



Delivering on the Degree

The College-to-Jobs Playbook

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About the Project on Workforce at Harvard

The Project on Workforce is an interdisciplinary, collaborative project between the Harvard Kennedy School's Malcolm Wiener Center for Social Policy, the Harvard Business School Managing the Future of Work Project, and the Harvard Graduate School of Education. The Project produces and catalyzes basic and applied research at the intersection of education and labor markets for leaders in business, education, and policy. The Project's research aims to help shape a postsecondary system of the future that creates more and better pathways to economic mobility and forges smoother transitions between education and careers. Learn more at www.pw.hks.harvard.edu.

Delivering on the Degree: The College-to-Jobs Playbook is part of the College-to-Jobs Initiative. This effort, led by the Project on Workforce, highlights the misalignment between higher education and employment in the U.S. It includes the College-to-Jobs Map, a data tool that compares employment growth to college graduate growth in regions across the country. To check out the College-to-Jobs Map, visit collegetojobs.hks.harvard.edu



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Executive Summary

For decades, a college degree has been considered the key to unlock economic prosperity in the United States. College degree-holders have, on average, earned higher wages than those without degrees, which has contributed to large and persistent U.S. income inequality.¹ The COVID-19 pandemic, associated economic disruption, and tight labor markets may be upsetting those trends. The college earnings premium appears to be declining for the first time in decades² and, in 2021, 40 percent of recent college graduates were working in jobs that have not require a bachelor's degree.³ Simultaneously, the value proposition of college is beginning to fade in the eyes of many in the American public.⁴ As higher education costs continue to skyrocket and student debt mounts, increasing shares of Americans are reconsidering whether college is truly worth the expense.⁵ Declining college enrollment numbers provide additional cause for caution.⁶

Colleges are being called on by the public to improve economic outcomes for their students. As the public increasingly asks colleges to prove their value, some in the business community question post-secondary institutions' contributions to addressing labor shortages and skill mismatches in occupations of. Likewise, they express concern about the skills system's capability to generate the number of diverse, skilled candidates to help them meet their diversity, equity, and inclusion objectives.⁷ In the wake of this disruption, leaders in the college ecosystem are modernizing long-standing programs and launching new initiatives to improve student connections to the workforce and enhance their career trajectories after college. However, to date, those initiatives have received too little attention both in higher education budgets and public policy priorities. Encouraging educators and policymakers alike to commit more resources to these efforts requires a better understanding of what helps students move from education into good jobs.

In this playbook, we provide a framework to help college better deliver on the American Dream. We create a coherent, comprehensive taxonomy of the landscape of college-to-jobs programs and policies through a review of the existing academic research according to a set of common criteria. With a focus on public two-year and four-year colleges, Minority Serving Institutions and Historically Black Colleges and Universities, we identify 13 "interventions" within the college ecosystem that could be used to ease the transition into good jobs in the workforce.



Interventions

Career coaching

One-on-one counseling between an advisor and a student, which may involve helping students develop career navigation skills and access career information, reviewing job application materials, and connecting students to professional opportunities. Advisors may include career counselors, faculty, alumni, or other trained staff.

Cohort programming

Career-focused learning program structures in which small groups of students are enrolled together in two or more linked courses that connect to specific industries, careers, or fields of study.

Career pathways initiatives *includes meta-majors, guided pathways*

Structured sequences of connected education and training programs that provide students with basic skills and occupational knowledge aligned with industry needs. A basic career pathway model includes multiple entry and exit points that result in stackable credentials, aligned with labor market demands.

Career mentorship programs

Targeted programs that foster personal relationships between college students and college alumni, faculty, staff, or local employers, designed to help students strengthen their ties with industry professionals, grow their knowledge of potential career paths, make informed career decisions, and build their social networks.

Career readiness curriculum

Content that provides instruction, materials, and other support mechanisms to help students gain competencies in career and social skills, including leadership, communication, professionalism, critical thinking, teamwork, and career- and self-development skills. Pedagogy may also include a focus on applied career practices like resume creation or interview preparation.

Experiential learning coursework

Coursework wherein students learn by actively engaging in hands-on, real-world, or simulated real-world projects, either in the classroom or within companies. These projects are intended to provide learners with both 'hard' and 'soft' skills.

Industry-recognized credentials

Certificates, certifications, and licenses that signify the attainment of skills and competencies needed for a career in a given industry or occupational area. These are generally based on standards developed or endorsed by employers or industry associations.



Last-mile bootcamps

Programs in or affiliated with a college that provide accelerated training in a specific skill set, geared towards teaching technical, job-focused skills. The programs are often the crucial final step before students enter the workforce.

Internships

Short-term work experiences that help students gain entry-level exposure and applied experience in a particular industry, field, or organization.

Job shadowing

Informal, short-term, usually unpaid experiences in which students follow and closely observe employees to better understand the day-to-day rigors of their job and company. These may range from one-time experiences to longer term, more regular experiences with a company or specific employee.

Co-ops

Longer-term (1-3 semesters), full-time work-based learning experiences at an organization that align with students' majors, are centrally organized by the college or faculty, and may provide academic credit to the students.

Apprenticeships

Industry-driven training programs that combine paid, on-the-job learning with classroom instruction and result in nationally-recognized, portable credentials. Colleges may co-design curricula, provide academic instruction, or administer and operate the apprenticeship program, in partnership with local businesses.

Subsidized youth employment programs

e.g., summer jobs programs

Publicly-funded initiatives in which students are paid to attend school in the summer or for practicum experiences in non-apprenticeship "learn and earn" models. In other settings, subsidized job programs may include general experiences where students are paid for related classroom and work-based learning experiences.



