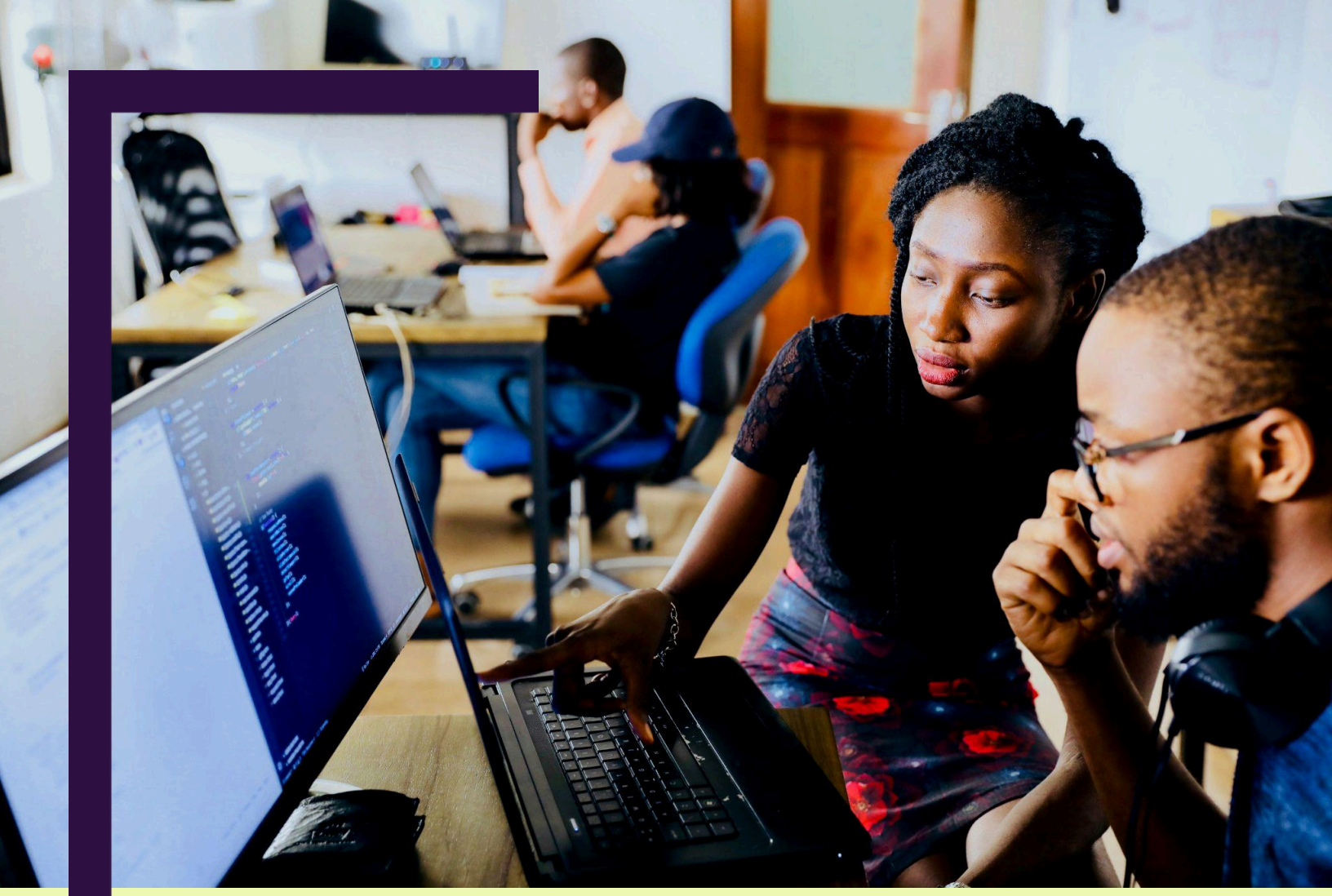

Building Career Pathways For Young People

AN ASSESSMENT OF EVIDENCE AND OPPORTUNITIES

APRIL 2025

PROJECT EVIDENT

Authors

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Executive Summary

As the value of postsecondary education and training in the labor market has increased, the economic gap between workers with postsecondary education and those without has widened. A growing number of states and organizations are adopting "career pathways" approaches to support economic mobility for students and learners. Pathways is defined by a structured sequence of education, training, employment, and other services designed to help people enter and advance in industries with high demand for skills. Specifics of pathways programs and practices vary widely across states, education and workforce systems, and organizations.

In the fall of 2024, Project Evident conducted an evidence review to understand the knowledge gaps around building successful career pathways for young people under 25. The goals were to take stock of existing research evidence and identify gaps that need to be filled to support effective and equitable pathways at scale.

The assessment combined an extensive review of research literature with interviews with more than 40 researchers and practitioners to surface key evidence gaps. The evidence review included in-school and out-of-school programs that seek to improve career-related outcomes for young people in K-12, postsecondary education, and workforce programs.

Current State of Evidence

Middle School	Efforts to expand career exploration and exposure to career-technical education (CTE) have increased in recent years, but research on outcomes, implementation, cost, and sustainability is limited.
High School	A growing body of evidence strongly suggests that CTE participation in high school can improve high school performance and completion, and chances of employment with higher earnings after high school. Strongest evidence is for intensive, multi-faceted programs and whole-school approaches.
Post-secondary and workforce	Strongest evidence of long-term economic impact for young people is limited to a small number of sector-based programs. On average, a non-degree credential is associated with higher earnings, but there is significant variation in returns by field of study and demographics. Disparities in outcomes for different credentials in different fields are not well understood. Programs for high-wage, high-growth occupations have high barriers to entry and success for young people who leave high school without a diploma or those who face severe life challenges.

Summary of Evidence Gaps

The scan highlighted common evidence gaps across systems and programs that span a young person's trajectory. These include the following:

Outcomes for youth under 25	• Longitudinal research on education and labor market trajectory and outcomes, including evidence of economic advancement • Research on causal impact of programs and practices
Equity	• Disaggregated evidence for different groups (including by race/ethnicity, gender, disability, socio-economic status, and geography) • Research on improving access to high-return pathways for young people with high needs and barriers • Understanding of factors that affect disparities in access and outcomes, including programmatic factors that influence youth choices
Cost-benefit	• Return-on-investment (ROI) for employer participation • Cost-benefit assessments from a societal perspective • Return on non-degree credentials for different groups in different fields

Scale, Sustainability	• Actionable evidence to guide design, implementation, and scale
	  ○ How specific program components and practices drive outcomes
	  ○ How context and capacity drive implementation and outcomes (such as policy and funding, community and labor market characteristics, staffing and partnerships, etc.)
	  ○ How to improve alignment between supply of programs and credentials and labor market demand
	• Research on impact of policy and systems change efforts

Key Areas of Evidence Gaps Across Systems

The literature review and interviews for the scan highlighted evidence gaps in five key areas that are relevant to different systems and programs across a young person's career pathway.

Work-based learning	Non-degree credentials	Career navigation	Employer engagement	Social Capital

1. Work-Based Learning

A body of evidence from European countries shows that work-based learning programs, including high school apprenticeships, can have a positive effect on labor market outcomes. But research on how work-based learning in the United States affects outcomes for youth under 25 is very limited. Strongest evidence of labor market gains comes from the registered apprenticeship program, which does not specifically seek to serve young people but has seen significant growth in participation by young people in recent years. There is emerging evidence that youth-focused apprenticeships may help with positive transitions to college and work after high school. Work-based learning is also a key component of successful high school CTE and sector-based programs, but there are gaps in our understanding of what makes them effective.

2. Non-Degree Credentials

There is a plethora of non-degree credentials available in the market at the secondary and postsecondary level. This includes certificates issued by colleges, credentials awarded by professional associations or industry groups, licenses awarded by government agencies, digital badges and microcredentials, among others. Navigating this landscape has become increasingly more complex for young people, and there are big gaps in evidence around the comparative value of different credentials in different fields and for different groups.

3. Employer Engagement

Strong employer engagement is a core component of a career pathways approach, and evidence suggests that it is perhaps the most challenging to implement. There is limited research on effective strategies to develop and sustain productive employer partnerships for pathways programs at scale, and research on how different types or intensity of employer engagement drive youth outcomes is limited. There are big gaps in evidence around effective use of financial and policy incentives to engage employers; models for training and supporting employers to engage young people in productive work-based learning; demonstrating the value proposition or ROI for participating in training and work-based learning; and strategies to engage employers in improving job quality and supporting workplace advancement.

4. Career Navigation

A core principle of the career pathways approach is that an individual should be able to sequence a series of education and work experiences at different stages of their lives to build skills that are in demand and advance their economic prospects. But there is very little evidence on how to help young people do this effectively in our fragmented education and workforce landscape, especially around advancement. Many programs offer career advising and transition support, but research on how these services support outcomes is limited. As artificial intelligence (AI) brings rapid shifts in the labor market and the number of credentials multiply, increased support to help young people build navigation skills and provide them with tools to

make effective choices is of utmost importance. There is great need to build evidence for what an integrated, cross-system approach to career navigation could look like, especially one that can effectively support transitions and advancement and foster youth agency and skills to navigate pathways.

5. Social Capital

There is emerging evidence that social capital — or the benefits and resources one can obtain through their social networks and interpersonal connections — plays an important role in academic success and economic advancement. Recent research shows that "economic connectedness" — or having friends in higher socioeconomic strata — is a strong predictor of upward mobility. Many career pathway programs incorporate practices to help young people build networks and connections, but their implementation or outcomes are not measured. More evidence is needed to understand how programs and institutions can help young people develop different types of social ties or expand their network for the benefit of their career aspirations.

How Funders Can Help Bridge Career Pathways Evidence Gaps

Young people need a continuum of developmentally appropriate supports that help them progressively advance their knowledge, skills, and experiences at different stages of adolescence and adulthood. Those that face challenges due to poverty, social inequality, or personal trauma need additional supports to stay on a positive trajectory. A lot of progress has been made in recent years in advancing the evidence base for a career pathways approach, but significant gaps remain in our understanding of what works for whom in creating pathways to mobility and wellbeing for young people.

The evidence gaps, however, do not mean that "nothing works." There is rigorous evidence that programs that take a comprehensive approach to developing and supporting young people, in strong partnership with employers, can produce outcomes for young people. But education and workforce development policy and funding generally do not support quality implementation of evidence-based models and practices at scale. Moreover, investments in program innovations and expansions are frequently not accompanied by investments in evidence building and learning.

Below are some key ways in which funders of career pathways programs and research can help bridge the evidence gaps discussed in this report.

1. Build alignment around outcomes, incentives, and language

Programs and initiatives in the pathways space are fragmented across K-12, higher education, and workforce systems, and outcome expectations and incentives are commonly misaligned. Misalignment in outcome goals affects programs and evidence building in several ways —

creating challenges in defining success, designing services, and determining what to measure. In addition, lack of consistent terminology and shared definitions in the field around programs and practices — such as dual enrollment, work-based learning, earn-and-learn, or even career pathways — can be a big obstacle to developing a cohesive body of knowledge.

Funders can lead efforts to build alignment on goals and definitions of career pathways programs and practices that aim to create a common understanding and language in the field. This can include a shared framework designed collaboratively with youth, practitioners, employers, and researchers, as well as activities to incentivize and encourage its adoption.

2. Test innovations in career exploration, navigation, and advancement

Many career pathways programs help people enter specific sectors or occupations, but there is very limited evidence on exploration opportunities or navigation supports that can help students choose pathways that are right for them and that can help them advance in their career. Current funding and policy practices often prioritize metrics around quantity (like numbers served) and immediate outcomes (like job placement in specific sectors), and do not sufficiently incentivize supports for career exploration, navigation of career choices, or navigation of transitions or advancement. As such, expectations of long-term outcomes are not always backed by resources and services that may be required to produce those outcomes.

Funders can work with practitioners, youth, employers, and researchers to test practices and innovations that promote effective career exploration, navigation, and advancement practices. This will need to include efforts to create a shared understanding of success and metrics related to proximal and long-term outcomes, as well as a framework and secure apparatus to incentivize employer data sharing.

3. Mobilize employers to advance evidence on work-based learning and job quality

Evidence suggests that the availability and quality of work-based learning connected to career pathways vary widely, and a substantial share of middle-skill jobs that require some postsecondary education or credential below a four-year degree do not pay a family-sustaining wage or support advancement. Stronger, large-scale employer engagement is key to improving the availability and quality of work-based learning, as well as the quality of early career, middle-skills jobs in different industries.

Funders can mobilize employers in different fields to expand access to work-based learning opportunities and improve the quality of early career work. This will need to include efforts to incentivize employers to participate in data collection, evaluation, and learning activities that can help bolster the evidence base, including a collaborative framework and secure data-sharing apparatus.

4. Support a holistic approach to building evidence

The assessment highlighted that systemic changes are necessary to the way we fund, build and share evidence. There was a high level of alignment among researchers and practitioners interviewed for this assessment around the need to augment quantitative evaluations of outcomes with other types of research that can contextualize the results, explain the mechanisms that affect those outcomes, and produce actionable evidence for future strategy, practice, and policy.

Funders can embrace a broader range of methodologies and research practices to meet the evidence gaps surfaced in this report.

They can:

- Incentivize innovations in causal research and the advancement of quasi-experimental methods
- Prioritize outcome-focused implementation and cost research that can inform policy and practice
- Build practitioner capacity for data use and evidence building for timely improvements
- Incentivize youth and practitioner engagement in evidence-building activities
- Invest in communication and learning activities to bridge the evidence-to-practice gap
- Invest in research to assess the impact of policy and systems-level changes
- Help address data barriers to longitudinal tracking of outcomes
- Incentivize more inclusive and expansive measures of success and youth development

A more holistic approach to evidence building — that is centered on meeting the needs of young people and enabling practitioners who serve them — can help researchers, practitioners and funders produce timely knowledge that effectively informs policy and practice in the evolving labor market.

1

Introduction

Most jobs in the United States will require postsecondary education or training by 2031, according to recent projections.[1] As the value of postsecondary education and training in the labor market has increased, the economic gap between workers with postsecondary education and those without has widened. And there are persistent disparities in access to opportunity and economic advancement for different groups that result from income, race or ethnicity, gender, or disability. In this context, a growing number of states, localities, and organizations are adopting "career pathways" approaches to help people prepare for jobs and industries that can help them succeed and advance in the labor market.

Between September and December of 2024, Project Evident conducted an evidence review to understand the knowledge gaps around building successful career pathways for young people under 25. The primary goal of the project was to better understand the evidence gaps that, if filled, can lead to actionable knowledge for funders, policymakers, and practitioners working to build career pathways for people.[2]

Career Pathways Approach

In education and workforce development contexts, a "career pathway" often refers to a coordinated sequence of educational courses, training programs, and support services that are aligned with employer needs and designed to help individuals enter and advance within a specific industry sector or occupational cluster.

Two key federal education and workforce funding streams — Workforce Innovation and Opportunity Act (WIOA) and the Carl D. Perkins Career and Technical Education Act (commonly known as Perkins V in its most recent reauthorization) — define career pathways as "a combination of rigorous and high-quality education, training, and other services" that is aligned with employer and industry skill needs, and structured to provide clear on- and off-ramps so that individuals can gain skills, credentials, and job opportunities in an incremental yet connected manner as they advance.[3]

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[1] Carnevale et al. (2023)
[2] The evidence assessment was conducted in partnership with the Pathways and Workforce Funders (PWF) Collaborative — a nationwide network of over 40 philanthropic organizations working collectively to accelerate impact for students and young adults in the K-12, postsecondary, and workforce systems.
[3] Congress (2022)

Specifics of career pathways strategies and program models vary widely across target populations (e.g., high school students, out-of-school youth, adults); industry sector focus; lead and partner institutions (e.g., K-12 schools, community colleges, intermediaries), and states.[4]

Scope and Guiding Questions

For this assessment, the Project Evident team used the term "career pathways" broadly to include programs or efforts that aim to support young people up to age 25 with career-related outcomes during their journey from adolescence to adulthood. This includes in-school and out-of-school programs or models that serve young people in K-12 and postsecondary education and training providers, including community colleges and community-based organizations.[5]

The assessment was guided by the following questions:

- **Where are the biggest evidence gaps when it comes to creating career pathways across K-12, postsecondary, and workforce for young people?**
    - What are the key questions that need to be answered in terms of what works and for whom?
- **What evidence is needed to mobilize impact and equitable outcomes at scale?**
    - What evidence and knowledge can give practitioners, funders, and policymakers the tools they need to create and sustain effective, equitable pathways at scale?

Methodology

To answer these questions, the Project Evident team reviewed relevant research literature and interviewed experts in the field.

1. Literature Review

The team reviewed nearly 200 publications released between 2000 and October 2024 that discuss research findings from programs that serve people in the United States.

These primarily include:

- Large-scale evidence reviews and meta-analysis
- Third-party outcome evaluations (experimental and non-experimental)
- Implementation and cost studies

[4] Kazis (2016).
[5] The scope of the assessment was defined with the Governance Committee of the Pathways and Workforce Funders Collaborative.

The team started with a list of high-quality evidence scans and meta-analyses on programs and practices relevant to the scope of this project, which were identified with the assistance of researchers and practitioners who participated in interviews for the project (see below). In the last five years, research teams across several organizations have produced evidence syntheses for programs, practices, or populations that are related to career pathways in the United States. The goal for this project was to build on those efforts in identifying evidence gaps.

In addition to reviewing the findings from evidence synthesis or meta-analyses, the team reviewed individual studies listed in these papers and other literature identified by expert interviewees. The team also searched databases and clearinghouses for career pathways programs.

2. Expert Interviews

Between October and December of 2024, the team interviewed more than 40 people with knowledge of and expertise in career pathways programs and research. The goals of the semi-structured interviews were to:

- Contextualize existing evidence base and fill gaps in knowledge from published research
- Learn about upcoming projects that can advance the evidence base
- Capture viewpoints on priorities for future evidence assessments from different vantage points in the K-12, postsecondary, and workforce space, including from researchers, practitioners, and intermediaries. The team also engaged a small set of funders.

The team started with a list of 20 experts who were identified through the initial review of literature and asked them to recommend others who might inform this work. Input from the first round of interviews and literature review were used to identify additional interviewees and research for subsequent rounds. Transcripts and notes from these interviews were coded and analyzed thematically. The expert interviews, typically not a component of existing evidence scans, helped contextualize the research literature in a meaningful way and were a significant value-add to producing a comprehensive look at the state of the field.

Interpreting the Evidence

As shown in **Table 1** below, the top criteria for assessing existing evidence was outcomes: Is there evidence of education or workforce outcomes for people under 25 in the United States for a program or model that can be considered a career pathways approach, as outlined for this assessment? Then, we assessed the evidence of outcomes with a lens on equity, cost-benefit, scale, and sustainability.

Table 1: Evidence Assessment Framework

CRITERIA	QUESTIONS
Outcomes for youth under 25	Is there evidence of education or workforce outcomes for young people in the United States? What type of evidence is it? Can we causally attribute the outcomes, or are they observational?
Equity	Is there evidence of outcomes for different groups, including by race/ethnicity, geography, and learning needs?
Cost-benefit	Is there any cost-benefit research? Or evidence of return on investment (ROI) for those involved?
Scale and sustainability	What are the facilitators or barriers to scale and sustainability of models with evidence of outcomes for young people?

Given the broad scope of our review (from middle school to age 25), we did not assess and report on the strengths and weaknesses of every evaluation of a particular program or model. Many such evidence reviews already exist, and they often categorize the strength of the available evidence using criteria that typically include considerations for research design, sample size, and number of studies. Additionally, the categorization of evidence levels can vary depending on the criteria used. For example, some evidence reviews of apprenticeship models consider them to have "strong" evidence, and others label them to have a "promising" or "emerging" level of evidence.

While such assessments and categorization of evidence levels are valuable and useful, the goal for this project was to surface evidence gaps. As such, the Project Evident team sought to understand the "headlines" around existing evidence in terms of outcomes, equity, cost-benefit, scale, and sustainability and produce a clear understanding of where the gaps are across a young person's trajectory. In other words, what can we definitively say about what works for whom and under what circumstances?

Causal vs. Non-Causal Evidence of Outcomes

When discussing evidence of outcomes, the report describes whether there is evidence to suggest that a program caused a difference in outcomes for young people, or whether the outcomes were associated with a program or model without sufficient evidence for causal attribution.

- RCTs and certain types of quasi-experimental designs allow for causal inference that a program or practice itself made the difference. These include natural experiments that rely on a lottery process to enroll or strongly designed regression discontinuity evaluations that exploit a clearly defined cut-off point for eligibility to create comparison groups.
- For other types of quasi-experimental designs (like pre/post or matching) or observational studies, measured results can only be associated or linked to exposure to a program or practice without definitively proving causation.

In making distinctions around causal inference, the team relied on information available about the study design, prior evidence reviews, and assessments in databases like the What Works Clearinghouse.

Limitations

There are several limitations to the analysis presented in the report.

