (1 credit)
- IVYT 104 Critical Thinking (1 credit)
- IVYT 105 Personal Finance (1 credit)
- ACOA 101 Human Relations (3 credits)
- AENA 101 Technical Writing (3 credits)
- AHSA 101 History of Organized Labor (3 credits)
- ACRP 212 Construction Supervision (3 credits)

Ivy Tech and the floor layers apprenticeship program have an arrangement that allows apprentices to enroll in Ivy Tech's Associate of Applied Science degree program. Apprentices are required to complete 15 credits at Ivy Tech (see text box), which count toward the general education requirements of the associate degree. The classroom component of the apprenticeship training is offered by the union to meet the degree's technical course requirements.

STUDENT RECRUITMENT AND SUPPORTS

Entrance Requirements

To participate in Bayless MAP, students must be at least 17 years old. This requirement ensures that students will be 18 years old when they begin the work-based learning portion of their program, thus negating any legal or liability concerns.



There is no formal recruitment process for Bayless MAP. Instead, the program relies largely on informal recruitment methods, such as feedback from current and former students as well as family members who belong to the union. Most current or past program participants cited their family members as the way they learned about Bayless MAP. Originally introduced to counter the high dropout rates among immigrant populations, the program is designed to serve "at-risk" students, defined as those having average grades of C or below. There are, however, no formal mechanisms to facilitate the entry of students who would meet this criterion.

Many stakeholders interviewed noted that recruitment has been an ongoing challenge, with most citing a lack of information on the program and parents preferring their students to pursue traditional college pathways. The program's focus on at-risk students also may adversely affect efforts to expand the program. There are no specific plans to address recruitment challenges beyond the existing channels. Transportation presents another challenge, because students who do not attend Bayless High School must provide their own transportation to the school.

PROGRAM BENEFITS

Graduates of Bayless MAP earn a high school diploma as well as two industry-recognized credentials: OSHA 10 and United Brotherhood of Carpenters' INSTALL. Students who choose to continue on in the Floor Layers Joint Apprenticeship Program may also apply 800 hours from Bayless MAP toward the requisite 6,000 hours for the full apprenticeship and journey-level certificate. Students who continue on in the full apprenticeship have the opportunity to earn an associate of applied science degree from Ivy Tech Community College.



OUTCOMES

In 2014–15, 100 percent of program participants graduated from high school and entered either postsecondary education or the workforce. In that program year, no graduating students entered into the Floor Layers Joint Apprenticeship Program. Although Bayless MAP has been active since 2004, the program was unable to provide historical data for this report. Similarly, while the employer partners see Bayless MAP as an important element of their talent pipeline, they do not keep track of how many Bayless MAP students have matriculated into the floor layers apprenticeship over time.



LESSONS LEARNED

Program staff and partners identified some lessons learned, including the following:



- Have a formal relationship with a registered apprenticeship program, which creates a clear pathway for students upon completion.
- Engage union staff, which creates a feedback loop for the program’s curriculum and instruction, ensuring continued alignment between the apprenticeship competencies and the secondary CTE program.
- Provide program completers with advanced standing once they matriculate into the apprenticeship, which ensures they receive credit for their learning and accelerates the time required to finish their apprenticeship.
- Have a dedicated, sustained program champion, which helps keep tight partnerships and relationships across sectors.

EDWARD J. MALLOY INITIATIVE FOR CONSTRUCTION SKILLS NEW YORK CITY, NY



ARCHITECTURE AND CONSTRUCTION



INSTRUCTIONAL ALIGNMENT: EXTERNAL
PROGRAM ARTICULATION: PREFERRED-ENTRY

BACKGROUND

Overview

The Edward J. Malloy Initiative for Construction Skills (Construction Skills) is an intensive, 14-week pre-apprenticeship program that prepares high school seniors for entry into registered apprenticeship programs in New York City's unionized building and construction trades. The program's mission is to create a diverse, well-prepared pipeline of union workers for the city's construction industry. Construction Skills recruits from 19 of the city's career and technical high schools, and serves an average of 150 pre-apprentices each year. The cohort size is tied to industry demand and the number of apprenticeships available in a given year.

History

The Construction Skills program has its roots in a pilot program launched in 1993 called Project Pathways, which is a joint venture of the New York City School Construction Authority (SCA) and the Building and Construction Trades Council (BCTC). The goal of Project Pathways was to build a diverse workforce in New York's building trades by setting aside 10 percent of apprenticeships for graduates of New York City's vocational and technical high schools, which at that time served a majority of African-American or Hispanic students.

By the late 1990s, employers and unions began to raise questions about whether the program graduates were adequately prepared to succeed in union apprenticeship programs. This led to declining apprenticeship placement rates for program graduates and a decrease in SCA's support for the program. To respond to these concerns, the program underwent a substantial restructuring. In 2001, Project Pathways was replaced by Construction Skills 2000, an independent nonprofit organization affiliated with BCTC and the Building Trades Employers' Association. The principal funders were—and continue to be—SCA and the Port Authority of New York and New Jersey. In 2007, the organization was renamed to honor Edward J. Malloy, the BCTC president who helped launch Project Pathways.

Today, Construction Skills continues to operate as an independent nonprofit organization that is based within the BCTC headquarters, and the city's unions continue to set aside 10 percent of apprenticeships for high school graduates. The program is now open to any city high school student, but its recruiting efforts continue to focus on the career and technical high schools because these students are most likely to be interested in a career in the building trades. Construction Skills staff serve as the intermediary between the city's technical high schools, labor, and employers. They are also responsible for program administration and implementation, which includes



Program Snapshot

- Participants (2014–15): 135
- Participants (2013–14): 161
- High school graduation rate (2014–15): 100 percent
- Placement rate (2014–15): 69 percent
 - Apprenticeship: 83 percent
 - Postsecondary: 16 percent
 - Workforce or military: 45 percent

brokering, maintaining, and nurturing the many relationships that are required to make construction skills work. The program relies on relationships rather than formal agreements to maintain its many partnerships.

PROGRAM STRUCTURE



Participants in the pre-apprenticeship program undergo 14 weeks of training to prepare for success as apprentices in the building trades. The training is broken into two segments—a 10-week training that is delivered to high school students in the spring of their senior year, and a four-week hands-on training over the summer following high school graduation that is designed to simulate industry employment, where participants learn the basic roles on a series of job sites.

Program completers receive a direct-entry referral letter for union apprenticeships in the building trades, which allows them to bypass the highly competitive public recruitment process. Construction Skills is one of only three programs in the city with a direct-entry agreement with the unions. However, participants must still meet the physical and aptitude requirements set by individual unions for entry into their apprenticeship programs. The other two programs seek to boost gender diversity as well as offer a pathway to employment for veterans.

While completers do not earn advanced standing in union apprenticeships or postsecondary credit, the construction skills program does provide training that gives participants a head start as they transition into apprenticeships. Also, the curriculum is designed to allow participants to explore the various building trades to help them select the apprenticeship program best suited to their interests.

On-the-Job & Classroom Instruction

During the 10-week classroom session, students attend a weekly, three-hour, after-school class taught by union journey workers from the building trades. Students receive training on basic workplace safety and professional skills, such as attendance and punctuality, and have the opportunity to hear from guest speakers who are completing apprenticeships in the building trades. Students also tour union-training facilities and meet with instructors to learn more about union apprenticeship programs in a range of trades.

Upon high school graduation, participants complete a four-week, full-time summer training run by the Consortium for Worker Education (CWE), a nonprofit organization that functions as a workforce development agency for the AFL-CIO of New York City. The training is not paid, nor do students have to pay to participate. Construction Skills does provide limited financial assistance to those who qualify because participants are not allowed to have other jobs while in training. CWE manages both the classroom and hands-on components of the summer program. Construction Skills works closely with CWE and the unions to ensure that training is aligned with union apprenticeship programs.

The hands-on training is conducted at sites throughout the city's five boroughs. Participants rotate through four different job sites, at which they work on basic construction projects, and are assigned to take on roles such as steward or foreman. The summer training acts as the program's primary work-based learning experience. Prior work-based learning experience is not a prerequisite for the program, nor is the training designed to seamlessly build on students' relevant high school CTE program, but Construction Skills staff report that they remain very connected to the high school CTE teachers who serve as their recruitment liaisons and have regular CTE curriculum alignment discussions even without a formal mechanism in place.

Curriculum & Assessment

The curriculum for Construction Skills was developed in close collaboration with the building trades unions, thus ensuring alignment between the program's instruction and the curricula for the available apprenticeships. Classes are taught by senior union instructors, who also play a role in ensuring alignment. A major emphasis of the training is on setting students up for success in apprenticeship programs by equipping them with work readiness skills. For example, Construction Skills participants are expected to adhere to very strict rules related to attendance and

tardiness that mimic the rules of apprenticeship programs and employers' expectations. At the end of the program, participants take aptitude and physical exams, both of which are entrance exams for apprenticeships, not necessary for an end-of-program assessment.

Though applicants are required to have a C average in math to be admitted into the program, program leaders cited math proficiency as an ongoing struggle, and as a result, the program has incorporated relevant math instruction into the curriculum.

Program Funding

As an independent nonprofit organization, Construction Skills is funded primarily through ongoing support from SCA and the Port Authority. It receives some supplemental grants from public-sector entities, including the New York City Council, the city's Department of Small Business Services, and the CWE's Education Jobs to Build On grant. In addition, the program hosts an annual fundraiser, the Building Futures awards reception, which honors leaders in labor, contracting, real estate, and government and is used to solicit donations.

KEY PARTNERS



Strong, long-lasting partnerships are a critical component of Construction Skills' success. These partnerships have been consistent since its founding as Project Pathways. The same key institutional partners are at the table, and they have been involved in largely the same capacities for more than two decades. However, rather than being governed by formal agreements or protocols, these partnerships were formed and are maintained on the basis of existing labor-management relationships. Construction Skills' program staff members are from the union world, which enables them to serve as effective intermediaries who can speak the language of business and industry.

Unions

Given the program's roots in Project Pathways and the BCTC's role as a founding partner, Construction Skills' strongest partnerships are with the city's construction unions. As a result of the BCTC relationship, the program is able to offer direct-entry referral letters for completers to use when applying to the city's competitive union building apprenticeships. Though the primary driver of the unions' participation in Construction Skills and two other similar programs is the potential to build a more diverse workforce, the unions have also collaborated to validate and strengthen the program's curriculum and provide journey-level instructors to help deliver the training.

Employers

Because Construction Skills does not place participants directly with employers, the partnership between the program and employers is primarily financial in nature. Two of the largest employers, SCA and Port Authority of New York and New Jersey, have been a part of Construction Skills since the beginning and continue to serve as major financial donors to the program.

“We want students to be able to walk through the many doors we teach them to build.”

John Widlund, executive director of career and technical education, New York City Department of Education

Secondary Institutions

Over the years, Construction Skills has developed close relationships with high school teachers who serve as liaisons that help identify potential program participants, supply students with information about the program, and assist with the program's screening and recruitment process. Construction Skills also works with high schools to deliver the first 10 weeks of training during the school year and to carry out recruiting activities, such as career fairs. Construction Skills works with high school CTE teachers to align secondary curricula to the pre-apprenticeship program. The program also has a very strong working relationship with the New York City Department of Education. However, the

district's role in directly supporting the program is limited, since Construction Skills largely operates independently of the district, and the most intensive portion of the program takes place after high school graduation.

STUDENT RECRUITMENT AND SUPPORTS



Recruitment and Entrance Requirements

While all students in New York City high schools are eligible for the Construction Skills program, the organization works most closely with 19 targeted high schools across New York City's five boroughs because these schools offer CTE programs in a related field, such as construction trades, engineering, and architecture.

