

Region 1 Comprehensive Center Reimagining Education Series: Innovative College and Career Pathways to Advance Equity and Opportunity

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Disruptions associated with the COVID-19 pandemic introduced opportunities for PK–12 education systems to accelerate evidence-based innovations that may better prepare students to pursue their educational and career goals. Thoughtfully designed pathways—the programs and experiences that students complete to satisfy graduation requirements—can play a key role in reshaping student experiences and outcomes. By strengthening and introducing pathways leading to high-demand careers and college enrollment, educators and policymakers can support students’ postsecondary ambitions in the months and years ahead.

The negative impact of the pandemic on employment for young workers and workers without college degrees further increases the urgency for schools to build robust student pathways. Workers at all levels of educational attainment experienced job losses during the pandemic, but those without college degrees faced higher rates of unemployment than did workers with an associate’s or bachelor’s degree (Daly et al., 2020; Georgetown University Center on Education and the Workforce [Georgetown], 2020). Young workers, individuals aged 16 to 24, also faced disproportional job losses compared with other age brackets (Aaronson & Alba, 2020; Gould & Kassa, 2020). A pandemic that left workers without a college degree worse off than peers with a degree brings renewed focus and urgency to the idea that education systems need to be built with pathways that have off-ramps and on-ramps for individuals to step out of and step into different career trajectories. Career and college pathways that are not typically part of a traditional education trajectory may now take center stage (Daly et al., 2020; Georgetown, 2020). This paper highlights three evidence-based strategies that, individually or as part of a system of pathways, can support students as they develop marketable workplace skills and prepare for postsecondary educational opportunities. These strategies are as follows:

1. **Work-based learning (WBL)**
2. Academically rigorous **career and technical education (CTE)**
3. Opportunities for **accelerated college credit**

This paper is organized by strategy and offers a brief description of each strategy, a summary of the evidence supporting the strategy, and common barriers to implementing the strategy. Stakeholders also will find actionable steps for implementation in schools. Although described separately in this paper, implementation of more than one of these strategies holds promise to further increase opportunities for students.

All Region 1 States Have Goals for Implementing and Expanding Educational Pathways

Prior to the pandemic, states within Region 1—Maine, Massachusetts, New Hampshire, and Vermont—prioritized workforce and career development in their education systems and statewide economic plans. Each state’s education system plays a critical role in achieving statewide workforce education goals.

- The **Maine** [Economic Development Strategy 2020–2029](#) identifies “grow local talent” as an essential action to drive state economic growth during the next 10 years. The strategic plan calls on the state to establish systems for K–12 career exploration, including a goal for “100% of Maine students [to] have a 6 month paid internship between their junior year of high school and one year post high school graduation” (p. 22).
- The **Massachusetts** 2019 economic development plan, [Partnerships for Growth](#), highlights the state’s plan for developing a skilled workforce by creating new employment pathways for youth and investing in high schools. The state identifies “apprenticeship programs, applied learning opportunities, and credential offerings” (p. 19) as strategies to expand pathways to in-demand careers. The state also launched its [High-Quality College and Career Pathways initiative](#) in 2017, which outlines its strategy for expanding student access to high-quality career pathways by promoting early college programs and certifying schools that have developed innovative pathways.
- The Business & Industry Association of **New Hampshire** released its [strategic economic plan](#) in 2013 that calls for applied and WBL opportunities, extended learning opportunities, internships, and education/business partnerships. In January 2021, the New Hampshire Department of Education also was awarded a [\\$2.9 million grant](#) from the U.S. Department of Education to expand access to career pathways and prepare students for careers in science, technology, engineering, and mathematics fields connected to postsecondary education opportunities. Recognizing the need for more equitable access to CTE statewide, the New Hampshire Department of Education partnered with a research organization to prepare a 2021 [research brief](#) outlining barriers to accessing CTE programs and specific strategies to improve access.
- The **Vermont** 2020 [comprehensive economic development strategy](#) outlines the state’s plan to develop and maintain a statewide system of workforce education and training. The report recommends improving CTE for high school students, in addition to developing Grades 9–14 career pathways that focus on Vermont’s key economic sectors and connect directly to postsecondary education. Since 2013, the state has maintained a [Flexible Pathways Initiative](#) that supports multiple pathways for students, including WBL, CTE, and accelerated college programming.



