



Updating Career and Technical Education for the 21st Century

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Executive Summary

Career and Technical Education (CTE) is undergoing rapid change in many schools across the United States, as educators strive to connect school programs with actual workplace needs. But while a small number of exemplary models are demonstrating powerful progress, as measured by postgraduation outcomes, many of the 17,000 high schools that offer CTE remain mired in outdated instructional models.

This report highlights many of the most effective models underway across the United States, and discusses those program elements best suited for replication. These include:

- Career Path High, a blended learning model in Kaysville, Utah offering personalized instruction with externships and onsite CTE training.
- Providence, Rhode Island's Metropolitan Regional Career and Technical Center, through partnership with The Big Picture Company, is a national leader at tracking post-graduation outcomes and utilizing comprehensive data.
- Pathways in Technology Early College High School in Brooklyn offers a 9th-14th grade high school/associate's degree program aiming students toward post-graduation job opportunities with starting salaries at \$40,000.
- Nationally, charter school authorizers like the District of Columbia Public Charter School Board are implementing CTE accountability frameworks that measure post-graduation outcomes and progress toward schools' mission-specific goals.

Details follow.

Introduction

The greatest potential of the U.S. public school system vocational school options – better known as career and technical education (CTE) – is yet to come. This career-centric type of learning has changed over past decades, along with the interests of students, demands of the workplace, and technology integration. Despite this progress, districts face challenges when connecting actual workplace needs to a school's CTE curriculum. This can be especially true in STEM (science, technology, engineering and math fields), where the fast pace of industry changes can be overwhelming for school systems that are notoriously slow to react.

Public educators also struggle with how to measure success of the career technical programs. And while it seems that such programs work best when local businesses and employers are involved in partnership roles, execution can be difficult. A new model in Brooklyn, New York, Pathways in Technology Early College High School ("P-Tech"), has partnered with IBM to create a 9th through 14th grade high school/associate's degree program that strives to place students in with post-graduation job opportunities with a starting salary of \$40,000. Unfortunately this relationship is the exception and not the norm.

In the last decade, many systems have also placed less emphasis on career readiness and instead encourage all students to pursue a 2- or 4-year degree. President Obama has repeatedly called for nearly doubling the nation's number of college graduates. Although this is an admirable goal, the workplace needs graduates from diverse background to fill its diverse needs. Nationally, 31 percent of students in the United States who graduate from high school continue on to receive a bachelor's degree. Worldwide, the U.S. ranks second in baccalaureate attainment. However, recent U.S. grads and the jobs they qualify for are not matching industry demands.¹

According to Andrew Sum, director of the Center for Labor Market Studies at Northeastern University, 36 percent of recent college graduates take jobs that don't actually require a college degree. These jobs are mostly hospitality and retail positions such as waiters, bartenders and sales

jobs. Since the recession which peaked in 2008, the number of professional jobs available to young college graduates has decreased. The result is that college graduates are taking jobs that they are overqualified for and getting paid lower wages.² The college graduates are also impacting the high school degree holders by taking those lower qualifying jobs they might otherwise fill.

Creating and offering a wide variety of high quality options creates the potential to reach more students and impact dropout rates of a school system. More than 90 percent of 18,000 public high schools in the United States offer a career technical option. About 5 percent or 900 of those schools have a sole focus on CTE education.³ According to a report from the California Dropout Research Project, "In short, combining academic and career-technical education in high school can keep

More than 90 percent of public high schools offer a career technical education option.

1 Anthony P. Carnevale, Tamara Jayasundera and Andrew R. Hanson (September 2012). *Career and Technical Education: Five Ways that Pay*, Georgetown University, at <http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/CTE.FiveWays.FullReport.pdf>.

2 Tami Luhby (June 25, 2013). "Recent college grads face 36% 'mal-employment' rate," CNN Money, at , <http://money.cnn.com/2013/06/25/news/economy/malemployment-rate>.

3 Ruth Curran Neild, Christopher Boccanfuso and Vaughan Byrnes (January 2013). *The Academic Impacts of Career and Technical Schools: A Case Study of a Large Urban School District*, Everyone Graduates Center, Johns Hopkins, at <http://www.every1graduates.org/the-academic-impacts-of-career-and-technical-schools/>.

students' options open. This integrated strategy can encourage students to pursue their college aspirations while providing skills that could be useful if they attend college or if they leave school without a bachelor's degree."⁴

"They don't just leave high school with a diploma, they exit with job-ready skills aligned to the workforce."

Career Path High Principal Robyn Bagley

Aligning career technical programs with academic requirements in a meaningful way should also be a priority. The model program would produce a student who is academically successful in both math and reading, has obtained on-the-job training and the proper certification to accompany it, as well as a job in that field when they graduate. But, does such an experience exist for CTE students? This study will examine several programs and look at the measures of success used for these programs.