Construction Skills and CWE staff emphasized that their goal is not to “sell” the program to all students, but rather to focus their outreach efforts on students who are interested in the field. Program staff are also engaged in outreach and recruitment efforts, and spend a lot of time traveling to high schools across the city to talk with students, families, and school staff about the program. Recruitment efforts also include community outreach. Program staff often attend community events, such as block parties, to inform students and their families about the program. A consistent recruiting challenge noted by Construction Skills staff, however, is that many parents are hesitant to consider postsecondary options that do not include college. Students also have opportunities to participate in “learning days” organized by Construction Skills and CWE. Learning days are structured like job fairs, but are not called job fairs in order to avoid giving the impression that the program leads directly to jobs, rather than to further training as an apprentice.

Program Eligibility Requirements

- Minimum cumulative grade average of 70 percent or higher
- 90 percent attendance record
- Commitment to pursuing a career in the unionized building and construction trades industry

To recruit students, Construction Skills uses liaisons, who are typically high school CTE teachers. The liaison role is not paid or formalized. High school teachers recommend students for participation in the program; students who wish to pursue this option then fill out an application and attend an orientation session. Construction Skills conducts interviews with applicants who are chosen primarily on the basis of recommendations from the liaisons. Admission to the program is competitive, and students must meet minimum cut-offs for both grade point average (GPA) and attendance records. The number of available seats in the program is determined by industry demand, and therefore varies and can range between 120 and 170 participants.

Student Supports

Once in the program, participants meet with a Construction Skills counselor who advises them on their choice of a specific trade. This person's primary role is to familiarize program participants with the entry requirements for apprenticeships in each trade and to help students ensure that their skills are aligned with the requirements for their chosen trade.

A related issue that suggests a need for increased student supports, particularly robust career information and advising, is that many participants in the program initially hope to enter apprenticeships with the electricians' union. Construction Skills staff noted that this is because an apprenticeship with the electricians' union demands less physical labor than apprenticeships in many other building trades, and is perceived as more closely tied to academic learning and college-level STEM coursework. Construction Skills and CWE staff also observed that families, especially those from immigrant communities, may encourage students to pursue the electrician track because they believe it is more likely to lead to college than apprenticeships in other building trades.

The program offers some financial supports to students, who can qualify for MetroCards during the four-week summer training, but Construction Skills and CWE made a deliberate decision not to offer additional wraparound supports, because they would not be available once participants enter their union apprenticeships. The goal of the

Construction Skills program is to emulate union apprenticeships to ensure that students are thoroughly prepared to become apprentices.

PROGRAM BENEFITS

Participants receive a certificate of completion and a direct-entry referral letter to union apprenticeship programs. Though neither is stackable, the referral is valuable because it allows students to circumvent the competitive public apprenticeship recruitment process. However, completion of the Construction Skills program does not confer any other special status on participants, who must still prove to the unions that they meet entry requirements, and who do not receive advanced standing in apprenticeship programs as a result of their Construction Skills training.



Unions and employers value the program, which they see as an important stream of diverse talent for New York's building trades. Unions' enthusiasm for the program is reflected in their strong support for it, including financial support, office space provided by BCTC, and a willingness to set aside 10 percent of apprenticeships for graduates of the career and technical high schools.

As for New York City schools, the district sees the program as a valuable pathway for students upon graduation. The executive director of CTE for the New York City Department of Education was previously the principal of the School of Cooperative Education, a primary sending school for Construction Skills. While he is enthusiastic about the program, the current state accountability system presents challenges for increasing participation, because the system does not track or reward placement into apprenticeships, which means that stakeholders at the school level are not incentivized to support Construction Skills or similar programs.

STATE SUPPORT

State support for Construction Skills is limited. Since this program is seated within the building trades unions, the state's Department of Education has not been particularly engaged with it. The New York State Department of Labor, which has administrative authority over registered apprenticeships, granted approval in 2009 to Construction Skills for the direct-entry referral status, which was critical, as this is seen as one of the most valuable benefits of the program.



OUTCOMES

Since 2001, Construction Skills has placed more than 1,800 New York City residents into union-run apprenticeship programs. According to the program, more than 1,300 of these placements remain actively employed by the unionized construction industry, and of those, 700 are journey-level workers.



To track participant outcomes, Construction Skills uses the Salesforce database. Indicators measured include application, enrollment, completion, and placement. Because its goal is to build a diverse construction workforce, the program also tracks the race and ethnicity of participants. For example, for the 2014–15 program year, participants hailed from all five boroughs, and 89 percent of the Construction Skills graduates who were placed into union apprenticeship programs were African American, Hispanic, Asian, or another minority group.

LESSONS LEARNED

Program staff and partners identified some lessons learned, including the following:



- Maintain a strong working relationship between labor and management, which is essential for a pre-apprenticeship program intended to connect with union-sponsored apprenticeships.
- Invest in education and training, as it is imperative for employers to build and maintain a skilled workforce. Steady donations and commitment from employers are necessary to support an intermediary to manage the program and its many partnerships—which are critical to its success and longevity—while maintaining financial stability.

GREEN ACADEMY AT SALINAS HIGH SCHOOL

SALINAS, CA



ARCHITECTURE AND CONSTRUCTION



INSTRUCTIONAL ALIGNMENT: EMBEDDED
PROGRAM ARTICULATION: EXPLORATORY

BACKGROUND

Overview



The Green Academy at Salinas High School prepares students to pursue multiple pathways in the building and sustainable construction fields, which may include registered apprenticeship, through a three-year course of study. In 2014, the Green Academy integrated the nationally recognized Multi-Craft Core Curriculum (MC3) into its existing program. Starting with the class of 2017, graduates will be eligible to receive a portable, nationally recognized certificate of completion from the North America's Building Trades Unions. The certificate includes a "stamp" from the Associated General Contractors of California to certify the Green Academy as an approved program and positions graduates to enter local pre-apprenticeship programs, which are very competitive.

History

The construction program at Salinas High School has a decades-long history of producing graduates skilled in cabinetmaking. In fact, the current instructor, who has taught construction at the school for almost 30 years, is also a graduate of the construction program. This instructor has played a pivotal role over the years in transforming the construction program into a comprehensive course of study by garnering and leveraging industry, community, and administrative support.

In 2009, the construction program was converted into a California Partnership Academy, making the Green Academy one of two school-within-a-school academies at Salinas High School. The academies offer a three-year course of study integrating academic and technical instruction around a career theme.

In 2014, the school was one of nine programs selected by the California Department of Education to participate in a three-year pilot to embed the Multi-Craft Core Curriculum, a pre-apprenticeship curriculum developed by North America's Building Trades Unions, into its construction pathway and Green Academy courses.^{27,28} For the Green Academy, adopting the MC3 curriculum meant that program graduates would be prepared for entry into local union-sponsored pre-apprenticeships, which are very competitive.

As educators across the state from the nine pilot Partnership Academies (including the Green Academy) began to implement the MC3 curriculum, they found it to be a bit basic for a three-course sequence. As a result, the pilot

Program Snapshot

- Participants (2014–15): 117
- Participants (2013–14): 116
- High school graduation rate (2014–15): 100 percent
- Placement rate (2014–15): 100 percent
 - Apprenticeship: 5 percent
 - Postsecondary: 91 percent
 - Workforce or military: 5 percent

²⁷ See <http://www.cde.ca.gov/nr/ne/yr14/yr14rel86.asp>.

²⁸ See <http://www.choiceworks.org/Members-and-Apprenticeship/Multi-Craft-Core-Curriculum-and-Pre-Apprenticeship>.

academies, the California Department of Education, and the University of California system partnered to create a capstone course that meets University of California admissions requirements and enhances student learning.²⁹

PROGRAM STRUCTURE



Students may apply to enter the three-year Green Academy during the spring of their freshman year. By law, at least half of each incoming sophomore class must meet three of the six “at-risk” criteria (see text box). As an academy, students take all classes as a cohort. Entry into the program is competitive, with an average of 130 applicants vying for 30 openings.

While all coursework for the Green Academy is delivered on-site at Salinas High School, the program receives its CTE administrative and reporting support through the Mission Trails Regional Occupational Program (MTROP). MTROP is structured to allow the seven-member school districts to share access to CTE programs. Some courses are offered at the shared MTROP campus, while others are offered exclusively on the high school campus. The MTROP serves as the Perkins fiscal agent for each affiliated program, including the Green Academy.

Curriculum & Classroom Instruction

The MC3 curriculum is embedded as part of a broader course of study, meaning that it is integrated into both academic and CTE instruction. For example, the topic “the heritage of the American worker” is incorporated into 11th grade U.S. History. To embed the MC3 curriculum into the program, the CTE instructor received professional development and certification in MC3 instruction from North America’s Building Trades Union’s Building Trades Academy.

In addition, the MC3 pilot required a sequence of coursework culminating in a capstone course that “prepares students for a pre-apprenticeship position in the construction trade industries or for further training in college or certification programs.”³⁰ The senior-level Green Careers Sustainable Construction capstone course serves this function at Salinas. Similar to the other courses in the Green Academy sequence, the competencies of this course have been adjusted to meet the knowledge and skills development defined in MC3.

Throughout their course of study, students can earn two industry certifications, OSHA 10 and CPR. Additionally, those who complete the required coursework with a “B” or higher receive six transcribed credits at Hartnell Community College. These credits articulate with specific postsecondary construction and architecture courses that align with content offered by the Green Academy, and are transferrable to other two-year institutions in the state.

On-the-Job Training & Classroom Instruction

While intensive work-based learning, such as an internship, is not a requirement of the Green Academy, the majority of students engage in such activities. The Partnership Academy model requires the school to offer exploratory activities, such as worksite tours, guest speakers, and mentoring. As juniors, all students are matched with mentors, who are typically employees of participating businesses and volunteer to be a career-related or caring adult in the student's life. In the spring prior to their senior year, students performing well enough to be on track for graduation are eligible to be placed in internship positions. Students apply for these positions as they would in the open market by preparing resumes, completing job applications, and participating in interviews with employers who ultimately make the hiring decisions for the internship. On average, about 75 percent of students participate in a paid or unpaid internship with a local employer. The majority of students are in unpaid positions, but the number of paid internships increases each year. Internships range from placements with construction companies to cabinet makers and frame construction.

²⁹ See <http://ucci.ucop.edu/integrated-courses/MultiCraft-Core-Curriculum1.html>.

³⁰ See <http://www.cde.ca.gov/nr/ne/yr14/yr14rel86.asp>.

To achieve certain elements of the MC3 curriculum, the instructor has leaned on members of the program’s CTE local advisory board. For example, scaffold erection, one of the components in the Introduction to Construction section, would be difficult to recreate to scale in a high school setting. To meet the competency, the instructor relied on industry partnerships to allow students to access a construction worksite at a local Veterans Administration hospital, where they directly interacted with journey-level experts in scaffolding.

Program Funding

The program operates primarily through state and local funding. It receives additional funding each year as part of the state’s ongoing support for the California Partnership Academies, and is eligible for federal funds through Perkins as a member of the MTROP. The MC3 pilot provides the program with technical assistance and resources.

KEY PARTNERS

Employers & Labor



The school district has maintained a strong culture of engaging employers through advisory committees. The Green Academy advisory committee meets formally two times per year but participates throughout the year in conducting classroom visits, placing interns, and providing access to job sites and mentoring. The program instructor has developed ongoing relationships with union and nonunion apprenticeship coordinators in the area, which he has been able to leverage for work-based learning placements, guest speakers, and the aforementioned scaffolding instruction.

Representatives from a variety of the trade unions are also represented in the program’s advisory committee and make in-class presentations on the opportunities that apprenticeship offers. In the spring of 2016, the CEO of the Santa Cruz County Building and Construction Trades Council visited the classroom to explain the apprenticeship exam and entry process. He then followed up to personally invite students to apply for the apprenticeship.

■ **“We have thousands of applicants that want to get into our program. Any kind of prior training that gets them priority status is a huge plus for them.”**

■ *Matt Rowlett, district coordinator, Carpenter’s Apprenticeship Program for Northern California*

Even with a large population of 155,000, Salinas has limited union-sponsored apprenticeship training centers in close proximity. For example, the closest Carpentry Training Committee for Northern California training center is about 40 miles north of Salinas. The majority of internships available for students are in nonunion shops.