The College-to-Jobs Matrix

Intervention Dimensions

To help inform future investments, we assess each intervention along four key dimensions:

- ▶ **Prevalence of research** supporting the intervention,
- ▶ **Strength of evidence** that the intervention improves students' economic outcomes,
- ▶ **Prevalence in practice** in the U.S., and
- ▶ **Ease of implementation** for colleges and their ecosystem partners.

Our evaluation is based on an extensive literature and landscape reviewed and summarized in the College-to-Jobs Matrix

Legend

A green circle indicates that an intervention has (1) a substantial body or (2) strong causal research behind it, (3) is prevalent in practice, or (4) is relatively easy to implement. Meanwhile, a red circle indicates that an intervention has (1) little research or (2) weak evidence supporting its economic impacts, (3) is rarely implemented in the United States, or (4) is difficult and resource-intensive to establish and operate. A yellow circle indicates a moderate amount of research and implementation prevalence and feasibility

Intervention Category	Research Prevalence	Research Strength	Implementation Prevalence	Implementation Feasibility
Career coaching				
Cohort programming				
Career pathways initiatives				
Career mentorship Programs				
Career readiness curriculum				
Experiential learning coursework				
Industry-recognized credentials				
Last-mile bootcamps				
Internships				
Job shadowing				
Co-ops				
Apprenticeships				
Subsidized youth employment programs				



Our review of the literature and practice in the field yields several additional insights:

- ▶ **The college-to-jobs ecosystem is poorly aligned, making collaboration among stakeholders difficult and limiting accountability:** Although partnerships between colleges, employers, and government agencies are critical to success, actions are rarely coordinated across sectors. Researchers study interventions as they are designed, which generates research insights that reflect the siloed nature of the workforce ecosystem.⁸ While many colleges are experimenting with new models, research often lags far behind practice, leaving the efficacy of such initiatives unknown. Moreover, employers are often overlooked in the research—even though they play a key role in student economic success. Although all stakeholders share an interest in improving economic outcomes for students, no one is held accountable for ensuring students achieve positive financial outcomes.
- ▶ **College-to-jobs interventions tend to be siloed within colleges:** Combining college-to-job interventions—and integrating them across departments—improves their effectiveness. However, few colleges do that well, in large part because it requires significant institutional and cultural change. Instead, the majority of schools offer disjointed career services and career learning opportunities. Students are generally required to seek out and navigate career-connected supports on their own.
- ▶ **Interventions are often implemented inequitably, but there are strategies to improve access and success for underserved students:** Communities of color, particularly Black students, have been underserved by the college-to-jobs ecosystem. Historically Black Colleges and Universities (HBCUs) and Minority Serving Institutions (MSIs) are historically under-invested in, despite their outsized contribution to economic mobility for students of color.⁹ In all environments, college-to-jobs interventions must be designed around equity, including through the integration of wraparound services for students and course credit and/or pay for work-based learning.

We also identified key actions that colleges, employers, policymakers, and researchers can take—both individually and in partnership—to improve college-to-job transitions for students.

- ▶ **Colleges must put economic mobility at the center of their mission and hold faculty and departments accountable to this goal.** This includes aligning courses and majors with in-demand, high-paying careers, integrating experiential learning opportunities into coursework, and providing for-credit or paid opportunities for career learning. Colleges should create a “go-to” place for employers to engage with the institution and student body. College leadership ought to actively participate in regional economic decision-making bodies, like the chambers of commerce. Institutions should also invest in learning and sharing best practices with peer institutions across the country.



- ▶ **Employers must invest in partnerships with postsecondary institutions, community-based organizations, and other employers if they are to escape the risks associated with relying on the 'spot market' for labor.** Employers ought to engage with diverse institutions and other partners in their regions, including community colleges and HBCUs. They should devote resources to career development earlier in the college pipeline, by helping co-design curricula, providing access to career mentors and state of the art equipment and technology. Moreover, they must remove barriers to students gaining in-demand skills by offering structured, paid, career immersion experiences aligned with learning goals.
- ▶ **Policy makers must provide resources to support colleges' career missions.** Colleges should be assessed on students' economic outcomes and provided with the necessary resources to promote student success. Both federal and state policymakers should emphasize transparency to incentivize institutions to improve their performance, including through the College Scorecard. Federal policymakers should consider reforming postsecondary funding to focus on career outcomes. For example, the population of institutions eligible for Title IV Federal funding could be expanded to include partnerships with employers providing appropriate training, with safeguards to avoid abuses. Policymakers should also renew efforts to advancing equity by expanding appropriations for HBCUs and MSIs with the purpose of building on growing corporate commitments to DEI. State policymakers must support student services at colleges and incentivize regional cross-sector partnerships, while improving longitudinal data systems to track economic outcomes—to ensure colleges are meeting economic mobility goals.

Higher education leaders, employers, policymakers, and researchers each can play an integral role in reimagining how college can deliver on pathways to career success for all students. To fulfill the economic promise of college, these stakeholders must embrace a shared definition of success and focus collectively on achieving it.