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Pathway to Employment Through Partnerships

Schools that partner with local businesses can get firsthand input into industry job projections for the coming years. Private/public partnerships allow schools to provide more career-ready opportunities for their students and companies to fill their needs. One example of a new and high-profile school that is utilizing this model is the Pathways in Technology Early College High School in Brooklyn, New York City.

The 'P-Tech' school, a collaboration involving IBM, the city's Education Department and City University of New York (CUNY), provides a STEM-oriented, six-year high school curriculum with work-based learning that leads to a high school diploma and an associates degree. Unlike some traditional career-technical models that offer vocational classes in a stand-alone facility, P-Tech intersperses the traditional and required classes of math and science with the career-technical options.⁵

At P-Tech, the children attend school on an extended day schedule that allows the school to not only keep them engaged, but also puts them ahead academically. The school's inaugural class will graduate in 2017 with the ideal goal for students headed straight into the workforce to obtain a technical job paying at least \$40,000 annual salary. In August 2013, New York Governor Andrew Cuomo announced additional plans were in motion to replicate this model in 16 other economic development zones around the state.⁶

IBM Vice President for Corporate Citizenship and Corporate Affairs Stanley Litow said as of August 2013 almost 1,800 IBM jobs were left unfilled and the company was experiencing shortages of skills in technical fields. Litow testified before the U.S. House of Representatives Education and Workforce Committee in November 2013, and explained the unique model of P-Tech is to focus on skill mastery, not seat time. The meaningful partnership between IBM and P-Tech has resulted

4 Patricia Clark, Charles Dayton, David Stern, Susan Tidyman and Alan Weisberg (October 2007). *Can Combining Academic and Career-Technical Education Improve High School Outcomes in California?*, California Dropout Research Project.

5 Al Baker (October 21, 2012). "At Technology High School, Goal Isn't to Finish in Four Years," *New York Times*, at http://www.nytimes.com/2012/10/22/nyregion/pathways-in-technology-early-college-high-school-takes-a-new-approach-to-vocational-education.html?_r=0.

6 Andrew M. Cuomo (August 28, 2013). "Governor Cuomo Announces Public-Private Partnerships to Prepare More Than 6,000 Students for High-Skill Jobs," Press Release.



in a curriculum developed for academic achievement and career readiness. Graduates will be first in line for a job at IBM and while in school, each student has an IBM mentor who shares academic support and career guidance.⁷

The trends for P-Tech are already showing academic gains. Some of the students were reading at elementary school levels when they first entered 9th grade in the fall of 2011. Now, 87 percent of that same class has completed at least one college course.⁸

Supporting Economic Development

Pickens County School District is another example of a positive business/school system partnership. The district is located in South Carolina's Appalachia region, where local industry has struggled in recent years. The school system has invested and is operating a state-of-the-art technical center for a district that serves 15,000 students and four comprehensive high schools. Students are given an opportunity at early age to experience STEM-related curriculum that provides a foundation for possible career-technical opportunities.

The "School to Work" program at the Pickens Career and Technology Center is a program where students must academically qualify to be accepted. South Carolina company United Tool & Mold, Inc. was one of the first official partners in the school's apprenticeship program. Through this program, the company provides apprenticeships to selected students with a starting wage of \$9/hour to be earned while still in high school.

The School to Work program was born out of the Career and Technology Center's partnership with the local organization Alliance Pickens — a public/private economic development organization whose primary mission is to attract, retain and increase the number of jobs and increase the tax base in Pickens County. The Alliance partners work to entice companies to move their businesses to Pickens who can then tap into a ready and willing workforce that is being trained by the school

7 Stanley S. Litow (November 19, 2013). "Preparing Today's Students for Tomorrow's Jobs: Improving the Carl D. Perkins Career and Technical Education Act," Testimony, U.S. House and Education Committee.

8 James Ford (October 22, 2013). "Why P-Tech High School in Brooklyn may be the Future of U.S. Economy," PIX 11, at <http://pix11.com/2013/10/22/pres-obama-to-observe-brooklyn-high-school-he-called-the-future/#axzz2qyYtc2BQ>.

system. Ken Hitchcock, director of the Career and Technology Center, said that the school system meets with the Alliance at least monthly, if not more, and that this open line of communication is critical to the successful job placement of students and a healthy local economy.⁹

The state government is also a partner in the Pickens school program. Its Apprenticeship Carolina program is dedicated to increasing the number of junior and adult apprentice positions in manufacturing, technology, healthcare, and other industries. State government, private industry and public school partnership creates a proven program that prepares students for real work-place opportunities. Since the inception of the program, registered apprenticeship programs have increased from 90 companies in 2006 to 522 in 2013. The number of actual apprentices has increased by 491 percent in the last seven years. Businesses in South Carolina who participate in this program receive \$1,000 tax credit per month for each registered apprentice.