Postsecondary Institutions

The Green Academy’s course sequence is aligned to the University of California’s and California State University System’s “a-g” college admissions requirement, which ensures that students take the requisite courses for admission to any institution within the two systems.³¹ Additionally, the program’s articulation agreement provides students who pass their junior- and senior-level CTE courses with a “B” or better with six transcribed postsecondary credits, which can be used at Hartnell Community College toward a certificate or associate degree program for a construction pathway and are transferrable to other institutions in the state. In 2014–15, 96 percent of Green Academy students earned postsecondary credit.

■ **Base Requirements to enter the Green Academy**

- Ninth-grader on track to graduate
- Completed application
- Signatures by two Salinas high school teachers and a parent

³¹ See <http://ucop.edu/agguide/career-technical-education/>.

STUDENT RECRUITMENT AND SUPPORTS



Entrance Requirements

In 2014–15, the program served 117 students. The law governing the California Partnership Academies requires that at least half of students in each incoming sophomore class meet three of the following six at-risk criteria to enroll in the academy: having a poor attendance record, being significantly behind in credits, demonstrating low motivation for the regular school program, being economically disadvantaged, having low state test scores, or having a low grade point average.³² The high school has structured career exploration activities, such as the ninth-grade “herd roundup,” during which all freshmen complete a career interest inventory and tour each of the CTE programs offered at the high school and MTROP. Based on these experiences, students with an interest in construction are encouraged to apply to the academy, with the expectation that they will participate in the school’s cohort model and meet the base requirements for entry. Applicants are encouraged, but not required, to take Introduction to Construction or Pre-engineering before applying to the academy.

Student Supports

The Green Academy has a dedicated guidance counselor, who provides direct support to students as they move through the three-year program. The counselor ensures that each student is on track to being “a–g”-ready at graduation. This designation, which represents the first seven entry requirements of the University of California and California State University systems, ensures that each student will also be eligible to enter any two- or four-year institution of higher education in the state. For students that get off track, the district offers summer and winter intercessions to help them get the credits they need for graduation.

Flexible scheduling to support student cohorts and commitment from the school administration have been critical to the Green Academy’s success. In addition, the construction program offers two courses, Geometry Construction and Mill Cabinet, through which students can receive up to five credits toward the math graduation requirement.

At-risk Criteria for California Partnership Academies

1. Having a poor attendance record
2. Being significantly behind in credits
3. Demonstrating low motivation for the regular school program
4. Being economically disadvantaged
5. Having low state test scores
6. Having a low grade point average

PROGRAM BENEFITS

Program completers leave the program with OSHA 10 certification and a nationally recognized certificate of completion from the North America’s Building Trades Unions. The certificate includes a “stamp” from the Associated General Contractors of California (AGC), certifying completion of an approved program. Students also accumulate six credits of transcribed credit that can be used at any two-year institution in the state. Additionally, the program’s course sequence is aligned to the “a–g” college admissions requirement, which ensures that students take the requisite courses for admission to any institution within the University of California and California State University system.



STATE SUPPORT

Administrative

The Green Academy’s success is supported by state-level policies, such as the California Partnership Academies, the ongoing state-level funding and support, and the course approval mechanism of the state university systems.



³² See <http://www.cde.ca.gov/ci/gc/hs/cpagen.asp>.



The state pilot for the MC3 curriculum has provided intensive professional development to the instructor of the Green Academy. The state department of education is in discussions with the California Labor Federation, which represents more than 1,200 union chapters, to replicate the pilot in other industries, including entertainment and health care. In 2016, the first cohorts from the pilot graduated and 53 students received the pre-apprenticeship distinction on their high school diplomas.³³ In 2017, the students from the Green Academy are expected to graduate, along with roughly 400 other students across the state.

The state has plans to continue expanding the California Partnership Academies, which will include additional construction-related programs and adjustments based on the lessons learned from the MC3 pilot.

OUTCOMES

The Green Academy's outcomes are on average higher than the rest of the school district. For example, the program's three-year average graduation rate is 99 percent, compared with the district average of 93.7 percent. The placement rate is also high, with 100 percent of the students from the 2013–14 school year continuing their education through postsecondary studies (89 percent), apprenticeship (7 percent), or military training (3.5 percent).



Though the construction program at Salinas High School has long had relationships with apprenticeships, it has not tracked how many students have entered apprenticeships. The newly embedded MC3 curriculum is too new to have generated any outcomes. The first cohort of students to complete the Green Academy and MC3 curriculum will graduate in the 2016–17 school year.

LESSONS LEARNED

Program staff and partners identified some lessons learned, which include the following:

- Continue to adjust and adapt CTE programs to keep pace with the demands of the labor market, the workplace, and education institutions.
- Use an industry-created curriculum to add currency and recognized value among employers.
- Recruit a diverse range of union and nonunion employers to provide students with a wide range of opportunities and pathways.
- Provide state support to help local programs advance and evolve, particularly with innovative pilot projects, such as the MC3 curriculum.



³³ See <http://www.cde.ca.gov/nr/ne/yr16/yr16rel40.asp>.

PUGET SOUND SKILLS CENTER SEATTLE, WA



ARCHITECTURE AND CONSTRUCTION



INSTRUCTIONAL ALIGNMENT: EMBEDDED
PROGRAM ARTICULATION: OPTIONAL-ENTRY

BACKGROUND

Overview

The construction technology program at Puget Sound Skills Center (PSSC) in Seattle, Washington, prepares students for five district-defined pathways: work, military, two-year college, four-year university, and apprenticeships. To formalize the pathway to apprenticeships, PSSC leaders cultivated and leveraged extensive employer and labor partnerships to embed the necessary competencies within the CTE program to make it equivalent to a pre-apprenticeship experience. As a result, the program was awarded state recognition in 2016 as an apprenticeship preparation program, meaning that students who complete both years of the CTE program at PSSC and the optional summer internship will receive preferred consideration and advance credit when applying to a registered apprenticeship.

Although graduates from the class of 2017 will be the first to benefit from the formal state recognition, the construction technology program's students have become apprentices upon graduation for many years. In 2014–15, the program's 23 graduates had a 100 percent graduation rate, with more than 40 percent entering apprenticeships.

History

The Puget Sound Skills Center (PSSC), a two-year area technical center in Seattle established in 1966, is the oldest skills center in Washington state, drawing students from 22 feeder high schools that enroll diverse populations representing 19 languages. Five school districts—Federal Way, Fife, Tahoma, Tukwila, and Highline Public Schools, which serves as the administrative and fiscal authority for PSSC—are members of the Skills Center Consortium. Students spend half the day at their home high school and then travel to PSSC where they spend the rest of the school day. In the 2014–15 school year, PSSC enrolled 662 students in grades 10 through 12.

The PSSC construction program path to pre-apprenticeship began in the spring of 2007. A former PSSC instructor collaborated with the Seattle Pipe Trades, Local 32, as part of a national effort to identify the core competencies of construction pre-apprenticeships. This would later lead to the development of the national Multi-Craft Core Curriculum (MC3), released in 2009 by North America's Building Trades Unions.³⁴ Through this collaboration, the PSSC instructor began to embed these competencies in the construction technology program.



Program Snapshot

- Participants (2014–15): 39
- Participants (2013–14): 43
- High school graduation rate (2014–15): 100 percent
- Placement rate (2014–15): 100 percent
 - Apprenticeship: 47 percent
 - Postsecondary: 18 percent
 - Workforce or military: 35 percent

³⁴ See <http://www.choiceworks.org/Members-and-Apprenticeship/Multi-Craft-Core-Curriculum-and-Pre-Apprenticeship>.

This shift to a pre-apprenticeship deepened the program's relationship with employers and other regional industry associations. Thirty-five local employer partners in other construction trades serve on a program advisory committee. In 2015, local general contractors, the Construction Center of Excellence at Renton Technical College, the Washington Carpenters Institute, and the Pacific Northwest Regional Council of Carpenters, worked with instructors and PSSC leaders to add a summer internship, called the "Construction Camp," to the two-year CTE program. The partners also recommended the program apply for official pre-apprenticeship recognition through the Washington State Apprenticeship Council, which was awarded in the spring of 2016.

In 2015, district leadership created the Career Pathways and Partnerships Department to promote all pathways equally. This means that all programs must be designed to prepare students for five well-defined pathways: work, military, two-year college, four-year university, and apprenticeships. Students receive personalized career advisement to help them decide which to pursue.

■ **"One of the things we say at Highline is we're working toward a minimum of 95 percent graduation rate, but that number means nothing if those diplomas are not a meaningful ticket to a promising future for every student. . . . We're working very hard to place equal value on the multiple pathways that kids can take after high school, knowing that whatever pathway they choose, they have to be highly skilled and well prepared in content."**

Dr. Susan Enfield, superintendent, Highline Public School District

PROGRAM STRUCTURE

Students may enter the construction technology program as a junior or senior. Graduates may earn up to 20 articulated postsecondary credits, and are eligible to apply for the eight-week Construction Camp that takes place during the summer between their junior and senior years.



Once accepted as an apprentice, they are also able to apply the hours from their construction technology classes and internship, meaning participants could achieve journey-level status in as little as two years compared to the average of four years. Though the registered apprenticeship does not include an embedded associate degree, the articulation agreements between PSSC's CTE programs and three local colleges can position students to more quickly complete the remaining credits of an associate of applied science degree.

The construction technology program earned state recognition as a pre-apprenticeship program in April 2016. Starting with the class of 2017, students who have completed both years of the program and the summer internship will be eligible to receive preferred consideration when applying to a registered apprenticeship with the Pacific Northwest Regional Training Council of Carpenters. Though the program has had longstanding connections with apprenticeships, receiving the state recognition enables the council to provide students with preferred consideration as well as advanced placement. Students may also receive similar benefits in other registered apprenticeships because of the state recognition.

On-the-Job Training & Classroom Instruction

The Construction Camp is a summer internship sponsored by the Pacific Northwest Regional Council of Carpenters, the Washington Carpenters Institute, local general contractors, and other employers. The Construction Center for Excellence, which is part of the state's sector strategy initiative and helps lead statewide education curriculum and training efforts, served as an intermediary for PSSC and their industry partners to support and facilitate this collaboration.³⁵

³⁵ See <http://www.sbctc.edu/for-employers/centers-of-excellence.aspx>.



Matriculation into the full apprenticeship is one of the goals of the Construction Camp, because connecting students to an employer and exposing them to the Pacific Northwest Regional Council of Carpenters' training headquarters can help make apprenticeships a more attractive, easy, and comfortable next step for students.

To participate, students are interviewed by the employers, who hire the students, and wages vary by employer. Students spend their first week of the Construction Camp at the union's training headquarters for orientation and training by the apprenticeship instructors. During the rest of the camp, students take classes once a week at the training center and spend the rest of the week in a supervised work experience. Participants complete 106 hours of training and 214 hours of supervised job site employment by the end of the internship. Currently, the Construction Camp is limited to a small number of placements each summer because interns may only work on private building sites. In the 2014–15 school year, nine construction technology students participated in summer internships, six of whom participated in the Construction Camp.

Summer work-based learning experiences like the Construction Camp are strongly encouraged by PSSC. To create a supportive work-based learning culture, PSSC leaders track a number of student success measures, including work-based learning participation, and use these measures to drive program improvement. Though work-based learning is not a required component to complete the construction technology program, it is required for students seeking advanced placement into a registered apprenticeship.

Classroom Instruction

The construction technology program integrates both academic and technical coursework. The technical courses are two sequenced, year-long, 540-hour courses in construction, both of which are taken at PSSC. Students complete their academic coursework at their home high school, with their course-taking guided by recommendations from PSSC's dean of college and career success and counselors. Specifically, PSSC counselors work with the home high school counselors to tailor the students' academic work for their career pathway, for example, taking into account any course equivalencies that may be available.