INTRODUCTION

Putting College-to-Jobs into Focus

For a growing share of learners and workers in the United States, college is failing to live up to its economic mobility promise. For decades, a college degree led to higher wages and more economic stability, on average, for American workers¹⁰ (with variations based on occupation).¹¹ As income inequality grew, policymakers became **myopically** focused on expanding college access, based on the **well-meaning assumption** that college attendance would lead to economic independence. Precious little attention was paid to student outcomes including graduation rates, loan affordability, and, especially, post-graduation employment and earnings status. The result has been college programs that are misaligned with the labor market. In fact, in 2021, 40 percent of students who completed a college degree found themselves underemployed after graduation,¹² and there are signs that the college earnings premium is beginning to decline.¹³

Meanwhile, the cost of college is rising, accompanied by mounting student debt,¹⁴ and students face health and economic challenges brought on by the COVID-19 pandemic. These conditions have prompted many learners and workers to reconsider whether college is truly worth the expense.¹⁵ Their concerns are **compounded** by other barriers to college enrollment, including time demands and access to housing, childcare, and transportation. Amid steep declines in college enrollment across the country,¹⁶ higher education leaders **face a moment of reckoning**—in which they must improve the economic returns of a college education.

At the same time, employers are **calling upon** colleges to improve the **workforce preparedness** of their graduates—particularly training in “soft skills” such as teamwork, communication, and critical thinking.¹⁷ In response, many education leaders are rethinking how their institutions can better prepare students for careers and connect them to specific opportunities. Several programs and initiatives have emerged to facilitate smoother transitions into the labor market for students—from career coaching to apprenticeships, and, more recently, last-mile bootcamps—but there is little clarity around which initiatives best improve a student’s earnings and employment status later in their career, which we reference in this paper as “economic outcomes.”

The **dearth** of information reflects, at least in part, the lack of attention and resources such programs have received from the majority of post-secondary institutions.

Relatively few institutions and their partners are as deeply invested in their career advancement mission as they are on enrollment and degree completion. Very little



public funding is specifically allocated for non-instructional costs, including career support services. When states cut their higher education budgets (as many have over the past few decades), institutional spending on student supports is often reduced, in part because it is perceived as having negative impacts on student degree attainment.¹⁸ There are bright spots of course—namely, innovative community colleges that are leading the field in workforce development in their regions.

This white paper puts “college-to-jobs” programs in focus, making the case that they should be a priority for future public policy, investment, and research. We map the field of policies and initiatives that smooth transitions for college students to the workforce, identifying 13 “interventions” that have been deployed to improve college students’ economic outcomes.

In doing so, we bring **diffuse programs** and policies under a unifying framework and examine not only the research, but also the implementation and feasibility of such interventions in practice, a consideration that is too often neglected in literature.

Through our analysis, we address four questions about each intervention:

- ▶ How prevalent is the research on this intervention?
- ▶ How strong is the evidence that it improves labor market outcomes for students?
- ▶ How common is the intervention across colleges and their partners in the United States?
- ▶ What level of investment or operational complexity is required for implementation?

The answers to these questions, **gleaned through** an extensive literature review and interviews with experts, inform the **College-to-Jobs Matrix**, which is designed to serve as both:

- ▶ **A bird’s-eye view** of the college-to-jobs landscape, highlighting the state of research and practice across the country; and
- ▶ A resource for higher education institutions, employers, policymakers, and other organizations to assess and develop new initiatives aimed at improving postsecondary students’ economic outcomes.

Although we frame our research as “college-to-jobs,” we acknowledge that this is rarely a one-way journey for learners and workers, many of whom return to college from the workforce. The students who benefit from these programs have diverse backgrounds and unique pathways. We did not review or disaggregate the research by specific industries or fields of study, as other resources are emerging to address this question.

Our contribution provides answers to a crucial question at a time of inflection for postsecondary education: what can we do to launch more college students onto successful career trajectories?



How we did it

Note

We use the term “intervention” throughout this paper to describe a program or initiative that is focused on connecting college students to the labor market. For an intervention to be included in our review, the program or initiative must (1) take place in a college setting or ecosystem and (2) intend to help students transition into and advance along careers that lead to economic stability.

To guide the creation of this playbook, we reviewed over 530 academic papers, articles, reports, book chapters, dissertations, and landscape reviews that address the transition between college and work. Based on this review of the literature, we built a framework organizing interventions across the duration of the student journey. The Playbook features 13 categories of programs and policies that connect college students to jobs. While we do not claim these categories to be exhaustive, we view our work as the most rigorous and comprehensive effort to date that aggregates and relates the literature across program type and setting.*

Our research does not just address the prevalence and strength of research, but also covers how common these interventions are in practice. We evaluated each intervention along four dimensions: research strength, research prevalence, implementation prevalence, and implementation feasibility.

We conducted our research primarily using ERIC (Education Resources Information Center), CLEAR (Clearinghouse for Labor Evaluation and Research), and Google Scholar. For each criterion, we used Boolean search commands to filter search results to include the intervention term, other common names for the intervention, and postsecondary key words (“college”, “postsecondary education”, or “higher education”). Additional methods for measuring each criterion are outlined in the Appendix. After we calculated the matrix scores, we validated scoring with Harvard faculty and Harvard-affiliated experts.*

** Note: Our initial classification included more than 30 interventions, including competency-based learning, institution-based records, and job platforms. In the process of refining our framework, we consolidated several initiatives and removed interventions that function primarily as institutional support structures.*