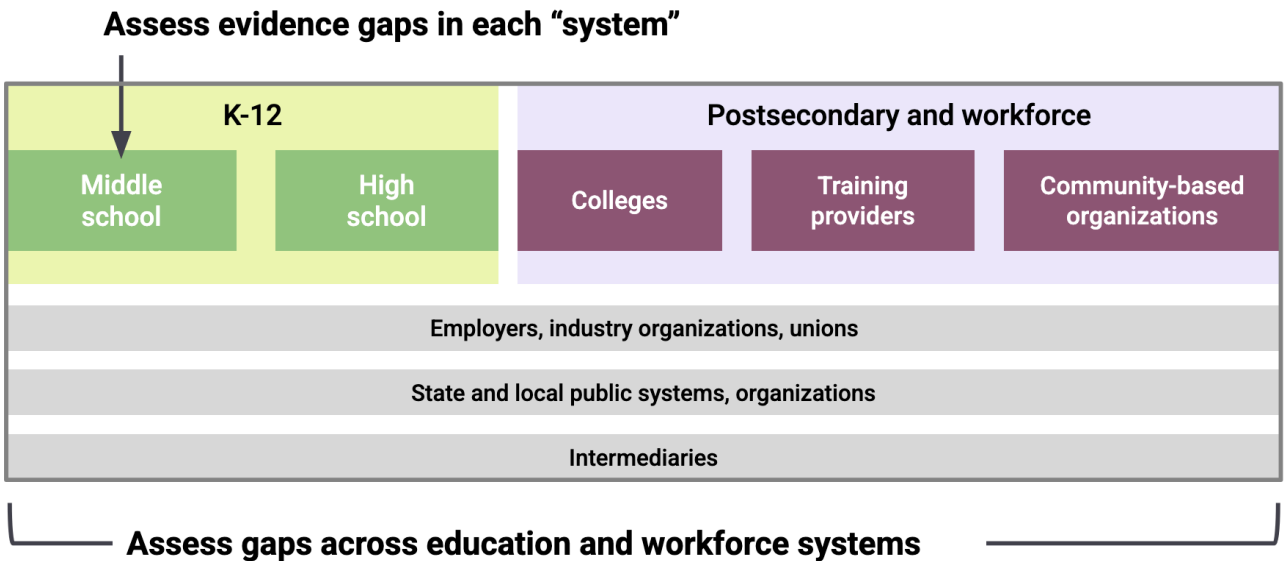
- The scope of this assessment is broad and spans programs and practices across multiple systems, geographies, populations, and policy domains. The project team conducted an extensive evidence scan but cannot be confident that all programs and practices that can be categorized as "career pathways" are represented here.
- The evidence scan did not focus on programs that primarily target outcomes related to secondary or postsecondary persistence and completion, or career-related efforts at four-year colleges. The scan also did not include programs that target outcomes related to legal system involvement, community violence, or behavioral health, as means to improve employability and employment outcomes for young people. Such programs and efforts are very important to a pathways approach, particularly for young people who face significant personal and structural obstacles, and are priorities for many funders in the PWF Collaborative. They were not included in this specific assessment to narrow the scope of the evidence review.
- The evidence scan focused on programs or initiatives that seek to directly affect and measure outcomes for young people. It did not extensively review initiatives that primarily target capacity building or "systems change" outcomes as a means to affect population-level outcome (for example, teacher training programs or collaborative network building efforts in a local area). Such initiatives play an important role in the career pathways ecosystem to affect outcomes for young people but were not in the scope of this project.

- Nearly all the literature included in the assessment are evaluations or research conducted by third-party organizations. States, localities, and providers often conduct their own analysis, outcome evaluations, implementation analysis, and case studies, but it was not feasible to identify and assess these across all states within the scope, budget and timeline of this project.
- The team was able to engage with a significant number of researchers and thought leaders in the pathways space, which is a strength of this project. However, pathways efforts vary considerably across states and localities, and the team only engaged practitioners across a handful of jurisdictions. As such, the assessment of key gaps may not be generalizable across all states and localities.

Report Roadmap

In the analysis phase, we used findings from the literature review and the interviews to assess evidence gaps within a lead "system" and across a young person's trajectory from K-12 to postsecondary and workforce (Figure 1). A cross-system approach helped the team surface common evidence gaps and priorities in the field.

Figure 1: Organization of Evidence Assessment



In the next three chapters, we discuss existing evidence and evidence gaps within systems — middle school, high school, post-secondary, and workforce programs.

- **Chapter 2:** Middle School
- **Chapter 3:** High School

- **Chapter 4:** Post-Secondary and Workforce Programs
    - Sector Programs
    - Community College Programs
    - Opportunity Youth Programs

The final three chapters contain a cross-system discussion of work-based learning and evidence gaps, along with a conclusion that discusses implications for future research investments.

- **Chapter 5:** Work-Based Learning
- **Chapter 6:** Evidence Gaps Across Systems
- **Chapter 7:** Looking Ahead

The report ends with supplemental materials and a list of references organized by chapter.

- **Appendix A:** Interviewee list
- **Appendix B:** List of upcoming projects
- **Appendix C:** List of “dream” projects from expert interviewees
- **Appendix D:** References

2

Middle School

Key Takeaways

A broad range of strategies and practices are employed in middle grades to provide career exploration and guidance. States have expanded career and technical education (CTE) efforts in earlier grades in recent years. Evidence base is nascent.

Evidence Snapshot	
Outcomes for youth under 25	Most research is observational or descriptive with small sample sizes. Career exploration and guidance efforts have been associated with improved academic engagement, performance, and self-reported career awareness. In qualitative studies, students, families, and teachers highlight the value of early career exploration. Outcome evaluation of programs or practices are very limited, and how these efforts affect high school transition, postsecondary readiness, or work readiness is little understood.
Equity	Research with disaggregated evidence of outcomes is very limited.
Cost-benefit	Research on cost-benefit or return on investment was not found.
Scale and sustainability	Limited research on implementation, scale, or sustainability. No published research yet on outcomes from recent scaling efforts or CTE expansion in lower grades.

Key Gaps

There are major gaps in research in the middle grades across all four areas above.

Many interviewees said that recent expansion efforts did not include sufficient investments in implementation, sustainability, measurement and learning, or outcome evaluation. K-12 practitioners said they lacked actionable, practitioner-focused evidence to shape their decisions around implementation and scaling. There was consensus that more work was needed to align the field around target outcomes and alignment with high school CTE efforts.

Subsections in this chapter

Context

The 2018 reauthorization of Perkins V, which provides federal funding to states to support CTE programs for students and adults, encouraged career exploration and development activities in the middle grades and allowed funds to be spent on students as early as fifth grade.[6] While middle school career-related efforts already existed, the latest reauthorization contributed to a national momentum to expand career exploration for middle school students, and many states and school districts are experimenting with CTE efforts.

A broad range of strategies and practices are employed in middle grades to provide career exploration and guidance, including:

- **Advising and planning.** Can include interest inventories, goal setting, and mapping high school course plans. Many states require students to create a personalized plan to help guide decisions about future course taking and potential careers.[7]
- **Career and technical student organizations (CTSOs).** Function as in-school, co-curricular programs led by CTE teachers in middle and high schools.
- **Project-based learning.** Integrates longer-term, hands-on projects with academic coursework to help students explore careers by tackling real-world challenges and building problem-solving skills.
- **Career courses and exploratory classes.** Can include classes or units within existing courses that focus on career exploration and postsecondary planning. May also include introductory CTE courses to help students identify careers of interest and develop employability skills.

[6] Previous iteration of the law supported activities starting at seventh grade. Lammers and Mathers (2024).
[7] American Student Assistance (2024).

- **Career-relevant instruction.** Involves integration of career relevance and knowledge into core middle school subjects (like examples of jobs and careers in which the content of courses has application).
- **Short-term career awareness activities.** Can include guest speakers, career fairs, workplace tours, and short-term job-shadowing aimed at broadening students' understanding of potential professions.
- **Technology-enhanced career exploration.** Platforms and digital tools enable students to explore careers virtually.
- **Summer enrichment programs.** Can focus on exploration of different sectors or careers, as well as immersive exploration of certain sectors like STEM.
- **Early work-based learning:** Most common practice is job shadowing.
- **Mentorship.** Typically, a part of models that engage employers, families, or community leaders in exploration activities.
- **Whole-school approaches:** Integrate career exploration activities throughout the school environment, including school-wide events and career ambassadors (high school students or teachers who serve as guides).[8]

The outcome goals for middle school career-related programs are multifaceted — with many focusing on immediate skill building (like increased awareness and planning) that can potentially lead to longer-term benefits (like high school, postsecondary, and work readiness).

Evidence Base

There is widespread recognition that career exploration should start earlier than high school, and the case for offering such programs in middle school is aligned with a broader evidence base for youth development. However, the evidence base is nascent.

Outcomes

- **Most research on middle school career-related efforts are observational and descriptive, have very small samples, and rely on self-reported outcome measures.**

In general, middle school career-related programs and practices have been associated with short-term outcomes that include:[9]

- Improved academic engagement, motivation, and performance
- Improved self-awareness and self-esteem

[8] American Student Assistance (2021).
[9] Bellwether Education Partners (2025); American Student Assistance (2021); Godbey and Gordon (2019); McCombs et al. (2019); Ting et al. (2012); Advance CTE (2018); Orthner et al. (2012); Chaplin, Bleeker, and Booker (2010); Stone et al. (2007); Arrington (2000).

- Improved awareness of career options
- Increased interest in certain types of subjects and related careers
- Increased postsecondary aspirations
- Increased work-relevant skills (such as creativity, problem-solving)

A 2004 evidence review found that school-based career guidance programs can be impactful and cost-effective with middle school students in terms of developing their skills for career decision-making skills and career knowledge. These findings primarily reflected meta-analyses of studies conducted before 2000.[10]

Middle school career exploration may support a smoother transition to high school through improved engagement and informed decisions about high school coursework, but empirical evidence on student outcomes related to high school or postsecondary transition is very limited. In many cases, research conducted among high school students is often applied to discussions of career exploration in middle grades because of the lack of applicable research from those grades. For example, there is some evidence that suggests that participation in CTSOs is associated with higher academic engagement, college aspirations, and employability skills for high school students, which may be applicable to the middle grades. But there is no research of CTSOs at the middle grades.

Table 2 provides a snapshot of outcome evaluations of middle school programs surfaced in the scan.

Equity

- **Most studies do not disaggregate data for different groups of students.**

The scan did not find much research on access and outcomes related to middle school career programming for racial and ethnic minorities, English language learners, students in rural areas, students with disabilities, or students of different genders. More research is needed to understand barriers to participation, the effectiveness of targeted interventions, and outcomes among these groups. The availability and quality of these programs in middle grades can vary widely due to funding levels, local industry partnerships, and community support. Research is lacking on how these disparities may affect student outcomes.

[10] Hughes and Karp (2004).

Table 2: Key Outcome Evaluations of Middle School Career-Related Programs

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
• **"Roads to Success"** A comprehensive school and career planning program, designed to be implemented for 45 minutes per week in grades 7-12. Includes career exploration activities and project-based learning.	**No effect on motivation to attend school or to learn job skills. Potentially increased student confidence and career knowledge.** An experimental evaluation did not find impacts on target short-term outcomes, including motivation to go to school or to learn job skills. However, the 6-year program was only implemented for two years. Exploratory analyses found that the program may have improved students' likelihood of talking to school staff about career and school plans, their confidence in knowing how to find out about what types of jobs are best, and their confidence in knowing what is required to succeed in different careers.[11]
• **Geosciences in Middle School** Year-long career and enrichment course	**Associated with improved career knowledge, self-esteem, and academic planning, as well as better math and science grades.** The program included coursework, enrichment and career activities, including group discussions, visits to employers and museums, and talks with professionals.[12]
• **CareerStart** Year-long program trained teachers to deliver career-relevant instruction in the classroom.	**Associated with a more positive outlook on school.** A school-level RCT found that students from the treatment schools, whose teachers had received CareerStart support, were significantly more likely to value their education than students in the control schools, based on data that students self-reported in terms of how important they viewed their schooling and to what extent schools provided them with useful information and knowledge for the future[13]
• **Summer Science Exploration Program** Two-week science camp	**Associated with increasing interest in science careers and short-term school engagement.** A science camp for 8th and 9th graders that offered inquiry-based learning and hands-on experiences was found to increase positive attitudes toward science and science careers.[14]

[11] Chaplin, Bleeker, and Booker (2010).
[12] Ting et al. (2012).
[13] Orthner et al. (2012).
[14] Gibson and Chase (2002)

Cost-Benefit, Scale, and Sustainability

- **There is very limited research on cost-benefit, implementation, scaling, or funding of middle school career-related efforts.**

Research on cost-benefit or return-on-investment for middle school programs was not surface in our scan. Descriptive research on program practices and implementation lessons based on experiences of practitioners and students are available but also limited, as are qualitative or quantitative studies of system-wide or school-wide implementation of middle school career exploration. Prescriptive models that offer a structured set of services (like Career Academies in the high school setting) have not been studied at scale.

There is no published research yet on outcomes and implementation of recent scaling efforts or expansion of CTE programs. A 2024 report from ASA found that nearly all states have policies that require some type of middle grades career exploration and have dedicated funding to support such activities, but that the scale, funding levels, implementation quality, and data collection vary widely. The report found that "few states measure and support the quality of [middle school] practices by collecting data" or have a "strong ecosystem of organizations supporting the work."[15]

Key Evidence Gaps

Interviews with researchers and practitioners confirmed and contextualized findings from the literature review on key evidence gaps.

GAP: Outcome	**Research on short-term and long-term outcomes for middle school career-related models and practices.**

Outcome evaluations — causal and non-causal — of programs are very limited. There is no research on the impact of middle school career-related programming on high school or postsecondary outcomes (like high school completion or CTE participation and career pathway choices). While most interviewees who discussed middle school programs agreed that measuring the impact of these programs on employment or long-term mobility is not practical, they stressed the importance of tracking outcomes at the high school level to build evidence on the theoretical assumption that these programs can improve long-term success by enhancing high school transition and potentially choice of high-return career pathways. There was consensus that more work was needed to align the field around target outcomes and alignment with high school CTE expansion.

[15] American Student Assistance (2024).

GAP: Equity	Research on equity in access and outcomes for different groups

In addition to highlighting the lack of disaggregated evidence for different populations of students, interviewees frequently raised concerns about prematurely pushing students into career pathways at a young age and the potential for socioeconomic "tracking," which refers to the practice of placing students into different CTE pathways or courses based on their perceived ability, interests, or future career goals. Historically, "tracking" in vocational education has been associated with placing disadvantaged students in low-value or lower-level tracks, perpetuating inequalities based on race, class, or socioeconomic status. One interviewee said:

> *"To the extent that early adolescence is all about beginning to explore self-concept and possibility, it's critical. I am worried about the extent to which we try to literally back map high school CTE programs of study into middle school because, to me, that looks a little too much like tracking by socio-economic status, or it has the potential to do that in ways that I think are potentially more harmful than good."*

GAP: Cost, scale, sustainability	Research on program design/implementation that is practitioner-focused. Research on cost-benefit.

K-12 practitioners who participated in interviews said they lacked actionable, practitioner-focused evidence to shape their decisions around implementation and scaling (like decisions around staffing, training, and resource allocation, and that there was a need for a more systemic approach to piloting and expansion that is grounded in local policy and systems.

Many interviewees said that recent expansion efforts in the middle grades did not include sufficient investments in implementation and sustainability, measurement and learning, and evaluation of outcomes and cost-benefit. They said initiatives often lacked a systemic or holistic approach to program development and implementation, leading to fragmented efforts that are not aligned with high school programs or curricula. Practitioners spoke of pilots and initiatives that were launched without any design participation from administrators or teachers, considerations for how they fit into the broader landscape of middle school and high school programs, or plans in place for implementation or outcome measurement (e.g., staffing, training, data systems, etc.). For example, one interviewee said:

> *"There is this push to get more state funding for grades 5 and 6 before we even know what the [career exploration] model should look like. What needs to happen there? What does the research tell us? How do we make sure [what we do in middle grades] aligns to 9th grade?"*

Several interviewees emphasized the need to think through how districts and schools can build the capacity for effective career counseling and navigation in the context of overburdened school counselors who are also helping students in other areas of need. In general, interviewees

said that expansions and experimentations needed to be designed and funded in ways that connected them to the broader context of school districts and state policy, and with input from practitioners, families, and young people — something that they were not seeing on the ground.

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees around middle school career programming included the following:

TARGET OUTCOMES

- What should be the target outcomes for career activities at an early age? What are the measurable indicators of success?
- What does it mean to support students' "career identity"? How do you measure development of career identity? What are evidence-driven practices that help support students' career identity?

ALIGNMENT TO HIGH SCHOOL AND OTHER AREAS OF DEVELOPMENT

- How do you align middle school career efforts with high school CTE pathways without narrowing the potential for exploration? How do you prevent potential "tracking"?
- How do you effectively align career skill building with skills related to academic and social-emotional learning? How do you integrate career exploration and skill-building across instruction and the whole-school experience?
- How do exploration of music, arts, and sports align with career exploration activities in middle grades? How do we think about exploration in a holistic manner?

EFFECTIVE IMPLEMENTATION OF CAREER ADVISING

- What are the advising needs for early age students related to career pathways (e.g., academic planning, career coaching, systems navigation, and college counseling)? What is a holistic approach to providing career pathway advising?
- Where do mental health and the personal and social-emotional development of students fit into career advising efforts? Is it holistic advising, or is it separate? What are the implications for staffing and professional development?
- What are effective staffing and resource allocation models? Who should be responsible for providing postsecondary and career advising (e.g., regular school counselors, instructional staff, dedicated career counselors, etc.)?
- What are the qualifications or competencies needed for those who provide career advising? What trainings do they need to be effective? What are the job descriptions and

requirements for an educator or school counselor in the middle school space responsible for career exploration or advising?

- What types of labor market data and tools do middle school counselors need to guide students on future career pathways effectively?
- What are effective ways to involve high school students (peers) in supporting career exploration for middle school students?

3

High School

Key Takeaways

Career and Technical Education (CTE) options can range from coursework at traditional comprehensive high schools to small learning communities to whole school models.

Evidence Snapshot	
Outcomes for youth under 25	A meta-analysis of causal research found that CTE participation in high school (HS) improves high school completion, 2-year college enrollment, and post-HS employment. Strongest evidence is for intensive, multi-faceted models, including whole-school approaches. Inconsistent research on long-term postsecondary and workforce outcomes.
Equity	Evidence of positive outcomes for different groups with structural barriers (young men, low-income youth, students of color, youth with disabilities). Equitable access and gender gaps remain concerns.
Cost-benefit	Very limited research. Some models are cost-effective.
Scale and sustainability	Research evidence for multi-faceted or whole-school models is not generalizable to the way most youth access CTE coursework in comprehensive high schools.

Key Evidence Gaps

Interviews and literature review pointed to the following key evidence gaps:

- Long-term postsecondary and labor market trajectory and outcomes
- Understanding disparities in access and outcomes
  - Unpacking the gender divide in CTE participation and outcomes
  - Factors that affect student access and choices, including program design
- Understanding the value of individual services and practices within multi-faceted models
- Scaling and sustaining work-based learning, employer engagement, and career navigation

Subsections in this chapter

Context

Career pathways-related efforts in high schools can include career and technical education (CTE) classes and programs, work-based learning opportunities, and dual enrollment models that allow students to earn college credits while in high school. There is significant overlap in these approaches. For example, there are models that integrate dual enrollment and CTE instruction, and many CTE models incorporate work-based learning (WBL). This section focuses on programs and practices that can fall under the CTE umbrella. Evidence on work-based learning, including that for high school students, is discussed in Chapter 5.

This assessment did not focus on general dual enrollment programs, which have emerged as an evidence-based strategy for improving high school and college educational outcomes. A comprehensive research agenda detailing key evidence gaps and research priorities for dual enrollment programs and practices was released in 2022. The report concluded that "on average, dual enrollment programs have positive impacts on high school and college outcomes such as high school graduation, college enrollment, college success, and college completion, although the magnitude of the effects vary by study and context."[16] Priorities to advance evidence of dual enrollment included research to address inequities in dual enrollment access and outcomes and to better understand how variations in program design affect outcomes.

[16] Taylor et al. (2022).

Evidence Base

Outcomes

- **There is a growing body of evidence that strongly suggests CTE can improve high school performance, high school completion, and chances of employment with higher earnings after high school.**

The evidence base is less definitive on high school CTE's impact on college enrollment and completion.[17] There is also limited evidence on the causal effect of CTE participation in long-term employment and earnings. There is considerable heterogeneity in CTE participation and outcomes by subgroups (gender, race, income, etc.) and field of study, and implementation of CTE instruction and programs also vary widely.[18]

A recent meta-analysis of causal research for secondary CTE programs found that, on average, CTE participation in high school has a positive impact on high school achievement and completion and short-term employment after high school.[19] More specifically, the analysis found that CTE participation led to:

- Improvements in high school academic achievement
- Increased likelihood of completing high school
- Improved employability skills and college readiness
- Increased likelihood of enrolling in two-year colleges
- Increased likelihood of employment after high school

The analysis found that high school CTE participation did not, on average, have an impact on earnings and concluded that there was insufficient research to compare the impacts of different types of CTE models.