92 percent of Worcester (MA) Technical High School students scored Advanced/Proficient in English, and 84 percent in math.

Worcester Technical High School (WTHS) Principal Sheila Harrity testified at the U.S. House Subcommittee on Early Childhood, Elementary, and Secondary Education in September 2013 and spoke to the improvements at her school in Worcester, Massachusetts. The

school has more than 350 industry advisors that contribute to the progressive technical education offerings at the school. One example is the Worcester Credit Union that created a full service bank within the school. Finance and marketing students are employed during the school day to work in the on-site bank. As a result, WTHS has trained more than 80 bank tellers at the school over the past six years.

The school, which has been in existence since 1910, was on the downside in 2000 with 97 percent of its students in the “Needs Improvement” or “Failing” categories on state assessment exams. The business, education and local community came together to reinvent the school. WTHS uses the small learning community model that divides the school into four small learning communities. This model also supports integrated curriculum and project-based learning. Today, the state assessment results are much different. In English, 92 percent of students scored in the Advanced/Proficient category, and in math, 84 percent of students were Advanced/Proficient. The school boasts a 96 percent on-time graduation rate and a low 1.5 percent dropout rate.¹⁰

In President Obama’s 2013 State of the Union speech, he encouraged private/public partnership to help high school students prepare for real world 21st century employment opportunities. He spoke to actual technology needs and training and has helped create a \$100 million grant opportunity “Youth CareerConnect” co-sponsored by the U.S. Department of Education and U.S. Department of Labor. Grants will be awarded to organizations and local education authorities that create programs that partner with businesses to support internships, job shadowing and other job-related opportunities, as well as academic and career-focused learning.¹¹

9 Interview with Ken Hitchcock, Career and Technology Center, Pickens County, October 28, 2013.

10 Sheila M. Harrity (September 20, 2013). “Preparing Today’s Students for Tomorrow’s Jobs: A Discussion on Career and Technical Education and Training Programs,” Testimony, U.S. House Subcommittee on Early Childhood, Elementary and Secondary Education, at http://edworkforce.house.gov/uploadedfiles/harrity_testimony.pdf.

11 “Fact Sheet: Youth CareerConnect Grant,” (November 19, 2013). White House, Office of the Press Secretary, at <http://www.whitehouse.gov/the-press-office/2013/11/19/fact-sheet-youth-careerconnect-grants>.

Accountability Through Charter School Models

Charter schools have a built-in level of accountability based on the nature of their relationship with their authorizing agency. Charters are opened and closed based on an annual review of a school's data that includes academic, financial and facilities based evaluations.

The DC Charter Board utilizes its Adult Ed Performance Framework using schools' mission-specific goals, post-graduation data, and other factors.

The District of Columbia's citywide, independent Public Charter School Board (PCSB) recently took action to create a performance management framework (PMF) for its adult education programs that outline CTE accountability that could be replicated in both charter and non-charter CTE programs.

The Adult Education framework includes mission-specific goals developed by individual schools that comprise up to 20 percent of their total score. For example, one school, Carlos Rosario International PCS, was approved for the following mission-specific goals in 2013:

- 64 percent of GED students enrolled in the fall will advance one grade level in language by the end of the school year on the Supera Test.
- 75 percent of English as a Second Language students will pass the CR Technology Test.
- 90 percent of students in the Culinary Arts Program will earn the ServSafe Certification by the end of the school year.¹²

But perhaps the most significant metric developed by the PCSB related to CTE is the Career/College Readiness Measures that tracks the percent of learners who have entered and retained employment and/or entered postsecondary education.¹³ PCSB broke these measures down into four areas:

- Entered Employment – Learners who are in the workforce (i.e. desire a job) and enter the program without a job and then obtain a job during the program or after they exit. (floor - 0, target 100 percent)
- Retained Employment – Learners who either enter the program with a job, or obtain a job after exit, and remain employed in the 3rd quarter after program exit. (floor - 39.8 percent, target-69.8 percent)
- Entered Postsecondary – Students with a GED or High School diploma successfully transition to occupational courses and/or college from the adult education program. (floor - 0, target 100 percent)
- Learners enrolling in a postsecondary education (target to be determined based on data analysis).

12 Adult Ed PMF Mission-Specific Goals (October 16, 2013).

13 2013 Adult Education Framework, (September 16, 2013). District of Columbia Public Charter School Board, at <http://www.dcpsb.org/data/files/adult%20ed%20pmf%20policy%20final.pdf>.

Although such data can be more difficult to track and obtain, districts, schools and policy-makers need to work with the National Student Clearinghouse and state department of education to create and maintain this data. Staff and resources to track and maintain this data has the potential to be a challenge for both the charter school and the authorizer, but reallocating resources to support this information could have a significant impact on gaining a clear picture of the success of high school career readiness programs. This could ultimately make the program more effective and successful.