Figure 1. Literature type by intervention

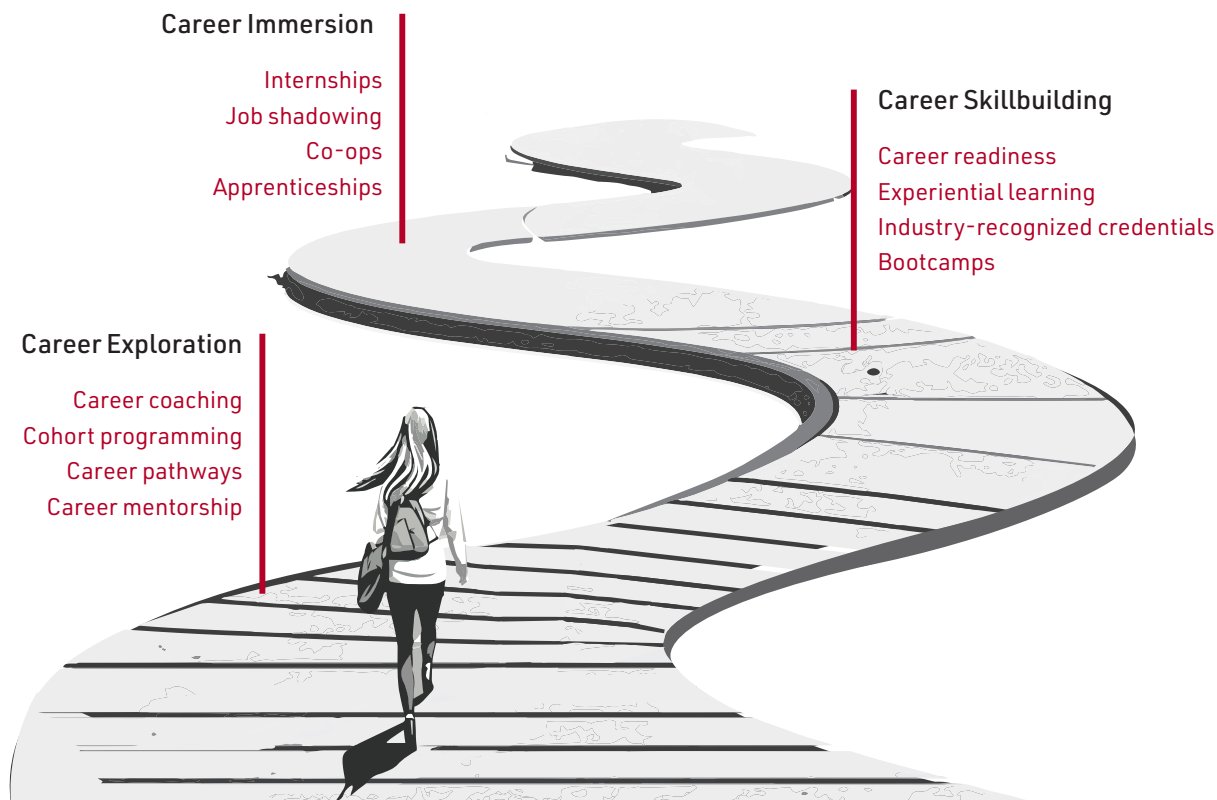
Intervention Type	Literature Type		Grand Total
	Peer-reviewed	Other	
Apprenticeships	10	17	27
Career coaching	23	15	38
Career Mentorship Programs	13	12	25
Career pathways initiatives (includes. meta-majors, guided pathways)	5	26	31
Career readiness curriculum	6	20	26
Co-ops	9	9	18
Cohort programming	7	7	14
Experiential Learning Coursework (includes simulation-based learning, project-based learning)	31	22	53
Industry-recognized credentials	4	38	42
Internships	39	20	59
Job shadowing	7	4	11
Last-mile bootcamps	4	16	20
Youth employment programs (e.g. subsidized summer jobs programs)	11	6	17
Not specific	51	106	157
Grand Total	220	318	538

In developing our methodology, we faced some limitations, including the lack of generalizable public information on implementation. Specifically, there is limited public benchmarking data for these interventions, such as costs and administrative constraints. Therefore, we had to estimate the necessary resources and operational complexity required for most interventions when we calculated the feasibility score. We also relied heavily on Google to measure implementation prevalence because it was the only data source accounting for frequency—apart from expert knowledge—that was consistent across the interventions. Despite these limitations, we believe this Playbook is among the most comprehensive landscape scans to date—both in breadth of programs considered and volume of literature reviewed.

Interventions

The 13 interventions we identified in our literature review fall at different points along a college student's academic and career journey. In the table below, we define the relevant interventions, provide a summary of the evidence supporting each, and highlight promising programs that are being implemented across the country.

Figure 2. Student Journey



While students may progress from one career activity to the next in a linear way, others engage simultaneously or cyclically, as they explore various fields and build a variety of career development, academic, technical, and "soft" skills and knowledge. For example, a student may participate in career coaching before or during an internship program, and that student may take part in a cohort program that includes career mentorship throughout. As we discuss later on, the most effective college-to-jobs programs often combine several interventions throughout the education cycle to support student career preparation and transition.

After arriving on campus, many students need guidance to understand their career options and, therefore, they engage in "career awareness" activities. Those initiatives include career coaching, cohort programs, career mentoring, and career pathways programs, which help students explore and map possible career paths and make decisions about which to pursue.



Through coursework, students engage in “career skill-building” activities, such as experiential learning, industry-recognized credentialing, career readiness curricula, and last-mile bootcamps, which enable them to gain the general and technical competencies they need for success in the workplace.

They may participate in career learning on the job as well, or “career immersion” activities. These programs include internships, co-ops, job shadowing, apprenticeships, and subsidized job programs. They situate students in the workplace, helping them gain crucial “soft” skills and social capital.