The state Office of Public Instruction's course equivalency policy, through which approved CTE courses can count as academic credit that applies toward graduation requirements, has been critical to help PSSC students maximize their CTE learning while also meeting the state's 24-credit graduation requirements. The Highline Public School District, which includes PSSC, has adopted the state's course equivalency option, which allows PSSC students enrolled in a CTE program for a minimum of two semesters to earn course equivalency credit for English, Algebra I, and geometry or Algebra II. This allows for extra time in students' schedules for additional CTE coursework and work-based learning. Additionally, students may also earn up to 20 articulated college credits with the Seattle Colleges system that include business math and spreadsheets, integrated communications, professional development, and business communications.

Curriculum & Assessment

The program uses a blend of the nonunion curriculum from the National Center for Construction Education and Research (NCCER) and project-based learning units from the MC3 curriculum from the North America's Building Trades Union. This blended curriculum gives completers the option to work for union and nonunion contractors. Further, the use of an industry-based curriculum helps ensure ongoing communication between employers and the PSSC instructional staff and helps sustain these long-term relationships.

PSSC monitors and tracks student technical skill attainment in a variety of ways. For national industry certifications, the program uses the NCCER assessment system, through which students can earn multiple entry-level NCCER certifications. During the 2014–15 school year, 100 percent of students earned at least one industry certification. In addition, students also earn a number of local, state, and national certificates such as CPR, first aid, and automated external defibrillator.

Program Funding

The PSSC construction technology program is primarily operated through the state education funding that is set aside for the skills centers. The program also has access to federal *Perkins* funding for program improvement and professional development as defined in the consortium’s local plan.

KEY PARTNERS

The program’s success can be attributed to a strong instructor with gifted relationship-building skills, clear school leadership support, and a critical mass of diverse business interest in building a combined CTE and pre-apprenticeship pipeline to full apprenticeship model.



Employers & Labor

The 35-member advisory committee is diverse, ranging from general contractors to industry and trade associations. While the committee officially meets at least four times per year, it also convenes as dictated by the program’s needs.

One of the key partners is the Pacific Northwest Regional Council of Carpenters’ Training Center, which encouraged PSSC to pursue state recognition. Partnering with the PSSC program was a clear value for the training council. Consistent with national trends, too many pre-apprentices who attend the council’s tuition-free training do not complete the program, and staff have estimated the center’s cost of each lost apprentice at \$10,000. Since PSSC construction technology students have already expressed interest in the building trades, been exposed to the career field, and begun their foundational training, council leaders believe they are more likely to persist and that the partnership is a good investment.

The council also encouraged PSSC to pursue the approved pre-apprenticeship status because it provided a credible way to move graduates from the PSSC construction program to the top of the full apprenticeship program trainee list. Historically, when the trainee list was long, it was difficult to justify advancing recent high school graduates over adult applicants on the waiting list. The pre-apprenticeship designation by the Washington Apprenticeship and Training Council confirmed the program and competency alignment with the full apprenticeship and formalized the conduit for completers to appropriately receive direct entry into the program.

Postsecondary Institutions

The program has strong ties to the construction programs at South Seattle College, Green River College and Seattle Central College. Each institution offers articulated college credit—up to 20 credits—for students who successfully complete the PSSC construction technology program.

Students continuing on at South Seattle College and Seattle Central College are also eligible to complete the appropriate general education courses to continue their path beyond an associate degree to a construction-related Bachelor of Applied Science.

STUDENT RECRUITMENT AND SUPPORTS

Recruitment and Retention

District leaders have targeted significant resources to support student retention and guidance. For example, the Highline Public School District created a districtwide Career Access Department in 2015. This department includes a dedicated staff of three career and guidance counselors who are responsible for educating counselors about CTE program offerings at each of the 22 sending high schools. Highline High School, where the PSSC campus is located, is the primary feeder school. They work with each school to identify interested students, post flyers, coordinate program tours, and market the program. In addition to sourcing and coordinating work-





based learning for PSSC and Highline District students, this department provides these services for the construction program and the Construction Camp.

To recruit future students, PSSC hosts its Career Camp each spring for all interested eighth-grade students from the five school districts. This hands-on evening activity allows students to explore three of the programs offered and introduces the skills and education required for careers in construction. Students also get a chance to complete a simple construction project.

To assist with retention, PSSC staff annually evaluate transcripts to help students update their “high school and beyond plan,” which includes a full portfolio of artifacts and certifications from their high school studies. This plan is tailored to the student’s post-high school aspirations. During this review, academic course equivalencies also are taken into account to guide students in building their home high school schedule for upcoming semesters.

The school also supports students through the Vocational Instruction Through Applied Learning (VITAL) program, which is a credit recovery program for students who may not have earned the credits needed in their first few years of high school. PSSC counselors work with each student to design a graduation plan and offer the academic classes needed to graduate. Every year, about four students in the construction program earn their high school diplomas with support from the VITAL program.

Entrance Requirements

The PSSC Construction Technology program has the same requirements for entry as all programs at the Skills Center. To ensure that all students have access to CTE, prospective PSSC students must have at least a 1.0 GPA and be within four credits of what their home high school defines as a junior or senior.

To qualify for the Construction Camp, students enrolled in the program must meet additional specific requirements (see text box). Applicants first go through an initial screening by the instructor, school administrator, and guidance counselor. Then, they interview with local construction companies or general contractors. Each employer establishes their own wages and is responsible for hiring decisions.

Construction Camp Entrance Requirements:

- Successful completion of junior year of program
- Minimum 2.0 GPA
- Successful completion of two years of math
- Physically fit
- Good school attendance

Recruitment Challenges

As a program that recruits students from five school districts and 22 high schools, raising and maintaining awareness about apprenticeship as a career pathway has been difficult, given the range of options available to students at PSSC. Most counselors and parents have never experienced the value of apprenticeship training and may not see it on the same level as a two- or four-year degree. To enhance awareness among the counselors in the home high schools, PSSC invites counselors in for breakfast early in the year. This provides a setting where PSSC staff are able to talk about their CTE programs and opportunities, like apprenticeship. These counselors are then equipped to carry the message about CTE and apprenticeships to parents.

An additional challenge for the construction technology program is that many junior and senior students do not have their driver’s license and need transportation to the workplace. A license is also a common employment requirement for construction employers. While not applicable to all students, the district has been able to provide some qualified students with transportation through the federal *McKinney-Vento Homeless Assistance Act*.³⁶ Additionally, other students may qualify for Metro bus tickets through the Highline Schools Foundation.

³⁶ See <http://www.k12.wa.us/HomelessEd/AssistanceAct.aspx>.

PROGRAM BENEFITS



Students who complete the two-year construction technology program receive up to 20 articulated credits to nearby colleges and the technical preparation for registered apprenticeship entry gained from the blended curriculum from unions and nonunion contractors. Students may also earn up to eight industry-recognized credentials from NCCER and three as part of the MC3 curriculum, which are recognized by nonunion and union contractors, respectively, across the region. There are added benefits for those students who also complete the internship and pursue an apprenticeship with the Pacific Northwest Regional Council of Carpenters. Other apprenticeships in the area may also award credit earned, but those agreements are not formalized. While the value of each credential depends on which path the student chooses, the summative value of these credentials is that the student has options upon graduation.

STATE SUPPORT



State agencies in Washington have created a set of policies and an infrastructure that can help expand these types of programs.

Administrative

Over the past decade, the state has worked through legislation and existing structures and systems to expand awareness and opportunity for secondary students to seamlessly move from high school CTE programs into apprenticeships.

In 2006, state legislation directed the Washington State Apprenticeship and Training Council (WSATC) to develop an approval system for “direct-entry” programs for high school graduates into building and construction-related apprenticeships and to oversee these programs by providing guidance and helping school districts to use and leverage existing resources.^{37,38} In 2012, WSATC approved the policy and procedures necessary for an education-based preparatory program to seek and obtain formal recognition as a “pre-apprenticeship” program.³⁹ As of August 2016, 14 programs, including the PSSC construction program, have received the pre-apprenticeship recognition. The clear student path from the PSSC program to a registered apprenticeship is what led the PSSC leaders to seek the state recognition.

In addition to documenting quality criteria—such as safety training and policies, training plans for instructional content, and a communication plan—each applicant must also provide evidence of a formal agreement detailing how student completers “will be prepared to meet/exceed minimum qualifications and compete for or receive direct entry into the registered apprenticeship program.”⁴⁰

As already discussed, the state’s course equivalency policy has proven critical for enabling students to take a full load of CTE courses while also meeting the state’s graduation requirements.

In 2009, the Washington State Legislature also directed the State Board for Community and Technical Colleges to partner with business, industry, and labor across the state to establish centers of excellence. Each center is industry-led and serves as an economic development driver for industries critical to Washington’s economy. The Center for Construction Excellence, housed at Renton Technical College, has been a key partner and convener for the PSSC construction program as it has evolved toward a stronger apprenticeship alignment.

³⁷ See <http://app.leg.wa.gov/RCW/default.aspx?cite=49.04.160>.

³⁸ See <http://app.leg.wa.gov/RCW/default.aspx?cite=49.04.190>.

³⁹ See WSATC Administrative Policy 49.04.160 RCW, April 19, 2012:

<http://www.lni.wa.gov/TradesLicensing/Rules/files/apprenticeship/policy/201203PrepProgRecog.pdf>

⁴⁰ Ibid.

OUTCOMES

In 2014–15, 39 students were enrolled in the construction technologies program and 100 percent of students graduated. Given the multiple post-graduation pathways promoted by PSSC, the placement rate for apprenticeships is quite high, with 47 percent of students pursuing apprenticeships after graduation. Additionally, 18 percent pursued postsecondary education, and 35 percent went into the workforce or military.



Beyond what is required for state and federal reporting, PSSC measures student success across a variety of indicators, such as industry credentials and course equivalencies earned, work-based learning participation, and placement in the five defined pathways, including apprenticeship (see text box). School leaders use these metrics to evaluate programs and drive program improvement and sustainability. For example, in 2014–15, construction technology students earned a total of 358 local, state, and national certificates, and nine students worked 1,369 hours in work-based learning placements.

PSSC Success Metrics

- Number of industry credentials earned
- Rate of participation in work-based learning
- Number of course equivalencies earned
- Number of positive placements in the five defined pathways: work, military, two-year college, four-year college, and apprenticeship

LESSONS LEARNED

Program staff and partners identified some lessons learned, which include the following:



- Create a districtwide culture of valuing and championing all pathways equally.
- Craft a program with a clear value proposition for everyone—the students, employer, school, and community.
- Ensure that the program benefits provided to students are portable.
- Develop a critical mass of employer and union partners offering apprenticeships and similar connections.
- Establish articulated partnerships that are designed to sustain leadership changes.

TECH READY APPRENTICES FOR CAREERS IN KENTUCKY – DR. SCHNEIDER AUTOMOTIVE SYSTEMS RUSSELL SPRINGS, KY



MANUFACTURING



INSTRUCTIONAL ALIGNMENT: FULL
PROGRAM ARTICULATION: FULL

BACKGROUND

Overview

Tech Ready Apprentices for Careers in Kentucky (TRACK) is a joint statewide initiative of the Kentucky departments of Education and Labor to establish a pipeline of secondary students into registered apprenticeship programs. Since 2013, employers and educators from local schools and area technical centers have partnered to create TRACK programs, which function as two-year pre-apprenticeships that fully articulate with registered apprenticeship. This summary focuses on one local TRACK program, Dr. Schneider Automotive Systems (Dr. Schneider) that is illustrative of how TRACK operates in the state.