Career Path High

A unique charter CTE model that recently opened in September 2013 is Career Path High, located within Davis Applied Technology College (DATC) in Kaysville, Utah. The flexible blended program serving grades 9-12 offers access to 30 job certificate programs. The school opened with 175 students this year, with plans to expand to 500. DATC is also the charter-authorizer to this school, in a state that allows multiple authorizers. This creates a unique opportunity and personal investment for both the charter and the authorizer to make this program a success.



Competency-based learning allows students maximum flexibility to work on their own path and at their own pace.

Since the school just opened, the data is limited, but Principal Robyn Bagley said that it is attracting a higher-than-average number of special education students as well as a slightly higher at-risk population. The high school has enrolled 20 percent special education students for its inaugural year compared to about 12 percent on average for traditional local high schools.

The school allows students to take their comprehensive high school classes online and their career-technical courses onsite at the College. This blended learning educational model has the potential to attract students who may have personal situations or learning styles that have kept them from being successful in a large comprehensive high school. It also allows students an opportunity to find their passion – whether it's information technology or architectural and engineering design – and pursue it early and often. The 'hands-on' environment and resources the school provides are beyond what many traditional career and technical high schools can afford to provide. Two-thirds of DATC's programs include externship or clinical experiences, with an estimated 1,400 students participating in these programs annually.

The comprehensive courses are taken through an online program facilitated through a partnership with Education Elements, a leading national blended learning design and implementation firm. Students are issued a laptop to use to take their courses. Ninth and tenth graders will work on the comprehensive courses until they meet the proper requirements, while 11th and 12th graders do onsite CTE training. A learning center is available to students who may do better in their online studies in a communal learning environment and some students may actually have academic plans that require them to report to the learning center on a regular basis.



Career Path High is a Blended Learning Flex model.

Career Path High strives to have every student graduate with a high school diploma and a CTE certificate with a minimum of seven CTE credits earned through the college. Graduates should be able to enter the workforce with potential earnings of \$30,000-\$60,000 in annual salary. Graduates should also have completed a career and technical certification that will allow them to get a job in their field to help them pay their way through college, if they choose to go on to postsecondary education.

Through its relationship with the technical college, Career Path High has created benchmarking and

methodology for post-graduation job placement. DATC is accredited by the Council on Occupational Education, an agency recognized by the U.S. Secretary of Education that has established benchmarks representing acceptable outcome percentages for postsecondary students. The national benchmarks are:

- Completion: 60 percent;
- Placement: 70 percent;
- Licensure Exam Pass Rates: 70 percent.

Career Path High in Kaysville, Utah utilizes a unique blended learning model to personalize instruction alongside onsite CTE training.

Currently, the technical college meets these benchmarks and has been a model in the area of placement. Specifically, its overall placement rate for graduates is 79 percent and the center's total placement rate (for graduates and non-graduates) is 89 percent. When defining the placement, which is important to note, a positive placement for non-graduates has to be in a field related to their program of study. Employment for graduates can be related or non-related.

With a model like Career Path High we are literally reinventing secondary education," says Principal Bagley. "Students become empowered over their own learning. Their education is personalized to fit their learning style and needs while the blended "flex" model allows them to tailor their schedule to accommodate their career training. A student's ability to accelerate post-secondary education is no longer restricted by traditional time constraints. They don't just leave high school with a diploma - they exit with job ready skills aligned to the workforce."

Economic Impacts of Career Tech Education

Creating quality programs and options that provide students with a litany of choices allows the educational experience to be driven by students' interest. Areas that have embraced the career-technical opportunities of the 21st century are offering classes that include subjects like engineering, cyber-security, and high-tech graphic arts.

A strong career technical option within a school system could greatly impact the dropout rate by providing an alternative route for children who may not have the desire or means to pursue postsecondary education. High school graduates earn \$130,000 more over their lifetime than high

school dropouts do, as the America's Promise Alliance and others have explored.¹⁴ Nationally, 78 percent of students earn a high school diploma within four years of starting high school, based on the class of 2010 and released by the National Center for Education Statistics.¹⁵ If states were to bring their graduation rate up to 90 percent, an additional 580,000 students would graduate, increasing the nation's Gross Domestic Product (GDP) by \$6.6 billion and generating \$1.8 billion in additional revenue.¹⁶

The outdated vo-tech model of career and technical education has a legacy of providing a sub-par instructional program for students who don't have the ability to achieve high academic success. Tech schools sometimes falsely assume that students don't need or can't handle a high level of rigor and use this as an excuse to provide lower-quality instruction. School systems need to provide students not only with a variety of options of high-level academics and career paths, but they also need to make sure that students are provided with the details of where the industry demands are focused. ACT, an independent, nonprofit organization that provides assessment and research on workforce development, identifies the five fastest growing career fields for 2020 as education, computer/information specialties, community services, management and marketing sales.¹⁷