While students may progress from one career activity to the next in a linear way, others engage simultaneously or cyclically, as they explore various fields and build a variety of career development, academic, technical, and “soft” skills and knowledge. For example, a student may participate in career coaching before or during an internship program, and that student may take part in a cohort program that includes career mentorship throughout. As we discuss later on, the most effective college-to-jobs programs often combine several interventions throughout the education cycle to support student career preparation and transition.

Intervention **Career coaching**

Our Definition One-on-one counseling between an advisor and a student, which may involve helping students develop career navigation skills and access career information, reviewing job application materials, and connecting students to professional opportunities. Advisors may include career counselors, faculty, alumni, or other trained staff.

Promising Model At Lorain County Community College (LCCC) in Ohio, students receive long-term, individualized coaching from an assigned advisor who facilitates regular outreach and meetings and monitors their progress to completion. LCCC provides customized support for specific **student cohorts** and communities, such as full-time Pell-eligible students and Hispanic/Latino students.¹⁹

Intervention **Cohort programming**

Our Definition Career-focused learning program structures in which small groups of students are enrolled together in two or more linked courses that connect to specific industries, careers, or fields of study.

Promising Model Bunker Hill Community College’s Learning Communities enable students to learn in a supportive environment that fosters strong relationships among students and faculty. Students benefit from interdisciplinary learning experiences, teacher-to-student mentoring, peer mentoring, and integrated support services, such as success coach advisors.²⁰



Intervention **Career mentorship programs**

Our Definition Targeted programs that foster personal relationships between college students and college alumni, faculty, staff, or local employers, designed to help students strengthen their ties with industry professionals, grow their knowledge of potential career paths, make informed career decisions, and build their social networks.

Promising Model The B.R.I.D.G.E.S. Program is designed for racially underrepresented freshmen, sophomore, and transfer students at Mississippi State University (MSU). Each student is assigned a MSU faculty or staff mentor for a year who provides the student with professional and personal skills, resources, and guidance to aid in the student's growth and success at MSU.²¹

Intervention **Career readiness curriculum**

Our Definition Content that provides instruction, materials, and other support mechanisms to help students gain competencies in career and social skills, including leadership, communication, professionalism, critical thinking, teamwork, and career- and self-development skills. Pedagogy may also include a focus on applied career practices like resume creation or interview preparation.

Promising Model Virginia Commonwealth University (VCU) developed an Interdisciplinary Career Readiness Skills minor, an 18-credit pathway designed to help students across industries acquire the eight National Association of Colleges and Employers (NACE) career readiness competencies.²²

Intervention **Career pathways initiatives** *(includes meta-majors, guided pathways)*

Our Definition Structured sequences of connected education and training programs that provide students with basic skills and occupational knowledge aligned with industry needs. A basic career pathway model includes multiple entry and exit points that result in stackable credentials, aligned with labor market demands.

Promising Model The Integrated Basic Education and Skills Training (I-BEST), developed by the Washington State Board for Community and Technical Colleges in conjunction with the state's community and technical colleges, integrates basic skills and technical skills instruction to increase the rate at which adult basic education and English-as-a-second-language students advance to college-level programs and complete postsecondary credentials.²³



Intervention **Experiential learning coursework**

(includes simulation-based, project-based learning)

Our Definition Coursework wherein students learn by actively engaging in **hands-on, real-world, or simulated real-world projects**, either in the classroom or within companies. These projects are intended to provide learners with both 'hard' and 'soft' skills.

Promising Model Worcester Polytechnic Institute provides a project-based learning track that aims to provide students with not only technical skills, but also soft skills like empathy, leadership, confidence, collaboration, and critical thinking. A set of surveys of alumni from the program conducted in 2012 showed that the projects affected their professional lives, character development, and global perspectives, especially if they had completed a project off campus.²⁴

Intervention **Industry-recognized credentials**

Our Definition Certificates, certifications, and licenses that **signify** the attainment of skills and competencies needed for a career in a given industry or occupational area. These are generally based on standards **developed or endorsed by employers** or industry associations.

Promising Model Workcred is partnering with the League for Innovation in the Community College and National Student Clearinghouse to develop and scale alternative degree pathways aligned with industry needs by embedding industry-recognized certifications into community college coursework (known as Certification+Degree Pathways).²⁵

Intervention **Last-mile bootcamps**

Our Definition Programs in or affiliated with a college that provide accelerated training in a specific skill set, geared towards teaching technical, job-focused skills. The programs are often the crucial final step before students enter the workforce.

Promising Model Cuyahoga Community College's bootcamp program, Cleveland Codes Software Development Academy, prepares students for careers in web application and development through a 14-week hybrid IT Fast Track Program. The program helps students develop key skills in programming and development. Students earn college credit and four certifications through industry-recognized IT exams.^{26,27}

Intervention **Internships**

Our Definition Short-term work experiences that help students gain entry-level exposure and applied experience in a particular industry, field, or organization.

Promising Model The Foundation for California Community Colleges partners with the California Film Commission to provide paid internship opportunities for students interested in the entertainment industry, offering students **first-hand experience** in art, camera, grip, wardrobe, and production.²⁸



Intervention **Job shadowing**

Our Definition Informal, short-term, usually unpaid experiences in which students follow and closely observe employees to better understand the day-to-day rigors of their job and company. These may range from one-time experiences to longer term, more regular experiences with a company or specific employee.

Promising Model UC San Diego Health collaborates with Southwestern Community College, City College, and Grossmont Community College to provide under-resourced community college nursing students with structured job shadowing and career support experiences. Students shadow nurses and participate in workshops over a 12-week period to better understand the professional clinical nurse role.²⁹

Intervention **Co-ops**

Our Definition Longer-term (1-3 semesters), full-time work-based learning experiences at an organization that align with students' majors, are centrally organized by the college or faculty, and may provide academic credit to the students.

