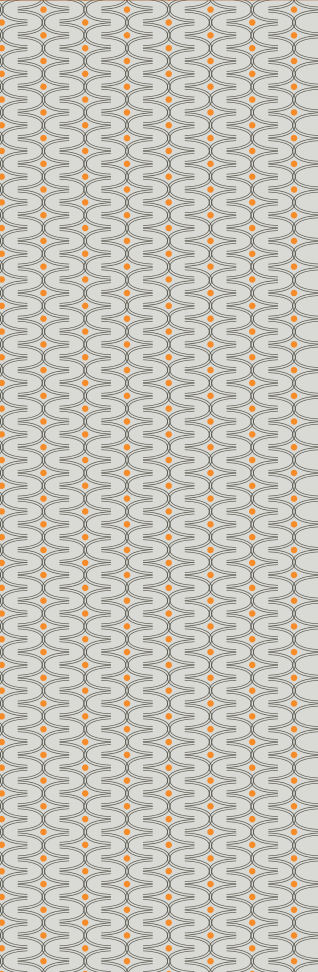


CTE'S ROLE IN URBAN EDUCATION

IN THIS BRIEF:

This Issue Brief will explore the promising role that career and technical education programs play in addressing key student achievement issues facing urban schools. CTE programs engage urban students by providing rigorous and relevant coursework, fostering positive relationships, establishing clear pathways and connecting education and careers—fulfilling a unique and positive role in today's urban education system.



Education in the United States is facing a crisis of completion and performance: An estimated 1.1 million students fail to graduate from high school each year,¹ and test scores for American students continue to fall behind those of students from other developed nations.² These issues at the secondary level contribute to similar problems at the postsecondary level. One-third of high school graduates need remedial courses upon entering college, and 43 percent of students who begin postsecondary studies fail to earn a degree after six years.³ The disquieting reality is that a significant number of students are ill-prepared for both college and careers.

The performance challenges are even more acute in America's urban schools. Compared to national averages, students from urban school districts are more likely to perform at below-basic proficiency levels on national assessments and have signifi-

cantly lower high school graduation rates.⁴ Those that are able to move on to college are more likely to need remediation and to eventually drop out.⁵

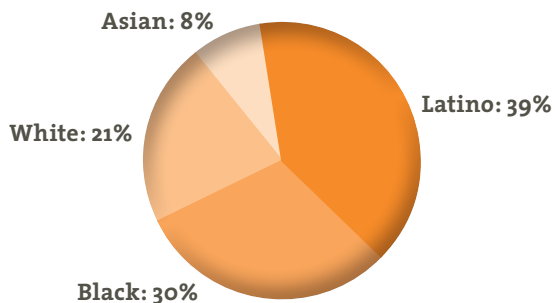
While the solutions to these achievement issues are often elusive, and at best complex, career and technical education (CTE) programs that engage students by linking rigorous academics with a coherent sequence of relevant, career-focused courses and opportunities can be a powerful lever to improve student outcomes in urban schools.

The Concerns

STRUGGLING STUDENTS

Urban school districts serve a diverse and disadvantaged student population, and these students have unique challenges that urban schools have struggled to overcome.

Demographic makeup of elementary and secondary students in urban school districts:¹⁹

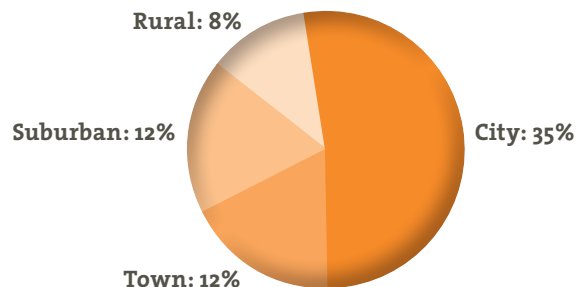


For instance, urban school districts serve approximately 30 percent of the nation’s economically disadvantaged students, with higher concentrations of students eligible for free or reduced-price lunch than in non-urban areas.⁶ These students are more likely to struggle academically throughout their schooling—with lower achievement test scores, high school graduation rates and postsecondary enrollment and completion rates—and the gap between low- and high-income students has grown in recent years.⁷ In just one example, the dropout rate for students from low-income families is five times higher than the rate for students from high-income families.⁸