High school CTE has grown in popularity and participation in recent years, as the federal government and states have increased investments in this area. Options can range from taking courses at high schools to participating in small learning communities around career themes to attending CTE-dedicated whole-school models. Most high school students who participate in CTE take courses at comprehensive high schools or regional technical education centers that are separate from local high schools.[20] Strongest evidence of CTE's impact on student outcomes comes from the multi-faceted, multi-year learning community or whole-school models where randomized or lottery-based evaluations were feasible, including Career

[17] Dougherty (2023).
[18] Ecton and Dougherty (2023); Klein et al. (2023).
[19] Lindsay et al. (2024). The analysis found no statistically significant negative impacts for CTE participation in high school.
[20] Dougherty (2023); Klein et al. (2023).

Academies, Regional Vocational Technical High schools, and CTE-focused Early College High Schools.

Some evaluations of CTE models suggest that attainment of industry-recognized credentials is potentially associated with earnings gains. However, a recent large-scale analysis in Texas found that, on average, earning an industry-recognized credential in high school was not strongly associated with employment outcomes. Credentials in certain sectors (like business and health) were positively associated with college enrollment and persistence, but the association was negative for other fields (like manufacturing and transportation).[21]

Table 3 presents a snapshot of outcome evaluations of high school CTE programs.

Table 3: Key Outcome Evaluations of High School CTE Programs

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
• **CTE courses within comprehensive high schools**	**Associated with increased likelihood of high school completion, two-year college enrollment, and better earnings.** A volume of research across different states strongly suggests that CTE course-taking can improve high school engagement and completion, as well as earnings after high school.[22] Evidence suggests that dosage matters. Taking multiple courses and/or higher-level courses is associated with better chances of high school graduation and earnings gains.[23] A few studies have also found that CTE concentrators are more likely to enroll in a post-secondary education or training, when compared to similar students who do not concentrate in CTE, and that outcomes vary by occupation and sector, and by demographics.[24] A recent lottery-based evaluation in New York City found that CTE enrollment in comprehensive high schools (or CTE-dedicated high schools) did not produce impacts on high school graduation or immediate college enrollment, concluding that wide variations in implementation and contexts likely influenced the results.[25]

[21] Giani (2022).
[22] Klein et al. (2023); Ecton and Dougherty (2023); Bonilla (2020); Kreisman and Stange (2020); Gottfried and Plasman (2018); Dougherty (2016); Plank, DeLuca, and Estación (2008); Bishop and Mane (2005).
[23] Ecton and Dougherty (2023); Broderson et al. (2021); Kreisman and Stange (2020); Plasman (2019); Gottfried and Plasman (2018); Dougherty (2016).
[24] Ecton and Dougherty (2023); Broderson et al. (2021).
[25] Kemple, Unterman, and Dougherty (2023); Kemple, Unterman, and Dougherty (2024).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
• **Regional Vocational and Technical High School** A whole-school model that offers most or all CTE options in a region or district.	**Increased high school completion and earnings.** Two strongly designed quasi-experimental studies of Regional Vocational and Technical (RVT) high schools from Massachusetts and Connecticut found that participation increased the likelihood of high school graduation. One of the studies also found that RVT attendance increased post-high school earnings but did not affect college enrollment.[26]
• **Career Academies** Incorporates small learning communities within larger schools. Integrate academic and technical education around career themes and offer work-based learning opportunities	**Increased long-term earnings. Mixed picture on education outcomes.** In a 2008 RCT at nine urban high schools across the country, Career Academies produced sustained earnings gains for students up to eight years after expected graduation. There were no effects on education outcomes, including high school graduation, postsecondary enrollment, or credential attainment. A 2019 lottery-based evaluation of an information technology-focused Academy in North Carolina found that participation improved high school graduation rates and college enrollment, as well as the likelihood of attaining industry-relevant certifications.[27]
• **Linked Learning** A whole-school model or small learning communities organized around sectors, offering dual enrollment, WBL, and support services.	**Associated with high school completion.** An evaluation of the pilot California Linked Learning District Initiative found that participation was associated with higher graduation rates. While the Linked Learning models share many components of the Career Academies model, there was a greater focus on district-level strategies and "integrated student support including academic, emotional, and social support, and college and career guidance."[28]

[26] Dougherty (2018); Brunner, Dougherty, and Ross (2021).
[27] Hemelt, Lenard, and Paeplow (2019).
[28] Warner et al. (2015).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
• **Pathways In Technology Early College High School (P-TECH)** Sector-focused, early college high school model that offers opportunity to earn an associate's degree in high school through dual enrollment, as well as work-based learning	**Increased two-year degree attainment.** P-TECH is a model of early college high school (ECHS) that is career-focused, incorporating industry and employer partnerships and work-based learning. A recent lottery-based study from New York City found that P-TECH students were more likely to enroll in college-level courses and participate in internships during high school and were more likely to have completed an associate's degree within seven years after entering high school.[29] Evidence from P-Tech is aligned with other causal research on the ECHS model in general, even when there is not a strong sector focus like P-Tech. Studies show that ECHS enrollment can improve postsecondary enrollment and credential attainment, namely an associate's degree.[30] A follow-up survey from one of the evaluations found that ECHS attendance did not affect long-term employment and earnings, but did improve bachelor's degree attainment for Black and Hispanic students within 10 years after expected high school graduation.[31]
• **CTE-Dual Enrollment Pathways** Offers the opportunity to earn postsecondary technical credential or college credit while in high school	**Associated with high school completion and college enrollment.** While the practice of offering dual enrollment courses in CTE pathways is becoming more common, research on their impact is limited outside of the whole-school CTE models like P-TECH. A recent study that looked at a statewide CTE dual enrollment initiative in North Carolina found that participation in CTE dual enrollment was positively associated with college credits earned in high school, graduation from high school, and overall enrollment in college within one year after high school.[32]

[29] Rosen et al. (2023).
[30] Taylor et al. (2022).
[31] Song et al (2019).
[32] Edmunds et al. (2024).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
• **Youth Career Connect** Blends features of Career Academy and sector-based models	**Produced small increases in high school attendance and credit accumulation.** A federally funded demonstration project tested a program model that included small learning communities, career-themed curriculum, work-based learning opportunities, and instruction in occupational and work readiness skills. The evaluation did not find impacts on graduation or post-secondary preparation within the follow-up period. Exploratory findings suggest that internships and mentoring components helped engage students and drive outcomes.[33]

Equity

- **There is consistent evidence that high school CTE is beneficial for male students.**

On average, male students enrolled in CTE programs have seen positive benefits on high school engagement, high school completion, and earnings after high school, particularly when compared to male students who do not participate in CTE.[34] In fact, the evidence for Career Academies and RVTs in Connecticut is largely driven by the programs' impact on male students. In the P-TECH evaluation, young women performed about equally as well whether they were enrolled in P-TECH or not, but the young men who attended P-TECH did much better than those in the comparison group when it came to completing a two-year degree.[35]

One recent study from California found that recent expansions of CTE in the state, which focused on in-demand health services pathways, had stronger impacts on high school completion rates for female students, suggesting that choice of CTE offerings is a factor.[36]

- **There is also consistent evidence from different studies that CTE can be beneficial for students who face systemic barriers to education and employment.**

This includes low-income students, students of color (particularly Black and Hispanic young men), students with disabilities, and students at high risk of disconnection. Much of the evidence for these groups is around improvements to high school completion, but there is also evidence that suggests increased employment and industry-recognized credentials for students

[33] Maxwell and Dillon (2019).
[34] Brunner, Dougherty, and Ross (2021); Kemple and Willner (2008); Hemelt et al. (2019).
[35] Rosen et al. (2023).
[36] Bonilla (2020).

with disabilities and earnings gains for young men of color.[37] Most studies aggregate all disabilities together, making it unclear which specific groups (students with learning disabilities vs. students with intellectual disabilities, for example) benefit most from various CTE models.

- **Equitable access to high-quality, high-return CTE programs for different groups remains a challenge.**

Young women and students of color are often underrepresented in high-return pathways.[38] One recent study found "large and sustained differences in participation across CTE fields of study" by gender and race, with white male students being more likely to participate in CTE courses more broadly than women and students of color. Students of color, despite their socioeconomic status, were also less likely to participate in STEM CTE courses.[39]

Findings from a recent multi-state study suggest that racial disparities in CTE participation in high school may be largely explained by differences in program offerings across schools, as opposed to inequitable sorting of students into specific tracks within schools. In other words, students' access to programs depended on where they lived and attended schools, and the widespread geographic and demographic disparities in our public school systems likely have the most influence on disparities related to CTE access.[40] In addition to resource disparities across districts, descriptive research suggests that equitable access to high school CTE may be affected by design and implementation choices (such as course scheduling, credit requirements, teacher staffing and training, and recruitment and advising practices), as well as persistent stigma of vocational education among parents and students that affect demand.[41]

Cost-Benefit

- **Early indications suggest that CTE models may be cost-neutral or cost-effective. Very few studies have incorporated cost-benefit or return-on-investment analysis.**

The evaluations of RVTs found that the benefits of these schools "likely outweigh their costs under most conservative plausible estimates of the lifetime public benefits and costs."[42] The evidence of positive return on investment (ROI) was clearer in Massachusetts, but Connecticut also saw a small ROI from these schools. Cost analysis for P-TECH in New York City showed that these schools "can generally be operated with resources that are not significantly different than other high schools in the community," but the findings about the model's cost-effectiveness in producing postsecondary degrees (a core target outcome) was inconclusive.[43] And while the

[37] Ecton and Dougherty (2023); Brunner, Dougherty, & Ross (2021); Dougherty (2018); Dougherty, Grindal, and Hehir (2018); Wagner, Newman and Javitz (2016).
[38] Rosen and Dalporto (2020); Reed et al. (2018).
[39] Leu and Arbeit (2020).
[40] Carruthers et al. (2022).
[41] Ansel et al (2022); Rosen and Molina (2019).
[42] Dougherty and Smith (2025).
[43] Rosen et al. (2023).

Career Academies evaluations did not produce a formal cost-benefit ratio in its main reports, the findings on employment and wages strongly suggest that benefits to individuals and society may outweigh the programmatic costs.[44]

Scale and Sustainability

- **Despite important advances in high school CTE research over the last decade, expansions and innovations in CTE policy and programming have surpassed the pace of building evidence.**

As in middle grades, there has been considerable growth in high school CTE programming across the country, fueled by increased state and federal funding and need for middle skill workers. For example, Texas began state-wide expansions of the P-TECH approach in 2021, and the Linked Learning model has been expanding beyond California and across the country. Many states and localities have also focused on increasing alignment between high school CTE and labor market demands, and engaging employers in programming and work-based learning for students. The evidence base for high school CTE has also grown considerably, but the pace of building evidence has not kept up with the rapid expansion and changes in high school CTE. Many interviewees said that expansion efforts are generally not accompanied by investments necessary to build evidence of efficacy or to support data-driven continuous improvement.

In addition, rigorous evidence from multi-faceted or whole school models may not be generalizable to how most students experience CTE within traditional comprehensive high schools. These intensive models are more challenging to scale effectively: they require significant state-level investments and policy incentives, employer engagement, and cross-sector collaboration. For example, Texas incentivized P-Tech expansion and secondary-postsecondary partnerships by making dual enrollment a measure for school success and establishing state-level infrastructure to support implementation fidelity.[45] A 2022 descriptive assessment from the Government Accountability Office found that funding, capacity, and staffing challenges can hinder replication of intensive CTE models supported by evidence. The report also echoed other research in the field that has consistently found that challenges with recruitment and retention of qualified teachers and developing work-based learning opportunities with employers are also pressing barriers to scaling CTE.[46]

Key Evidence Gaps

Interviews with researchers and practitioners confirmed and contextualized findings from the literature review on key evidence gaps.

[44] Kemple and Wilner (2008).
[45] Lowe (2024); Downs and Phillips (2024); interviews.
[46] Government Accountability Office (2022).

GAP: Outcome	Research on long-term post-secondary and labor market outcomes.

Research on long-term post-secondary and labor market impacts of high school CTE programs is very limited. In addition to rigorous, longitudinal research on student outcomes related to credentials, employment, and earnings, many expert interviewees emphasized the need for descriptive research to understand in a more granular way how secondary CTE may shape the experiences and trajectories of students. For example: whether students continue to pursue education and employment in the same sectors or fields of study or whether they branch out; types of postsecondary education and training they pursue (degrees, credentials, apprenticeships, etc.); how they weave together employment and education to advance; and how quality of their jobs affect their trajectory.[47]

Many interviewees highlighted that schools and districts struggle to align on target outcomes and measures for success, whether that is helping students attain high-wage jobs immediately after high school or preparing them for college and advanced training. One interviewee said:

> *"If high schools were to say that our goal is to get students jobs straight from high school, a lot of people would get very upset by that.… Perkins V's policy is pretty clear about preparing young people for high-wage, high-demand jobs. But the districts might have different goals or may not see getting students jobs [as their responsibility]."*

As with middle grades, many interviewees also highlighted the tension between helping students explore different careers in high school versus helping them narrow their choice of pathways. One interviewee said:

> *"One thing that's really challenging about measuring outcomes for these students is that giving kids the opportunity to explore things and find out what they don't like in high school is an equity equalizer. Students who are lower income don't have the luxury of changing majors after they get halfway through college and adding on an extra year to graduate. If they do a certificate [in high school] and decide they don't want to pursue that pathway any longer in college.… I think that happens with a lot of students. As often, they're using [CTE programs] to figure out what they don't want to do. I don't think that's a failure."*

Existing research evidence points to considerable heterogeneity in participation, outcomes and trajectories across different student populations, CTE models, and field of study — suggesting that different CTE programs may add value to different groups of students in different ways and success may not always look that same.[48] In this context, it's very important to bolster our

[47] There's limited, emerging evidence that concentrating in a particular CTE field or career cluster in high school is associated with getting postsecondary education, credential or employment in the same field or cluster. But, as with other CTE studies, these findings vary by sector and cluster. One study found that the association was strongest for health fields. Gottfried et al. (2023); Xu and Backes (2022); Plasman, Gottfried and Sublett (2018).
[48] Ecton and Dougherty (2023).

understanding of how CTE programs affect outcomes for different groups and under what conditions.

GAP: Equity	Research on equity in access and outcomes for different groups

As noted above, there is consistent evidence that CTE can be beneficial for young men, students of color, low-income students, and students with disabilities. However, there are still big evidence gaps around understanding postsecondary and labor market outcomes for different groups, and the factors that affect equitable access and participation in CTE. Much of the research is also done in urban settings; there is very limited evidence of CTE efficacy or implementation in rural settings. In addition to these general gaps, interviewees highlighted two key areas:

- **Unpacking gendered patterns of CTE participation and outcomes**. This includes improving our understanding of why these gender gaps occur and what can be done to make CTE programs more impactful for female students; how to increase female enrollment in high-return programs non-traditional for their gender; and whether gender gaps at the high school level continue to persist and shape female students' trajectories into the workforce.
- **Understanding factors that affect student access and choices.** As high school CTE options and choices continue to grow, many interviewees emphasized the need to better understand how students and families navigate those choices and how the design of CTE systems and programs (like recruitment, enrollment and advising practices) may affect those choices. For example, in some states, access to CTE programs, dual enrollment, and other career-related programming are tied to students meeting certain college and career readiness standards, which affects when and how students access different options.

GAP: Cost, scale, sustainability	Research on program design/implementation that is practitioner-focused. Research on cost-benefit.

While the body of research on secondary CTE has grown, both researchers and practitioners who participated in interviews frequently spoke about the lack of evidence that can drive implementation and practice. There are significant gaps in research on effective program design and implementation and on all things related to cost. Practitioners talked about their struggle to identify evidence that applies to their own context and that can help them decide the "how to" of building capacity to deliver services at scale (for example, hiring and training staff, monitoring performance, etc).

Much of the implementation and practice guidance comes from intensive programs like Career Academies or whole-school models like P-TECH, and are not necessarily generalizable to most students who experience CTE in comprehensive high schools. While these models share common components — such as strong industry and postsecondary partnerships, work-based learning opportunities, integrated or contextualized academic and technical instruction, work-readiness trainings, and often opportunities to earn college credits and industry-recognized credentials — there is not much research on how these different components shape outcomes or how they may be implemented, scaled and sustained around outside of these multifaceted models.

In alignment with findings from literature, many interviewees emphasized the need to build evidence around scaling and sustaining work-based learning, employer engagement, and career advising and navigation. Practitioners said that career advising is a key area that is often under-resourced, and there was more evidence needed to make decisions on staffing models and effective use of intermediaries in filling gaps.

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees around secondary CTE evidence gaps included the following:

LONG-TERM OUTCOMES

- What does postsecondary and career progression from secondary CTE programs look like for different groups of young people?
    - Do students secure initial jobs in the sector or occupation for which they received CTE education? Do they stay in the sector in which they received training? Are employment and earnings outcomes for CTE students tied to whether they stay in their sector?
    - If they continue to postsecondary education, do they pursue education and training in the sector or occupation in which they received CTE education in high school? How do they balance employment or work-based learning with the pursuit of advanced credentials?
    - What is the ROI for taking different pathways out of high school (e.g., college, work, other types of training)? Does it differ by subgroup?

NAVIGATION AND CHOICE-MAKING

- How can schools, educators, and/or advisors most effectively help students and families understand their career options and make informed decisions about CTE program choices while minimizing the risk of inequitable tracking?
    - What are the best ways to raise awareness and disseminate information about CTE and career pathways across different communities? What types of outreach, recruitment, and enrollment methods are effective? How do design choices around these factors drive student and family decision-making?
    - What is the role of technology in building knowledge and exploring choices? Do career exploration tools and resources help students make informed choices toward CTE pathways that align with their interests and aptitudes?
    - What competencies, tools, and training do educators and/or school counselors need to advise students on effective choice-making?
- What drives a student to enroll in CTE or a particular CTE option? What drives a student's choice when planning the transition from high school and their choice of pathways?
    - What role does family, peer, or social network play? How do a family's financial needs or professional experiences shape student choices?
    - What role do educators and counselors play? To what extent is policy encouraging or incentivizing advisors or counselors to guide students to different CTE options and postsecondary pathways?
- What are effective staffing and resource allocation models for career counseling and navigation services? What types of labor market data and tools do staff need to guide students on career pathways effectively?

DESIGN AND IMPLEMENTATION

- How do states/districts choose CTE programs of study and pathways that are effective for their communities? What types of evidence, data, and supports are needed at the state and local levels to better align secondary CTE offerings with employer and youth needs, particularly as generative AI and technology rapidly shift the labor market in coming years?[49]
- How do you build an "ecosystem" of secondary CTE programs that balances flexibility with structure and exposure with direction?

[49] There is descriptive evidence that high school CTE offerings and student participation patterns are generally partially aligned with local labor markets, but that there are significant gaps in alignment between supply and demand. Carruthers et al. (2024); Harris et al. (2020).

    - How do you get young people to think critically about careers as young as possible without boxing them in? How do you align CTE programs to align with the developmental trajectory of young people?
    - How should programs balance opportunities for career exploration while also building skills for advancement?
    - Should we think about options for different groups differently based on student interests? For example, should students only take dual enrollment courses in college if they have a certain level of confidence about what they want to do? And if they are less clear about their interests, should they be offered more exploration-focused work-based learning?
- How do different types of interventions work together (e.g., dual enrollment, CTE instruction, work-based learning, etc.)? How do they drive change independently and when combined, and how much does context matter? How do different CTE programs and practices fit into a holistic vision for student outcomes?
- How much do class size, cohort model, mentoring, and advising matter for CTE pathways? How do they contribute to student outcomes?
- What is the value of industry-recognized credentials in high school CTE programs? What types of credentials hold the most value, and what drives their value (i.e., demand in the sector, signaling potential for employers, etc.)?
- What supportive services can help students who face structural barriers to education and employment better access and engage in CTE programs?
- How much does the mode of delivery matter? Can technology be leveraged to deliver services and experiences without sacrificing outcomes, particularly in rural areas?

SCALE AND SUSTAINABILITY

- How can we identify and evaluate effective strategies for scaling CTE programs while maintaining quality and fidelity to the components that drive outcomes?
    - How do we scale features of whole-school models into comprehensive high schools or regional technical centers effectively? Can we replicate the outcomes?
- How can we tailor programs and practices for communities with fewer resources? Is it possible to do so without sacrificing outcomes?

- What are the policy and system factors that facilitate the effective implementation of evidence-based CTE programs at scale? What are enabling conditions that help produce outcomes?

4

Postsecondary and Workforce

Key Takeaways

The scan focused on sectoral programs, community college programs, and programs that specifically target opportunity youth who are not connected to school or work.

Evidence Snapshot	
Outcomes for youth under 25	Strongest evidence of long-term economic impact for youth is limited to a small number of sector-based programs. On average, a postsecondary credential is associated with higher earnings, but there is significant variation in returns by field of study and demographics. Meta-analysis of programs that used a career pathways approach found evidence of increased short-term credential attainment and employment but limited impact on earnings.
Equity	Disparities in outcomes for different credentials in different fields are not well understood. Sector-based programs for high-wage, high-growth occupations have relatively high barriers to entry and success, particularly for youth who leave high school without a diploma or those who face severe life challenges.
Cost-benefit	Limited research. Some sectoral models are cost-effective.
Scale and sustainability	Intensive, evidence-based sectoral programs are challenging to scale. Non-degree credential programs have grown exponentially but evidence on their quality and effectiveness is not generalizable and well-understood.