A Well-Rounded CTE Graduate

A piece that has the potential to get overlooked in many educational programs is the development of non-cognitive or 'soft-skills' for the workplace. Studies show that many employers deem students that come out of high school career-ready are often not properly prepared for the workforce. Employers complain that young graduates often lack communication skills, professionalism, literacy and critical thinking skills. In 2007, 67 percent of small business leaders said that they were challenged with finding employees that were a good fit for their company. These small companies accounted for approximately 50 percent of available jobs in 2007. A national survey of CEOs and postsecondary leaders said that 53 percent of business leaders were struggling with recruiting non-managerial employees.¹⁸

A survey performed by the National Association of Colleges and Employers rated the top two candidate skills as "ability to work in a team structure" and "ability to verbally communicate with persons inside and outside the organization."¹⁹

14 Robert Balfanz and others (2012). *Building a Grad Nation: Progress and Challenge in Ending the High School Dropout Epidemic*, Civic Enterprise, Everyone Graduates Center, America's Promise Alliance and Alliance for Excellent Education, p. 5.

15 Lyndsey Layton (January 22, 2013). "National public high school graduation rate at a four-decade high," *The Washington Post*, at http://articles.washingtonpost.com/2013-01-22/local/36472838_1_graduation-rate-dropout-rate-asian-student.

16 John Bridgeland, Stanley Litow, Tess Mason-Elder and Grace Suh (September 2012). *Enterprising Pathways: Toward a National Plan of Action for Career and Technical Education*, Opportunity Nation Summit, at <http://www.civicenterprises.net/MediaLibrary/Docs/Enterprising%20Pathways%20CTE%20Final%202012.pdf>.

17 *The Condition of College & Career Readiness 2013*, ACT, at <http://www.act.org/research/policymakers/cccr13/pdf/CCCR13-NationalReadinessRpt.pdf>.

18 John Bridgeland, et al. *op cit*.

19 "Job Outlook: The Candidate Skills/Qualities Employers Want" (October 26, 2011). National Association of Colleges and Employers, at http://www.naceweb.org/s10262011/candidate_skills_employer_qualities/.

One school district has taken a pro-active approach to preparing its students in this area. Plymouth School District in Plymouth, Wisconsin created a soft skills evaluation for its high school students in collaboration with local businesses. This evaluation is used as an ongoing discussion point and benchmark to instill a sense of value and commitment to students' interpersonal skills, but does not get tallied into the overall academic grade. The school has developed a rubric (see next page) to evaluate these skills and use as a talking point during student evaluations and parent conferences. Through the partnership with local businesses, students are encouraged to share their evaluation results with employers to give them an advantage in the job market.²⁰

Additional challenges exist in the area of primary academic preparedness for career technical students. Less than half of high school graduates in the 2013 ACT study met the benchmark for reading, math and science for career fields of education, community services, management, and marketing/sales. More than half of students met or exceeded the benchmark for English in these areas and computer/information specialties. Computer/information specialties had the highest scoring graduates with more than half of students reaching or exceeding the benchmark in all categories except for science.²¹

On a national level a group of CTE professionals came together in 2012 to develop common standards that would address the career readiness, academic preparedness, and critical-thinking skills. Led by National Association of State Directors of Career Technical Education Consortium (NASDCTEc) CTE experts from 42 states, and Washington DC, developed a first-ever national set of common benchmarks for career technical education. They took data from more than 3,500 representatives from K-12, postsecondary, and business and industry to create the Common Career Technical Core (CCTC).

The NASDCTEc recently commissioned a third-party to examine the 50-state career technical standards and compare those with the national standards. The study found a "significant mismatch." The national standards are not intended to replace state standards, but instead help update or supplement them. Career Ready Practices are the basis for implementation of a standard. In the study, only a third of the existing CTE programs were 'fully aligned' to 'use technology to enhance productivity' and 'employ valid and reliable research strategies.' The analysis goes on to show that the state standards are more job-focused, while the CCTC standards define what students need to know at the end of a program of study.²²



20 "Soft Skills Grading Rubric," Plymouth School District, Plymouth, Wisconsin, at <http://www.plymouth.k12.wi.us/schools/PHS/softskills.html>.

21 The Condition of College & Career Readiness 2013, *op. cit.*

22 *The State of Career Technical Education: An Analysis of State CTE Standards* (October 2013). National Association of State Directors of Career Technical Education Consortium, at <http://www.careertech.org/cctc.html>.