Interwoven with the challenges of the low-income population are the challenges faced by the large number of minority students who are served by urban schools. A persistent minority achievement gap continues to exist despite many years of work to address this issue. For example, on the 2011 NAEP science assessment, Latino students scored an average 26 points behind white students, and black students scored 34 points behind.⁹ In addition, while the average graduation rate is 73.4 percent nationally, it is only 59 percent for black students and 63 percent for Latino students (with much lower rates in some urban districts).¹⁰ If these students do graduate, they have lower postsecondary enrollment rates and higher rates of remediation, and are less likely to complete a degree.¹¹

Many of these diverse students are not native English speakers, adding to the challenges for urban schools. The share of students categorized as limited English proficient in central cities is twice what it is in the suburbs (17.3 versus 8.2 percent).¹² The range of languages and cultures in urban areas makes it difficult for schools to offer instruction to students in their native languages and to effectively communicate with parents, ultimately contributing to lower student achievement.

Percentage of schools where more than 75 percent of students are eligible for free or reduced-price lunch, by school locale:²⁰



STRUGGLING SCHOOLS AND COMMUNITIES

Many urban schools also face the tremendous challenge of operating with inadequate resources while trying to serve these high concentrations of students that have traditionally struggled academically. Spending per student is greater in high-poverty cities than in other areas,¹³ but these funds are still insufficient to meet the needs of urban schools, such as the modernization of outdated facilities and the necessary support systems for the urban student population.

The lack of resources often means teachers and career counselors are stretched thin. The average class size for teachers teaching self-contained classes in high schools is substantially higher in urban locales than in other areas.¹⁴ In addition, student-to-counselor ratios average 315:1 nationally, but can grow to 1,056:1 in low-income urban districts.¹⁵ This divided attention impedes teachers’ and counselors’ ability to engage with students and help them create individual pathways to postsecondary education and careers. Both the urban student and teacher population are also highly mobile,¹⁶ further straining positive relationship development and meaningful interaction between students and adults in schools.

Students in urban districts also face challenges in their communities that impact their education. In fact, the Urban Education Lab proposes that “Schools matter only so much,” and that the social context in which schools operate is equally critical.¹⁷ For instance, students in low-income urban areas often lack examples of adults who have attained high-quality education credentials, and may be the first in their families to attend college. Without a role model with experience navigating the logistics of course enrollment, financial aid and other bureaucratic aspects of both college preparation and attendance, these students can founder.¹⁸

In addition, economic challenges often disproportionately affect certain regions and populations. Minorities, especially those living in urban areas, have been impacted by unemployment at much higher rates than other groups across the nation during recent recessions.²¹ Such factors as high unemployment can create disruptive forces in urban students' lives, increasing financial demands and family responsibilities that impede learning.

STRUGGLING FOR RELEVANCE

Given these challenges, it can be difficult for urban students to connect education with a future of high-wage, high-demand and satisfying work, leading many students to disengage or drop out of school. The average high school graduation rate in the 50 largest cities in the United States is only 53 percent, compared to 71 percent in the suburbs.²²

Relevancy has been shown to be a significant factor affecting dropout rates. The report *The Silent Epidemic* found that 81 percent of dropouts said “more real world learning” may have influenced them to stay in school.²³ The most recent High School Survey of Student Engagement found that 42 percent of those who considered dropping out did so because they did not see value in the schoolwork they were being asked to do. Furthermore, many students, even those not thinking of dropping out, expressed a desire for “work that connects to what they want to do with their lives after high school.”²⁴

CTE Provides a Solution

Today's CTE is on the cutting edge of connecting students to their futures through relevant education. These programs engage and prepare students for postsecondary education and a range of career opportunities by providing core academic, employability and technical skills through an integrated, applied and connected curriculum.

CTE can be overlooked by urban education leaders under pressure to improve dismal academic results because CTE programs are more readily associated with rural and suburban locales than urban schools, and are at times typecast as appropriate only for students not planning to pursue postsecondary education. Urban school leaders who embrace these stereotypes are doing their students a disservice.

Improving the level of engagement in urban schools is absolutely essential to improving performance and completion, as students who are more engaged in their academic studies,



With 25 percent of Illinois jobs based in agriculture, the Chicago High School for Agricultural Science (CHSAS) plays an important role in training a key part of the state's workforce.²⁵ CHSAS also serves as a national model for urban education with its innovative curriculum, stellar student engagement and effective dropout prevention strategies.