Key Gaps

Interviews and literature review pointed to the following key evidence gaps:

- Long-term postsecondary and labor market trajectory and outcomes for youth
- Addressing inequities in access and outcomes
    - Understanding factors that affect student choices
    - Supporting youth with barriers and limited skills to gain access to high-return pathways
- Understanding the value of components within multi-faceted, intensive sector models
- Unpacking variation in non-degree certificates and credentials

Subsections in this chapter

Context

The pathways landscape after high school is fragmented: there are multitudes of programs across colleges, training providers, and community-based organizations that can potentially be considered part of a career pathway. In the words of one interviewee:

> *"It's a really fractured system. There are postsecondary colleges, there's WIOA, and then there's a whole nonprofit sector that is connected to those two other systems, but sometimes they're doing their own thing, and all of those can have a slice of a career pathway. It's not a system that's connected particularly well after you leave high school. Even if there are issues in secondary education, once you leave, it becomes even more of a challenge."*[50]

Much of the research after high school is not specific to young people under 25, and there is a lot of overlap and variation across programs that are labeled "career pathways," "occupational programs," "sector programs," or "CTE pathways" — making it challenging to categorize them.

The discussion of postsecondary and workforce evidence is split into four parts in this chapter. First, there is a discussion of findings from meta-analysis of programs that use career pathways strategies. Then, there are discussions of outcomes, equity, cost, scale, and sustainability for sector-based programs, community college programs, and programs that specifically target

[50] WIOA is the primary federal workforce development law, and has funding streams for training and employment services for youth, adults, dislocated workers, and workers with disabilities, among others.

opportunity youth.[51] As mentioned above, there are overlaps among these categories — for example, sector-based programs can be run by community colleges or serve opportunity youth.

Evidence Base

Meta-Analysis of Career Pathways Approach

KEY TAKEAWAY: Evidence of increased short-term credential attainment and employment but limited impact on earnings. Most programs did not specifically target young people.

In the last two decades, the federal government has funded several large evaluations of programs that take a career pathways framework, including programs funded by the Health Profession Opportunity Grants (HPOG), Pathways for Advancing Careers and Education (PACE), Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant, and other employment and training programs funded by the Department of Labor and WIOA.

A 2022 meta-analysis of 46 studies that largely draws from these efforts, along with evaluations of sector-based employment and training programs, found that a career pathways approach increased postsecondary credential attainment and industry-specific employment but had no meaningful impact on earnings. The causal analysis included experimental and quasi-experimental research. The results should be interpreted with the following considerations:[52]

- The analysis defined "career pathways" broadly, acknowledging that "most programs implement just some of the elements of that framework." It generally included programs that provided occupational training in the context of the career pathways framework.
- The programs offered a similar set of services, including occupational skills training, support services, opportunities for credential attainment, and work readiness training. However, the design, length, and intensity of services varied widely, including the sectors in which training was offered, types of credentials, and level of employer engagement in work-based learning and job training. Not surprisingly, the analysis found that the average impact of a career pathways approach on education and labor market outcomes varied substantially across evaluations — suggesting that program design and implementation likely influence outcomes.

[51] To narrow the scope of this assessment, the scan did not include four-year degree programs, or programs at four-year public colleges or any private colleges. The scan also did not focus on college success and persistence efforts at community colleges, which are important to career pathways. The scan also did not include programs that target outcomes related to legal system involvement, community violence or behavioral health, as means to improve employment outcomes for young people.
[52] Peck et al. (2021).

- Programs generally targeted low-income adults. The evaluation did not look at disaggregated impact by age, race, or gender due to limited data from original evaluations. The average age of participants was 31, which may limit the generalizability of the findings to younger adults initially transitioning from secondary education to postsecondary and workforce domains.
- A non-causal exploratory analysis of program design and implementation factors found:
    - Programs where community colleges were the lead or a partner provider were associated with smaller impact on credential attainment compared to programs operated by other types of providers (largely community organizations).
    - Education outcomes were larger when employers provided input on curriculum or other aspects of program design.
    - Programs may have increased access to sectors and advancement pathways for underrepresented groups, as larger labor market impacts were associated with programs with a larger share of Black participants.

Findings from a separate meta-analysis of TAACCCT programs, which provided federal grants to community colleges across the country to provide training and advancement support to unemployed and underemployed adult workers, were similar. Community colleges used TAACCCT to create a wide range of programs and services aligned with the career pathway approach. The meta-analysis found that participants were significantly more likely to earn a short-term credential, when compared to a comparison group. Participants were also more likely to have employment or wage gain, but the magnitude of effects was greater for credential completion than post-program employment and wage gains.[53]

Sector-Based Programs

KEY TAKEAWAY: Strongest evidence of postsecondary success for youth under 25. Can increase earnings in the longer term and can lead to career advancement over time.

The sector-based approach to career pathways was piloted and pioneered by several community-based organizations to train people for high-quality jobs in industries and occupational clusters that have strong local demand and offer the opportunity for career advancement.[54] The term is now often used for many pathways programs because they focus on occupational skills training in specific industry sectors, as opposed to more generalized job training or work readiness training. The programs and demonstration projects that led to the broader expansion of a sector-based approach are intensive and multifaceted. They include the following components:

[53] Blume et al. (2019); Eyster et al. (2017).
[54] Schaberg (2020).

- Upfront screening on basic skills (e.g., math and literacy), motivation, and other factors to ensure alignment with the program and industry requirements.
- Strong engagement with local employers to identify in-demand occupations.
- Occupational skills training targeted to high-wage sectors and leading to an industry-recognized credential.
- Career advising and employment services, including work readiness training, job placement, post-placement retention, and advancement coaching.
- Wrap-around supports and financial assistance — ranging from assistance with transportation, childcare, and apparel to weekly stipends for living expenses.[55]

Outcomes and Equity

- **Several experimental evaluations of sector-based approaches in workforce development have shown that these programs can boost employment and earnings for nearly a decade after program enrollment, but some are more effective than others.[56]**

While it is not well-understood why some sector programs achieve better outcomes and lead to larger economic impacts than others, evidence suggests that the field of study, program characteristics, and implementation quality matter.[57]

Year Up[58] is the only program in these studies that targets young people under 25, and one of the few youth employment programs with evidence of longer-term earnings impact. The program was part of two experimental evaluations, and both found positive impacts on earnings.[59] The latest study found that Year Up participants earned more than the comparison group for up to seven years after study enrollment; the rate of postsecondary credential attainment was the same for program and comparison groups. In the study, the program provided six months of full-time training in information technology (IT) and financial services occupations, followed by six-month internships.[60] While some sector programs included in these evaluations incorporated work-based learning opportunities, Year Up is the only program that has a six-month internship as a standard part of their model, along with stipends during training and internships, suggesting that a paid work-based learning opportunity may be specifically important for young people.[61]

[55] Katz et al (2022); Schaberg (2020).
[56] Kanengiser and Schaberg (2022); Katz et al. (2022); Schaberg (2020); Schaberg and Greenberg (2020); Roder and Elliott (2020); Roder and Elliott (2014); Maguire et al. (2010).
[57] Schaberg (2020)
[58] Year Up was rebranded as Year Up United (YUU) in 2024.
[59] Roder and Elliott (2014); Fein and Dastrup (2022).
[60] Fein and Dastrup (2022).
[61] This also aligns with broader research literature on youth programs. Hossain and Bloom (2015).

In addition to Year Up, some programs that did not specifically serve young people under 25 also produced earnings gains for this group, but evidence of long-term earnings impact for youth is limited. Per Scholas, which was in two experimental evaluations and provides sector-based training in IT occupations, was found to produce positive earnings impact for young people under 25 after two years of study enrollment.[62] A seven-year follow-up study found that the program increased average earnings up to year 7 for all participants, but there was no analysis of the youth subgroup.[63]

- **Evidence is limited on equitable outcomes for youth.**

In general, research shows that sector-based training programs are effective in improving labor market outcomes for low-income people and people of different gender and racial identity.[64] But disaggregated evidence for young people of different characteristics is very limited. Year Up, which specifically serves young people, produced large and sustained impacts for young people of different demographics, including Black and Hispanic students.

Sector-based programs for high-wage, high-growth occupations have relatively high barriers to entry and success: they require a high school diploma or a GED, certain literacy and numeracy levels, and often other competencies related to entry into certain occupations and industries. In the evaluation for Year Up, participants with better high school grades and some college experience benefited more than those with worse grades and no prior college experience.[65] Young people with low levels of basic academic skills and those without a high school credential generally need a "bridge" program to access high-return sector programs. There is very limited evidence on bridge models that are effective in helping young people who need skill-remediation to access and benefit from sector programs in high-wage occupations. Studies of models that integrate or reinforce basic skills in the process of providing skills training or CTE instruction — like Washington State's well-known Integrated Basic Education and Skills Training and the Accelerating Opportunity demonstration — have shown promise in helping low-wage adults attain industry-recognized credentials or postsecondary certificates but studies have not found consistent evidence on improvement to earnings.[66]

Cost-Benefit, Scale and Sustainability

- **There's limited but strong evidence that the benefits of effective sector programs outweigh their cost, which can be considerably higher than many other workforce development models.**

[62] Hendra et al. (2016).
[63] Kanengiser and Schaberg (2022).
[64] Kanengiser and Schaberg (2022); Katz et al. (2022); Schaberg (2020); Schaberg and Greenberg (2020); Roder and Elliott (2020); Roder and Elliott (2014); Maguire et al. (2010).
[65] Fein and Dastrup (2022).
[66] Anderson et al. (2017).

Benefit-cost analysis from the WorkAdvance evaluation found positive ROI from the perspectives of the participants, the government, and society at all four sites due to an increase in earnings and benefits. A benefit-cost analysis of Year Up also found that the program produced a positive ROI of $2.46/per dollar spent, with a net gain to society of $33,884 per participant.[67]

- **While sector programs have the most rigorous causal evidence of producing long-term labor market outcomes, the intensive, multifaceted models are difficult to implement well at scale to replicate their impact.[68]**

For example, Year Up's efforts to scale its model in community colleges faced challenges around maintaining fidelity to the model, including hiring and training staff who can uphold Year Up's dual-customer approach to serving both young people and employers; aligning the content of credit-bearing classes with the skills that internships required; and sustainably fund operating costs with earned revenue from employers for talent placements due to costs students incurred in tuition and fees and barriers to accessing financial aid.[69]

Community College Programs

KEY TAKEAWAY: Earning a postsecondary credential is associated with increased earnings, but there is significant variation in returns to credentials by field of study. Evidence is not specific to young people under 25.

This evidence scan primarily focused on non-degree CTE or occupational programs and credentials in two-year schools, but it's important to start with what we know about postsecondary education in general.

- There is a robust evidence base for the economic returns of earning a post-secondary credential. With each additional level of postsecondary education — workers typically earn more throughout their lifetimes. In other words, on average, the returns from a four-year degree are higher than returns from a two-year degree, and the returns from a two-year degree are higher than those with shorter, non-degree credentials.[70]

- Various factors, including field of study and occupation, geography, and demographics, drive differences in earnings for different lengths of postsecondary credentials. So, in some cases, wages and growth of certificates in some occupations can exceed the wages of four-year degrees in others.[71] Non-degree CTE or occupational certificates are

[67] Fein and Dastrup (2022)
[68] Ubalijoro and Schaberg (2024); Hendra et al. (2023).
[69] Hendra et al. (2023).
[70] Carnevale, Cheah and Wenzinger (2021).
[71] Carnevale, Cheah and Wenzinger (2021), Congressional Research Service (2022), Dougherty (2022).

more sensitive to economic fluctuations across industries and occupations than two-year or four-year degrees.[72]

- There are significant disparities in degree completion by gender, race and ethnicity, and socioeconomic status. There are also disparities in how students pay for college, with Black students borrowing at the highest rates and higher default rates for Black and Hispanic student loan borrowers as compared with their White peers.[73]

Community colleges provide a wide range of CTE and occupational training and certificate programs below an associate's or a bachelor's Degree, and these programs can be credit-bearing (can count toward a degree and eligible for federal financial aid) or non-credit bearing (can result in a short-term certificate and typically not eligible for aid). Offerings and enrollment in these programs have grown significantly as colleges and students have sought short-term, lower-cost options to meet the growing demand for postsecondary credentials.[74] Historically, credit and non-credit programs have existed in silos, but there are increasing efforts to improve alignment and integration between the two.[75] There is also a growing momentum to make credentials "stackable" by organizing programs into a series of short certificates that build on each other to help students advance within an industry. Non-credit students tend to be older than for-credit students, but both types of programs still serve a significant number of students under 25. For example, about a quarter of the students were under 25 in a recent evaluation of a non-credit program in Virginia; in comparison, about half of the students in short-term credit-bearing certificate programs were under 25.[76]

Outcomes and Equity

- **On average, non-degree credentials (both credit and non-credit) can improve earnings, but returns to credentials vary significantly by field of study and occupation. Credit-bearing credentials are associated with higher returns but the evidence comparing the two is limited.[77]**

Credit programs: Most research on non-degree community college programs is on for-credit programs. Broadly, credentials from longer programs or that require more credit are associated with higher earnings gains, but there are variations across locations. A study in Washington state found positive returns for one-year certificates but negative returns for programs that require less than one year; but one California study found considerable differences in returns across certificates of different length with no clear evidence that longer certificates yield higher

[72] Belfield and Bailey (2019).
[73] Kim et al. (2024); Pew Charitable Trusts (2024).
[74] Dadgar et al. (2024).
[75] Education Strategy Group (2020); Buckwalter and Maag (2019).
[76] Xu et al. (2024).
[77] Van Noy, Scovill and Boyd (2024); Bahr et al (2022); Dougherty (2022), Congressional Research Service (2022), Hester and Kitmitto (2020); Belfield and Bailey (2019); Xu and Trimble (2016); Bahr et al. (2015); Stevens, Kurlaender and Grosz (2015).

earnings.[78] Earning or "stacking" multiple credentials can lead to gains beyond earning a single credential, and a recent study found that low-income certificate-earners in Colorado and Ohio who earn a higher-level credential (after completing their first certificate) advance their earnings.[79] There is wide variation in earnings gains for certificates in different sectors and occupations, and rates of stacking also vary widely across fields of study.

Non-credit programs: Research on non-credit programs and credentials is more limited due to inconsistent data collection across states. While credit-bearing credentials go through an accreditation process to ensure certain standards, non-credit options in community colleges do not have a consistent set of definitions or quality assurance processes. Funding sources for non-credit programs vary based on state policy, and those funding streams influence the design of the programs, the supports they provide, and the data they collect. Non-credit programs tend to serve an older student population, with an average age of 30 years old. Non-credit programs and credentials are associated with higher earnings when compared with having no postsecondary education, but the gains are modest when compared to degree programs. Earnings outcomes varied widely across field, gender, and geography.[80] Evidence suggests that few non-credit students pursue higher-level credentials or transition to credit pathways for advancing their education and careers.[81] A recent qualitative study that interviewed certificate completers from four manufacturing programs across three states found that students were unlikely to return to college if their first job after certificate completion did not meet expectations around wages and job quality.[82]

Industry-recognized credentials. Both credit and non-credit programs can also offer industry-recognized credentials, such as industry certifications or licenses, that are awarded by third-party organizations or industry groups (as opposed to the certificates awarded by the colleges for completion). These credentials are associated with small to moderate wage increases, but there is very limited evidence from credentials offered by non-credit programs.[83] A recent study in Virginia found that earning an industry-recognized credential through short-duration, non-credit training programs can increase short-term earnings, but the returns vary widely across sectors and occupations. The study also found that these programs enrolled an older student population.[84]

- **Research with disaggregated evidence of outcomes is very limited.**

As discussed above, there is consistent evidence that the return to postsecondary credentials varies by field of study and individual characteristics (like race and gender), but it is difficult to

[78] Belfield and Bailey (2017); Daugherty (2022).
[79] Daugherty (2023).
[80] Van Noy, Scovill and Boyd (2024).
[81] Bahr et al (2023); Bahr et al (2022)
[82] Dadgar et al. (2024).
[83] Daugherty (2022).
[84] Xu et al. (2024).

draw any conclusions due to wide variations across fields and geographies. Existing studies have primarily looked at gender-based differences. There is evidence of inequities in access and completion for students of color for traditional two-year and four-year degrees, but there is limited research on how different races and ethnicities fare in non-degree occupational or CTE programs in community colleges.

Cost-Benefit, Scale, and Sustainability

- **Research on cost-benefit, implementation, scaling, or funding is very limited.**

Non-degree training programs and credentials at community colleges are likely cost-effective for some people in some fields due to a positive return on earnings, but the scan did not surface research evidence in this area. While the variety of postsecondary non-degree credentials available at community colleges (and at other providers) has grown rapidly in recent years, research on design and implementation of these programs and how they affect students' experiences and outcomes remains limited.

Much of the research on student outcomes is based on administrative data, and qualitative research is limited. Length and types of certificate programs in studies have varied widely, making it difficult to generalize their findings or draw conclusions about effective design or practices without examining specific programs features or local context. In addition, a recent analysis found considerable misalignment between the current supply of postsecondary sub-baccalaureate certificates and associate's degrees and projected labor demand.[85]

Funding levels, mechanisms, and policies that shape non-degree programs vary widely across states, and affect offerings and quality of non-degree programs. Colleges have reported challenges with financing new program research and development in emerging areas and being responsive to labor market trends, as well as funding basic needs, supportive services, and navigation and advising services that have been found to be effective in degree persistence programs.[86]

Programs Designed for Opportunity Youth

KEY TAKEAWAY: Strongest evidence of positive long-term impacts comes from sector programs. Large-scale, federally funded programs, like YouthBuild, have shown short-term academic and labor market gains. Subsidized employment programs can produce short-term boosts in employment and earnings but the impact fades over time.

The term "opportunity youth" refers to young people, typically between the ages of 16 and 24, who are disconnected from school or work. For most young people, disconnection from school or work is not a steady state, and periods of work and education can be interspersed with spells

[85] Strohl, Mabel and Campbell (2024).
[86] Palmer and Jyotishi (2022).

of disconnection. Some remain persistently disconnected, while others have periods of work and education interspersed with gaps, which can still amount to disconnection. Prevalence of disconnection is higher for young men, low-income young people, and people of color.[87] Young adults in this population often access education, training, and employment through adult programs for people over 18, including many of the programs described above. This section describes programs that specifically seek to work with this group and target career-related outcomes.

Outcomes and Equity

- **Evidence of programs and practices that produce long-term education or labor market outcomes is very limited. Sector-based programs, which have the strongest evidence, have high barriers to entry for many in this group.**

Other than Year Up, there is very limited evidence — causal or non-causal — of long-term postsecondary or labor market outcomes from pathways-related programs that specifically target opportunity youth. As noted above, the opportunity youth population is diverse and heterogeneous. Year Up serves a very specific slice of opportunity youth — those who have a high school credential and can meet criteria that demonstrate readiness and stability. Intensive screening for aptitude and motivation is a core part of the sector-based approach, and a large share of opportunity youth would need other programs and interventions that help them build up to sector-based programs. That is not to say that sector-based programs do not serve young people with disadvantages but that they serve a specific segment of that population. As one interviewee said:

> *"If you're going to be in a great occupational program and like a Per Scholas, you gotta be there for 3 months, and if you're late, you're kicked out. I don't care if the subway wasn't working or you had something come up, you're kicked out. So, you have to plan for it. Is it a great alternative to a college degree? Yes. But it's still not for everyone."*

Most young people who are persistently or long-term disconnected leave high school without a diploma and have little experience in the formal economy. It is widely recognized that they need "bridge" programs to help them access sector programs and other training for in-demand jobs, but the evidence base for such programs is limited.[88]

- **Federally funded, out-of-school youth programs, like Job Corps and YouthBuild, have increased receipt of high school credentials. Evidence on postsecondary education, employment and earnings is more mixed.**

[87] Millenky, Treskon and Hossain (2024); Lewis et al (2024).
[88] New York City is testing a pathways model called Advance & Earn that connects three distinct sets of services to help opportunity youth with limited skills to incrementally build academic and work readiness skills and qualify for advanced training.

These programs primarily target young people who leave high school without a high school credential, and provide a wide array of services to help young people complete their high school credential, gain work experience and occupational skills, and pursue post-secondary education and training. They are successful in helping students get their high school credential and improve employability, but their impact on postsecondary and employment measures are mixed.[89] Under WIOA reauthorizations, these programs have adopted career pathways principles in recent years, including a greater focus on labor market alignment and employer engagement, but research on these efforts is limited.[90]

- **Subsidized employment programs can increase short-term employment and earnings.**

Short-term employment programs, including summer jobs and internships, are particularly effective at increasing employment and earnings for people with limited work experience and other structural barriers to employment (like a criminal record), but outcomes generally fade over time after the jobs end.[91] Despite the lack of long-term evidence, they have been an important strategy to provide work experience and immediate earnings to people who struggle to find work on their own. Subsidized jobs are often part of multifaceted programs that serve severely disconnected or system-involved people — like Center for Employment Opportunity and Rapid Employment and Development Initiative (READI) Chicago — and evidence suggests that they are effective in lowering rates of recidivism and incarceration.[92]

To narrow the scope of this assessment, the evidence review did not focus on programs that serve system-involved youth or programs that do not target career outcomes. In many such programs, training and employment services are often integrated into a multi-pronged approach to stabilizing young people's lives, developing basic education and work-readiness skills, building social-emotional skills, and navigating structural barriers. While these programs do not meet the definition of career pathways in a traditional sense, they are important bridges to create pathways for young people who face severe disadvantages in life.