Work-Based Learning Programs

WBL programs provide structured opportunities for students to engage in authentic workplace settings to explore fields of interest while applying academic and career-specific skills (Giffin et al., 2018; see also the [Work-Based Learning Tool Kit](#)). The most robust WBL experiences typically take the form of internships, apprenticeships, or co-ops, which allow students to engage in workplace responsibilities during a period of months or years (Alfeld et al., 2013). High-quality programs reinforce and deepen classroom knowledge by encouraging students to connect what they learn in the workplace to classroom curriculum and vice versa. For example, a student completing WBL in a healthcare setting might use their workplace experiences to enhance academic learning from a biology course. In addition to benefiting students, WBL programs have the potential to generate broader economic gains by developing workers with the skills needed to bolster local businesses (National Governors Association, 2020).

In contrast to traditional, classroom-based learning, WBL situates learning in applied, real-world contexts. Students use their knowledge and skills to solve practical problems or produce concrete products. Learning in this type of setting, in which students' assignments contribute to business outcomes, may be especially motivating for students who feel disengaged in conventional academic environments (Holzer & Lerman, 2014). When WBL is paid and integrated into the school day, these programs can eliminate the need for students to choose between advancing their education or building their résumés, thus potentially retaining students who might otherwise exit high school early to work.

Although research on the effectiveness of WBL is still emerging, existing evaluations point to WBL as a promising strategy to support students' educational and employment outcomes. Studies have found that high school students who participated in WBL were more likely than nonparticipants to graduate from high school on time and leave high school with a plan for postsecondary education (Gemici & Rojewski, 2010; Warner et al., 2016). Researchers also have documented relationships between involvement in apprenticeships, co-ops, and internships during high school and positive employment outcomes, such as higher earnings, better job quality, increased comfort with soft skills, and a lower likelihood of unemployment following high school (Neumark & Rothstein, 2006; Ross et al., 2020). Within Region 1, an evaluation of New Hampshire's Extended Learning Opportunities (ELOs), which include apprenticeships and internships, found that students who participated in school-facilitated (i.e., nonvirtual) ELOs were more likely than non-ELO students to be on track to graduate, take the SAT, and enroll in college within 6 months after high school graduation (Callahan et al., 2016).

Young men, including young men from historically underserved populations, appear particularly likely to benefit from WBL participation (Kemple & Willner, 2008; Neumark & Rothstein, 2005;

Theodos et al., 2017). Multiple studies, including rigorous randomized controlled trials, found especially strong impacts of WBL on men’s rates of high school graduation, college enrollment, and earnings. These findings are especially relevant, given recent data showing that young men’s employment and college enrollment rates are lower than those of young women (Abraham & Kearney, 2018; Lopez & Gonzalez-Barrera, 2014). Expanding high school WBL pathways may be a responsive educational strategy to counteract the current gender gap in postsecondary trajectories.

Common barriers to equitable access to WBL opportunities include participant selection criteria, transportation, and variations in program quality between schools and districts (Alfeld et al., 2013; Altstadt et al., 2020; Zinth, 2018). Strategies to prevent and address inequities in WBL include the following:

- Critically review existing school- or district-level standards (e.g., minimum grade point average, attendance records) for participation in WBL programs. Eliminate or change criteria to allow more students to participate.
- Offer paid WBL opportunities to expand participation among students from low- and middle-income households.
- Offer virtual or blended WBL opportunities to increase access for students without individual transportation. Districts can alleviate transportation challenges by arranging shared transportation to business centers or offering student passes for public transit systems.
- Define and monitor state- or districtwide standards for WBL quality; articulate expectations for participating students and employers; and adjust resources (e.g., technical assistance, funding) to optimize benefits for students who are historically underresourced, such as those from low-income backgrounds and those with disabilities.

Definitions of WBL From Two Region 1 States

New Hampshire: “[Work-based learning](#) is an educational strategy that offers students knowledge and skills through instruction or study, in a real-world workplace environment, to deepen their learning and explore career fields in an authentic setting.”

Vermont: [Work-based learning](#) is an educational experience involving “student interactions with industry or community professionals in real, virtual, online, or simulated work environments that expose learners to postsecondary options, provide opportunities for skill development and proficiency attainment, and allow students to reinforce and deepen their school-based learning.”

Additional action steps related to WBL are in Table 1.

Career and Technical Education Programs

CTE programs offer course sequences that equip students with occupation-specific knowledge and technical skills in preparation for entry into related careers and postsecondary education (National Center for Education Statistics, n.d.). Many CTE programs support the development of skills essential to one of 16 “career clusters” spanning a range of fields (Holzer et al., 2013). Example career clusters include health science, information technology, and manufacturing.