Opened in 1985, CHSAS combines core academic subjects with courses in agribusiness and plant and animal sciences to provide cutting-edge career pathways in animal science, agricultural mechanics and technology, agricultural finance, horticulture, and food science. Courses are taught by industry professionals, and campus facilities include a nearly 50-acre working farm, a greenhouse, an atrium and a food-science lab.

Student engagement is enhanced through hands-on learning experiences, such as running the school's farm stand, which involves growing and marketing produce; caring for the school's livestock of sheep, goats, horses, beef and dairy cattle, chickens, turkeys, pigs, groundhogs and iguanas; and designing and building landscape structures, including a three-hole golf course. Students can expand their technical training through summer employment opportunities and internships at the University of Illinois and Michigan State University. All CHSAS students are also members of the National FFA Organization, which increases student's leadership abilities, life skills and career achievements.

Despite the fact that 40 percent of the student body comes from low-income families, the great majority of CHSAS students meet or exceed state academic standards. The school also boasts a 92 percent graduation rate, compared to 70 percent citywide, and 83 percent of CHSAS graduates go on to college.²⁶ Because of its innovative curriculum and effective student engagement strategies, CHSAS has received the Award for Instructional Innovation by *Business Week*, as well as the 2006 Emerald Award for Implementation of Postsecondary Educational Programming.

regardless of their social and economic background, are far more likely to perform well on tests, need less remediation and graduate on time.²⁷ While CTE cannot claim to solve the structural problems that exist in urban schools, such as budget and staffing issues, it can address the issue of student engagement and connect more urban students to positive educational experiences.

CTE programs engage urban students by providing rigorous and relevant coursework, fostering positive relationships, establishing clear pathways and connecting education and careers—fulfilling a unique and positive role in today’s urban education system.

PROVIDING RIGOROUS AND RELEVANT COURSEWORK

A core component of engagement is relevance: The most engaged students are those who find their coursework relevant to their everyday lives and future career goals.²⁸ Urban students face a wide variety of financial, academic and social challenges, both inside and outside of schools, that can make it difficult for them to see the relevance of education. Schools must work hard to impart the value of education, and CTE, which already employs strategies that emphasize relevancy, can help.

CTE is proven to decrease dropout rates and improve academic performance, due in part to instructional methods, such as

hands-on, project-based, inquiry-based and service-learning, that provide real-world context to academic subjects. For instance, research has shown that “a ratio of one CTE class for every two academic classes minimizes the risk of students dropping out of high school.”²⁹

Engaged CTE students not only stay in school, but improve their academic performance, showing that urban schools do not have to sacrifice rigorous academics to provide a relevant curriculum. Students in one recent study who took three or more CTE courses improved their 12th grade NAEP scores by eight points in reading and 11 points in math, while students who took no CTE courses did not increase their math scores and only increased their reading scores by four points.³⁰

One important component of the success of CTE programs in improving student achievement is the purposeful integration of rigorous academic coursework and technical training, leading to more contextualized learning. A study by the Southern Regional Education Board found that “students at schools with highly integrated rigorous academic and CTE programs have significantly higher achievement in reading, mathematics and science than do students at schools with less integrated programs.”³¹

By embedding academics into CTE, students can better grasp the relevance of core academics, such as math and science, to solving real-world problems. Students utilizing the National



For more than 75 years, Aviation High School (AHS), a public New York City high school in Queens, has set students on a direct pathway to careers in aviation maintenance and the aerospace industry. Combining rigorous coursework in language arts, mathematics, science and social studies with world-class technical training, graduates from Aviation High can earn Federal Aviation Administration airframe and/or powerplant certifications. As of 2011, Aviation High School has been awarded four straight “A” ratings by the New York City Department of Education and has been recognized as one of the best high schools in the nation by *U.S. News & World Report*.

One of the strengths of AHS’s program is the close relationship between the school and the aviation industry. For example, in addition to using state-of-the-

art equipment purchased by the school, AHS students also work on a functioning 727 aircraft donated by FedEx. In order to create more real-world instructional opportunities, AHS partnered with the airline companies to create an on-site classroom located in an annex at J.F.K. International Airport. Students also intern with airline companies, such as Delta and JetBlue, as well as with the airport.