Plymouth (WI) School District developed this “soft skills” evaluation for high school students:

Grading Rubric - Soft Skills

COLLABORATION	4 Exceeds expectations	Acts as a leader or exemplary team member Consistently provides thoughtful ideas in teams Consistently values and encourages all members of teams
	3 Meets expectations	A strong team member • Provides thoughtful ideas in teams Values and encourages all team members
	2 Emerging expectations	Participates minimally and requires some prompting as a team member Sometimes provides thoughtful ideas in teams Sometimes values and encourages all team members
	1 Below expectations	Rarely participates in team activities Rarely provides thoughtful ideas in teams Rarely values and encourages team members

RESPECT	4 Exceeds expectations	Seeks and accepts the opinions and input of others Consistently demonstrates both respectful and helpful behavior
	3 Meets expectations	Listens and accepts the opinions of others Demonstrates both respectful and helpful behavior
	2 Emerging expectations	Shows growth in accepting others Improvement noticed in demonstrating respectful and helpful behaviors
	1 Below expectations	Usually ignores the opinions and input of others Needs improvement in demonstrating respectful and helpful behavior

INITIATIVE	4 Exceeds expectations	Initiates curiosity and interest in learning Independently engages in learning activities Consistently perseveres and problem solves Demonstrates resourcefulness and seeks assistance as necessary
	3 Meets expectations	Demonstrates curiosity and interest in learning Engages in learning activities Demonstrates perseverance Demonstrates resourcefulness and seeks assistance as necessary
	2 Emerging expectations	Occasionally demonstrates curiosity and interest in learning Sometimes engages in learning activities Occasionally perseveres Shows growth in resourcefulness and sometimes seeks assistance
	1 Below expectations	Seldom demonstrates curiosity in learning activities Rarely engages in learning activities Lacks perseverance Rarely uses alternate resources to assist with learning

WORK HABITS	4 Exceeds expectations	Always punctual and prepared • Consistently displays a positive attitude Always on task • Always strives to reach full potential
	3 Meets expectations	Punctual and prepared for class • Displays a positive attitude Stays on task • Strives to meet potential Completes tasks and meets deadlines
	2 Emerging expectations	Occasionally punctual and prepared Shows improvement in displaying a positive attitude Sometimes stays on task • Beginning to strive to meet potential Inconsistent with task completion
	1 Below expectations	Seldom punctual and prepared Rarely displays a positive attitude Needs to remain focused on task Does not strive to meet potential Needs to complete tasks and meet deadlines

Reexamining Federal Support

Funding on the national level for CTE programs has received renewed attention under the administration of President Barack Obama. In 2012, President Obama advocated for Congress to allocate educational funds to focus on the Carl D. Perkins Career and Technical Education program - the largest federal program for high schools. The proposal for more funds came with an increased level of accountability for grantees and an emphasis on coordinating the funds with actual high-demand industry jobs in the career and technical field.

In September 2013 the U.S. House Subcommittee on Early Childhood, Elementary and Secondary Education, held a hearing to get input on existing career technical education programs, industry needs and the accountability of these programs. The Subcommittee was to use the information to make changes to help with the reauthorization of the Perkins grant. Data supplied included Bureau of Labor Statistics that said more than 8 million Americans between the ages of 16 and 24 are still looking for jobs.

Testimony from Alvin Bargas, president of Associated Builders and Contractors Pelican Chapter, in Louisiana, addressed the strong need for options for students who will not go onto postsecondary education. He said that most high schools in Louisiana are preparing all students for college at the expense of quality CTE options, but stressed that academic rigor needs to be a part of any technical education program.²³

The vocational educational model of the 1970s-80s did not focus on integrating core instruction to proficient levels in English, reading, math and science with vocational training.

In subsequent hearings in November 2013, Blake Flanders, Vice President of Workforce Development, Kansas Board of Regents, testified in support of increased accountability and concurrent rewards for high performing career technical education programs. He asked for states to be given the flexibility to move a portion of the funding into a competitive pool designed to incentivize improvements and reward actual outcomes. Flanders used the example that Kansas could allow up to 50 percent of the state's Carl Perkins grant funds to be awarded competitively based on outcomes.²⁴

Academic Preparedness for Career-Ready Graduates

The vocational educational model of the 1970s-80s did not focus on integrating core instruction to proficient levels in English, reading, math and science with vocational training. In more recent years, educators have been trending more towards providing an integrated educational experience, so that students are able to graduate with both an academic baseline and technical skills and have a choice of pursuing a career or college.

23 "Strengthening CTE Programs will Help Young Americans Gain an Edge in the Workforce" (September 20, 2013). U.S. House Education & the Workforce Committee, at <http://edworkforce.house.gov/news/documentsingle.aspx?DocumentID=350543>.

24 Dr. Blake Flanders (November 19, 2013). "Preparing Today's Students for Tomorrow's Jobs: Improving the Carl D. Perkins Career and Technical Education Act," Testimony, Committee on Education and the Workforce. U.S. House of Representatives.



