Introduction

Rethinking Career and Technical Education

Throughout our history, innovation and technology have driven a continuous evolution of the jobs and skills needed by workers. Today, automation, artificial intelligence (AI), and advanced robotics are accelerating this rate of change beyond anything experienced in our history. It is estimated that the United States will experience a deficit of 6.5 million skilled workers over the next decade (Korn Ferry 2018). These jobs of the future will require different technical skills focused on critical thinking, technology, creativity, and empathy and have fewer barriers to entry than jobs requiring a bachelor’s degree. In addition, it is estimated that 17.9 million workers in the U.S. will need to transition to new occupations by the year 2030 and 14.9 million of these workers will need to transition to completely different occupational categories (McKinsey Global Institute 2021).

In the context of this rapid change, educators in the United States and around the world are grappling with the critical task of preparing students with the knowledge, skills, experience, and adaptability needed to meet the challenge of our future job market. One school district that has reimagined career and technical education to provide new opportunities for its students aligned to the jobs of the future is Harvard Community Unit School District 50 (Harvard D50) located in McHenry County, Illinois. Through a variety of innovative programs that include dual credit, coding boot camps, advanced building trades curriculum, modern STEM classes, and a business incubator program, Harvard D50 is providing equitable opportunities that help all students succeed.
The city of Harvard, Illinois, is located 63 miles Northwest of Chicago and is the last stop on the Union Pacific railroad line out of Chicago. The community has a long history of agriculture and dairy farming that still exists today but is evolving as technology and business change the community like in so many small towns across the country. Harvard’s school district, like the community, has a population of students with diverse learning needs that is majority Hispanic with 37.9% English Language Learners (ELL) and 42.9% designated low income. In addition, all five schools within the district qualify for federal Title I schoolwide assistance.

This community understands the imperative of career readiness and the impact that it has on economic choices and outcomes. With a focus on improving student academic outcomes, Harvard D50 has increased its on-time 4-year graduation rate by 8.4 percentage points from 2018 to 2021. And through a broad set of career programs, the district is providing postsecondary opportunities for success in areas like business, healthcare, the arts, audio/video, communication, technology, agriculture, and others.
A Critical Investment in Success for All Students

Educators at Harvard D50 understand a simple truth that research bears out—family poverty and language barriers are significant risk factors to children’s academic and life success (Ardasheva & Tretter 2012; Reardon 2011). At Harvard D50, tackling these risk factors and supporting families starts at birth. They have a pre-K and a birth through 3-year-old program that are both fully funded and as Dr. Mary Cooke, Director of Curriculum, Assessment, and Grants states, “These programs are always at capacity—there's always a waiting list.”

At both junior high and high school, CTE is an important part of providing opportunities for success in school and in life. The district has established a network of partnerships with local business, non-profit organizations, and with McHenry County College. And in 2017, Harvard D50 partnered with Edmentum to support the success of its CTE and postsecondary outcomes.

In order to provide all students, including those with economic need or language barriers, access to Harvard D50 CTE programs, the district is investing in a variety of initiatives. As Dr. Cooke explains, “We’ve been really working to beef up these opportunities for kids, aligning our CTE programs and our course sequences so that students can graduate with endorsements on their diploma in a particular career cluster. We have funding set aside through our CTEI [Career and Technical Education Initiative] and our Perkins grants that go toward paying for certifications and credentialing for students. Whether it’s a test that they have to take in order to be certified, an additional class they need to complete, or even help writing an application, we have money available through the grants, as well as district funds, to take care of those kids that have need.”

Inspiring Student Success

One of the country’s industry leaders in materials manufacturing and metal forging, Scot Forge came to Harvard D50 several years ago to create a manufacturing internship program that would provide skilled workers needed by the company. They initially developed a strict set of academic and grade point average (GPA) standards to qualify students for the program. But what James Bosworth, Harvard D50 Division Chair for Student Services, knew is that passion, enthusiasm, and engagement would lead to success more than an arbitrary set of academic standards. As Bosworth explains, “I had a few students who didn't meet the GPA requirement, but they were excited about the opportunity and I just knew their enthusiasm would lead to success.”