While the primary goal of AHS is to prepare students for college, students are immediately ready for employment upon graduation, and entry-level jobs in these fields typically earn \$50,000-60,000 annually. Sixty percent of Aviation High’s students are from low-income families, yet the school boasts an 88 percent graduation rate, compared to 57 percent citywide, and carries the distinction of having trained 12 percent of the industry’s aviation technicians.³²

Research Center for Career and Technical Education's Math-in-CTE program, which integrates career and technical training with academic teaching methods, scored significantly higher on two national math assessments than students being taught through traditional methods.³³ Examples of this approach can be found in urban areas across the country, such as Washington, DC, and Detroit, Michigan, where, as part of districtwide Math-in-CTE implementation, culinary arts teachers integrate study of exponential bacterial growth into lessons related to the restaurant industry.

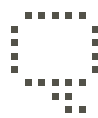
At the postsecondary level, integration is often seen benefitting students who require extra help to be successful, but also face the need to quickly secure postsecondary credentials and employment. For example, working from Washington state's I-BEST (Integrated Basic Education Skills Training) model, community colleges in the Milwaukee, Wisconsin, area serve English language learners through a welding career ladder program that incorporates team teaching in English and the technical skills necessary for welding certification.

FOSTERING POSITIVE CONNECTIONS

For students who lack role models for education and career success, CTE can put them on track toward a rewarding future by connecting them to adult leaders in the education and business communities. CTE teachers and program mentors are repeatedly able to reach students in ways that other adults in schools cannot, and are often relied on by students to provide education and career advice, either informally or through formal programs like teacher-as-adviser initiatives.

Another way that CTE fosters positive connections is by shrinking the educational environment. Many urban areas have begun to utilize the career academy model, which provides smaller, more personalized learning environments for students, to accomplish this goal. As specialized programs within comprehensive high schools, career academies provide more direct interaction with teachers and counselors, making them an effective engagement strategy for large and often impersonal urban high schools.³⁴

Career academies function as “schools-within-schools” that integrate core academic subjects with technical training in specific career fields. The combination of relevant coursework and smaller class sizes leads to more positive education connections, as students who are a part of these academies feel less alienated from teachers and peers, are more likely to pass their courses and accumulate credits toward graduation,



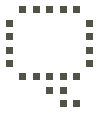
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and are less likely to drop out.³⁵ These results have often been most dramatic for at-risk populations. For Latino youth, career academies have been shown to improve confidence, a sense of belonging, interest in academics, and overall achievement and motivation.³⁶ Academies have also had dramatic effects on the post-high school outcomes of young men, a key at-risk urban population, including increased earnings and employment stability, positive family formation and independent living.³⁷

CTE is also at the forefront of work-based learning opportunities that engage students in the career fields of their choice and provide early connections to employers. Working directly with those in their desired career field allows students to not only learn through application, but also develop important relationships with teachers and mentors. Such strategies have proven effective in urban school settings: One study found that “students participating in paid after-school internships in some of Chicago’s most economically disadvantaged schools missed fewer days of school, failed fewer core academic courses and had higher graduation and lower dropout rates than similar students who did not participate.”³⁸

ESTABLISHING CLEAR PATHWAYS TO CAREERS

Career pathways and programs of study that form a coherent sequence of relevant, career-focused courses are a central element of CTE’s success and address many of the needs of urban students. These CTE strategies clearly delineate the sequence of courses students need to connect secondary and postsecondary education with their chosen career fields and show students the means by which they can achieve their goals. This can be critical for urban students who perceive limited educational and career options.



Students in CTE programs have a clearer perspective of how their coursework relates to their career aspirations, and CTE’s instructional approach helps students learn academic and technical content not by rote, but in an in-depth and meaningful way.



California has embraced career academies as a way to improve student achievement. California Partnership Academies (CPAs)

are a career academy model utilized in many urban school districts in the state. CPAs provide college-preparatory curriculum organized around a career-related theme. For example, the Technology Academy at the Foshay Learning Center, a K-12 school in South Central Los Angeles, integrates core academics with training in information technology. Students combine courses in computer applications and digital imaging with chemistry and biology courses, and video production and web design are integrated into such courses as English and history. Impressively, 80 percent of Tech Academy graduates satisfied the “A through G” course requirements for admission to the California State University and University of California, compared to 36 percent of graduates across the state.³⁹

Statewide, these partnership academies are yielding notable results. According to the California Department of Education, 95 percent of seniors attending CPAs graduate, compared with 85 percent of all students. Even more impressive, the graduation rate for African-American students in CPAs is 16 percent higher than African-American students statewide; for Latino students, the graduation rate is 14 percent higher.⁴⁰ What makes these results especially meaningful is that 50 percent of CPA students enter the program as “at-risk students,” which means they have demonstrated low motivation and poor academic performance. However, through contextualized learning and small learning communities that lead to increased student engagement, CPAs have proven to be an effective strategy for helping urban high school students graduate college and career ready.