Program Snapshot

- Participants (2015–16): 4
- High school graduation rate (2015–16): 100 percent

Dr. Schneider, a German-owned automotive parts manufacturer located in Russell Springs, Kentucky, has partnered with the Lake Cumberland Area Technology Center (Lake Cumberland) to offer a TRACK program in three pathways: industrial maintenance technician, injection mold setter, and mechatronics. Students participating in each two-year program earn 2,000 on-the-job training hours from Dr. Schneider and a minimum of 288 classroom hours of related technical instruction at Lake Cumberland. They also have the option of earning relevant industry-recognized credentials and a trip to Dr. Schneider’s headquarters in Germany. Upon earning their high school diploma, students have the option to continue into a three-year, competency-based registered apprenticeship sponsored by Dr. Schneider, as well as the opportunity to continue their postsecondary education to earn an associate of applied science degree.

History

The introduction of the TRACK initiative closely aligns with Dr. Schneider’s location in the area. The 90-year-old German plastic injection molding company, which also has production facilities in China, Spain, Poland, and elsewhere in the United States, opened its manufacturing facility in Russell Spring in August 2013. The first cohort of TRACK students at Dr. Schneider began their two-year pre-apprenticeship in the 2014–15 school year. High school students attend Lake Cumberland, one of 53 area technology centers operated by the Kentucky Department of Education, to receive their technical education instruction. On-the-job training is offered at the Dr. Schneider plant.

Dr. Schneider’s interest in the TRACK program is both cultural and self-interested. Due to its German roots, where such apprentice programs are common, company leaders were familiar with the apprenticeship model and its value in training workers. The company also has experienced considerable growth, with the Russell Springs plant employing 180 employees at the start of 2016, and a planned expansion of an additional 200 employees by the end of the year. Consequently, TRACK is seen as an important component of the company’s workforce recruitment strategy,

and plans are currently underway to recruit more experienced employees to become TRACK mentors.

In spring 2014, the state TRACK coordinator presented on the program at a regional economic development meeting. It was here that leaders from Dr. Schneider heard about and expressed interest in participating in the program; they were subsequently introduced to Lake Cumberland administrators by the TRACK coordinator, who facilitated initial program planning efforts. Partners relied heavily on guidance from the Kentucky Department of Education and the state Labor Cabinet to design a course sequence and pre-apprenticeship training program that satisfied both state CTE program requirements and apprenticeship needs. Agency staff also helped the partners navigate youth labor laws and design competency and performance-based models.

“Sometimes you’ve just got to think outside the box. We’ve not been in the box for a couple of years now. . . We’re doing more than your old conventional CTE programs. We’re trying to expand the curriculum so that it benefits these students.”

Jeff Adams, principal, Lake Cumberland Area Technology Center, Kentucky

PROGRAM STRUCTURE

The organization of the Dr. Schneider program closely parallels that of the TRACK program structure employed statewide. Employer sponsors, in collaboration with a partnering high school or an area technology center, choose a four-course CTE sequence (at a minimum) and identify at least one industry certification. This gives employers the flexibility to align classroom instruction to the needs of their workplace, while ensuring that the program meets the state’s CTE program quality standards and definition of a CTE program for federal *Perkins* reporting.⁴¹



TRACK also leverages the state’s competency-based education policy that allows K–12 credit to be measured based on performance, not instructional time.⁴² This means that the program at Dr. Schneider is largely competency-based. With assistance from the state apprenticeship office, leaders at Dr. Schneider created a defined list of competencies that students must master as they progress through the program. These competencies also form the basis of their CTE coursework in the manufacturing pathway.

The Dr. Schneider TRACK program offers students three career pathways: industrial maintenance technician, injection mold setter, and mechatronics. Dr. Schneider staff work with participating students to choose four courses from Lake Cumberland’s class schedule each semester that align to each student’s selected TRACK pathway. Freshmen and sophomores who are considering participating in TRACK are encouraged but not required to take introductory courses in the manufacturing pathway, which address cross-pathway foundational skills, such as blueprint reading and basic troubleshooting. This exposure helps to provide students with an understanding of the field, which can inform their decision to participate, as well as ensure that those who enter the program possess a common base of skills. Students apply during their sophomore year and officially enter the program at the beginning of their junior year.

During their junior and senior years, students split their days between Dr. Schneider and Lake Cumberland. They attend classes at Lake Cumberland in the morning and then work at Dr. Schneider from 10:30 a.m. to 4 p.m., four days a week. The fifth day is spent entirely at Lake Cumberland. During the summer months, students work full time at Dr. Schneider. This program structure has evolved over time. During the first project year, students were scheduled to attend school on Friday and work Monday through Thursday. However, the partners mutually agreed to shift this plan to better accommodate students’ learning needs and the school’s regular calendar. This change allowed more contact time between the teachers and students.

⁴¹ See http://education.ky.gov/CTE/cter/Documents/TRACK%20Agreement%20ATCs-Final_Form_distributed.pdf.

⁴² See [KRS 156.108](#) and [160.107](#) (House Bill 37, enacted 2012).



To ensure that students meet academic and technical course requirements for graduation, Lake Cumberland offers flexible and alternative schedules and delivery systems for instructional content. For example, students complete academic and technical requirements through a tailored blend of in-person and online coursework. Students also receive dual credit for coursework in the manufacturing pathway at Somerset Community and Technical College (Somerset). Upon completion of TRACK, the company sends those students who transition into the full apprenticeship program to visit its German headquarters and broaden their understanding of the company.

On-the-Job & Classroom Instruction

TRACK participants earn 2,000 hours of on-the-job training while working at Dr. Schneider. This amounts to roughly 20 hours per week during the school year and 40 hours per week during the summer. All participants are paid on a graduated wage scale, starting at \$8.50 an hour—30 cents higher than the state’s minimum wage. By the third year of the apprenticeship, students accepted into the program make \$11 an hour.

Each student works under the supervision of a mentor, who is a journey-level worker at the company. A mentor must have the required technical expertise and a willingness and ability to teach, and agree to invest up to eight hours per day directing the work of their apprentice. Currently, the size of the TRACK program is limited to the number of available mentors, though the company hopes to train more mentors in order to take on more students.

Treated as a regular employee, each high school apprentice is given different assignments throughout the work day, with the difficulty progressing as students gain more experience and demonstrate mastery of competencies. Ultimately, students rotate through all tasks required on their chosen pathway’s competency list. During work hours, students must complete paper-based daily logs of their experience and progress. Mentors sign off on the logs to affirm that students have demonstrated competency. They also assign quarterly progress grades for each student for the four CTE courses in which the student is enrolled at Lake Cumberland. Grades are submitted back to Lake Cumberland to be included on the student’s transcript.

Curriculum & Assessment

Employer-developed competencies form the basis of the curriculum for both the school-based coursework and the workplace training offered for each of the three pathways. Each semester, Dr. Schneider mentors select the four most relevant CTE courses from the Lake Cumberland course catalog for each student based on their program progress. Course content is broadened by a blended learning platform used throughout the school district, which allows students to complete required academic courses at their own pace. Additionally, Lake Cumberland uses a manufacturing-specific online curriculum to help supplement students’ technical learning. In addition, Dr. Schneider provides the students on-the-job access to industry-specific online content through Paulson Training Programs, Inc.

Students are assessed each semester on their progress toward mastery of the competencies defined for that term. Once students transition into the registered apprenticeship, they must pass a final assessment at the end of their third year, which grants them their journey-level certificate.

Program Funding

The Dr. Schneider TRACK program leverages existing educational funding to support program operation. At Lake Cumberland, support for program administration and instruction is provided through state and local funding. In addition, as an approved CTE program through the Kentucky Department of Education, the program is able to access federal Perkins funds. Dr. Schneider pays students wages and offers in-kind support by investing staff time in defining program competencies and mentoring students in the workplace.

KEY PARTNERS



By design, TRACK requires each partner to have a shared vision for the program and invest time and resources to deliver on their agreed-upon responsibilities. These basic roles and responsibilities are laid out in the state's work-based learning manual.⁴³

Employers

Leaders at Dr. Schneider have dedicated significant time and resources to the development of the local TRACK program. This includes creating a new employee policies handbook for TRACK participants to adequately address issues that include youth labor laws; training current employees to be mentors; and creating strong support for the program across the company, including from its human resources department.

Leaders at Dr. Schneider said that, as a company, they are not seeking an immediate return on investment. The company recognizes the contribution that TRACK can make in worker recruitment, and as such, expects program benefits to increase over time as the apprentices progress through their training and become full employees.

“Apprenticeship is not a burden, it is an investment for our future. That's what I always say. You can't measure it, but it's clear that it's very successful.”

Torsten Langguth, plant manager, Dr. Schneider Automotive Systems, Inc.

Postsecondary Institutions

Somerset is the postsecondary partner for the Dr. Schneider program. The college offers dual credit options for pre-apprentices according to the chosen apprenticeship pathway. Once accepted into the full registered apprenticeship, students are eligible to earn their associate of applied science degree at Somerset, which is paid for by Dr. Schneider.

STUDENT RECRUITMENT AND SUPPORTS



Entrance Requirements

Recruitment for TRACK begins during the spring of students' sophomore year, with marketing taking place through school announcements, flyers, and class presentations. Dr. Schneider and Lake Cumberland share the recruitment responsibilities. Lake Cumberland helps recruit interested students to attend an information session explaining the details of the program, and Dr. Schneider arranges for them to tour the facility to learn more about the three apprenticeship pathways. In mid-April, students complete an application developed by Dr. Schneider. Completed applications, along with student transcripts, are provided to Dr. Schneider's human resources department for evaluation. Top candidates are brought in for a competitive interview. Selection for the program hinges on student performance, with Dr. Schneider staff having the ultimate say on who is accepted.

“[TRACK] has helped drive such a change in our high school and our whole philosophy—away from this college-for-all mentality to now, the new rock stars on our campus, are the kids doing CTE.”

Allan Reed, superintendent, Adair County Schools

After being hired as pre-apprentices, the school principal, CTE instructors, and guidance counselors assist students with rearranging their schedules and completing all of the necessary paperwork. The Dr. Schneider human resources department and mentors pick the fall semester manufacturing courses for each student, which is based on the apprenticeship pathway that they enter.

⁴³ See <http://education.ky.gov/cte/cter/pages/wbl.aspx>.

PROGRAM BENEFITS

High school students who complete their two-year pre-apprenticeship program earn their high school diploma, as well as 2,000 on-the-job hours and 288 classroom hours, which are awarded as advance credit toward Dr. Schneider's three-year registered apprenticeship.



Students accepted into Dr. Schneider's registered apprenticeship program complete a total of 4,000 hours of work experience and a minimum of 576 hours of classroom instruction by the end of their apprenticeship training. They also earn a Somerset certificate and their journey-level certificate. Though not a requirement of the statewide TRACK initiative, the registered apprenticeship at Dr. Schneider includes a company-sponsored associate of applied science degree at Somerset that is specific to the pathway the student chose.

STATE SUPPORT

TRACK began as an interagency venture of the Kentucky Department of Education's Office of Career and Technical Education and the Kentucky Labor Cabinet. Since TRACK was intentionally designed to be embedded into the state's existing CTE and apprenticeship infrastructures, the program's creation has placed no additional cost on the state. In addition to Dr. Schneider, the state TRACK program has agreements with the manufacturing industry and is currently piloting programs in the carpentry and electrical fields. Across the state, more than 200 students participated in TRACK programs in the 2015–16 school year. Additional TRACK programs are being developed with employers in health sciences, welding, and information technology.



Administrative

The two state agencies have devoted considerable staff time and resources to develop the TRACK program. Serving as intermediaries, state staff provide support for local employers and K–12 institutions interested in participating. They broker relationships, facilitate meetings, and act as interpreters for employers and educators. TRACK works with local economic development and workforce systems to identify and recruit prospective employer partners. The state CTE office has developed a suite of resources, which they use to help employers and educational partners navigate the most efficient path to establishing such programs. The Labor Cabinet has developed sample task lists to help employers translate their workplace requirements into measurable competencies, and also works with employers to register their apprenticeships with the state, which is a requirement to participate in TRACK.