Table 4 presents a snapshot of key outcome evaluations of career-related programs that specifically serve opportunity youth.

[89] Miller et al. (2018); Schochet, Burghardt, and McConnell (2006).
[90] Miller et al. (2018); Grossman et al. (2024).
[91] Cummings and Bloom (2020).
[92] Millenky, Treskon and Hossain (2024), Bhatt et al (2023); Redcross et al (2009).

Table 4: Key Outcome Evaluations of Opportunity Youth Programs

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
Year Up • Occupational training • Work readiness • Paid internship • Advising, mentoring • Stipend • Transition support	**Increased earnings for up to 7 years after enrollment.** In an RCT, the program increased participant earnings, which led to increases in household and personal income and decreases in housing insecurity, debt, and public benefit receipt. There were no effects on longer-term education credentials or overall wellbeing.
Job Corps • Residential • High school credential preparation • Occupational training • Case management • Career counseling • Work-based learning • Work readiness • Stipends • Transition support	**Increased high school completion and short-term earnings.** A national RCT found the program generated earnings gains among participants during the fourth year after enrollment. The earnings gains persisted up to 10 years for older youth between (20 to 24-year-old) after they entered the study, but did not persist for the full sample. Majority of the study sample were Black and Hispanic men.[93] The program has changed under WIOA to have a greater focus on industry alignment, employer engagement, and a career pathways approach. There has not been any recent research on how it operates and its effectiveness under WIOA.[94]

[93] Schochet, Burghardt, and McConnell (2006).
[94] Grossman et al. (2024).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
YouthBuild ● High school credential preparation ● Occupational training (namely construction) ● Case management ● Career counseling ● Work-based learning ● Supportive services ● Leadership training, community service ● Stipends ● Transition support	**Increased high school completion and college enrollment.** A large, national RCT found the program increased the receipt of high school credentials and college enrollment; impact on degree receipt after four years was very small. YouthBuild increased survey-reported employment rates and earnings, but did not increase employment as measured with administrative records — suggesting that participants were working in gig economy or other informal work. The programs in the study primarily served Black and Hispanic men.[95] In recent years, YouthBuild has expanded occupational skills training beyond construction to align with local employer demand and is developing apprenticeship pathways. WIOA has designated YouthBuild as a pre-apprenticeship program. There has been no research related to recent adaptations.
Young Adult Internship Program (YAIP) ● Paid internship for up to 12 weeks ● Paid pre-internship work readiness ● Post-internship transition support ● Case management	**Increased short-term employment and earnings.** In an RCT, the New York City program had a significant impact on employment and earnings in the year after enrollment, but the impacts did not persist through the 30-month follow-up and there were no impacts on education or postsecondary enrollment. Like YouthBuild, the program produced small improvements in survey-reported employment during follow-up but not employment as measured by administrative records, indicating that the program group may have been more likely to hold jobs in the informal economy or as independent contractors.

[95] Miller et al (2018).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
Los Angeles Reconnections Career Academy (LARCA) ● High school credential preparation ● Case management ● Supportive services ● Work readiness ● Work-based learning ● Connect to occupational trainings	**Increased high school completion and college enrollment.** In an RCT, the program produced a positive impact on high school credential attainment and college enrollment, but fared slightly worse in employment and earnings outcomes than control group members. The study measured outcomes for up to one year after random assignment for the whole study sample and for up to two years for part of the sample. Impacts generally were not different by subgroups.

Cost-Benefit, Scale and Sustainability

As previously discussed, sector-based programs are cost-effective from the perspective of participants and society but are challenging to scale with quality. Job Corps was cost-effective for older youth who saw sustained earnings gains for up to 10 years. Benefits exceed costs for the participants themselves, but benefit to society was close to total cost, suggesting that the program "effectively redistributed resources toward low-income youth." YouthBuild's benefits through four years did not outweigh its costs, but benefits may accrue over participants' lifetimes (through future earnings gains or through degree completion, for example).

Existing evidence suggests that training and employment programs for opportunity youth — particularly young people who leave high school without a diploma and young people who face significant disadvantages due to poverty or legal system involvement — need to offer supportive services, relationship-building and individualized support to keep youth engaged and help them address their challenges, which makes the programs. However, public and private funding streams do not adequately cover the true costs of running effective programs for opportunity youth, particularly administrative costs associated with building the organizational culture and infrastructure necessary to support evidence-based practices.[96] For example, there is strong evidence that helping young people develop meaningful relationships to caring adults is an important engagement strategy for opportunity youth; however, low pay and limited opportunities for training and advancement lead to high rates of turnover among youth workers and affect the development of those relationships.[97]

[96] Millenky, Treskon and Hossain (2024), Altshuler and Tirona (2019).
[97] McGuiness-Carmichael (2019); Borden, Schlomer and Bracamonte Wiggs (2011).

Key Evidence Gaps

Interviews with researchers and practitioners confirmed and contextualized findings from the literature review on key evidence gaps.

GAP: Outcome	Research on long-term postsecondary and workforce outcomes

As in the secondary setting, there is a need for more longitudinal research on postsecondary and career outcomes. In addition to causal and quantitative research, interviewees emphasized the need for more research to understand the trajectories of young people beyond employment outcomes, including retention and advancement in sectors or fields of study, patterns of entry and exit from employment and education, and factors related to job quality. Evidence also pointed to the need to test interventions that help people advance, and not just enter, a career pathway. One interviewee said:

> *"There is simply no evidence on how to help people advance."*

Much of the research in the postsecondary and workforce space applies to a general adult population. There is very limited research on understanding the transition from K-12 to postsecondary education, namely from high school to community colleges, and the trajectories of young people under 25. One interviewee said:

> *"The evidence we have from certificate and degree programs in two-year colleges around workforce trajectories are largely for working-age adults who have already been in the workforce… and they are not really looking at the direct enrollment of traditional 18- to 20-year-old first-time college enrollees. There is a need for more investment in understanding how people move from traditional high school settings into 2-year-colleges, where transitions may be happening in the highest volume."*

GAP: Equity	Research on equity in access and outcomes for different groups

There is a need to better understand how programs and policies affect career trajectories of young people with different demographics and needs. A key area of consensus among many interviewees was unpacking how providers and policymakers make decisions on what to offer and how students make decisions on training and credentials. This is important because: (a) the supply of middle-skills credentials are misaligned with the projected labor demand and a large share of middle-skills credentials are conferred in many local markets with no occupational match; and (b) race- and gender-based field and occupational segregation among non-degree credential holders is high.[98] Colleges, training providers, and industry organizations are offering thousands of credentials, and identifying which are high-return and aligned to labor demand can be complex. In this context, understanding factors that affect choice-making — including

[98] Strohl, Mabel and Campbell (2024); Cruse et al (2023); Hanson (2021); Tesfai, Dancy and McCarthy (2018); Carnevale, Rose and Hanson (2012).

program design, marketing, recruitment, and advising practices — is crucial to address potential sources of inequities.

As discussed above, another key area of evidence gap is understanding how to help different groups of young people mitigate barriers to advancement. Existing research suggests that systemic factors that affect racial and gender disparities in the labor market may continue to mediate advancement outcomes for young people in the long run, even for participants of programs that are successful in helping people enter high-return pathways.[99] In this context, it's important to build evidence on strategies that can better bridge disparities in long-term labor market outcomes.

GAP: Cost, scale, sustainability	**Research on program design/implementation that is practitioner-focused. Research on cost-benefit.**

Design and implementation of non-degree credentials. There is not much research on how features of non-degree occupational credentials at community colleges — such as length, curriculum, instruction, stackability, staffing, work-based learning, support services, and availability of career counseling — affect student experiences and outcomes. Research is needed to understand the factors that drive the variations in quality and outcomes for non-degree credentials in different fields and for different groups. There was a lot of consensus among interviewees about the need for more evidence around how credential programs are designed as a way to truly understand how to improve them and produce better outcomes for students, especially in the community college space.[100] One interviewee said:

> *"Quite a bit of work has been done to estimate the labor market returns to different programs of study. But what's challenging is that there's a ton of variation… even within broad occupational fields. What's distinct about estimating the impacts of different types of certificates is that they are determined by so many different dimensions….It's not just about what the labor market is valuing. But what are the relationships between institutions and employers? How much work-based learning is being offered? How much support do students have? It's about what are the underlying dimensions and dynamics of those programs, which doesn't exist in the data. So, everything gets watered down and you see these murky, inconsistent results across different contexts. And you don't really know without the qualitative work to come with it, to understand what potentially is driving a lot of these differences that we see."*

Supporting access and completion of rigorous, high-return pathways for students with high needs. Evidence is lacking on how to best support students who are academically

[99] Fein and Dastrup (2022); Year Up (2022); Grads of Life (2022).
[100] For a conceptual framework of quality in community college noncredit workforce education, see Van Noy, Hughes and Bjorn (2023).

underprepared and face other barriers to enter and complete programs in high-wage occupations. A postsecondary practitioner said that there is a misconception that occupational programs are a less-intensive or easier alternative to traditional degree programs, when there's a big need to think about how to support students who face barriers to entry and completion:

> *"These programs are intensive, they're pretty hard. You kind of got to love that education environment to go into an intensive certificate or non-degree training. And they are expensive and not covered by Pell. It's not always for the kid who hated [traditional high] school, who was not academically prepared, who had a lot of vulnerabilities in life. It's actually for the person who is highly motivated and probably could have succeeded in college. They have study skills, and grit, determination, discipline to get through it. Often funders are like — 'give me that non-college option because college isn't for everyone.' There's just a mismatch there. What's the evidence for what it looks like to support these students with vulnerabilities?"*

While many community-based occupational programs offer advising and support services to mitigate life challenges and bridge skill gaps, such supports are not prevalent in occupational programs in community colleges, often due to funding and capacity issues. Several interviewees mentioned the need to test comprehensive, evidence-based personal and academic support models, like CUNY's Accelerated Study in Associate Programs (ASAP), for non-degree occupational programs.[101]

Value of program components and practices within intensive, multi-faceted models. To facilitate scale and replication of evidence-based programs, there is a need to build better evidence on how specific program components (like work-based learning, work readiness training, or different types of support services) and variations in their implementation can affect youth outcomes in different contexts.

Research on cost-benefit and return-on-investment. In the context of very limited cost research for postsecondary and workforce models, practitioners who participated in interviews emphasized the need to better understand the comparison in ROI for different programs and credentials for different groups. This is important in the context of supporting better choices and helping students navigate their postsecondary options.

Conversations about ROI of non-degree programs often centered around the desire to understand how to create evidence-based career pathways for young people who may not benefit from or have the capacity to pursue a two- or four-year degree right after high school. One interviewee said:

[101] More on the ASAP model can be found here: Scrivener (2015).

"There's a group of funders and institutional actors who for a very long time, especially if they were committed to equity, felt like the college-for-all was the conversation to be had. There was so much push toward four-year degrees. [Young] people incurred debt; they stopped and felt like failures; they didn't necessarily connect to a career. There's a real narrative change that needs to give a collective voice around career pathways that gives some 'equalizing' to all the options that are there."

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees around postsecondary and workforce programs included the following:

OUTCOMES AND IMPLEMENTATION

- What are the long-term impacts and ROI of different types of postsecondary credentials for different groups of young people, particularly students who transition from high school to two-year colleges?
    - What explains the outcomes for different groups — choice of sector or field of study, credential type, program or credential design, labor market experiences and work quality, or something else?
    - How do we understand the quality and value of credentials as it relates to economic and individual advancement? How do they affect participants' entry and retention in quality jobs or wellbeing?
    - Do students secure initial jobs in the sector or occupation for which they received training and credential? Do they stay in the sector in which they received training?
    - Does the quality of the first job affect their advancement trajectory?
- What is the optimal length or duration of training you need to be able to get people into good jobs with advancement pathways?
    - What types of learning experiences and opportunities do training and certificate programs need to provide? What is the role of technology?
- How can states, colleges, and providers design stackable pathways that are effective and equitable? How can short-term credentials serve as an on-ramp to more advanced education and training for different groups in different fields?
    - What factors facilitate or challenge the stacking of higher-level credentials for different groups? What are ways to address disparities in stacking across institutions, fields and race/ethnicity?

- How do structural and individual barriers — like disconnection from secondary education, legal system involvement, transportation, childcare, housing and workplace bias — affect young people's success in pathways programs?
    - What do programs and systems need to do to effectively support access and completion for young people with high needs and barriers to entry?
    - Can programs help young people overcome structural barriers, like racism or sexism in hiring, to improve advancement for different groups?
    - How do community college funding models affect program offerings, implementation and outcomes? For example, understanding the impact of recent funding shifts in Texas from course-and-credit-hour based system to a performance-based model that prioritizes student success metrics like degree completion and credential attainment.

NAVIGATION AND CHOICE-MAKING

- What factors drive the misalignment between the supply of occupational credentials and labor market demands?
    - How do community colleges and other training providers make decisions on occupational program and credential offerings and design? How do policy and funding contexts shape these choices?
    - What are evidence-based strategies to help states and providers better align their offerings with the labor market demand?
- Do programmatic factors — like recruitment and advising practices or credential and program design — contribute to educational and occupational segregation?
- How can postsecondary providers most effectively help students understand their career options and make informed decisions about program and credential choices while minimizing the risk of inequitable tracking? What are the best ways to raise awareness and disseminate information that also foster equity?
- How do you market high-wage, high-growth programs to increase access for under-represented students who typically may not be on these pathways?
- How can providers effectively help young people navigate choices?
    - Where do navigation responsibilities live? Who is best suited to provide career counseling and navigation supports (e.g., a career advisor or faculty/instructor)? How do these extend beyond gaining employment and help with advancement?

    - What tools, training, and knowledge do advisors need to effectively advise students to make informed decisions that meet their individual needs and understand trade-offs of choosing different options?
    - What are effective recruitment and counseling practices to increase demand for high-return pathways?
- How are students making decisions around different types of credentials?
    - How does program length drive their decision? What about other programmatic factors like the availability of supportive services?
    - How do social characteristics of work (like workplace culture, representation and inclusion, and support systems) drive the choice of occupation and training?
    - What role does family, peer, or social network play? How do a family's financial needs or professional experiences shape student choices?
    - What role do providers play?
- What are effective, actionable ways to get data and evidence in the hands of providers and students to guide decision-making on pathways?
    - How can providers and students stay up to date on labor market trends and upcoming shifts resulting from advancements in generative AI?

5

Work-Based Learning

Key Takeaways

This scan focused on programs and practices that provide experiential learning opportunities in high school and postsecondary settings, such as apprenticeships and internships.

Evidence Snapshot	
Outcomes for youth under 25	Work-based learning is a key component of successful pathways programs with long-term labor market impacts, like Year Up and Career Academies. Research on effectiveness of work-based learning models for youth under 25 is very limited but growing, including youth apprenticeships.
Equity	Can be beneficial across gender and racial groups, but equitable access can be challenging. Disaggregated evidence of outcomes is limited for different groups and models.
Cost-benefit	Very limited research. Some models are cost-effective.
Scale and sustainability	Limited research on effective implementation. Intensive, sector-focused models like apprenticeships are challenging to scale.

Key Gaps

There are significant gaps in research across all four areas above.

- Secondary, postsecondary, and workforce outcomes for different WBL models and practices for youth under 25
- Understanding disparities in access and outcomes
  - Disaggregated evidence by subgroups
  - Factors that affect student choices, including program design
- Scaling and sustaining work-based learning
  - Engaging employers at scale: incentives, training, evidence of ROI
  - Designing effective youth experiences: dosage, structure, use of technology, etc.
  - Effective partnerships and intermediaries

Subsections in this chapter

Context

The term "work-based learning" refers to a continuum of activities that range from more light-touch opportunities for career exploration (like career fairs and workplace tours) to more structured opportunities to learn through experiences (like internships and apprenticeships).[102] For this assessment, the evidence scan focused on work-based learning programs and practices across the K-12 to postsecondary pathways that involve experiential learning opportunities. These opportunities can vary widely in length and intensity — ranging from short, low-commitment activities like job shadowing to longer, more immersive programs like apprenticeships. They can be a stand-alone experience or a component of a more comprehensive model where it is integrated with training and education.[103]

Evidence Base

Outcomes

- **Work-based learning is a key component of successful secondary and postsecondary pathways programs with strong evidence of outcomes for youth under 25.**

Multi-faceted high school CTE programs, such as Career Academies, P-TECH and Linked Learning, include work-based learning as a feature of their model. Work-based learning is also a key component of several sectoral programs that have shown evidence of long-term earnings gains, like Per Scholas and Year Up.[104] Research is limited on the implementation of work-based learning within these models (such as dosage, activities and structure), and on how they shape experiences and outcomes for young people.

The strongest evidence of implementation and outcomes for youth under 25 comes from the evaluation of Year Up, where participants spend half of their program duration (six months) in

[102] Pistorino, Darche and Headington (2024).
[103] Ross et al (2020).
[104] Rosen et al. (2023); Fein and Dastrup (2022); Hendra et al. (2016); Warner et al. (2015); Kemple and Wilner (2008).

an entry-level internship that is partially subsidized by the employer. Since the internship is a significant part of the program, it is believed to be a key driver of Year Up's impact on participant employment and earnings. Some research also suggests that work-based learning opportunities in sector-focused secondary and postsecondary programs may increase access to work-based learning for people who otherwise may not have these opportunities. For example, P-TECH participants were significantly more likely (39 percentage points) to have had an internship during four years of high school than students in the comparison group.[105] In the WorkAdvance evaluation, Per Scholas participants were also twice as likely than the comparison group to participate in an internship during the program period.[106]

- **Research on the impact of "stand-alone," work-based learning experiences, such as internships, apprenticeships, and summer jobs, for youth is very limited. The registered apprenticeship program is the only work-based learning model with causal evidence of long-term earnings impact.**

There is a body of evidence on the positive impact of work-based learning models and practices from European countries, but research on how work-based learning affects outcomes for youth under 25 in the United States is very limited. Strongest evidence of long-term employment and earnings gains is limited to a quasi-experimental study of the registered apprenticeship program, which does not specifically seek to serve youth but has seen significant growth in participation by young people.[107] The average age of registered apprentices is about 30, and people under 24 make up about 30 to 40 percent of all registered apprentices in any given year.[108] According to one estimate, about one-fifth of active apprentices are under age 25.[109]

There is emerging evidence that experiences like internships, summer jobs, and youth apprenticeships can lead to short-term employment and earnings gains.

Table 5 presents a snapshot of research evidence on key work-based learning models.

[105] Rosen et al. (2023).
[106] Hendra et al. (2016).
[107] Reed et al. (2012); Prebil (2022).
[108] Boren and Lerman (2024); Kuehn et al. (2023).
[109] Prebil (2022).

Table 5: Key Outcome Evaluations of High School CTE Program

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
Internships • Short-term work placements, typically in entry-level work • Can be paid/unpaid or part-time/full-time	**Associated with increased work readiness and short-term labor market gains. Evidence for long-term labor market gains is strongest for occupational training models with internships.** An analysis of longitudinal studies, mostly from other countries, shows that internship participation in college is associated with academic engagement, acquisition of employability skills, employment, and short-term earnings. Paid internships may be more effective.[110] An RCT of Urban Alliance's paid, year-long internship program for high school students in Baltimore and District of Columbia found positive impacts on high school graduation and college attendance for male students.[111] However, a follow-up evaluation that included additional programs in Chicago and Virginia did not find impacts on high school completion, college enrollment, or persistence. Program had positive impacts on self-reported employability skills and short-term employment.[112] An RCT of a short-term, paid internship program for out-of-school youth in New York City produced gains in employment and earnings in the year after enrollment, mainly due to participation in the internships, but the impacts faded over time.[113]
Co-Ops • Typically paid; involve more extended or repeated work terms than internships • Aligned with a student's field of study or major	**Associated with increased employment in field of study and earnings after college graduation.** There is more research on co-ops at four-year colleges than at community colleges or high schools, where they are typically a component of a broader CTE framework and combined with other types of work-based learning. Participation is associated with positive outcomes on post-graduation employment and earnings, but that outcomes vary by dosage and field of study (positive outcomes were primarily found in STEM and business).[114]

[110] Deming et al (2023); Tu (2022); Rogers (2017).
[111] Theodos et al. (2017).
[112] Theodos et al. (2023).
[113] Cummings, Farrell and Skemer (2018).
[114] Deming et al (2023); Main, Johnson and Wang (2021); Owen and Clark (2001).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
School-based enterprises ● Student-run businesses; can be virtual	**Very limited research.** A very small study found that participation in these enterprises improved GPAs and discipline outcomes for special education students in high school.[115] A quasi-experimental study of Virtual Enterprises, where students run a virtual firm in a year-long high school class, is underway in New York and California.
Summer Youth Employment Programs (SYEP) ● Serve both in-school and out-of-school youth in short-term, paid summer jobs	**Causal evidence of short-term employment and earnings gains, as well as decreased legal system involvement.** There is consistent evidence from causal research that SYEPs increase employment rates and earnings during the program summer and reduce short-term involvement in the legal system. Evidence on education outcomes is mixed, and SYEPs generally have not increased post-program employment rates. SYEPs disproportionately serve low-income youth and young people of color, and there is evidence to suggest that they are beneficial for groups with higher barriers to formal employment.[116]
Pre-Apprenticeships ● Short-term bridge program to prepare people, often those with limited work experience or technical skills, to enter and complete a registered apprenticeship	**Very limited research. May increase access to registered apprenticeships for underrepresented groups.** Results from a recent federal initiative suggests that pre-apprenticeships can boost short-term earnings and serve as an onramp to registered apprenticeship programs for populations underrepresented in the registered apprenticeship program (including women, people of color and young people under 24).[117] Unlike registered apprenticeships, which are tracked by federal and state agencies, pre-apprenticeships are not uniformly regulated or recorded, but there is federal guidance for quality. Models and program practices can vary.