An example of these pathways can be seen in Texas’s urban zones. Houston Independent School District is implementing career pathway programs in five of its low-income high schools. Each school will adopt a pathway program that would allow students to graduate with industry certification in process technology, electronic engineering, network and computer administration, logistics and global supply, or pharmacy technology. In addition to certification, students can also complete an associate degree from Houston Community College while in high school. These programs give students the opportunity to secure well-paying jobs immediately after high school or to continue their studies at a four-year college.

Career pathways are often developed and strengthened through partnerships between CTE programs and local business and industry, particularly in urban settings. For example, CTE programs in Philadelphia have a number of effective school and industry partnerships. A Sunoco oil refinery partners with the Process Control Technology Academy at Bok High School to develop curriculum, as well as provide up to 20 job opportunities for students each year. Those students who successfully complete the program and choose to pursue postsecondary education in an engineering, science or technology-related program are eligible to compete for scholarships. The Lockheed Martin Integrated Systems and Solutions Registered IT Apprenticeship is a three-year-long IT apprentice program that provides mentoring, job shadowing, projects and hands-on training. Students who successfully complete this program are certified as an information technology technician by the Pennsylvania Department of Labor and Industry.

In addition to providing opportunities for students, local business and industry can also fill a critical resource gap and ensure courses are appropriately aligned to workforce needs by donating time, expertise and funds for such projects as facility improvement or the purchasing of new equipment. These investments are essential to ensuring that students receive high-quality instruction connected to careers, and that business and industry receive a return on their investment in the form of a well-trained workforce.



Career pathways and industry partnerships help the Community College of Baltimore County (CCBC) transform its urban community by educating and training individuals for jobs that enhance their lives and strengthen the local economy. Serving more than 70,000 students on three campuses, CCBC offers more than 100 associate degree and certificate programs in such fields as business communications, computer programming, dental assisting, veterinary medicine, automotive technology and manufacturing technology.

The college has shown a commitment to student pathways and engagement by helping high school students prepare for college, as well as by equipping those who have traditionally struggled academically. The curriculum emphasizes personal development activities designed to get students engaged in their academic development. CCBC also recently launched MI-BEST (Maryland Integrated Basic Education and

Skills Training), an occupational training program that allows students to earn their high school diploma while learning a trade in either building maintenance or construction.

Because of CCBC's commitment to improving student engagement, the college was recently awarded a nearly \$2 million grant from the U.S. Department of Education. The money will go toward implementing an initiative to further increase student persistence and graduation.

CCBC is also partnering with business and industry to expand opportunities and resources for its students. For example, Grainger, the leading supplier of facilities maintenance supplies in North America, is providing scholarships each year to two CCBC students in technical education programs. These scholarships assist CCBC in developing future leaders within the industrial trades.

Conclusion

Clearly, urban schools benefit from utilizing CTE programs as an educational reform method. As has been demonstrated, such cities as New York, Los Angeles, Chicago and Philadelphia are already seeing the advantages of targeted investment in CTE, as CTE programs provide the kind of relevant and engaging coursework that not only helps students achieve academic success, but also prepares them for viable careers in high-demand areas.

Students in CTE programs have a clearer perspective of how their coursework relates to their career aspirations, and CTE's instructional approach helps students learn academic and technical content not by rote, but in an in-depth and meaningful way. The nature of instruction also creates an environment in which students can develop strong relationships with teachers and mentors in the business world, and better connect to their schools, communities and employers.

CTE strategies of engagement through rigorous and relevant coursework, positive relationships and clear pathways for



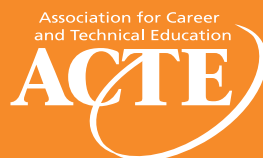
The net effect of CTE programs in urban school districts is higher graduation rates and improved academic performance, leading to well-educated and trained individuals ready to succeed in both postsecondary education and their careers.

education and careers can make a difference for urban students, who often struggle against economic and social disadvantages. The net effect of CTE programs in urban school districts is higher graduation rates and improved academic performance, leading to well-educated and trained individuals ready to succeed in both postsecondary education and their careers. Policymakers and education leaders in urban areas will be well-served, and will serve their students well, by considering widespread adoption of CTE programs and strategies.

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