Many of the successful models have implemented a community-based, student driven model that teaches students how to interact with groups, be professional and negotiate. While this seems unusual or progressive here in the U.S., this model is the norm, not the exception, in countries like the Netherlands, Norway and Switzerland. In the 9th or 10th grades, students from these countries exit the traditional classroom environment and are paired with mentors in the workplace to get 'on-the-ground' training in a particular field.

In Germany more than half of its students participate in a 3-year apprenticeship program where students have a weekly schedule that includes more than half of their time in an actual workplace environment and the remainder of their week in CTE and/or general education courses. Germany has approximately 350 apprenticeship programs for students to choose from in high school. Most often than not, this internship experience results in a certification or diploma that gives the student an advantage to working in that field.²⁵

Postsecondary certificates are one way of gaining industry experience after high school. Postsecondary certificate programs are U.S. created certifications that have more than doubled in participation in the last two decades. In 1994 only 300,000 certificates were awarded versus an estimated 1 million in 2010. The certificates vary in time commitment and cost with 54 percent of programs taking less than a year and 41 percent taking 1-2 years. The costs are estimated between \$6,000-\$20,000/year.

However, the pay-off an employee could receive is high, especially for male-centric industries. Men with postsecondary certificates earned on average 27 percent more than men with high school diplomas and females earned 16 percent more than their counterparts. Men were more likely to enter fields in auto mechanics, construction, electronics, transportation and heating, ventilation and air conditioning (HVAC), while women entered healthcare, office work and cosmetology.²⁶

25 John Bridgeland, et al. *op. cit.*

26 Anthony P. Carnevale, et al. *op. cit.*

Methodology for Data Collection

The Metropolitan (“The Met”) Regional Career and Technical Center, located in Providence, Rhode Island, is one of the most well-known high school technical schools in the United States. It opened as a partnership with The Big Picture Company in 1996 with only 50 students and today boasts an enrollment of 700. The Met was named as one of only 14 Regents’ Commended high schools in Rhode Island as a result of its students’ improvement on the state standardized testing. Nationally, The Met has been replicated in 16 cities and 12 states.

The school set the bar for the Rhode Island Board of Regents to issue new high school regulations including an advisory system, internships, individual learning plans, senior exhibitions and portfolios. Students who attend The Met spend four years experiencing project-based learning and internships pursuing their individual interests. Students spend two days a week in the ‘field’ at an internship with one of The Met’s 2,000 registered mentors. The other three days are at the school with their advisors, working on their project which integrates the core academic subjects in a meaningful way.

The advisors that are put with the students are one of the keys of the success of the school. Advisors are assigned in 9th grade and follow these students throughout their high school experience. Unlike a traditional school where a student is often re-introduced to a new set of teachers each year, this tracking system provides students with a level of consistency that is often non-existent in most comprehensive schools.

While The Met is extremely proud that 100 percent of its students apply to college (this goal is part of its curriculum) and 75 percent go on to attend college, co-director Nancy Diaz Bain says that post-high school graduation statistics and benchmarks are still difficult to track.²⁷ However, The Met’s founder, the non-profit Big Picture Learning, is currently undergoing a longitudinal study that tracks graduates from all of its schools. This may be one of the best data repositories of post-graduate information we have found in our research.

To support the study and the graduating students, The Met created an alumni coordinator position to support students as they transition out of high school and into the workplace or college. The coordinator supports the recent grads with completing college loan applications and other logistical details that may be overwhelming for many students who are often the first in their family to go onto college.

Men with postsecondary certificates earned 27 percent more than those with just high school diplomas. For women that rate was 16 percent.

Dr. Karen Arnold, associate professor at Boston College, is the lead on the longitudinal study commissioned by Big Picture Learning. Arnold said the researchers originally had electronic surveys that were sent out to gather data on the grads. The response rate was very low. They then changed their strategy to leverage the ‘connectors’ relationships that students have with their mentors who were assigned to them for their four-year high school experience. Staff is responsible for keeping notes on students, chronicling their successes and challenges, in a database. The

27 Interview with Nancy Diaz Bain, October 4, 2013.

connector relationship has given them a 96 percent response rate.²⁸ Surveys ask students about their work and postsecondary educational experiences and how those experiences relate to their studies in high school. The study strives to follow students from age 18, which is usually their senior year, until age 30.²⁹

CTE programs and the districts that support them may want to consider this model used by The Met. While The Met's longitudinal study is an in-depth look at the success of this program that would be costly for other districts and schools to undertake, utilizing the use of the 'connector' model shows an incredible return on investment for data collection.

Accountability is Key

Looking at models where children are graduating with meaningful and useful certifications and actual job opportunities is vital to a school district's career and technical program. Students need more than just guidance counselors who often carry heavy loads of students and can do little beyond pulling together class schedules and monitoring test scores.