“For the employer, though, it's about making sure textbook meets real world. That's where TRACK makes the difference, because what they're learning in the classroom ensures that they understand how to use it on the production floor or in a real world concept. That's the value of TRACK.”

Melissa Aguilar, executive director of the Kentucky Workforce Innovation Board

TRACK, which serves as a student's CTE program, was designed to fit seamlessly into the state's K–12 accountability system that awards points to school districts based on whether a student meets requirements to be college-ready, career-ready, or college- and career-ready. Since the TRACK program also counts as a student's CTE program, school districts, in turn, are incentivized within the state's accountability system to encourage CTE concentration and completion. As time goes on, the state will have the ability to track progress and outcomes because TRACK has been embedded in the state's K–12 accountability and registered apprenticeship systems, thus allowing staff to evaluate the impact and adjust the program as needed.

The state has also leveraged its existing relationship with Adecco, a national staffing agency, to address employer concerns about insurance and liability, issues for employees under 18. Under the state's Youth Employment Solutions (YES) program, Adecco manages the administrative and legal elements of work-based learning, including TRACK.



According to the state, the YES program has helped remove barriers for some employers, and as a result, they have agreed to participate in TRACK. Adecco also helps recruit employers and prepare students with the professional skills they will need to be successful in the workplace.⁴⁴ However, Dr. Schneider did not choose to use the YES program, as all TRACK students are hired directly through the company’s human resources department.

Financial

Kentucky uses its *Perkins* reserve fund to implement new pathways aligned to high-need industries. Though not exclusively set aside for the TRACK initiative, emerging TRACK programs are eligible for these implementation funds because they are recognized by the Kentucky Department of Education as CTE career pathway.

OUTCOMES

Regarding the Dr. Schneider program, four students (two seniors and two juniors) participated in the 2015–16 school year, the program’s second operational year. In May 2016, the two seniors transitioned into Dr. Schneider’s full apprenticeship upon graduation, and the two juniors continued their participation in the following school year.



Across the state, more than 200 students participated in TRACK programs in the 2015–16 school year. However, outcomes are not available for those students in programs that are in the state’s pilot phase, such as the carpentry and electrical TRACKS. The manufacturing TRACK is the only program with available outcomes at this time. In 2014–15, the statewide TRACK program had 14 participants in its manufacturing program. It had a 100 percent high school graduation rate, and a placement rate of 25 percent in apprenticeships, 38 percent in postsecondary education, and 37 percent in the workforce or military.

LESSONS LEARNED

Program staff and partners identified some lessons learned, which include the following:



- Collaborate across state agencies to leverage resources, create capacity, and most importantly, create opportunities for innovation.
- Embed the program into existing state infrastructures. This helps to create efficiencies, reduce duplication of effort, and target resources to accelerate replication of programs.
- Create a common statewide model that also allows employers to have flexibility, which helps create a win-win for employers, the state, and students.
- Provide opportunities for students to learn beyond the traditional school day and setting, which allows for increased learning time.
- Collaborate across education and employment systems to build to a common set of competencies that enables student learning and future success.

⁴⁴ Advance CTE (2016). “Removing Legal Barriers around Work-based Learning.” https://careertech.org/sites/default/files/WBL_casestudy_Legal_2016.pdf

UPPER VALLEY CAREER CENTER PIQUA, OH



ARCHITECTURE AND CONSTRUCTION



INSTRUCTIONAL ALIGNMENT: EMBEDDED
PROGRAM ARTICULATION: OPTIONAL ENTRY

BACKGROUND

Overview

The School-to-Apprenticeship program at Upper Valley Career Center in Piqua, Ohio, provides CTE students in agriculture power, carpentry, electrical, HVAC, manufacturing, and welding programs the opportunity to engage in a state-recognized pre-apprenticeship experience. The program is fully embedded within the two-year CTE program, and completers have the option of moving into a registered apprenticeship or non-registered apprenticeship, full-time employment, or additional postsecondary education and training, depending on the opportunities provided by the employer sponsor and student choice. In the 2015–16 school year, 30 students (about 30 percent of the eligible student body) participated in the School-to-Apprenticeship program.

History

Upper Valley Career Center (UVCC), a two-year full-time academic and technical high school offering instruction to more than 800 students across the region, has historically offered a range of work-based learning experiences, including pre-apprenticeships, to its students. Since the 1980s, students have had access to pre-apprenticeship experiences or placement into an apprenticeship upon graduation, albeit on an informal and ad hoc basis. In the last decade, with support from district leadership, a school-based intermediary, highly engaged employers, and a state support structure, UVCC now offers formal, state-recognized, earn-and-learn pre-apprenticeships that are fully embedded within a CTE program.

The shift toward a more formal aligned CTE apprenticeship program at UVCC began during the late 1990s after Congress passed the School-to-Work Opportunities Act. The new federal law sought to create a comprehensive system to help students prepare for their future careers and ease the transition from high school to college or the workforce. It was at this time that UVCC adopted the School-to-Apprenticeship model, a type of pre-apprenticeship program that contextualizes academic and technical learning through relevant workplace experiences. Like many school-to-work programs across the country, it required a high level of involvement from employers and did not sustain itself as school-to-work largely was phased out. By the mid-2000s, program enrollment had dwindled to the single digits and the budget was reduced among schoolwide budget cuts, which eliminated the program coordinator position and dispersed the duties among the school's instructors.

While UVCC remained committed to providing meaningful work-based learning opportunities that benefited both students and employers, it was not until 2008 that the School-to-Apprenticeship program once again became a schoolwide priority. This shift was primarily due to the hiring of a new district superintendent who espoused a



Program Snapshot

- Participants (2014–15): 24
- Participants (2013–14): 20
- High school graduation rate (2014–15): 100 percent
- Placement rate (2014–15): 100 percent
 - Apprenticeship: 42 percent
 - Postsecondary: 13 percent
 - Workforce or military: 46 percent

commitment to offering students authentic work experiences. The new superintendent recognized how the School-to-Apprenticeship program—which allowed seniors to apply their classroom learning, gain workplace experience, and earn advanced placement toward a registered apprenticeship or similar program—could be a conduit to help students achieve college and career readiness, a growing priority in Ohio and across the country. As a critical first step, the superintendent restored some of the program’s resources to provide for the hiring of a part-time coordinator to manage student recruitment and work placement.

“This program—more than any other—helps show that career is end game, not just college.”

*Jason Haak, executive director,
Upper Valley Career Center*

A few years later, the part-time coordinator position was assigned to an HVAC instructor who had been at UVCC for over a decade. Students, fellow educators, employers, and parents cited this appointment as the critical element in the program’s success and growth over time. The school has since directed more resources to the program and made the coordinator a full-time position starting in the 2014–15 school year. At the same time, the employer involvement has steadily increased as local manufacturing began to make a comeback after the Great Recession and employers began to experience a skilled worker shortage. Several employers began looking for new ways to partner with UVCC, a well-known producer of quality graduates in the region, to create better pipelines of skilled employees for their workforce.

As a result of these investments of resources and time, and in particular the full-time coordinator, the program has grown from eight students and seven employer sponsors in 2008 to 30 students and 23 employers in the 2015–16 school year. Though six CTE programs are connected to the School-to-Apprenticeship program, participants typically come from four programs: carpentry, electrical, HVAC, and manufacturing.

PROGRAM STRUCTURE



Today, the School-to-Apprenticeship program is one of the many structured work-based learning opportunities that UVCC students can experience as part of their program of study. At this time, the program is available for the skilled trades, but the school is actively working to align its medical technologies, engineering, and information technology programs in order to offer School-to-Apprenticeship placements. Pre-apprentices must meet a set of program prerequisites to enter the program (see text box) and, if selected, complete 144 hours of on-the-job experience during their senior year. Pre-apprentices earn an average of \$12.50 per hour, which is considerably higher than the state minimum wage of \$8.10 per hour. While there is no formal wage structure, all employers commit to paying above the minimum wage.

The School-to-Apprenticeship program is designed to create a pipeline into registered apprenticeships. However, employer participation is not limited to just those employers that offer registered apprenticeships, as UVCC staff wanted to maximize post-program placement options for students. Therefore, some students may enter unregistered apprenticeships or immediately begin working with an employer following program completion.

On-the-Job & Classroom Instruction

Selected pre-apprentices begin with an internship with their employer or union sponsor during the summer between their junior and senior years. Once the school year begins, they work on the job site for two weeks at a time, rotating between the worksite and the classroom. While on their work rotation, the pre-apprentices work eight hours a day without participating in any school-related tasks. When possible, two students are placed with one employer on a staggered schedule to provide the employer with ongoing coverage, since at least one student is always on the job site. Placements begin with a signed agreement that includes an approved training plan, as well as expectations for the student, employer, school, and parents.

To manage the rotating schedule, the school assigns pre-apprentices to a cohort for their academic classes during their senior year. This helps the school and the academic teachers manage the pre-apprentices' scheduling and instruction. This also allows academic teachers to create projects that are contextualized to the pre-apprentices' experiences, such as by integrating business writing into English/language arts instruction. The pre-apprentices rejoin their CTE classes and non-apprenticeship classmates when they return to school, with their technical coursework similarly compressed into two-week segments.

The program coordinator monitors student performance at the workplace and supervisors evaluate pre-apprentices' performance against agreed-upon competencies that closely align to their CTE coursework and the job requirements. The program coordinator shares the work evaluation with the CTE instructors, who work with students to target certain skills to ensure that they are prepared for their next work rotation. One instructor said he often uses the feedback to review certain skills with the entire class, because all students would likely benefit from the targeted instruction, especially since the pre-apprentices tend to be top performers in the class.

Curriculum & Assessment

Given that the School-to-Apprenticeship program is embedded in the students' CTE program, the curriculum follows the course sequence approved by the Ohio Department of Education. Along with the OSHA 10 industry-recognized credential that all students earn in their CTE program, the pre-apprentices earn the 30-hour OSHA credential, which has a \$100 fee that is paid for by the employer sponsors. All students enrolled in the CTE program also have the ability to earn up to 18 dual credits at the nearby Edison Community College—many of which can often be transferred to other in-state colleges, but full transfer of credits is not guaranteed due to the lack of a statewide articulation agreement. CTE instructors report that the curriculum is heavily informed by their program advisory committees, on which many of the pre-apprenticeship sponsors are prominent figures.

Program Funding

Funding for the School-to-Apprenticeship program is provided through a blend of state and local funding, which is used to pay the program coordinator's salary. The CTE program in which pre-apprentices must take part receives local and state Perkins dollars for program administration. Some key employer sponsors, such as Emerson Technologies, have paid for promotional materials for the School-to-Apprenticeship program and the related CTE programs.

KEY PARTNERS

Employers & Labor

Employers were among the key partners who helped resurrect the School-to-Apprenticeship program, and they remain essential to maintaining program operations. Cultivating these relationships is a primary responsibility of the program coordinator, and has led to a 35 percent increase in the number of participating employers since 2013 (up from 17 to 23 employers). The related CTE programs also have engaged employers through program advisory committees. For example, the HVAC program has an advisory committee of roughly 65 members,

Program Prerequisites for Four Consecutive Quarters:

- Maintain 95 percent attendance since enrolling in Upper Valley Career Center
- Have a minimum 2.5 grade point average and pass all classes during the junior year
- Be on track for graduation
- Have parent/guardian support to participate in the program
- Demonstrate good citizenship characteristics
- Follow regulations, demonstrate self-discipline
- Receive teacher support/references
- Have reliable transportation to and from work
- Be interviewed and accepted by an apprenticeship sponsor



40 of whom actively participate in work-based learning activities, ranging from being pre-apprenticeship sponsors to providing job shadow opportunities and financial and in-kind donations.