[115] Pilot (2011).
[116] JPAL Evidence Review (2022).
[117] Walton, Gardiner and Barnow (2022).

PROGRAMS, PRACTICES	EVIDENCE OF OUTCOMES
Registered Apprenticeships • Validated by the Department of Labor (DOL) or a state agency • Structured programs that combine paid, on-the-job training, classroom instruction, and credential attainment	**Associated with increased long-term employment and earnings.** Evidence from other countries shows positive outcomes for young people who participate in apprenticeships, but research in the U.S. is limited and not specific to youth. Registered apprenticeships have the strongest evidence of outcomes. A 10-state study conducted in the early 2000s found that, when compared to similar non-participants, program participants earned more for up to 9 years after enrollment, and that net social benefits exceeded costs.[118] Youth participation has grown significantly in the registered apprenticeship program in the last 10 years. Young people who complete registered apprenticeships earn an exit wage of $30 per hour, which is higher than the median wages among all young people.[119]
Youth Apprenticeships • Targets participants between 16 and 24 years old • No official definition used by DOL	**Very limited research.** There are different models of youth apprenticeships led and coordinated by different types of organizations, including high schools, colleges, intermediary organizations, or regional collectives. Evidence on outcomes from these efforts are nascent and suggest potential education and employment benefits in the short run.[120] For example, an observational study of the CareerWise program in Colorado found that 64 percent of students pursued postsecondary education and 37 percent pursued employment after completing the program.[121] Partnership to Advance Youth Apprenticeship (PAYA), an initiative to expand high quality youth apprenticeships, will include an outcome and implementation study to strengthen the evidence base around youth apprenticeships.

[118] Reed et al (2012).
[119] Sullivan et al. (2022).
[120] Kuehn et al. (2023); Fuller et al. (2022).
[121] Fuller et al. (2022).

Equity

- **Work-based learning programs can produce positive outcomes for different groups, but equitable access, occupational segregation, and wage disparities remain concerns.**

Evidence across different work-based learning models suggests that they may improve access to work experience for young people who face structural barriers in the labor market, like low-income youth. But young people of color and female learners continue to lag in access and outcomes. For example: (a) Black apprentices only make up 8 percent of registered apprentices under 25, compared to 63 percent for white youth apprentices; (b) Black youth apprentices made $18 per hour compared to $30 for white apprentices; and (c) females under 25 made up only 7 percent of all youth apprentices.[122] The 2012 national evaluation of Registered Apprenticeship programs found wage gains for women and people of color, but the gains are not as large as those for white male apprentices.[123]

Cost-Benefit, Scale, and Sustainability

- **Research is limited on cost-benefit of different models, effective implementation, or effective funding models.**

Recent authorizations of federal workforce legislations, including Perkins (CTE), WIOA (workforce) and ESSA (K-12), have emphasized and incentivized work-based learning, and states have updated policies and funding to encourage WBL expansion in education and workforce. A recent review of state policies found that states commonly leverage federal funds focused on workforce supports to fund work-based learning but only a few provide state funding and employer incentives in this area, and that most states do not have quality expectations or measurement and data collection systems to monitor outcomes.[124] Despite the growth, there are still not enough opportunities to meet demand and need, and more intensive but potentially impactful models, like apprenticeships, have been difficult to scale due to challenges around funding, large-scale employer engagement and the needs for coordination across systems and silos.[125]

[122] Sullivan et al. (2022).
[123] Reed et al. (2012).
[124] Robson, K., Scheiss, J., & Lammers, J. (2021).
[125] Lawal, Meynet and Lopez (2023).

Key Evidence Gaps

GAP: Outcome	Research on short-term and long-term outcomes

Work-based learning was identified as a significant area of evidence gap across the entire secondary, postsecondary, and workforce pathway, in both literature and in interviews. Interviewees frequently spoke about the general lack of evidence on youth outcomes related to different work-based learning models. One interviewee said:

> *"There's a general assumption that work-based learning is good…. But there has not been a look at the evidence in terms of what the impacts are on student outcomes from work-based learning yet. It has not been included in most studies [of high school CTE programs] because nobody was tracking it. It's a lot of trouble: How do you track it? How do you measure it? How do you know what students are learning when they are at the worksite?"*

Several interviewees cautioned against applying evidence on work-based learning from other countries to the U.S. context without additional research. For example, one interviewee said about youth apprenticeships:

> *"There's been a lot of press coverage of states' efforts to try and do [apprenticeships], and I think some private-public partnerships that are in support of this based on what we know from mostly Central European countries. They are probably worth pursuing, but we still know relatively little about whether and how [apprenticeships] are getting implemented, and I have a lot of skepticism that they're being done in a way that looks like what we know is done in other settings. We should have a low degree of confidence that we might replicate similar outcomes, or what we might expect in Austria, Germany, Denmark, Switzerland."*

GAP: Equity	Research on equity in access and outcomes for different groups

As with most career pathways interventions, there are big evidence gaps around understanding academic and labor market impact of work-based learning for different groups of young people, and the factors that affect equitable access and participation. There is a strong need to improve our understanding of gender and racial gaps in high-quality work-based learning, and how program, policy, and contextual factors affect equitable access and participation. For example, one interviewee said that if a young person earns a prevailing wage for apprenticeship participation in their state, the student's parents may no longer meet the eligibility threshold for public benefits, which may disincentivize participation from low-income students.

GAP: Cost, scale, sustainability	Research on effective program design and implementation that is practitioner-focused. Research on cost.

There are significant gaps in research on effective design and implementation of work-based learning, and on all things related to cost. Many interviewees also said that the lack of shared definitions of work-based learning models and widespread variations in implementation makes existing evidence less actionable. “WBL is another phrase that people are saying with high frequency. I lack confidence that we mean the same thing when we say that across five different settings,” said one interviewee. Practitioners expressed frustration with the lack of research that can inform design and implementation in different geographic and labor market contexts, including detailed descriptions of program models and enabling conditions. This includes:

- Structure, intensity, and quality of work-based learning that can create a positive learning experience for young people at an employer worksite
- Role of technology and how it affects implementation, experience,s and outcomes
- Role of intermediaries as facilitators of youth and employer matching
- Strategies to increase alignment and transitions between secondary CTE, apprenticeships, and higher education
- Engaging and incentivizing employer participation at scale, and training employer staff on structuring worksite learning and mentoring

Related to employer engagement and incentives, there was also frequent emphasis on building evidence for funding models that can sustain the cost of providing youth meaningful WBL opportunities in the long run. “Who pays for this?” was a consistent theme: there was a lot of interest in building evidence around how different public and private entities can collaborate to spread costs of building the infrastructure and capacity required for large-scale, high-quality work-based learning across multiple systems. Many interviewees also emphasized the need to better understand how to create and scale a continuum of effective low-touch and high-touch work-based learning experiences across the developmental trajectory of young people — experiences that can build on one another to help students advance in their pathways.

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees around work-based learning included the following:

SCALE AND SUSTAINABILITY

- What are the enabling conditions needed to promote greater cross-system coordination at scale and to implement high-quality, work-based learning opportunities for students in an equitable way? What are effective models of collaborations and employer engagement?
- What are effective funding models that can sustain intensive work-based learning experiences at scale?
- What are the most effective intermediary models? How do we better understand the effects of different types of intermediation models on youth experiences and outcomes?

EQUITY

- How do labor and wage policies affect access and outcomes for work-based learning programs?
- How do we ensure that apprenticeships can be accessed in different regions, specifically rural areas?
- How do we design pre-apprenticeships to provide extra support for groups that need it as a pathway to registered apprenticeships?

DESIGN AND IMPLEMENTATION

- How do we build supply and demand for apprenticeships in high-growth, high-wage sectors? How do we get more employers on board and get more people interested in pursuing them?
- How do we create more apprenticeship opportunities that can also lead to postsecondary two-year or four-year degrees? What is the efficacy, ROI, and need for public and private investment for apprenticeship degree pathways?
- What is the relationship between work-based learning with strategic dual enrollment in creating postsecondary pathways?
- What model of apprenticeship is truly the best one? Does the European model of apprenticeship work in the U.S. and can it work at scale? Is there a net positive benefit to the workforce?

- What types of industries and occupations are youth apprenticeships targeting? What are the returns for different fields? How do we expand apprenticeships outside of traditional fields like construction and manufacturing?
- How do we effectively build a pipeline from secondary CTE programs to apprenticeships, particularly registered apprenticeships? How can states create better alignment between secondary CTE and apprenticeships programs?
- How are we building earn-and-learn models to match the needs and wants of young people at different stages? Are we matching the right WBL model to the needs and wants of specific populations at different stages?
- How can technology enhance access and outcomes for WBL models? How viable are virtual experiential models, like virtual enterprises, apprenticeships, or internships?
- What intensity of work-based learning is needed? Does having conversation with someone in an employment sector or doing a job shadow make a difference? What is the evidence of combining light-touch, WBL experiences with more advanced ones?
- How can summer job programs be enhanced to serve as a rung on the career pathway for young people? Can they be designed to provide career pathway explorations and connections to the work-based learning continuum?
- How do we design youth apprenticeships or other youth-focused WBL models that are not as expensive or time-intensive but can maintain a level or rigor?
- As artificial intelligence transforms jobs and early career work, how do we need to adapt WBL experiences, particularly apprenticeships?

6

Evidence Gaps Across Systems

Previous chapters presented evidence for programs and models within different systems and organizations. Taken together, the scan highlighted common evidence gaps across systems and programs that span a young person's trajectory. These include the following:

Summary of Evidence Gaps	
Outcomes for youth under 25	• Longitudinal research on education and labor market trajectory and outcomes, including evidence of economic advancement • Research on causal impact of programs and practices
Equity	• Disaggregated evidence for different groups (including by race/ethnicity, gender, disability, socio-economic status, and geography) • Research on individual, systemic, and programmatic factors that affect disparities in access and outcomes • Research on improving access to high-return pathways for people with high needs and barriers
Cost-benefit	• ROI for employer participation in training and work-based learning • Cost-benefit from individual and societal perspective • Return on non-degree credentials in different fields for different groups

Scale and sustainability	• Actionable evidence to guide design, implementation, and scale
	  ○ How program components and practices drive outcomes
	  ○ How context, capacity, and program implementation drive outcomes (such as policy and funding, community and labor market characteristics, staffing and partnerships, etc.)
	  ○ How to improve alignment between supply of programs and credentials and labor market demand
	• Research on impact of policy and systems change efforts

The literature review and interviews for the scan also highlighted evidence gaps in five key areas that are relevant to different systems and programs across a young person's career pathway. These were:

Work-based learning	Non-degree credentials	Career navigation	Employer engagement	Social Capital

- Evidence gaps for work-based learning is discussed in Chapter 5.
- Evidence gaps for non-degree credentials are discussed in Chapters 3 and 4. There is a plethora of non-degree credentials available in the market at the secondary and postsecondary level, including certificates issued by education providers and colleges, certifications awarded by professional associations or industry groups, licenses awarded by government agencies, digital badges, and microcredentials, among others. Navigating this landscape has become increasingly more complex for young people, and there are big gaps in evidence around the comparative value of different credentials in different fields and for different groups, and how they contribute to advancement.
- Career navigation, employer engagement and social capital are discussed in the rest of this chapter.

Career Navigation

A core principle of the career pathways framework is that an individual should be able to sequence a series of education and work experiences at different stages of their lives to build skills that are in demand and advance their economic prospects. But there is very little evidence on how to help young people do this effectively. Many of the programs that are included in this assessment offer career advising and transition support, but research on how these services support outcomes is limited. As artificial intelligence (AI) brings rapid shifts in the labor market and the number of credentials multiply, increased support for navigating pathways is of utmost importance.

A recent research paper on career navigation practices concluded that the "research base is slim" and laid out several knowledge gaps that must be addressed, including **disaggregated and longitudinal research on career trajectories, causal research on career navigation practices, and research on the ways in which individuals acquire and use labor market information**.[126] The paper concluded that "policymakers, employers, educators, workforce intermediaries and organizations, and philanthropy must all play a role in building a career navigation ecosystem"

[126] Fuller and McKittrick, et al. (2023).

that can support people in making effective choices. Literature review and interviews conducted for this scan also surfaced these gaps.

Interviewees for this scan highlighted the need to build evidence on the following:

- **How to help youth develop navigational skills and agency**

Many emphasized the importance of fostering youth agency and skills to navigate their pathways, in the context of an ever-evolving labor market and economic landscape. "How can we help them become 'path-makers' and not 'path-takers?'" asked one interviewee. Another said:

> *"We can't assume that any career is terminal anymore. The idea that we're gonna train you to be a software developer, and off you will go to be a software developer for many years – that is not a thing…. The more that we can design systems for agility and for not just training a specific set of technical skills, the better… If we continue to incentivize systems to anchor on and train for one specific job, even if it's a stackable job, especially for young people, we do them a disservice. Because what we really need is to train them on a core foundational set of skills and then give them an understanding through all of the tools — peers, mentors, sponsors, stories from the field, career navigation data, support, insight into all of the options that are available to them today and are likely to be available to them in the future."*

Several interviewees felt that the intense focus on employer needs has shifted focus away from helping young people develop critical navigation skills and have prioritized credentials and employment instead. One interviewee said:

> *"An emerging concern is that we're increasingly talking about young people as economic assets, and that's really dangerous. This work was never about shifting a focus and saying that the purpose of education is to serve the needs of employers."*

- **How to help youth make effective choices**

Interviewees often described the tension between taking a youth-centered approach to advising, while also helping young people understand the value of different pathway options and their trade-offs. For example, one researcher said that community college counselors that they spoke with often struggled to balance being student-driven and helping them make informed choices:

> *"In almost every conversation I had with advisors, I would ask — 'Do you try to guide toward certain types of programs that you think might be more appropriate for them?' And they'd say, no, no, it's the students' choice and we don't want to give them any incorrect information. We don't want to track."*

There are many open questions about how best to share data and evidence with young people about education and pathways choices, and how best to provide coaching and advising services to help them effectively understand and navigate their options. As discussed in previous chapters, most interviewees urged the need to better understand how young people

make education and career choices to design more youth-focused career navigation strategies. This includes: (a) how they acquire information about education and training options and labor market trends; and (b) how their choices are shaped by individual and contextual factors, including the influence of family, peers, and friends.

- **How to help youth navigate transitions**

Evidence suggests that many young people transition between systems (for example, high school to college or training to employer) without continuous and consistent guidance or support. Many interviewees said that there was no "ownership" of career navigation responsibilities across a young person's trajectory due to (a) fragmented funding streams; (b) disconnection between high school, higher education and workforce systems; and (c) structural issues around capacity, funding and data access.

For example, career services at community colleges are often isolated and underfunded, making it difficult for students to access meaningful support. K-12 school districts also struggle to provide dedicated navigation of postsecondary and career pathways, where advisors have to balance the needs of academic planning and social-emotional development with postsecondary navigation. Opportunity youth who are persistently disconnected or system-involved often find it difficult to navigate the different options available to them in their communities and to put them into a beneficial sequence without strong support at transition points. Existing research and interviews for this scan point to a great need to build evidence for what an integrated, cross-system approach to career navigation could look like, especially one that can effectively support transitions and advancement.

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees included the following:

- How do we help young people develop skills and agency to take ownership of their pathways and make informed decisions as they navigate an ever-evolving labor market?
- What are developmentally appropriate career advising and coaching strategies for young people at different stages?
- How can we share information on labor market trends and value of different pathways with young people and their networks in accessible and actionable ways to help with career navigation?
- What is the role of AI and digital tools in making career navigation affordable and scalable?

    - Can AI augment personal advising without losing relational elements that generally makes advising effective?
    - What data, privacy, and ethical considerations must be addressed in incorporating AI-driven navigation tools?
- What training, data, knowledge, capacity, and tools do career navigators or advisors need to have to effectively guide young people?
    - What is the most effective way to staff career navigation functions? Should advising and navigation functions be specialized (e.g., academic advisors vs. career advisors) or infused throughout instructional and advising staff?
- What are effective ways to reduce system and organizational silos and fragmentation of youth experiences when navigating career pathways?
    - Can we formalize and closely integrate career navigation and guidance as part of education and training systems at scale?
    - Are there effective ways to provide lifelong career navigation support that is not tied to specific institutions but follows individuals over time? What are the data and privacy considerations?
    - What would an integrated system that spans education, workforce and personal support networks look like?
    - How can we design navigation systems, processes or practices to reduce youth disconnection and to ensure that opportunity youth or underserved students can access support?
- How do we support navigation and advising from a policy perspective? What policy and funding shifts need to occur to build greater capacity for career navigation within and across systems?

Employer Engagement

Strong employer engagement and alignment is a core component of a career pathways approach, and evidence suggests that it is perhaps the most challenging to implement. In research literature, programs with evidence of youth outcomes have engaged employers to align curriculum and instruction with industry needs, provide work-based learning opportunities,

provide mentorship and coaching to participants, support post-program job placements, and connect to employer networks.[127]

While examples of effective employer partnerships exist for different types of programs, employer engagement is frequently identified as a key barrier to scaling evidence-based programs and providing work-based learning opportunities for young people. Challenges to engaging employers can vary greatly by program model, sector, and location, but can include concerns about ROI, administrative or regulatory burdens, limited understanding of how programs fit into their broader talent strategy, evolving skill needs, and perceived risk or bias toward hiring young people.[128]

There is limited research on effective strategies to develop and sustain productive employer partnerships for pathways programs, and research on how different types or intensity of employer engagement drive youth outcomes is limited.

- Evidence suggests that employers are motivated by a combination of factors, including benefits to their businesses (boosting hiring efficiency, lowering turnover, getting well-prepared entry-level talent, addressing skill shortages, increasing brand reputation) and fostering social impact.[129]
- Employer engagement can be resource intensive — programs need dedicated staff to recruit employers and maintain relationships. Sector-based programs have had success in engaging private employers by taking a "dual customer" approach, where they focus on the needs and wants of both job seekers and employers to fill jobs. Year Up is the only sector-based youth program that has been evaluated where employers partially fund participant wages for internships.[130]
- Many other programs for youth have engaged employers in work-based learning opportunities for young people by offering wage subsidies. In general, research on use of subsidies or tax incentives for workforce development is limited to programs for disadvantaged adults (such as those on public benefits), where they are often used for short-term, low-wage job placements, and results have been mixed.[131]

Some recent studies have reported that it is often difficult for programs to find a balance between attracting employers and maintaining their satisfaction, and meeting the needs of participants. This was a key theme in many of the interviews conducted for this assessment.

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[127] Klein et al. (2023); Fein and Dastrup (2022); Patterson and Carson (2021); Schaberg (2020); Hossain and Bloom (2015).
[128] Patterson and Carson (2021); Scott et al. (2018); Koller et al. (2021).
[129] Ibid.
[130] Patterson and Carson (2021); Schaberg (2020); Scott et al. (2018).
[131] Corwin (2022); Bloom (2020); Qian (2019); Anderson, Farrell, Glosser, and Barden (2019).

Many interviewees felt that the prevalent approach to engaging employers in career pathways was too transactional and not sufficiently youth-centered, where employers dictate needs without deep collaboration. Educational institutions often bear greater responsibility in employer engagement, while many employers see participation as altruistic rather than a business imperative. Several said that employers often promote short-term credentials to create a worker pipeline for low-quality jobs with high turnover ("talent-takers"), rather than investing in increasing job quality and worker growth ("talent-makers").

A key theme in conversations around employer engagement was finding a balance between making programs demand-driven while also centering on the needs of young people, the quality of their job experience, and their advancement.

Interviewees for this scan highlighted the need to build evidence on the following:

- **Use of financial incentives and tax credits**
- **Training and supporting employers to support young people with work-based learning**
- **Demonstrating the value proposition or ROI of participation**
- **Engaging employers in improving job quality and supporting youth advancement**

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees included the following:

- What is the business case for employer engagement in career pathways for young people, and how do we demonstrate a clear ROI?
    - What evidence of direct and indirect benefits (e.g., improved company culture, brand equity, or reduced turnover) can be leveraged to maximize employer participation? How can we address employer concerns about losing trained employees to competitors?
- What are effective incentives to expand employer engagement at scale for high-quality work-based learning opportunities for young people? What policy and regulatory changes are necessary to ensure access while centering outcomes for young people?
- What are effective strategies to partner with employers of different sizes and in different sectors?
- How can schools, providers or intermediaries effectively train and support employers to create work-based learning experiences that are beneficial for young people?
    - What are effective models for training and supporting employers and their staff to help young people build skills for advancement?