Bosworth goes on to describe, “We initially created an application with Scot Forge and decided to focus on sophomores already enrolled in CTE classes. After interviewing all the interested students, a small group of three students who were all friends showed a lot of excitement and were selected for the program. The program was a big success. The students started as paid interns from the beginning and after the program was complete, two of the students were hired by Scot Forge.”

Bosworth credits their metal manufacturing teacher for building both the students’ interest and their basic skills. “We're lucky to have a full CTE facility on campus with metal manufacturing, wood working, drafting, and construction trades and great teachers that inspire students.”
Harvard D50 has intentionally designed a high-quality CTE program at the intersection of what research says works and what state and federal policy require. Career education can make learning relevant to student interest and future career and life success creating intrinsic motivation that increases student overall engagement in school. Decades of research tells us that CTE programs improve both secondary and postsecondary outcomes (Cheng & Hitt 2018), increasing graduation rates (NCES 2018), and decreasing student dropout rates (Gottfried & Plasman 2017). CTE participation is associated with improved postsecondary outcomes including increased postsecondary attendance and retention (ACTE 2017) and higher wages (Kreisman & Stage 2017). Within this context, Harvard D50's CTE program includes an integrated set of CTE program initiatives to holistically support the success of all its students—from the most struggling to the most advanced.

### Career Exploration
Harvard D50 is providing career exploration courses that enable junior high and high school students to learn about a wide range of career possibilities and ultimately guide them into a career pathway that aligns with their individual interests and goals.

### Junior High Connections and High School Transition
In addition to laying the foundations of career exploration in junior high, Harvard D50 is creating collaborative CTE initiatives that give junior high and high school students an opportunity to work together on real-world projects.

### High-Quality Curriculum and Career Courses
Harvard D50 partners to leverage Edmentum's catalog of over 180 middle and high school CTE courses in 16 career clusters and 17 career certification pathways. Edmentum CTE courses have been approved on 33 national and state lists.

### Work-based Experiences
Through their onsite career education center and a network of local business partnerships, Harvard D50 offers students real work-based experiences, training, and internships in a wide variety of occupational areas that align with local job needs.

### Community Connections
Harvard D50 works with McHenry County College and other local organizations to provide comprehensive career education, dual credit/enrollment, and academic acceleration opportunities for students.
One of the most innovative career education initiatives at Harvard D50 has been its Business Incubator program. Dr. Cooke describes it this way, “We started with a business incubator program that is kind of like a Shark Tank concept where our high school students develop a business plan and hold a pitch night. Well, the first thing that every single group wanted was an app - they had to have an app! And so we decided to create an app-making initiative within our junior high coding program so the high school students could outsource their app building to the junior high students. But the really cool thing that we were able to do with one of the courses in the Edmentum catalog was to offer a summer coding boot camp. This was important because when we started the mobile app program, our kids had no coding background whatsoever. We needed to set some foundational information, some background knowledge for students, and the Edmentum Introduction to iOS and Android Mobile App Development courses provided that foundation. The whole initiative worked out beyond what we thought it would be—which is a great thing. At the junior high, we had them. They got the coding background they needed at coding boot camp, and they got to work with the high school students and that became a really positive thing.”

Harvard and McHenry County, like so many places across the country, have a growing need for skilled healthcare workers at all levels of the profession. And Harvard D50, educators have responded to this need by building a comprehensive healthcare career pathway in partnership with McHenry County College, local healthcare facilities, and with Edmentum.

Students often begin the healthcare career pathway at Harvard High School by taking Edmentum’s CTE course Introduction to Medical Terminology. Dr. Cooke explains that this is a critical foundational course for students, “I know from having had two daughters go through the program that the Medical Terminology course gives them a leg up—they have that additional confidence and the background needed to be successful before going to MCC [McHenry County College] in the fall.”

James Bosworth describes the overall success of the program saying, “It’s really common for students to go through our CNA [Certified Nursing Assistant] program, complete their coursework, do an internship at a local healthcare facility, take the CNA exam, and get a job as a nursing assistant. These students also often continue their postsecondary education to go on and become an RN [registered nurse].”
According to Bosworth, at Harvard D50 their build-a-house program has been one of their most successful career programs at the district. “There were so many kids interested in the program that we literally held a competition to get in,” he shares. In the program, students gain experience across a wide range of jobs and skills within the construction trades.