Promising Model The University of Cincinnati has provided co-op opportunities for its students for nearly 100 years. Students alternate between academic semesters and those spent working full-time in their chosen field—in organizations from startups to large corporations or nonprofits—allowing them to gain vital on-the-job experience while earning wages.³⁰

Intervention **Apprenticeships**

Our Definition Industry-driven training programs that combine paid, on-the-job learning with classroom instruction and result in nationally recognized, portable credentials. Colleges may co-design curricula, provide academic instruction, or administer and operate the apprenticeship program, in partnership with local businesses.

Promising Model A consortium of South Carolina HBCUs, the Urban Institute, and businesses collaborated to develop a degree-based apprenticeship program in secure software development. The program enables students to gain meaningful paid work experience while simultaneously advancing toward a bachelor's degree.³¹

Subsidized youth employment programs

Intervention *(e.g., summer jobs programs)*





Our Definition Publicly-funded initiatives in which students are paid to attend school in the summer or for practicum experiences in non-apprenticeship "learn and earn" models. In other settings, subsidized job programs may include general experiences where students are paid for related classroom and work-based learning experiences.

Promising Model One Summer Chicago is a summer youth employment program administered by the City of Chicago's Department of Family and Support Services. It brings together government, community-based organizations, and private companies to offer paid employment and internship opportunities to thousands of youths and young adults ages 14 to 24 across the city.³²



In addition to evaluating the prevalence and strength of the research behind each intervention as it is commonly implemented, we searched for newer models that are pushing the boundaries through experimentation (see "New Horizons" under the Intervention Summaries section). In our review of the field, we found that some colleges, employers, and intermediaries are experimenting with abbreviated opportunities, such as micro-credentials and micro-internships. Stakeholders are also developing virtual experiences, such as remote job shadowing and virtual cohort programs. While these models may expand access to underserved individuals with geographic and time constraints, the evidence and research on the efficacy of such newer models are still quite limited.

INTERVENTION RESEARCH OVERVIEW

	Minimal evidence No causal evidence and minimal (if any) descriptive evidence (quantitative and qualitative) supporting outcomes
	Moderate evidence There is some high-quality descriptive evidence and some causal evidence. However, there is reason for skepticism. For instance, the research may not adequately rule out other causes, may not focus on college students, and/or may differ across different institutional contexts.
	Mixed evidence There is some high-quality causal and descriptive research but impacts of the intervention are heterogeneous or there is wide variation in quality of the studies.
	Strong evidence There is high-quality causal and descriptive evidence demonstrating outcomes. Evidence includes rigorous research designs, such as randomized experiments or established quasi-experimental designs.



Career coaching

Employment and earnings outcomes

- ⊗ **Minimal evidence** that career coaching impacts students' economic outcomes, including job placement and future earnings, although it may impact job satisfaction.³³

Academic performance and persistence

- ⊕ **Strong evidence** that integrated, sustained advising improves college persistence and graduation, academic achievement, and postsecondary degree attainment.^{34,35,36,37}

Additional outcomes

- ⊕ **Strong evidence** that career coaching (including the integration of career exploration activities) increases students' self-efficacy, human capital, independence, and adaptability.^{38,39}

Example

(Bettinger & Baker, 2014): A randomized study of InsideTrack, a student coaching service, found that students who were assigned to a coach were more likely to persist during the coaching period and more likely to be attending the university one year after the coaching had ended than students who were not assigned a coach.⁴⁰

Cohort programming

Employment and earnings outcomes

- ⊗ **Minimal evidence** that cohort models impact economic outcomes, including employment and earnings.⁴¹

Academic performance and persistence

- ⊕ **Strong evidence** that cohort programs increase student persistence and academic achievement, including for historically underrepresented populations.^{42,43,44,45,46}
- ⓘ **Mixed evidence** that cohort programs impact college completion and degree attainment.^{47,48,49,50}

Additional outcomes

- ⊖ **Moderate evidence** that cohort models increase student engagement and satisfaction with their college experience.^{51,52}

Example: (Weiss, et al., 2015): A randomized trial of over 1,500 students at Kingsborough Community College found that learning communities' positive effects on short-term academic progress (credit accumulation) are maintained seven years after random assignment. The study provides some limited evidence that the program positively affected graduation rates, particularly for those students without remedial English needs, over this period.⁵³



Career pathways

Employment and earnings outcomes

- + **Strong evidence** that career pathways programs can increase short-term employment and short-term earnings, although impacts vary drastically by program area and length.^{54,55,56,57,58}
- × **Minimal evidence** that career pathways increase long-term employment and earnings outcomes.^{59,60}

Academic performance and persistence

- + **Strong evidence** that career pathways initiatives can improve credit accumulation, academic performance, and credential attainment, although there is **mixed evidence** about the impact of career pathways on degree attainment.^{61,62,63,64}

Example: (Strawn, Peck & Schwartz, 2021): A meta-analysis of 46 experimental and quasi-experimental impact evaluations of career pathways programs, mostly carried out at technical and community colleges, found that career pathways programs increased credential attainment, overall employment rates, employment in targeted industries, and short-term earnings for program participants.⁶⁵

Career mentorship programs

Employment and earnings outcomes

- × **Minimal evidence** that career mentorship programs improve student economic outcomes.