State and national initiatives, such as the federal [Strengthening Career and Technical Education for the 21st Century Act of 2018 \(Perkins V\)](#), have reinforced CTE’s role in preparing students for high-demand careers and postsecondary education (Rosen et al., 2018; U.S. Department of Education, 2019). These careers fill a growing gap in the U.S. labor market while providing workers with decent entry-level wages and expanded earning potential across time (Burning Glass Technologies, n.d.; Carnevale et al., 2018).

The existing research on high school CTE programs is limited but of high quality. Recent evaluations tend to employ quasi-experimental or experimental designs, in which outcomes for CTE participants are compared with a similar group of nonparticipants (Brunner et al., 2019; Dougherty, 2018; Hughes et al., 2020). Results from these studies found positive relationships between CTE participation and rates of on-time high school graduation, completion of college preparatory mathematics courses, college attendance, and earnings. More research is needed, however, to understand the effect of CTE enrollment on different student subgroups. The Brunner et al. (2019) study, for example, observed that positive outcomes associated with CTE, such as higher earnings, accrued primarily to men but not women.

Although there is a growing trend toward creating and revamping CTE to incorporate rigorous academic standards that lead to both careers and postsecondary degrees, some programs have yet to raise academic expectations (Holzer et al., 2013). Some CTE programs of study are misaligned with current labor market needs, do not adequately prepare students for postsecondary education, and/or teach using outdated equipment. With these concerns in mind, strategies to advance equity in CTE include the following:

- State-level technical assistance programs to support adaptation and the addition of programs that align with labor market demand for skills and careers
- Outreach and marketing efforts to expand awareness of CTE options and postsecondary outcomes among all students and families, including high-achieving students
- Maintaining high academic expectations for performance in both CTE courses and general academic courses to prepare students for careers and postsecondary opportunities

- Increasing the flexibility of high school pathways to enable students to easily shift into and out of CTE programs.

Additional action steps related to CTE are in Table 1.

Accelerated College Credit Programs

Accelerated college credit programs allow students to complete and obtain transferrable credit for college-level coursework while still enrolled in high school. These programs offer students experience completing college-level coursework and navigating institutions of higher education, while reducing the time and cost to postsecondary degree completion (Tobolowsky & Allen, 2016). Students typically earn credit toward a college degree, high school graduation, or both. Accelerated college credit programs vary widely (College & Career Readiness & Success Center [CCRS] at American Institutes for Research, 2013), but most fall under the following four types:

- **Exam-based** options, such as Advanced Placement (AP) and International Baccalaureate (IB), are perhaps the most common types of accelerated college credit programs. Students may earn college credit by achieving a minimum score on AP or IB exams; specific guidelines for awarding credit vary by college.
- **Dual-enrollment** programs allow students to enroll in college-level courses taught by college-level faculty in postsecondary settings. Dual enrollment closely replicates what students would experience if they were enrolled as college students.
- **Concurrent enrollment** programs offer college-level courses taught by high school teachers at students' high schools. The courses and teachers must be preapproved by the credit-granting higher education institution.
- **Early college models** involve a high school partnering with a postsecondary institution to provide a structured pathway for all students to earn an associate's degree (or up to 2 years of college credit) alongside a high school diploma. Early college models typically enroll students who have historically faced systemic barriers to accessing higher education.

Accelerated college credit programs were initially introduced to provide challenging coursework for high-achieving students (CCRS, 2013; Giani et al., 2014; Tobolowsky & Allen, 2016). Today, schools and policymakers are more likely than in the past to view accelerated college credit programs as a stepping-stone to college enrollment for all students, especially students from groups historically underrepresented on college campuses or potential first-generation college students. Early college models may be particularly suited to advance this goal because of their focus on enrolling students who are underresourced. For example, the Massachusetts [Early College Program Designation Criteria](#) names equitable access as its first guiding principle,

ensuring that programs prioritize students who are underrepresented in higher education enrollment and completion. This target population, combined with the expectation that students will earn a substantial number of college credits prior to high school graduation, represents a departure from traditional pathways to college.