The way the program worked is each year the district purchased land to build a house. They partner with a local construction company to oversee the project. Students had the opportunity to take the skills they had learned at Harvard D50’s career education center and apply those skills to a real work project: building a house from the ground up.

Boswell sums up the success of the program by saying, “After completing the build-a-house project, students often get jobs right away. And at the end of the year, the district would sell the house and take the money to do another house the next year. It was a great success!”

For many years Harvard D50 has offered credit recovery opportunities to struggling students during the summer. But three years ago, they moved to also offering class advancement during the summer which enables advanced students to complete core required courses during the summer and creates space during the school year for advanced courses like AP® (Advance Placement®), dual credit, CTE, and elective classes.

Harvard D50’s dual credit program is a new initiative and as Dr. Cooke states, “We’re going all in on college and career readiness and a key part of our college ready initiative is our dual credit/dual enrollment program where our kids can graduate from high school with their diploma as well as an associate degree. Students are enrolled in both Harvard High School and at McHenry County College, and during a typical school day these students will actually go to MCC in the morning where they take two dual credit college-level classes and come back to Harvard High School in the afternoon to finish out the day with their high school classes.”

The first cohort of students in the district’s dual credit program are juniors right now and are on track to graduate next year with a diploma from Harvard High School and an associate degree from McHenry County College.
For years, many educators and civil rights advocates have pushed back on traditional vocational technical (Vo-Tech) programs for tracking disadvantaged children into pathways leading to fewer opportunities for success. Harvard D50 educators are breaking through these outdated models and proving that high-quality career and technical education can provide opportunities for all students.

The district is taking a holistic approach to career and technical education, starting in junior high, with career exploration that allows students to identify areas of interest early so when they get to ninth grade, students can take the CTE and other courses that lead to career concentrator pathways that culminate in credentials and certification. Dr. Cooke explains, “We know that the more we hook kids into CTE and electives that they are really interested in, the more invested and engaged they're going to be in school.” She adds, “We’re really working to expand the availability and opportunity for our freshmen and sophomores to take more CTE and electives courses.”

Having established a high-quality framework that includes early career exploration, junior high to high school transition and connections, high-quality CTE curriculum, real work-based experience, and strong community connection, Harvard D50 educators are also looking to the future to further expand opportunities for their students. Dr. Cooke adds, “We are really intent on making Harvard High School a hub for cybersecurity. It's the fastest growing area, there are lots of opportunities, and it's a great living wage. We can establish the credentialing where kids could actually enter the workforce right out of high school or continue in college and even earn a master's in cybersecurity if they wanted to. But graduating high school with those credentials would open up so many more pathways for them.”

James Bosworth is truly proud of how Harvard D50 is helping kids succeed saying, “We look at the whole student and understand who they are and what their interests are. We don't push kids to go to a 4-year college if they have other interests. If a student is passionate about carpentry, they can be very successful in that field and have a career—and we'll help them do that. There can be a lot of pressure from society to track students into a 4-year college degree pathway. I'm really proud that we haven't sacrificed our career program to try and track every student into college. We've always worked and fought to keep our CTE programs strong because we know how much it benefits our kids and our community.”
2% Increase in Wages per CTE Course
There is a significant link between taking CTE courses and higher wages, especially among students who took upper-level CTE courses (Kreisman & Stange 2017).

75% Pursue Post-Secondary Studies
75% of high school students who take CTE coursework also pursue post-secondary studies shortly after graduation (ACTE 2017).

CTE Credits Increase College Attendance
Students who take three or more credits as a CTE concentrator are more likely to go to college than equivalent students who did not (Giani 2019).

CTE Increases Student Engagement in School
CTE is associated with higher levels of student engagement in school (Cheng & Hitt. 2018).

CTE Students Have Higher Grades
A 2010 literature review found students enrolled in CTE courses had higher grades than student not taking CTE courses (Stern et al. 2010).

7-10% Increase in Graduation Rates
Participation in a high-quality CTE program boosts the probability of on-time high school graduation by 7 to 10 percentage points (Dougherty, S. 2018).

94% Graduation rate for CTE Concentrators
The average high school graduation rate for CTE concentrators is 94% compared to the national rate of 85% (NCES 2018).

CTE Concentrators Less Likely to Dropout
Students taking CTE concentrators are associated with reduced dropout rates (Gottfried & Plasman, 2017).
References