- How can programs effectively and efficiently staff employer engagement functions? What roles, knowledge and tools are needed?
- How can we increase employer engagement in guiding workers through career pathways, including supporting career navigation and advancement?
- What are the levers to engage employers to increase job quality? How can job quality be measured systematically across employers and integrated into workforce programs?
- How can states and localities engage employers in a systemic and centralized way to reduce burden on individual schools and providers? How can centralized data or coordination efforts streamline employer engagement and align training programs with workforce needs?
- From a coordination and financing perspective, what would it take to go from individual employer partnerships that are very strong to cross-institutional and industry-wide collaborations?
- What are effective strategies to sustain employer participation through economic or labor market shifts?

Social Capital

There is emerging evidence that social capital — or the benefits and resources one can obtain through their social networks and interpersonal connections — plays an important role in academic success and economic advancement.[132] Evidence suggests that the quality or make-up of social networks matter greatly in how they affect labor market outcomes. Recent research from Opportunity Insights shows that "economic connectedness" — or having friends in higher socioeconomic strata if you are of lower socioeconomic status — is a strong predictor of upward mobility, but other measures of social capital like tight-knit friendship networks or high levels of civic engagement are not.[133] Another study found that, on average, having a higher number of employed contacts increases a person's rate of finding a job. But for low-wage workers, having a higher rate of employed relatives may have a negative effect, as they end up in lower wage work when they leverage their network for job search.[134]

While research literature on pathways-related programs and practices highlights the importance of building networks and connections, there is very little evidence on strategies that are most effective. Many career pathway programs incorporate practices to help young people build

[132] Tassigne and Goble (2023); Chetty et al. (2022); Almeida et al (2021).
[133] Chetty et al (2022). The mechanisms for how economic connectedness helps people advance is not yet well-understood. For example, it could be that having friends in higher socioeconomic strata increases exposure to role models in the labor market and/or it increases access to resources like information and referrals.
[134] Cappellari and Tatsiramos (2015).

networks and connections — including cohort-based programming, work-based learning, career exploration activities, and mentoring — but their implementation or outcomes are not measured, and they are not grounded in emerging theory and evidence base around social capital. For example, research suggests that "weak ties" with casual acquaintances may expand job opportunities more so than "strong ties" with close friends and family, which has the value of providing stability and emotional support.[135] There is not much evidence for how programs and institutions can help young people develop different types of social ties or expand their network for the benefit of their career aspirations. There are also big gaps in evidence on how to best measure and evaluate social capital in education and workforce development programs.

Opportunities to Advance Evidence

Exploratory questions surfaced by interviewees included the following:

- What are effective ways to foster economic connectedness for low-income young people when schools and communities remain highly segregated along racial, ethnic, and socioeconomic lines? What about students in rural communities with limited networks?
    - What role can schools, providers, educators, and other youth workers play?
    - How can technology, like virtual tools and platforms, be used effectively to help young people build social capital outside of their immediate network and community?
- How does economic connectedness drive outcomes around mobility? What are the implications for career pathways program design and strategy?
- What interventions and practices are currently being deployed by pathways-related programs in different settings to create opportunities for young people to build networks and connections? How can they be enhanced with a more intentional application of social capital research?
- How can we design work-based learning opportunities to help build social capital?
    - How can programs and institutions effectively and intentionally engage employers and community members to help young people enhance their networks?
    - What skills and guidance do young people need to intentionally build networks and connections at work?

[135] Wang and Uzzi (2022).

- What is an effective framework for measuring social capital within a career pathways context for young people?

7

Looking Ahead

"Career Pathways" is an approach that is defined by a structured sequence of high-quality education, training, and support services designed to help learners enter and advance within an occupation or industry. The evidence review and expert conversations conducted for this assessment highlight that a lot of progress has been made in recent years in advancing the evidence base for specific elements of a pathways model. But significant gaps remain in our understanding of what works for whom (and under what context) in creating pathways to mobility and wellbeing for young people. "There are more places where we don't have evidence than we do have evidence when it comes to career pathways," said a researcher — a sentiment that was echoed by nearly all interviewees who participated in this evidence gap assessment.

The evidence gaps, however, do not mean that "nothing works." There is rigorous evidence that programs that take a comprehensive approach to developing and supporting young people in strong partnership with employers can produce outcomes for different groups of young people. But education and workforce development policy and funding generally do not support quality implementation of evidence-based models and practices at scale. Efforts to scale complex, multi-faceted models with evidence of outcomes often fall short in replicating those outcomes because they cannot always replicate the depth of partnerships and services in different contexts. And investments in program innovations and expansions are frequently not accompanied by investments in evidence building that can drive learning and evidence building.

This chapter summarizes ways in which public and private funders of career pathways programs and research can help bridge the evidence gaps discussed in this report.

How Funders Can Help Bridge Career Pathways Evidence Gaps

1. Build alignment around outcomes, incentives, and language

Young people need a continuum of developmentally appropriate supports that help them progressively advance their knowledge, skills and experiences at different stages of adolescence and adulthood. Those that face challenges due to poverty, social inequality or personal trauma need additional supports to stay on a positive trajectory. That means young people should have access to a range of evidence-based options and opportunities across systems that build on one another.

But programs and initiatives in the pathways space are fragmented across K-12, higher education, and workforce systems, and outcome expectations and incentives are commonly misaligned. There is often a mismatch between what students in postsecondary occupational programs are looking for, what training providers are incentivized to do, and what employers want from the programs. A recent qualitative study illustrated misalignment in expectations between community college staff and participants of manufacturing certificate programs. Staff viewed some certificate programs as a means to "spark interest" or help students "get their foot in the door" that may not lead directly to family-sustaining jobs. Bu,t students who graduated from these programs expected entry into a "quality job" with living wages after program completion.[136]

At the secondary level, there are debates about whether high school CTE programs should prepare students for employment in high-demand jobs immediately after high school or focus more on preparing students for college. Often there is a tension between broad exploration and preparing for specific career pathways. For example: Is dual enrollment meant to allow students to explore different academic or career fields while still in high school, or should it be reserved for advancement in a field they have already identified as their interest?

Misalignment in outcome goals affects programs and evidence building in several ways — creating challenges in defining success, designing services, and determining what to measure. Moreover, the lack of a shared vision about the purpose of different education and workforce interventions makes it hard to understand how they fit together and what overall impact they are designed to achieve. In addition, lack of consistent terminology and shared definitions in the field around programs and practices — such as dual enrollment, work-based learning, earn-and-learn or even career pathways — can be a big obstacle to drawing meaningful conclusions about their effectiveness and to developing a cohesive body of knowledge. It also makes it difficult for practitioners to apply research evidence.

Funders can lead efforts to build alignment on goals and definitions of career pathways programs and practices that aim to create a common understanding and language in the field. This can include a shared framework designed collaboratively with youth, practitioners, employers, and researchers, as well as activities to incentivize and encourage its adoption.

2. Test innovations in career exploration, navigation, and advancement

The core goal of a career pathways approach is to help people enter *and* advance in high-value pathways. However, even intensive programs only support young people for a limited time. Many career pathways programs aim to help people enter specific sectors or occupations, but

[136] Dadgar et al. (2024).

there is very limited evidence on exploration opportunities or navigation supports that can help students choose pathways that are right for them and that can help them advance.

Current funding and policy practices often prioritize metrics around quantity (like numbers served) and immediate outcomes (like job placement in specific sectors) and do not sufficiently incentivize supports for career exploration, navigation of career choices, or navigation of transitions or advancement. As such, expectations of long-term outcomes are not always backed by resources and services that may be required to produce those outcomes.

Evidence suggests that sector-based programs can help young workers advance their careers over time but cannot speak to the mechanism or practices that support advancement. There is also a lack of evidence and alignment on what success should look like and how it can be measured when it comes to supporting career exploration, navigation, and advancement for youth. In addition, there are emerging questions around the potential role of AI to enhance and support career exploration, navigation, and advancement.

Funders can work with youth, practitioners, youth, employers, and researchers to test practices and innovations that promote effective career exploration, navigation, and advancement practices. This will need to include efforts to create a shared understanding of success and metrics related to proximal and long-term outcomes.

3. Mobilize employers to advance evidence on work-based learning, job quality, and advancement

Evidence suggests that the availability and quality of work-based learning connected to career pathways vary widely across the country.[137] In addition, recent shifts in the labor market, rising inequality, and changing expectations among younger generations have also increased the focus on the quality of jobs that one can access through career pathways programs. A substantial share of middle-skill jobs that require some postsecondary education or credential below a four-year degree do not pay a family-sustaining wage or support advancement, including jobs that have high social value like roles in early childhood education.[138]

Employer engagement is key to improving the availability and quality of work-based learning, as well as the quality of early career, middle-skills jobs in different industries. A lot of work has been done over the last decade to expand work-based learning, advance job quality, and learn about effective employer partnerships.[139] But significant evidence gaps remain around understanding how these efforts have affected outcomes for different groups of youth or the strategies and practices that drive outcomes. A key gap is our understanding of how youth

[137] Ross et al (2020).
[138] Mabel et al (2024).
[139] Cage (2025); Seth, Rogers and Bediako (2024); Katz, Congdon and Shakesprere (2022); Scott and Katz (2021); Scott et al. (2018); Spaulding and Blunt (2018).

experiences at employer organizations and features of their work experience (like wages, benefits, skill-building opportunities, workplace culture, and opportunities for relationships and mentoring) affect their education and career decisions, advancement, and wellbeing.

In addition to working with employers to support job quality and advancement, it is also important to increase employer engagement and participation in learning and evaluation activities. Getting companies to share their employee data is a big barrier to tracking job quality and advancement within employer organizations, and assessing how the characteristics of a job or an organization may shape youth trajectory and advancement (see discussion below on job quality). Concerns about data security and potential legal risks prevent data and knowledge sharing at the employer level.

Funders can mobilize employers in different fields to expand access to work-based learning opportunities and improve the quality of early career work. This will need to include efforts to incentivize employers to participate in data collection, evaluation, and learning activities that can help bolster the evidence base, including a collaborative framework and secure data-sharing apparatus.

4. Support a holistic approach to building evidence

The career pathways evidence assessment highlighted that systemic changes are necessary to the way we fund, build, and share evidence. There was a high level of alignment among researchers and practitioners interviewed for this assessment around the need to augment quantitative evaluations of outcomes with other types of research that can contextualize the results, explain the mechanisms that affect those outcomes, and produce actionable evidence for future strategy, practice and policy.

Funders can embrace a broader range of methodologies and research practices to meet the evidence gaps surfaced in this report.

a) **Incentivize innovations in causal research.** While RCTs are considered a gold standard, they are resource-intensive and are not feasible in every setting or context, especially when evaluating system-level innovations. Continued innovations in quasi-experimental methods are necessary to fill the extensive gaps in causal evidence around career pathways efforts. For example, Opportunity Insight's success in recreating RCT-level evidence for sector-based programs using non-experimental matching designs with federal administrative data highlights this potential.[140]

b) **Prioritize implementation and cost research that can inform policy and practice decisions.** Evidence of outcomes is not useful without an understanding of the "why"

[140] Chetty et al. (2021)

and the context in which the evidence was produced, and evidence is not actionable unless it can answer questions relevant to policy and practice. There is a need for more interdisciplinary, mixed-method research on how specific program components and implementation practices drive outcomes, as well as exploring the role of structural and contextual factors. Analyses of cost-effectiveness and resource requirements for effective implementation are highly useful for practitioners, but they are conducted infrequently.

c) **Build practitioner capacity for data use and evidence building to inform timely improvements.** While we need rigorous experimental and non-experimental evaluations to advance the evidence base, they take time to develop and conduct. Schools, colleges, and other providers face a lot of pressure around expedient decision making as needs emerge or their policy and funding context changes, but often do not have the data or research capacity that allows them to make data-driven or evidence-informed decisions. Funders can help providers and practitioners build the capacity (talent, tools, technology, strategy, systems, etc.) and partnerships that are needed to build evidence that is timely and that can improve strategic decisions, including descriptive analysis to understand trends and variation in implementation and outcomes. "Some evidence is better than no evidence," one researcher said about the need for more low-touch, timely research. Based on conversations with practitioners, investments in alignment-building activities across institutions and partners — like a theory of change that guides implementation or a learning agenda that guides measurement and data collection — can be valuable in building the capacity of practitioners to build and use evidence in a timely manner.

d) **Incentivize youth and practitioner engagement in evidence-building activities, including development and testing of solutions.** User research is a standard practice in product development and in other fields to understand a prospective user's needs, motivations, experiences, and behaviors, but meaningful use is lacking when designing education and workforce programs or when evaluating them. Funders can encourage and incentivize intentional engagement of young people and practitioners when developing and testing programs to ensure that proposed solutions are grounded in their needs and operating context, that target outcomes are meaningful for them, and that young people and practitioners can engage equitably in the evidence-building process.

e) **Invest in communication and learning activities to bridge the evidence-to-practice gap.** Many interviewees emphasized that the gap between research evidence and what practitioners and policymakers know and use is significant. As noted above, one reason is that outcome or impact evaluations often do not have details about implementation, practice, or cost. In addition, practitioners said that they found it challenging to (a) understand how findings from studies can be generalized or applied to their own

organizational and community contexts and (b) translate findings into actionable steps that they can implement in their specific contexts. Funders can invest in dissemination products and strategies that are audience-specific and enable practitioners to translate evidence into action. In addition, there is also a need to invest in systems and tools that make research data and findings widely accessible.

f) **Invest in systems-level research.** In addition to research on individual programs and their components, there is a great need to understand the impact of policy and systems-level changes, such as changes to funding structures and performance incentives or changes to the way counseling functions are staffed and trained. It's challenging to measure the effects of systems-level changes, but they are consequential and affect access and outcomes for young people at true scale. Funders can incentivize innovations in rigorous systems-level research to unpack outcomes at the organizational and population level.

g) **Help address data barriers to longitudinal tracking of outcomes.** There are many challenges to accessing and linking administrative data across systems and time points, which limits the ability to track young people longitudinally. K-12, postsecondary, and workforce data systems often operate in silos with different data formats, definitions, and reporting mechanisms, making data linkage technically and legally complex. There are also limitations in national-level labor market data. For example, unemployment wage records can provide some information on employment and earnings, but they often lack details like occupation within a job and industry of placement. In recent years, there have been data access, alignment, and integration efforts at the state and national level, including a recent effort to create a national, nonprofit hub for non-degree credential data.[141] There is still great need for more investments in (a) modernization and interoperability of data systems at the state level to support data integration and use; (b) innovative data collection approaches that simplify self-reported data collection from students and workers; and (c) foster collaboration with stakeholders, like employers and training providers, to create secure and neutral data repositories for ethical research use.

h) **Incentivize more inclusive and expansive measures of success and youth development.** To date, the core measures of success of a career pathways approach have included program completion, credential attainment (including high school diploma), employment rates, and earnings. But emerging evidence suggests that people prioritize factors other than earnings in choosing careers (including fringe benefits, scheduling flexibility, and perceptions of meaningfulness and contribution), and that the non-monetary benefits

[141] Jobs for the Future (2024), Learn & Work Ecosystem Library (2024).

and social value of some lower-wage work can outweigh earnings consideration for many — something that was stressed by many interviewees in this scan.[142] One said:

> *"We talk about mobility up and down the ladder. But what if they like being a childcare worker? Or what if they like being a domestic worker because it gives them freedom and flexibility? And they like that because they're highly organized, and that matters to them, and they see themselves as a professional. Then job quality comes into play."*

In this context, interviewees urged funders to consider a more inclusive and expansive view of success that includes measures for (a) youth development, such as non-cognitive and employability skills, self-efficacy, resilience, and positive habits; (b) overall wellbeing, such as life satisfaction, work-life balance, psycho-social wellbeing, and housing stability; and (c) economic wellbeing, such job quality, material hardship, and asset building.

A more holistic approach to evidence building — that is centered on meeting the needs of young people and enabling practitioners who serve them — can help researchers, practitioners and funders produce timely knowledge that effectively informs policy and practice in the evolving labor market.

[142] Baum and Espinoza (2021); Rothwell and Crabtree (2019).

Appendix A

Interviewee List

ORGANIZATION	NAME	TITLE, ROLE
Abt Global	Deena Schwartz	Senior Associate, Research, Monitoring, and Evaluation
American Institutes for Research	Katherine Hughes	Principal Researcher at AIR and Principal Investigator of CTE Research Network 2.0 (at the time of the interview)
Annie E. Casey Foundation	Allison Gerber	Vice President, Center for Economic Opportunity
	Sarah Gonzalez	Senior Associate, Employment, Education, and Training, Center for Economic Opportunity
	Bethany Boland	Senior Research Associate, Research, Evaluation, Evidence and Data
Brookings Institution	Martha Ross	Senior Fellow – Brookings Metro
	Annelies Goger	Fellow – Brookings Metro
Boston College Lynch School	Shaun Dougherty	Professor of Education & Policy; Co-Principal Investigator for CTE Research Network 2.0
Careerwise Colorado	Mandana Nakhai	Senior Manager, Research
Clayton Christensen Institute	Julia Freeland Fisher	Director, Education

ORGANIZATION	NAME	TITLE, ROLE
Community College Research Center, Columbia University	Maria S. Cormier	Senior Research Associate
Delaware Department of Education	Jonathan Wickert	Director, Career and Technical Education and STEM Initiatives
Education Equity Solutions	Mina Dadgar	Founder, Executive Director
Foresight Law + Policy	Alex Perry	Policy Advisor, leads Dual Enrollment Research Fund
Gates Foundation	Jacklyn Altuna Willard	Senior Program Officer, Measurement, Learning and Evaluation, Early Learning and Education Pathways
Generation Schools Network	Wendy Loloff Cooper	Executive Director
	Kirk Banghart	Vice President; Chief Facilitator Colorado Rural Education Collaborative
	Audrey Gutierrez	Area Manager for Community & Career Connected Learning
	Amanda Burns-Hawley	Pathways Coordinator for College & Career Readiness
	Alison Lauge	Vice President, Partnerships and Development
	Brad Mitchell	Strategic Advisor
Georgetown University Center on Education and the Workforce	Zack Mabel	Director of Research
Harvard Project on Workforce	Kerry McKittrick	Co-Director
	Nathalie Gazzaneo	Co-Director

ORGANIZATION	NAME	TITLE, ROLE
Jobs for the Future	Kyle Hartung	Associate Vice President, Education
	Alex Swartsel	Managing Director, Insights, JFF Labs
Macomb Community College	James Jacobs	Former President of Macomb Community College and research advisor at CCRC
Maryland State Department of Education	Richard W. Kincaid	Senior Executive Director, Office of College and Career Pathways
MDRC	Rachel Rosen	Director of the Center for Effective Career and Technical Education
	Frieda Molina	Director of Economic Mobility, Housing, and Communities Policy Area
National Fund for Workforce Solutions	Amanda Cage	President and CEO
	Michelle Wilson	Director of Evaluation and Learning
	Natalie Applegate	Development Manager
nXu	Yutaka Tamura	Executive Director
NYU School of Professional Studies	Angie Kamath	Dean of NYU SPS; formerly Dean of Continuing Education & Workforce Programs at City University of New York and Executive Director of Per Scholas
Opportunity Insights	David Forte	Director of Research Translation and Strategic Initiatives
	Sarah Oppenheimer	Executive Director
Progressive Policy Institute	Bruno V. Manno	Senior Advisor
Project Evident	Bi Vuong	Managing Director, Education Advisory Practice

ORGANIZATION	NAME	TITLE, ROLE
RAND	Lindsay Daugherty	Senior Policy Researcher
Strada Education Foundation	Holly Custard	Deputy Director of Institute Partnerships and Outreach, Strada Institute for the Future of Work
Year Up United (YUU)	Garrett Warfield	Former Chief Research Officer at YUU; current Chief Research and Impact Officer at National Recreation and Parks Association

Appendix B

"Dream" Evidence Projects

If you could design a dream project to test and evaluate the efficacy of programs, practices, policies, and/or collaboration mechanisms related to career pathways at scale, what would it be?

Project Evident asked interviewees who participated in this assessment to describe research questions or projects they would prioritize to address evidence gaps in the career pathways space. Their answers to the question above were included in the qualitative analysis of evidence gaps, and are shared in this section.

K-12

INTERVIEWEE	DREAM PROJECT
Alex Perry, Foresight Law + Policy	**NAVIGATION** How do we better support students in navigating choices around the ever-expanding menu of high school career pathways offerings and options (such as dual enrollment, apprenticeships, CTE courses, and work-based learning)? From an implementation and policy standpoint, how do we design and build capacity for a career counseling and advising ecosystem that can effectively guide students to high-value options for them?
Katherine Hughes, formerly of American Institutes of Research	**NAVIGATION** School districts are offering a wide range of high school CTE programs, but we do not have good research on how these decisions are being made and how students are navigating them. How are districts choosing which CTE programs to offer, and how do these offerings align with the needs of their student populations and the local labor market? How are students deciding which CTE options to pursue, and what motivates their choices?