Numerous studies conducted across various settings suggest participation in accelerated college credit programs, including dual enrollment, early college models, and exam-based options, are positively related to educational outcomes (e.g., Berger et al., 2014; Song & Zeiser, 2019). Recent summaries of the research on dual enrollment highlight its association with increased rates of high school graduation, college readiness, college enrollment, and college completion (An & Taylor, 2019; What Works Clearinghouse, 2017). Experimental studies of early college models also have documented positive impacts on similar types of outcomes for students (Edmunds et al., 2017; Haxton et al., 2016). Exam-based options, such as AP or IB, have not been evaluated to the same extent as other accelerated college credit programs. Still, the research that does exist points to a positive relationship between exam-based enrollment and college readiness, persistence, and time to degree completion (Burns et al., 2019; Davis et al., 2017). Notably, the research indicates that students of various races/ethnicities and income levels, in addition to first-generation students, stand to benefit from accelerated college credit programs (An, 2013; An & Taylor, 2019; Edmunds et al., 2017).

With the exception of early college models, participation in accelerated college credit programs tends to be inequitably distributed among student populations. In general, participants are disproportionately White and/or from middle- to upper income families (Davis et al., 2017; Lochmiller et al., 2016; Pierson et al., 2017). Strategies to broaden participation and success in accelerated college credit programs for all students, including students of color and students who are economically disadvantaged, include the following:

Case Study: The Aspirations Program in Maine

Through the Aspirations Program, the Maine Legislature pays tuition for eligible high school students to take up to 12 credits per academic year at participating higher education institutions, including the University of Maine system and the Maine Community College system. Students can earn credits toward both their high school diploma and a postsecondary degree. The program is administered by the Maine Department of Education. For more information, see <https://www.maine.gov/doe/learning/highered/earlycollege>.

- Critically review existing school- or district-level standards (e.g., minimum grade point average, attendance record) for participation in accelerated college programs. Eliminate or relax criteria to allow more students to participate.

- Proactively share information about available accelerated college programs with students and their families. Provide outreach materials in families’ home languages.
- Set aside funding to reduce costs for tuition, books, and fees.
- Expand online options and/or high school–based options to increase access for students without transportation.
- Implement systems and activities to support the social and metacognitive skills associated with success in college coursework. Specific activities might include cohort models, mentoring, or workshops on topics such as time management or study skills.
- Schedule regular student check-ins with an advisor or instructor who can identify whether students are struggling and can match students to appropriate supports.
- Monitor equity gaps in access and outcomes and set specific goals to reduce inequities.

Additional action steps related to accelerated college credit programs are in Table 1.

Table 1. Action Steps for Stakeholders

	Teacher	Administrator	Policymaker and education agency staff	Employer	Student/guardian
1. Collaborate with other stakeholders to spread awareness of new and existing programs.	•	•	•	•	•
2. Create an advisory committee of diverse representatives from education, business, and the community to provide input on programs.	•	•	•	•	•
3. Establish statewide standards to ensure quality across schools.	•	•	•	•	•
4. Identify academic standards or learning goals in courses that students can fulfill through WBL, CTE, and/or accelerated college credit programs.	•	•	•		
5. Embed employability skills into coursework and standards.	•	•	•		
6. Establish scholarships or waivers to help defray student costs associated with programming, such as tuition, fees, textbooks, and transportation.		•	•	•	
7. Collect and analyze data to monitor the extent to which access to and success in programs is equitable for all groups of students.		•	•		

	Teacher	Administrator	Policymaker and education agency staff	Employer	Student/guardian
8. Dedicate a full- or part-time position to coordinate programming.		•	•	•	
9. Provide funding and professional development opportunities to support programming.		•	•	•	
10. Evaluate alignment between your school, district, or state’s programs and labor market predictions.		•	•		
11. Conduct a scan to understand the landscape of CTE programs in your region or state to identify strengths and opportunities.		•	•		
12. Examine and adapt policies to increase flexibility of student pathways, including the ease with which students can move between programs.		•	•		
13. Identify and incorporate opportunities for students to demonstrate and apply nontechnical skills critical to employment, such as communication, problem solving, and teamwork.	•	•			
14. Provide technical or other assistance to schools and districts looking to implement or improve programs.			•	•	
15. Encourage your local and regional chambers of commerce or business and industry associations to offer programming and opportunities for students.			•	•	
16. Engage with schools to share career opportunities and offer internships, job shadowing, or mentorships for students.				•	•
17. Ask teachers and/or counselors to identify programs that are a strong fit for your interests and skills.					•
18. Teach concurrent enrollment courses at your high school by becoming an approved instructor.	•	•			
19. Establish and maintain relationships with local institutions of higher education.		•	•		

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