Academic performance and persistence

- × **Minimal evidence**

Additional outcomes

- − **Moderate evidence** that career mentorship programs promote postsecondary students' career self-efficacy, which includes positive outcomes in self-efficacy with respect to in career selection, job applications, professional skills and competencies, and growing personal and professional networks.^{66,67,68,69,70,71,72,73}
- − **Moderate evidence** that formal workplace mentorship programs improve professional, on-the-job skills of current employees, however, little studies have conducted similar research on prospective employees who are postsecondary students.⁷⁴
- − **Moderate evidence** that formal mentorship programs have a greater impact on women than on men in promoting positive labor market and educational outcomes.^{75,76}

Example: (Crisp & Gloria, 2010): This study uses structural equation modeling analysis to examine the impact of mentoring on persistence among a random sample of community college students in the United States. The results indicate that mentoring "significantly predicted the degree to which students became socially and academically integrated," and indirectly influenced persistence among students.⁷⁷



Career readiness curriculum

Employment and earnings outcomes

- ⊗ **Minimal evidence** of impacts on student employment and earnings post-graduation, although employability models and employer demands include career readiness skills.^{78,79}

Academic performance and persistence

- ⓘ **Mixed evidence** that career readiness content increases academic outcomes such as persistence in college, graduation rates, and cumulative GPA.^{80,81}

Additional outcomes

- ⊕ **Strong evidence** that career readiness curriculum improves career decision-making skills, self-efficacy, career confidence, vocational identity, and career satisfaction, especially for minoritized groups.^{82,83,84,85,86}

Example: (Folsom, et. al., 2005): Researchers compared student participants in a career development course at Florida State University to a matched sample of non-course participants after five years and found that women participants graduated college in less time than non-participants, while men took longer to graduate but had higher GPAs than male non-participants.⁸⁷

Experiential learning coursework

(includes simulation-based, project-based learning)

Employment and earnings outcomes

- ⊗ **Minimal evidence** of the causal impacts of experiential learning on economic outcomes, such as employment rates and earnings.

Academic performance and persistence

- ⊕ **Strong evidence** that experiential learning improves academic outcomes, including course performance, course completion, and degree attainment.^{88,89,90,91,92}

Additional outcomes

- ⊕ **Strong evidence** that experiential coursework has a positive impact on student learning, including content knowledge and retention and skill attainment, such as problem-solving, collaboration and communication skills.^{93,94,95,96,97,98}

Example: (Chen & Yang, 2019): The authors conducted a meta-analysis of journal articles on project-based learning. They analyzed 46 effect sizes from 30 journal articles over a twenty-year period (1998-2017), which resulted in a sample of 12,585 students from 189 schools in nine countries. Their analysis showed a medium to large positive effect size of project-based learning on student academic achievement compared to regular classroom instruction. These results were impacted by subject area, school location, hours of instruction, and IT support.⁹⁹



Industry-recognized credentials

Employment and earnings outcomes

- ⊖ **Moderate evidence** that completers of credentials, including stacked credentials, see higher wages and increased employment, although this varies by field.^{100,101,102,103}

Academic performance and persistence

- ⊖ **Moderate evidence** that industry-recognized credentials have positive effects on academic outcomes such as graduation rates and future college enrollment.¹⁰⁴

Additional outcomes

- ⊗ **Minimal evidence** that credentials close equity gaps, as male completers may see greater employment and earnings returns than female completers.^{105,106,107}

Example: (Meyer, Bird, & Castleman, 2022): This study used a comparative individual fixed effects strategy and administrative panel dataset of enrollment and employment in Virginia to determine causal estimates of stacking credentials among working adults. Their findings indicate that stacking credentials increases employment by four percentage points and quarterly wages by \$375. They also note that these returns are higher in health sectors and for individuals who complement their credentials with a college degree.¹⁰⁸

Last-mile bootcamps

Employment and earnings outcomes

- ⊗ **Minimal evidence** that bootcamps in a college setting improve students' economic outcomes, although there is moderate evidence that independent coding bootcamps increase job placement rates and employment opportunities.^{109,110,111}

Academic performance and persistence

- ⊗ **Minimal evidence**

Example: (Joshi & Savi, 2019): We are not aware of any causal studies that examine the impact of bootcamps in a college setting. That said, one study out of the University of Pennsylvania (Joshi, Savi, 2019) evaluated the technical job placement rates for graduates of coding bootcamps through regression analysis and propensity-score matching. They found that attending a bootcamp significantly positively increased the chances that individuals would find a future technical role and may have diminished any penalties from having a non-technical background or lack of undergraduate degree.¹¹²



Internships

Employment and earnings outcomes

- ⊕ **Strong evidence** that internships contribute to higher earnings after college, however, there is variation in impact on earnings, depending on whether the internship is paid or unpaid, or voluntary or mandatory.^{113,114,115,116,117,118}

Academic performance and persistence

- ⊕ **Strong evidence** that internships also benefit employers because the intern performs needed job tasks and because the intern's role may save the organization recruitment and training costs.^{119,120}

Additional outcomes

- ① **Mixed evidence** about how internships contribute to increasing human capital; that is, whether they contribute more towards increasing skills for future jobs or towards better understand how to function and interact in a particular field or workplace.^{121,122}

Example: (Margaryan et al. 2020): This study provides causal evidence of the effects of student internships on earnings and students' transition to the labor market. Using longitudinal data from the German Centre for Research on Higher Education and Research Studies (DZHW), the authors found that university student internships in firms increases earnings by around six percent in the short and medium term. They also found that graduates who completed an internship face a lower risk of unemployment during the first year of their careers.¹²³



Job shadowing

Employment and earnings outcomes

- ⊗ **Minimal evidence** that job shadowing supports positive outcomes in students' employment post-graduation.