The School-to-Apprenticeship program works with union and nonunion sponsors. The training director for Local 24 Sheet Metal, which offers a registered apprenticeship, said the work his union is doing with the UVCC program is becoming a statewide model for unions across Ohio because it shows that participants under the age of 18 can be part of a registered apprenticeship program. A recent policy change by the Ohio State Apprenticeship Council now allows for minors to participate, but the difficult part is convincing contractors to take them on. So far, three contractors have agreed to take on pre-apprentices, who earn a year of credit toward the full apprenticeship, and all three students are still involved. The Local 24 Sheet Metal training director said he sees the UVCC program as “perfectly aligned” to the union apprenticeship, which is why he has continued to partner with them, but reported that it is still too early to know what the return on investment will be as they have only taken on high school apprentices for the past two years.

As noted above, employers participating in the School-to-Apprenticeship program are not limited to those offering registered apprenticeships, which has implications for post-program placements for students. While the broader mix of employer sponsors allows more companies to participate in the program and take on apprentices, it does mean there is no guaranteed placement for the majority of students who apprentice at companies without a formal registered apprenticeship.

Postsecondary Institutions

Edison Community College is physically located next door to Upper Valley Career Center, which has enabled the creation of a strong dual credit link with UVCC’s CTE programs. Students—regardless of their participation in the School-to-Apprenticeship program—can graduate UVCC with as many as 18 credits that will transfer to Edison. The college is not a direct partner in the School-to-Apprenticeship program, and only a handful of employer sponsors offered embedded postsecondary credit in their full apprenticeship or postsecondary tuition reimbursement. This, combined with weak college advisement from the Career Center and overturn in their postsecondary contact, translated to some students never capitalizing on the 18 credits, which are only valid for a year. Instead, several students interviewed were drawn to the prospect of immediate employment and a salary. For students who did want to go on to postsecondary education but not at Edison, their options were less clear, given the lack of a statewide articulation agreement, meaning they may be required to retake courses.

STUDENT RECRUITMENT AND SUPPORTS

Entrance Requirements

The School-to-Apprenticeship program has strict entrance requirements to help ensure that any students participating are geared toward success and are fully committed to the opportunity. School counselors and teachers use the program as both a recruitment tool for UVCC as well as an incentive to motivate students to stay on track with their studies and attendance so that they may qualify for program entry at the end of their junior year. Once students apply, the program coordinator, counselor, and CTE instructor work to match students with employers. Importantly, students must also maintain eligibility in order to stay in the apprenticeship program.



Recruitment Challenges

In 2015, the program had more placement opportunities than eligible students, which school administrators attributed to a combination of strict entrance requirements and a lack of program awareness or understanding from prospective students, their parents, and the sending high schools (where students attend for their first two years). The requirement for students to provide their own transportation also can create a barrier for student participation. At this time, the school has no formalized system in place to provide transportation for students to or from the worksite, which limits access for some students.

Another overarching challenge to student recruitment into the School-to-Apprenticeship program—and into UVCC more generally—has been the persistent stigma associated with CTE. In particular, the program struggles to recruit female and minority students, although school leaders are trying to raise awareness about the program through open houses and career fairs. Some employer sponsors, all of whom actively participate on the school’s CTE local advisory committees, often share their experiences with the School-to-Apprenticeship program at these events, with the goal of attracting high-achieving students to UVCC and its CTE programs. The program coordinator also promotes the program to all applicable CTE classes within the first few months of school.

■ **“When you’re applying to a job, you put in your resume and it only lists the courses you’ve completed in school and your two-year associate’s degree, and no work experience. [Employers] are going to want to choose someone who has all that and work experience on top of it. That’s why these apprenticeships are a great option not only for students who don’t want to go to college but also those who do.”**

Dale Garber, former pre-apprentice and recent graduate at Upper Valley Career Center, Ohio

PROGRAM BENEFITS

As participants in a state-recognized pre-apprenticeship program, School-to-Apprenticeship program completers receive a certificate from the Ohio State Apprenticeship Council that highlights the rigor and quality of the UVCC program. In 2016, the school presented the certificates during the senior graduation ceremony, which helped raise the profile and value of the School-to-Apprenticeship program in front of the entire community. Though a pre-apprentice’s exact benefits vary depending on where they are placed, UVCC’s training agreement makes it clear that “it is the intention of this program that the student will be kept on as an employee, but employment after this date and aspects thereof are between the student and the employer.”



For example, successful pre-apprentices who are placed with Sheet Metal Workers Local 24 are eligible to receive up to one year of credit toward their four-year registered apprenticeship, which includes transcribed credit with an area community college and a graduated salary. Some employer sponsors may offer non-registered apprenticeships. The program coordinator reported that program graduates were able to use the state certificate of completion with these employer sponsors to earn advanced placement, but it is often a case-by-case basis. Other employer sponsors offer immediate employment with a benefits package that includes postsecondary tuition reimbursement and other professional development. Also, by completing their UVCC CTE program, students will have earned dual credits at nearby Edison Community College and relevant industry-recognized credentials.

The ability to measure other program benefits, particularly the return of investment for employers, is limited by data collection efforts on the part of the employer partners. No partner had any quantitative data to share, but all shared positive anecdotal evidence citing the students’ productivity and their streamlined hiring. One small business owner estimated that about 70 percent of his workforce was composed of graduates from UVCC, including his most recent planned hire, a current pre-apprentice.

STATE SUPPORT

In Ohio, state-level agencies are working together to increase the connections between apprenticeships and high school CTE programs. The state’s efforts can be categorized in two ways: administrative and financial.



Administrative

The state Department of Education’s Office of Career-Technical Education has a staff member dedicated to coordinating and increasing high school pre-apprenticeships and strengthening local alignment between CTE programs and apprenticeships. Since 2010, this staff member has served as a liaison to the Ohio State Apprenticeship Council,



which is the governing body for registered apprenticeships in the state. This partnership has led to increasingly coordinated and targeted efforts to strengthen the pipeline of CTE students pursuing registered apprenticeships. Among those efforts are a state policy for pre-apprenticeships and a process to recognize quality programs. In 2015, UVCC's School-to-Apprenticeship Program became one of three state-recognized pre-apprenticeship programs that serve high school students.

“CTE is the farm league for apprenticeships.”

*Patrick Reardon, executive administrator,
Ohio State Apprenticeship Council*

Ohio has created a process to recognize pre-apprenticeship programs that meet certain criteria. The process is intended to recognize quality and outcomes of youth and adult pre-apprenticeship programs in an effort to create more equitable results for both participants and employers. The process, which was developed jointly by the state's apprenticeship council and the state's CTE office, qualifies pre-apprenticeship program completers to receive a certificate from the Ohio State Apprenticeship Council recognizing the quality and rigor of the program. The state is developing best practices from those recognized programs, including UVCC, to develop statewide models and provide technical assistance to help other programs meet these criteria.⁴⁵ The state often enlists UVCC instructors and students to present at schools, other career-technical centers, and statewide convenings.

The state agencies are also working together to tackle the persistent gender equity issues in CTE as well as pre-apprenticeships and apprenticeships. In 2016, the state worked with Ohio construction industry leaders and the National Alliance for Partnerships in Equity Education Foundation to develop a guidebook that CTE educators can use to dispel myths about construction careers, as well as lesson plans and other resources. The publication also features a female graduate of UVCC who is now employed as a result of her participation in the School-to-Apprenticeship program.

Additionally, the state CTE office, in conjunction with its partners, continues to target nontraditional industry sectors to develop pre-apprenticeship offerings for high school students. For example, the state is helping to develop a high school pre-apprenticeship pharmacy technician program with CVS Pharmacy, a national retail and healthcare chain. The pre-apprenticeship will feed into the company's pharmacy technician and store manager apprenticeships. The state is also helping to develop a farm-to-table pre-apprenticeship that will blend agriculture and culinary skills, as well as one in the performing arts.

Finally, in addition to the interagency collaboration, the state CTE office has reworked its own secondary-level course coding system to ensure that different types of work-based learning, including pre-apprenticeships, have unique course codes to help the state better track student participation in each activity. In total, more than 116,000 students enrolled in a pre-apprenticeship program in 2015–16 (see figure 3). Before the 2015–16 school year, all work-based learning and capstone courses were captured under a single course code. Now with course codes for internships, pre-apprenticeships, and capstones, the state CTE office is able to capture the number of students participating in each. This enables the state to conduct further data analysis, target programs for technical assistance or improvement, and encourage programs to pursue the state recognition process.

⁴⁵ See https://www.jfs.ohio.gov/apprenticeship/pre_app_policy_10_02.pdf.

Figure 3: Top five pre-apprenticeship subject areas for school year 2015-16

Subject Name	Unduplicated Student Count Per Subject
Pre-engineering Technologies	25,216
Information Technology	11,747
Engineering Design	7,897
Engineering Principles	7,175
Construction Technology - Core and Sustainable Construction	5,453
<i>Total Number of Students Enrolled in Pre-Apprenticeships</i>	<i>116,621</i>
Source: Ohio Department of Education	

Financial

Ohio has also employed tax credits as a means to persuade companies to take on interns and pre-apprentices. While tax credits may not sway a larger company to participate, state leaders interviewed said it has been an effective way to encourage smaller businesses to participate. In 2014, lawmakers passed the Career Exploration Internship Program, which directed \$1 million of state money to pay for half of the wages for a student’s work-based learning experience such as an internship or pre-apprenticeship. The law covers up to three high school students per employer in a calendar year.⁴⁶ Additionally, the Ohio Manufacturing Extension Partnership, which is federally funded through the National Institute of Standards and Technology, has launched an effort that subsidizes half of wages for apprentices working in manufacturing fields, including apprentices who may be employed by a manufacturer but working in another field, such as accounting or information technology.

OUTCOMES

Given that the School-to-Apprenticeship program is relatively small and well-coordinated, UVCC now collects data on post-program placement and is able to capture participation through the new state-developed course code. In 2014–15, the program had a 100 percent placement rate, which exceeded the school’s average graduation rate, and more than 40 percent of participants continued their apprenticeships. School leaders noted that employer satisfaction is a key measure of program effectiveness. This information is collected through the students’ work plans, and informs program improvement and student instruction, but is not currently a formal program outcome. As noted above, employer sponsors reported that they do not regularly collect data on student participation or outcomes to calculate their return on investment but rely more on anecdotal evidence of productivity and hires.



UVCC largely relies on school-level indicators about post-high school placement and follow-up surveys to measure student outcomes, which means they are not limited to the apprenticeship participants or completers. UVCC does collect some data on their apprentices, such as average wage (\$12.50/hour) and aggregate annual income (\$228,000), which are largely used for recruitment. Although the program has been in operation for more than 15 years, historical data and records were not available due to staffing and institutional changes.

⁴⁶ See <http://www.lsc.ohio.gov/fiscal/fiscalnotes/130ga/hb0107en.pdf>.

LESSONS LEARNED

Program staff and partners identified some lessons learned, which include the following:



- Commit resources to support a dedicated, dynamic coordinator to manage the program and relationship with employers.
- Maintain a supportive administration that is willing to be flexible to make the program work by tackling issues such as scheduling and advisement as well as providing financial support.
- Set rigorous entrance requirements to create an environment of high expectations and commitment on the part of students.
- Maintain open communication and ongoing engagement with employers even if they are not able to place a student in a given year.
- Learn from others while building a model that works best for the program and the employer community.



CONCLUSION

Recognizing the similarities between CTE and apprenticeship, states and local educators increasingly are collaborating with employer and labor groups to provide opportunities for high school CTE students to participate in apprenticeship programs. This report examines implementation efforts at eight sites that have succeeded in aligning CTE programs with apprenticeship and the approaches they are using to structure their involvement. On-site interviews with program staff, employers, state officials, parents, and students were conducted to identify how the programs' design, features, and operational factors contributed to their effectiveness and success.

Each of the study sites used their own, unique approaches for offering high school CTE students' apprenticeship options, with programs organized as either a pre-apprenticeship, youth apprenticeship, or apprenticeship.