Career and technical schools need career coaches and actual on-the-ground role models and mentors who can help students realize obtainable career opportunities that will not only spark their interest but give them reasonable salary options that in many cases could help children get out of an at-risk living situation. Both The Met and P-Tech use this model. Many of the other programs that also utilize this model have the mentor follow the student from grade 9-12. This provides an opportunity for the student to develop a meaningful relationship with this instructor instead of recreating the relationship year after year.

Experts in CTE are needed not only on the school and internship level, but are also needed in districts' central office administration, within charter school authorizers' staff and within the state departments of education. In Utah, where Career Path High launched this year, the state has a multiple authorizer charter school law where the tech college serves as one authorizer. This structure, relationship and expertise helped develop the unique model being used at the school. This is one model to watch as the school grows and produces results. This type of relationship has the potential to be beneficial to career technical programs nationwide.

The charter school model provides a framework for accountability, based on outcomes like those used by the DC Charter School Board's Performance Management Adult Education Framework, that could be replicated in traditional CTE schools. Setting measurable goals, obtaining data and using the reports to increase student outcomes in a school will only enhance the programs.

28 Interview Dr Karen Arnold, November 5, 2013.

29 "Data: Now What? Data Beyond High School" December 2008/January 2009, Big Picture Learning, <http://www.bigpicture.org/2008/12/data-now-what-data-beyond-high-school/>.



Conclusions

After examining many different CTE programs nationwide and seeing what programs are successful, it's clear that districts and their CTE programs greatly benefit from meaningful, ongoing relationships with businesses. Receiving up-to-date data on the types of workers needed and the current, specific qualifications for those jobs is critical to the success of a CTE program.

When employers are looking to hire students straight out of high school, having a previous relationship with that student or their school, can produce a mutual advantage. Although some positions may not require a college degree, employers still want to make sure their new employees are professional and socially adept. CTE schools must adjust their programs to educate the full student by teaching both cognitive and non-cognitive skills. Internships and mentor experiences seem important in giving the students those real, social environment skills that cannot be taught in a traditional classroom setting. The Youth CareerConnect grant opportunity offers an incentive for jurisdictions to pursue these relationships and options.

Tax incentives for businesses to work and partner with CTE programs through initiatives like Apprenticeship Carolina can help build those relationships between the school and private sector. Building a relationship with an outside entity, like Apprenticeship Carolina, to help facilitate and create best practices for a useful program can also be important.

Big Picture Learning's innovative system has achieved a 96 percent response rate tracking post-graduation outcomes.

Tracking the success and progress of students from graduation to career and forward is vital to measuring the success of CTE programs. If a school's goal is to prepare a student for a career, they need to pursue data to support that goal. Using some of the methodology that the Big Picture Company uses for its school may help. That study started in 2006, so the researchers have had time to figure out how to get the highest response and most valuable data from its graduates. CTE programs need to track the number of graduates and non-graduates that are moving and staying in jobs related to their area of study and certification. CPH, in partnership with DATC, is on the right path for gathering some of this data, but we would encourage the school and others to track the students as long as possible. While the Big Picture Company study is costly, the importance of the data collection to measure the successes and challenges of a program is extremely valuable.

Nationally, there has been a push to track students beyond high school, but the focus has been more on postsecondary education. The Data Quality Campaign has been pushing for states to track students throughout their preschool to graduation experience. In 2010, all states reported that they were tracking this data. At that same time, 33 states reported being able to follow student progress into postsecondary education. They connect the original records with its state public higher education system.

Setting measurable goals, obtaining data and using the reports to increase student outcomes in a school will only enhance the programs.

Certainly, tracking for career paths is a lot more complicated and would require substantially more resources, but we think it is essential in measuring the success of CTE programs. The National Student Clearinghouse and state education agencies should also examine ways to work on tracking student career data beyond graduation.³⁰

The academic performance of these schools and the quality of the programs must be on par with traditional comprehensive schools. Integrating the curriculum or providing it to students in a creative way – via an online educational program or traditional routes – may be useful.

Students that are drawn to CTE education are often there because their traditional classroom setting is not a good fit. Finding a way to integrate basic math, reading and science skills at proficient levels into CTE electives could not only increase academic outcomes, but could also engage more students and keep dropout rates down. Worcester Technical High School saw positive results in their technical high school when they recreated the traditional model to create small learning environments that promoted project-based learning with a 96 percent on-time graduation rate. Career Path High's innovative CTE blended learning model also provides ample reasons for strong expectations as it completes its first year.

We believe that schools and their communities should embrace these CTE opportunities with public/private partnerships, increase accountability with long-term post-graduation measures, and innovative curriculum options. Working towards these goals will be a step in the right direction for improved CTE opportunities in our public schools.



30 By the Numbers: States Make Progress in Tracking Student Success, American Council on Education, Fall 2010.





About the Author

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