INTERVIEWEE	DREAM PROJECT
Jonathan Wickert, Delaware state DOE	**EQUITY: YOUTH WITH DISABILITIES** How do we expand access to high-quality CTE programs to students with disabilities and ensure their success in different mid-and high wage, in-demand fields like health care and computer science? What are effective strategies or practices that can make CTE classrooms and programs more inclusive, where students with disabilities can learn alongside their peers? How do we effectively align Pre-Employment Transition Services — which provide exploration and advising services to students with disabilities for postsecondary and workforce transition — with a career pathways approach and high school CTE programs?
Martha Ross, The Brookings Institution	**EQUITY: DISADVANTAGED STUDENTS** How do we build effective career pathway models for young people for whom the formal education system often does work? For example: connecting alternative high schools with work-based learning, dual enrollment and apprenticeships.
Rachel Rosen, MDRC	**GREEN JOBS** The demand for "green" jobs in renewable energy has outpaced the availability of workers trained in the building, installation, operation, and maintenance of the new technologies. Can we effectively scale evidence-based CTE models to meet the demand for skills in these areas? What are the barriers and potential solutions to scale? (See framework here)
Richard W. Kincaid, Maryland State DOE	**EQUITY: YOUTH WITH DISABILITIES** How does the K-12 system incentivize employers to expand access to supportive career-connected learning opportunities for young people with varying needs, particularly students with physical or learning disabilities who may need additional accommodations at worksites? How do we provide equitable opportunities for students who face systemic barriers in the labor market and can benefit most from career-connected learning opportunities?
Shaun Dougherty, Boston College	**LONGITUDINAL EVIDENCE** A dream project would be to conduct the richest, most comprehensive descriptive study possible to build evidence on students' longitudinal trajectories from high school to postsecondary education and workforce. This would require connecting several administrative data sets, namely state-level K-12 and

INTERVIEWEE	DREAM PROJECT
	postsecondary data (including detained longitudinal records of course-taking), national Unemployment Insurance data, data from the National Student Clearinghouse, and ideally IRS tax records that would allow for a look into mobility across states.
Wendy Loloff Cooper, Generation Schools Network	**EQUITY: JUSTICE-ENGAGED YOUTH** We would like to gain greater understanding of what programs, practices, policies, and collaboration mechanisms can be used to give justice-engaged students in Colorado credentials to increase economic mobility and self-sufficiency when their education has been disrupted. We are working on opening two Community Campuses for this purpose in Fall 2025 in Aurora and Colorado Springs.
Yutaka Tamura, nXu	**LONGITUDINAL EVIDENCE** How do we build longitudinal evidence for career programs designed for early exploration and development, particularly middle school-focused programs? How do we build the capacity of nonprofit training providers — both internal capacity and external research partnerships — to continually collect and analyze data and contribute to the evidence base?

Postsecondary and Workforce

INTERVIEWEE	DREAM PROJECT
Angie Kamath, NYU School of Professional Studies	**ADVANCEMENT, JOB QUALITY** As the economy changes and hybrid work is more common, internships seem harder to come by, and starter jobs seem more important. I am not aware of research that looks at the transferability and experiences in career mobility for young people who start out in starter/static jobs (retail, food service, customer service). What happens to young people who start out working in Starbucks, McDonald's, etc., and how does that matter to their future job attainment?
Deena Schwartz,	**WORKFORCE PROGRAM LANDSCAPE** There is so much variation in workforce programs and how they link to jobs and employers in different fields. A deep, intensive landscape analysis of

INTERVIEWEE	DREAM PROJECT
Abt Global	workforce programs would be valuable — one that really describes the programs, what they do, what they have in common, and how they are shaped in terms of funding, policy, and context. I'd also love to understand the experiences of people with job search and preparation in this labor market with a race and gender lens, so that we can understand how to support young people as they enter the labor market.
Frieda Molina, MDRC	**ADVANCEMENT** The field knows more about training individuals for entry-level jobs than how to support workers to advance in their careers. How can we support workers to make informed decisions about advancement?
Garrett Warfield, formerly of YUU	**LONGITUDINAL EVIDENCE** How do we engage individual employers to participate in a "Data Switzerland" — a neutral, secure, and risk-free mechanism for sharing company-level data — that allows for an understanding of how evidence-based sector programs affect the longitudinal trajectory and outcomes for young people, especially those without four-year degrees, within companies?
James Jacobs, formerly with Macombs Community College	**ADVANCEMENT, JOB QUALITY** How can community colleges work with employers toward a more collaborative, less transactional model of engagement to develop workforce programs that are also engines of economic development and can lead to "good" jobs with sustainable wages for students? **NAVIGATION** How do students choose occupational pathways and training programs at colleges? What are the factors that shape their choices, such as length of training, wages, and social characteristics of work?
Maria Cormier, Community College Research Center	**ADVANCEMENT, JOB QUALITY** How do we effectively support students to complete postsecondary training and transition to the workplace? How can we make the transition from education to workplace more seamless and integrated? How do we

INTERVIEWEE	DREAM PROJECT
	engage employers to create and sustain “good” entry level jobs for young people that are not underpaid and undervalued?’
Mina Dadgar, Education Equity Solutions	**ADVANCEMENT, JOB QUALITY** What does it take to design community college occupational training programs that can help students successfully transition to a “good job” in different industry sectors? What are the considerations in terms of training duration, curriculum design, target competencies, integration of work-based learning, and student supports that contribute to labor market value for credential earners? **EQUITY** How do different sorting mechanisms track low-income and Black and Latino students out of "high-value" community college credentials? What quantitative and qualitative evidence exists on the impact of different mechanisms (e.g., program offerings, dual enrollment offerings, college counseling, access to work-based learning opportunities, etc.) on sorting into programs of value by student race and income? What are examples of community colleges successfully removing barriers, or intentionally recruiting and supporting low-income students and students of color in programs with labor market value?
Nathalie Gazzaneo, Harvard Project on Workforce	**IMPACT OF AI** How do we bend the arc of generative AI adoption in postsecondary space to increase access to opportunities for more people, and avoid widening existing inequalities and economic disparities?
Zack Mabel, Georgetown CEW	**LONGITUDINAL EVIDENCE** I would love to empirically track the education-to-workforce trajectories of different groups earning various middle-skill credentials and use the insights to guide investments that expand economic opportunity for workers of all backgrounds while meeting our nation's workforce needs.

Across Systems

INTERVIEWEE	DREAM PROJECT
Amanda Cage and Michelle Wilson, National Fund for Workforce Solutions	**NAVIGATION, SOCIAL CAPITAL** We'd love to work with several of our network partners to build a regional career navigation system. Our nation suffers from disjointed and underfunded career services. We lack worker-centered, coordinated systems that facilitate career navigation and upward mobility. With a larger investment, we would like to work with several communities to explore what it would take to build such a system. This would include multiple systems and institutions: K-12, postsecondary education, public workforce, employers, and other key community resources. It would also address the key drivers of career navigation success, including but not limited to: access to reliable information about careers and what's needed to access them and building social capital.
Allison Gerber, Bethany Boland and Sarah Gonzalez, Annie E. Casey Foundation	**EQUITY** Do CTE and career pathways programs perpetuate or reduce racial inequities? How do we design or adapt models to counteract structural discrimination? A dream project would be to take an intersectional approach to understand the needs and barriers of young people based on their various, overlapping identities.
Annelies Goger, The Brookings Institution	**WORK-BASED LEARNING** How do we develop and test a consistent measure of return-on-investment for different work-based learning models that can produce evidence for how certain design elements affect ROI in different occupations?
Bruno V. Manno, Progressive Policy Institute	**NAVIGATION, WORK-BASED LEARNING** A dream project would be to develop a "practical how-to" for career education and navigation — beginning in preschool and going through age 25. It would: (a) assess the use of AI, including the tutoring potential of AI and skill and aptitude assessment, and (b) include a clear link to work-based experiences and pathways to jobs that are in demand, with emphasis on pathways to "launchpad jobs."

INTERVIEWEE	DREAM PROJECT
David Forte, Opportunity Insights	**ADVANCING EVIDENCE UPTAKE** How do we create stronger connections between the production of research and its uptake and application by practitioners and policymakers on the ground? What are effective ways in which research evidence can be made more actionable for practitioners and policymakers?
Holly Custard, Strada Education Foundation	**NAVIGATION, BREAKING SILOS** How do we create a "network of networks" that efficiently and effectively leverages the strengths and capacity of different organizations focused on various aspects of education and learner success to build seamless pathways for all learners over a lifetime? What are the most effective strategies for organizations within different networks to collaborate — particularly in areas like marketing and outreach, coaching, wrap-around support, and developing employer partnerships — to avoid individual organizations having to build everything from scratch and unnecessarily be forced to compete in areas that distract from their impact potential? How can the "network of networks" be designed to be both structured enough to provide organizational support and clear pathways for learners, and nimble enough to respond to the diverse and unpredictable nature of the education-to-workforce ecosystem and needs of individual learners?
Jacklyn Altuna Willard, Gates Foundation	**ADVANCING CAUSAL EVIDENCE** How do we leverage challenges around systems constraints to build causal evidence for pathways interventions through natural experiments? For example, shortage of qualified teachers is a big challenge in expanding dual enrollment programs. This presents an opportunity to potentially test staffing and teaching models — such as, use of subject matter experts vs. generalists in teaching roles or testing of virtual or hybrid models — using a RCT to build evidence for solutions to address the challenges.
Julia Freeland Fisher, Clayton Christensen Institute	**EQUITY, SOCIAL CAPITAL** What are promising subgroup-specific strategies to build social capital that lead to economic mobility, especially for those facing systemic barriers to economic success? What are the best practical measures of high-quality weak ties developed in the course of career-connected learning?

INTERVIEWEE	DREAM PROJECT
Kerry McKittrick, Harvard Project on Workforce	**LONGITUDINAL EVIDENCE** What is the longitudinal evidence for career pathways programs and policies — what happens to learners and workers after 5, 10, or 15 years?
Kyle Hartung, Jobs for the Future	**NAVIGATION, BREAKING SILOS** How do we create a “no dead-end” system for young people? What does it look like to move beyond the traditional linear trajectories from education and training to workforce that often track people into limited opportunities for advancement, and toward a system that offers numerous possibilities for skill and knowledge accumulation, credentials, degrees, and work experience? How do we break down the silos between education and workforce systems and create new incentive structures that support seamless transition and lifelong learning? How can funders effectively invest in and support "radical collaboration" as a driver of systems change, moving away from the current norm to fund specific “things” with short-term, student-level outcomes? How do we incentivize a fundamental shift in how stakeholders work together toward system change — one that influences institutional practices and behaviors and the lived experiences of students and workers?
Sarah Oppenheimer, Opportunity Insights	**ADVANCING IMPLEMENTATION EVIDENCE** How can we advance the field of implementation evaluation to better understand the “why” behind program outcomes, and to address long-standing evidence gaps around the most effective types, modalities, and dosage of services across different populations?

Appendix C

Upcoming Evidence Projects

What are some projects that you or your organization are working on that most excite you right now and that you feel have the potential to advance the field's understanding of what works in creating pathways to mobility for young people as they navigate secondary, post-secondary, and workforce domains? Are there initiatives or research projects in the field that you're excited about because of their potential to advance knowledge and action on pathways?

Project Evident asked interviewees who participated in this assessment to identify upcoming projects or publications that will advance the evidence base for career pathways. Their answers to the questions above were included in the qualitative analysis of evidence gaps, and are shared in this section. Please note that this is not a comprehensive list of upcoming evidence.

K-12

UPCOMING PROJECT	ORGANIZATIONS
CTE + DUAL ENROLLMENT + WORK-BASED LEARNING An outcome and implementation study of a CTE initiative in New York City that incorporates work-based learning, dual enrollment, and personalized career planning from a trained advisor.	MDRC, Research Alliance for New York City Schools
CTE + DUAL ENROLLMENT An outcome evaluation of CTE-focused dual enrollment courses in Delaware, with a specific focus on understanding how dosage affects student outcomes (for example, taking one CTE dual enrollment course compared to students taking multiple, sequenced courses).	Dual Enrollment Research Fund, University of Delaware

UPCOMING PROJECT	ORGANIZATIONS
CTE A descriptive study using administrative data from 15 cohorts of high school graduates in Massachusetts will explore whether and how characteristics of CTE participants have changed over time, in the context of overall demographic shifts.	Shaun Dougherty, Boston College
WORK-BASED LEARNING Two studies on the effectiveness of entrepreneurial work-based learning programs in high schools, including a study of a Career Technical Student Organization that is centered on agricultural CTE education and a quasi-experimental study of Virtual Enterprises where students run a virtual firm in a year-long course.	American Institutes for Research, RAND
WORK-BASED LEARNING The Partnership to Advance Youth Apprenticeship (PAYA) is a multi-year, collaborative initiative that supports states and cities in their efforts to expand access to high-quality apprenticeship opportunities for high school age youth. Will include an outcome analysis and an in-depth implementation study to advance the evidence base for development, implementation, and scaling of high-quality youth apprenticeship programs.	Multiple funders and partners (list here)
WORK-BASED LEARNING A multi-organization research partnership will examine how a corporate work-study program offered through private high schools in the Cristo Rey Network affects low-income students' economic outcomes, including college enrollment and persistence, employment, earnings, and credit. The program provides all students with a work-based learning experience with a local business one full day per week during school months, all four years of high school.	Boston College, Brown School at WashU, University of Pennsylvania, Jimenez Strategy & Analytics
NAVIGATION, SOCIAL CAPITAL The ASA Center for Career Navigation will develop and pilot a digital platform to help high school students and opportunity youth explore education and career paths that do not require a college degree.	Jobs for the Future, American Student Assistance (ASA)

UPCOMING PROJECT	ORGANIZATIONS
NAVIGATION, EXPLORATION A RCT is testing two technology-based advising tools in high school for career exploration and navigation in the context of CTE programming. Will also include an implementation and cost analysis.	MDRC
EMPLOYABILITY SKILLS A student-driven curriculum for "North Star" non-cognitive, employability skills that includes a focus on entrepreneurship and opportunities to earn micro-credentials is under development. Designed to include opportunities for special populations (system-involved, ELL, IEP/504, medically disabled, etc.), as well as a general population of students.	Generation Schools Network
SOCIAL CAPITAL An approach to building social capital in schools where teachers are trained to work with students to address real-world problems facing local businesses is under development.	Generation Schools Network
SOCIAL CAPITAL A multi-community project is testing strategies to build, expand, and mobilize the social capital of underrepresented learners, especially those within high school STEM pathways.	Education Strategy Group, Siemens Foundation

Postsecondary and Workforce

UPCOMING PROJECT	ORGANIZATIONS
COMMUNITY COLLEGE PROGRAMS Qualitative study of students enrolled in noncredit workforce programs in three community colleges, focusing on the students' decision-making processes, program navigation, and college experiences. Builds on earlier work at these colleges on noncredit program design and offerings. (Expected publication in 2026)	Rutgers University's Education and Employment Research Center

UPCOMING PROJECT	ORGANIZATIONS
COMMUNITY COLLEGE PROGRAMS, JOB QUALITY Evaluations of Department of Labor's Strengthening Community Colleges Training Grants, which applies learnings from the TAACCCT grants to build the capacity of colleges to collaborate with employers and to support students to get "good jobs in in-demand industries."	CCRC, Mathematica
COMMUNITY COLLEGE PROGRAMS Study of non-credit CTE programs in the Virginia Community College System will draw on a data set that links detailed CTE program data with longitudinal student education and earnings data — along with qualitative data from staff and students — to identify institutional and program factors that promote the academic and labor market success of students enrolled in noncredit CTE programs.	MDRC, University of California-Irvine
COMMUNITY COLLEGE PROGRAMS, EQUITY Study of "high-value" certificate and Associate's degree programs in the California Community College System will seek to identify the barriers and opportunities in scaling such programs and ensuring access by low-income students and students of color.	Education Equity Solutions
COMMUNITY COLLEGE PROGRAMS, JOB QUALITY, EQUITY The Advancing Equitable Career Pathways initiative brings together community colleges and industry partnerships to understand drivers of occupational segregation and test and adopt practice changes that create more equitable pathways to good jobs for targeted occupations and industries.Supports colleges and industry leaders to adopt practices within educational and training systems that ensure all students have access to the right information, supports, training, and connections that result in good jobs.	National Fund for Workforce Solutions
SECTOR-BASED PROGRAMS The Sector Training Evidence-Building Project (STEP) will build on WorkAdvance to expand the evidence base for sector models through A key component of this project is to build evidence for critical program elements necessary to scale sector models.	Ascendium Education Group, MDRC

UPCOMING PROJECT	ORGANIZATIONS
SECTOR-BASED PROGRAMS An evaluation will assess the impact of training programs across a range of sectors and institutions and unpack how program effectiveness varies by industry, geography, program characteristics and population characteristics. Will include a cost and ROI analysis, and an exploration of how program features and components (such as modality, length, sector, cost, sector, wraparound supports, etc.) affect participant outcomes.	Opportunity Insights, Social Finance Institute
LONGITUDINAL EVIDENCE, NON-DEGREE CREDENTIAL CredLens is an independent, nonprofit organization that will serve as a hub for various public and private data sources to understand the education and labor market outcomes of non-degree credentials.	Strada Education Foundation
JOB QUALITY, NAVIGATION The Centering Workers in Job Design initiative will seek to help employers engage employees in co-designing new workplace practices that boost job quality, through increased compensation and/or better career navigation services. The Fund is collaborating with partners in eight communities to increase the number of employers using human-centered approaches to making jobs and workplaces better.	National Fund for Workforce Solutions
JOB QUALITY The Better Jobs for Better Access initiative seems to make childcare more accessible for all workers by improving job quality in the sector and pushing for policy and regulatory changes that will boost the number of workers and entrepreneurs operating programs.	National Fund for Workforce Solutions
NAVIGATION, SOCIAL CAPITAL A mixed-method study of low-wage earners and community college students to better understand how they navigate their careers, including information sources, use of social capital, skill confidence, and their perspectives on job quality. (Initial release in 2025)	Project on Workforce at Harvard

UPCOMING PROJECT	ORGANIZATIONS
EQUITY A report on the opportunity gaps by gender and race/ethnicity in high-paying middle-skills jobs and how addressing credential shortages in aligned programs could expand economic opportunity and narrow earnings disparities. (Expected release 2025)	Georgetown University Center on Education and the Workforce
SUPPLY AND DEMAND ALIGNMENT A project to examine alignment between the supply of certificates and associate's degrees and the future demand for jobs providing middle-skills workers with the best opportunities for starting their career in a good job and experiencing above-average earnings growth between early and mid-career. (Expected release summer 2026)	Georgetown University Center on Education and the Workforce

Across systems

UPCOMING PROJECT	ORGANIZATIONS
BUILD ALIGNMENT The Gates Foundation is launching work to help get the field aligned on what is meant by the term "pathways", including identifying “north star” goals, and codifying what an intentional set of coherent and cohesive student pathway experiences might look like that lead to credentials of value.	Gates Foundation
BUILD CAPACITY The State Opportunity Index and the Postsecondary Employment Outcomes Coalition initiatives are seeking to build state-level capacity to address gaps in data access, integration and infrastructure that allow states to produce timely analysis on education-to-employment outcomes.	Strada Education Foundation

UPCOMING PROJECT	ORGANIZATIONS
LONGITUDINAL EVIDENCE A descriptive, longitudinal study will explore the most common pathways among young adults in Washington and their labor market implications. Will provide insights into students' pathways, including postsecondary degree, non-degree, and workforce pathways, both overall and among subgroups defined by demographic and geographic characteristics.	MDRC, Washington Education Research & Data Center, Washington Student Achievement Council
WORK-BASED LEARNING, EQUITY Advancing Workforce Equity in Energy & Infrastructure Jobs seeks to boost opportunities and supports for underrepresented workers in apprenticeship and training programs in these fields.	National Fund for Workforce Solutions
WORK-BASED LEARNING Systemic evidence review of rigorous work-based learning research in the U.S. since 2003. Will focus on career immersion and experience-related work-based learning across secondary, postsecondary, and adult education populations connected to education settings. (Expected publication in 2025)	CTE Research Network 2.0, American Institutes for Research
WORK-BASED LEARNING A conceptual framework for addressing barriers to scaling "earn-and-learn" opportunities. Developed in a community of practice with state leaders from Alabama, Colorado, and Indiana. (Expected publication in 2025)	The Brookings Institution
USE OF AI The Center for Artificial Intelligence & the Future of Work is exploring the effective use of AI in advising and coaching for young people, including models that use a hybrid approach to combine human advising with AI tools. The center is also examining how training providers are adapting to evolving trends in the labor market, particularly the potential impact of AI on different sectors and implications for pathways offerings and design.	Jobs for the Future

UPCOMING PROJECT	ORGANIZATIONS
DIGITAL CREDENTIALS, NAVIGATION SkillsFWD is testing the feasibility and implementation of digital learning and employment records in seven states, which track "records of a person's jobs and skills acquired through education, credentialing, in the workplace, and through service and life experience." Strada Education Foundation, a partner in SkillsFWD, is also working on a multi-state initiative to align digital credential and learning recognition efforts that collaborates with post-secondary institutions to develop shared standards, frameworks, and data systems for seamless credential recognition.	Multiple partners (see list here)
SOCIAL CAPITAL Jonathan Zaff and a team at Boston University are researching youth voice in social capital measurement, in partnership with iCouldBe, Big Picture Learning, nXu, Career Launch, and Juma Ventures.	Multiple partners

Appendix D

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Large Evidence Reviews

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