While the eight sites visited are unique in their programming design, administrative features, and approach to delivering instruction, some overarching takeaways are worth noting.

PROGRAM DESIGN

There is no inherently right or wrong approach to connecting CTE students to apprenticeship programs. Study sites were located in communities with varying geographic, socioeconomic, resource characteristics, and state administrative or legislative policies, all of which affected program structure. The key to sustainable program design was the way that project partner engaged. Key takeaways include the following:

- **Programs should be aligned to workforce demand**—Programs should take into account state, regional, and local employment opportunities. In particular, apprenticeship programs should be designed to address in-demand fields for which there are sufficient employment options.
- **Buy-in must come from all sides**—Educators and apprenticeship sponsors must collaborate to identify a structure that meets the needs of all parties. All stakeholders—teachers, employers, parents, and students—must see the value of their participation if the program is to persist over time.
- **Employers need to drive the process**—Many programs at the study sites were not initially designed as education-led approaches to meeting employer needs. The impetus for program formation came from employers and/or labor associations with a need to bolster their pipeline of workers and the initiative, commitment, and resources to create and maintain programs.
- **No one size fits all in designing partnerships**—Five of the eight sites enrolled fewer than 25 participants, and all of the programs tailored their connections to apprenticeship to best meet their regional needs. Since program size is primarily driven by the availability of placements with apprenticeship sponsors, some sites managed larger enrollments by working with a consortium of employers or unions or by offering less intensive preparation to large numbers of students enrolled in a school or academy for multiple pathways, including but not limited to apprenticeship.

PROGRAM EFFECTIVENESS

Both qualitative and quantitative measures need to be considered when evaluating the success of programs' efforts to align CTE and apprenticeships. For example, student outcomes should include enrollment, completion, and placement rates, but these measures do not necessarily tell the full story of students' preparation for the workforce and/or the value of such programs to employers. There are limited data available from the eight sites, largely because this type of program connecting secondary CTE students and apprenticeships is still a relatively new innovation, particularly in nontraditional Career Cluster areas. Over half of the sites visited were in their first three years of



operation. The majority did attempt to track student progress from secondary CTE into apprenticeship and shared information about their data collection challenges. Key takeaways include the following:

- ***Use both short- and long-term metrics to gauge program value and offer deeper insight into program effectiveness***—It can take years before a high school CTE student completes an aligned CTE-apprenticeship program. Beyond enrollment and general employer satisfaction, many sites had not yet developed the long-term metrics necessary to quantify the benefit of these connections. As a consequence, quantitative data on student outcomes was lacking in some study sites, particularly those seeking to expand program connections into new fields.
- ***Program enrollment alone is not an appropriate measure of effectiveness***—As noted, many of the programs had small enrollments, but their ability to scale up enrollment often had less to do with student interest or success once enrolled and more to do with the number of placements that employers were able to support. Therefore, it is important to analyze what happens to students once enrolled to determine how effectively programs are preparing them for apprenticeship and other post-program options. For example, those programs that connected to apprenticeship as one of multiple pathways realized high program completion and graduation rates, as well as high rates of postsecondary education placement. However, as a result of the multiple pathways available to students, the numbers of students who ultimately pursued the apprenticeship pathway were relatively low.
- ***There are challenges with collecting and sharing data across systems***—All eight sites experienced challenges in collecting outcome data for students, and analyzing the data to inform program improvement. These challenges stem from a lack of a single reporting infrastructure, as well as difficulties in accessing information from employers. These programs often exist in a gap between K-12 and postsecondary education and workforce reporting systems; program participants are often their own cohort that fit neatly neither within the secondary CTE nor the apprenticeship system. As a result, their outcomes are typically reported in combination with a larger cohort, such as all CTE concentrators, rather than as a subset of pre-apprenticeship participants. In other cases, apprenticeship is not measured as a placement metric at the secondary level, thus making it difficult to track the number of students who go on to pursue an apprenticeship pathway.

STUDENT-PARENT ENGAGEMENT AND COMMUNICATIONS

To be successful, programs must engage key audiences, including those who are crucial to program design, such as state and local CTE and apprenticeship administrators and business, industry, and labor representatives, as well as postsecondary education partners. Programs must also have robust communications and engagement activities to ensure participation, specifically targeting students and parents. The eight sites provide examples of different ways to engage students and parents through recruitment and marketing efforts. Key takeaways include the following:

- ***Educate parents and students on participation benefits***—Leaders at all sites cited the negative perception that CTE and apprenticeships lack rigor or offer students limited opportunity. This presented an ongoing and persistent challenge for student recruitment and for gaining support from other school-based or community-based individuals. Several sites underscored the importance of educating parents and students on the benefits of participating in CTE and apprenticeship programs; they did so by creating various communication materials and hosting public events, such as apprentice signing day celebrations and tours of workplace facilities.
- ***Market postsecondary opportunities***—A number of study sites included a postsecondary component, such as dual enrollment or options for earning articulated credit for participating secondary students. The opportunity to continue education and training beyond an apprenticeship was cited by students and parents at multiple sites as being critical to their decision to enroll in the program.

- **Attract students to new fields/innovative programs**—A potential way of introducing new students to apprenticeship options involves expanding the fields in which programs are offered beyond the traditional skilled trades. One site visited created new innovative programs in the hospitality and IT fields to increase the pool of participants. These programs allow students the chance to gain work experience in a wider array of industries.

FINANCING

Securing stable resources is critical to maintaining program operations. Aligning CTE programs with apprenticeship entails leveraging public funding with that provided by employer sponsors and other partners. Ideally, all sides should realize some benefit from program involvement, though returns on investment may not necessarily be quantifiable in the short term. Key takeaways include the following:

- **Leverage education resources where possible**—Study sites used different strategies for funding programs, often as a function of program alignment. Financing came from local contributions, state secondary and postsecondary education finance formulas, and federal *Carl D. Perkins Career and Technical Education Act of 2006* resources.
- **Higher wages can help attract students**—Students participating in apprenticeship or pre-apprenticeship programs were paid for their on-site time, often making more than the minimum wage. At other sites, students earned postsecondary credit that could be applied to further study. Incentivizing student involvement helped to remove potential barriers to enrollment while providing a clear and early illustration of the economic and educational benefits that such programs offer.
- **Offer financial incentives to employers**—While tax credits may not sway a larger company to participate, these and other financial incentives were seen as a successful way to convince management in smaller businesses that participation would be, at a minimum, cost neutral.

EQUITY AND ACCESS

All sites experienced challenges around recruiting and providing access for nontraditional students, and removing access barriers, most notably transportation to and from work placements and employers' concerns about hiring minors. Key takeaways include the following:

- **Remove barriers to access by offering transportation to and from the job site**—Unless the site was based in an urban center with a reliable public transit system and the participating companies were located along the transit lines, students at the study sites generally were required to provide their own means of transportation. This is a clear challenge for education institutions, which may not be able to create a bussing system, given that student participation is asynchronous and at varying locations, especially in the case of construction sites that move often.
- **Mitigate concerns about youth labor laws and/or liability issues**—For many employers, the hesitation to offer work-based learning opportunities for high school students—including, but not limited to, apprenticeships—appears largely rooted in concerns about child labor laws and liability. However, federal and state laws do not necessarily prohibit youths under 18 from being employed, so programs need to educate employers about what is possible and help ease concerns. A number of sites were able to address this challenge by communicating labor laws accurately, by extending liability coverage for participating students, and/or by leveraging existing employer partners to help allay such concerns.



IN SUMMARY

The programs profiled in this report demonstrate a diversity of approaches that states and localities have used to create programs that fit their needs and address the persistent skills gap that leaves quality jobs with family-sustaining wages unfilled. States have many strategies and levers at their disposal to connect secondary CTE students with apprenticeship, including establishing a state framework to connect historically disconnected systems, creating a supportive policy environment, and removing barriers to participation. With the right partners, policies, programmatic elements, and support in place, aligned CTE-apprenticeship programs can both enrich CTE programs and contribute to the apprenticeship pipeline.

APPENDIX A: SITE SELECTION METHODOLOGY

The goal of the *Potential Role of Secondary Career and Technical Education Programs in Preparing Students for Apprenticeship Programs* project, supported by the Office of Career, Technical, and Adult Education (OCTAE), U.S. Department of Education (ED), is to support state and local leaders as they consider building programs that connect secondary CTE students with apprenticeship programs. To do this, the project team, led by the National Career Technical Education Foundation (NCTEF), selected eight sites to visit based on two-tiered criteria. The site visits were conducted by NCTEF and partner organizations, Jobs for the Future and Vivayic, with guidance from RTI International.

SELECTION CRITERIA

To select high-quality, evidence-based programs that align secondary CTE and apprenticeship programs, NCTEF, with input from the project partners and the external advisory group, identified the following two tiers of selection criteria:

- *Tier 1 criteria* are the quality elements that any program identified as a model site should possess, including both inputs (e.g., employer partners and sponsors) and outcomes (e.g., student achievement and attainment indicators).
- *Tier 2 criteria* were used to ensure a diversity of programs were selected, taking into account factors such as geographic distribution, types of partnerships, and Career Cluster® focus.

Tier 1 Criteria

When selecting the sites, the following elements were taken into consideration:

- The program enrolled secondary students.
- The program had clear alignment to registered apprenticeships or other apprenticeship opportunities.
- The program involved employer partners in the design and delivery of the program.
- The program offered meaningful work-based learning experiences.
- The program was embedded or aligned to a CTE program.
- There were student supports to facilitate participation and success.
- The program demonstrated evidence of student achievement and skill and/or credential attainment for participating students. (*This was not required for programs established in the last five years.*)

Tier 2 Criteria

When selecting the programs for site visits, criteria were also applied to ensure a diversity of approaches and programs, including these:

- **Geographic distribution:** There will be representation from at least five states, in at least three of the main census regions (Northeast, Midwest, South, and West).
- **Career Cluster:** Multiple Career Clusters will be addressed, which are aligned with direct workforce development need in a program's community or region.
- **Partnership type:** At least three sites will be a direct partnership between an area technical center or comprehensive high school and sponsor(s), and three will use an intermediary outside of the secondary school.

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- **Program type:** At least one site will feature a pre-apprenticeship, and at least one site will feature a full apprenticeship experience for secondary students.
 - **Age of program:** At least three programs will employ newer, innovative models (i.e., less than five years old).

OUTREACH EFFORTS

Site selection involved extensive research and outreach, including

- reviewing the pending report from the National Center for Innovation in Career Technical Education (NCICTE), *Connecting Secondary Career and Technical Education and Registered Apprenticeship: A Profile of Six State Systems*, which includes some local examples;
- analyzing information gathered through a survey of state CTE directors, over a third of whom responded with sites or programs that had potential for the project;
- asking the external advisory group members for any recommendations of sites or individuals Advance CTE should engage (see appendix C);
- conducting a basic Google search of best practices in pre-apprenticeship and apprenticeship programs in high school; and
- reviewing the American Apprenticeship Initiative grantees, with support from the National Governors' Association, the lead technical assistance provider.

Over the course of November and December 2015, outreach was conducted to leaders and representatives from nearly 30 different sites, spanning 16 states. In addition to the eight sites selected, approximately another 20 programs were researched that were ultimately not selected because they did not meet the tier 1 criteria and/or led to an over-representation of a certain tier 2 criterion, such as Career Cluster or geographic region.

APPENDIX B: ACKNOWLEDGMENTS

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The project's external advisory group:

- Crystal Bridgeman, Senior Director of Workforce Development Programs, Siemens Foundation
- Alex Gromada, Program Coordinator, Southern Illinois Carpenters Joint Apprenticeship Program
- Robert Lerman, Fellow, Urban Institute
- Linda O'Connor, Assistant Director, Career and Technical Education, Ohio Department of Education
- Martin Simon, Director of Workforce Development Programs, National Governors Association
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The project's partner organizations:

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- Steven McShane, City Councilman and Owner, McShane's Nursery
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