Academic performance and persistence

- ⊗ **Minimal evidence** that job shadowing supports positive outcomes in students' retention in educational programs and employment post-graduation.¹²⁴

Additional outcomes

- ⊖ **Moderate evidence** that job shadowing has a positive impact on students' career self-efficacy, defined as students' perceptions of their confidence and ability to perform in their chosen career.^{125,126,127,128}
- ⓘ **Mixed evidence** that job shadowing has a positive impact on students' developing professional skills for the workforce, such as in teaching, hospitality, and nursing fields. This may be due to job shadowing experiences being too brief to provide a significant benefit to students.^{129,130,131,132,133}

Example: (Neumark, et al, 2006): Using longitudinal data from the 1997 National Longitudinal Survey of Youth (NLSY97), the study observed the impact of a range of school-to-work interventions on high school students' college enrollment and post-high school employment. This study provides causal evidence that job shadowing positively affects high school students' college enrollment, and finds a positive—but not significant—association between job shadowing and employment. Although this research focuses on high school students, and many of the other interventions studied were found to have a greater association with college enrollment and employment, this study presents a potential model for future research on postsecondary interventions.¹³⁴

Co-ops

Employment and earnings outcomes

- ⊕ **Strong evidence** that co-ops have a positive impact on students' employment and earnings, however, these findings may be limited to students' co-op completion rather than only co-op participation.^{135,136,137}

Note: Positive returns on employment and earnings exist mainly for STEM co-op participants. There is moderate evidence that income premiums exist for business students, and little evidence that income premiums exist for arts or social science programs.¹³⁸

Academic performance and persistence

- ⊗ **Minimal evidence**

Additional outcomes

- ⊖ **Moderate evidence** that co-ops have a positive impact on students' career self-efficacy, meaning that co-op students feel more empowered and confident to pursue a career in their co-op industry after having participated in the co-op program.^{139,140,141}

Example: (Wynoch, Rosalie, et al, 2019): The authors used linear estimation models and quasi-experimental data to estimate the impacts of co-op programs on income or other post-graduation benefits. The results indicate that co-op programs positively impact participants' transition into the labor force and incomes within the labor force, and may also help overcome wage gaps related to race, gender, or immigration status.¹⁴²



Apprenticeships

Employment and earnings outcomes

- +** **Strong evidence** that apprenticeships have a positive impact on students' employment outcomes across a wide range of geographical sites and industry programs.^{143,144}
- I** **Mixed-but mostly strong-evidence** on improved students' earnings post-apprenticeship. Studies that show slight negative association between apprenticeships and earnings were conducted during an unusually deep recession. These positive associations also extend to students' fringe benefits in their jobs.^{145,146,147,148,149}

Academic performance and persistence

- I** **Mixed evidence** that apprenticeships have a positive impact on students' educational outcomes.^{150,151}

Example: (Reed, et. al., 2012): Using data from Unemployment Insurance records, the authors compared individuals who had completed a registered apprenticeship (RA) program with nonparticipants. They estimated the impact of program participation on earnings and employment using regression models that controlled for demographic characteristics and earnings and employment before the start of the program and reported outcomes six years after program enrollment for 57,924 people in six states, and nine years after program enrollment for 45,366 people in five states. The study found that employment rates were 8.6 percentage points higher among RA participants than nonparticipants both six and nine years after program enrollment, and RA participants earned more than nonparticipants at both follow-up periods.¹⁵²

Subsidized youth employment programs

Employment and earnings outcomes

- I** **Mixed evidence** that subsidized summer youth employment programs improve employment opportunities and earnings, however, some research suggests that elements such as writing recommendation letters for participants can improve employment outcomes.^{153,154,155}

Academic performance and persistence

- I** **Mixed evidence** that subsidized summer youth employment programs improve educational achievement or completion.^{156,157,158}

Additional outcomes

- +** **Strong evidence** that subsidized summer youth employment programs reduce the arrest rates and lower the probability of being arrested for a crime during the summer months, especially among "at-risk" youth.^{159,160,161,162,163}

Example: (Modestino Sasser & Paulsen, 2022): A randomized evaluation of the Boston Summer Youth Employment Program (SYEP), which provides out-of-school early work experience for high schoolers, found that participants are 4.4 percent more likely to graduate on time and 2.5 percent less likely to drop out in the years after participating in SYEP. SYEP seemed to positively impact attendance rates, college aspirations, work habits, and social skills which contributed to these improved outcomes.¹⁶⁴ While this study focuses on high school students, the findings offer insights for future research at the postsecondary level.



Figure 3

The College-to-Jobs Matrix

Our evaluations of each of these 13 initiatives inform our College-to-Jobs Matrix, which serves as an overview of the research and practice of each intervention. In sum, the matrix highlights the strengths and challenges associated with implementing various interventions, while yielding insights about the state of research and practice in the field.

Intervention Dimensions

To help inform future investments, we assess each intervention along four key dimensions:

- ▶ **prevalence of research** supporting the intervention,
- ▶ **strength of evidence** that the intervention improves students' economic outcomes,
- ▶ **prevalence in practice** in the U.S., and
- ▶ **ease of implementation** for colleges and their ecosystem partners.

Our evaluation is based on an extensive literature and landscape review and summarized in a College-to-Jobs Matrix.

Legend

A green circle indicates that an intervention has (1) a substantial body or (2) strong causal research behind it, (3) is prevalent in practice, or (4) is relatively easy to implement. Meanwhile, a red circle indicates that an intervention has (1) little research or (2) weak evidence supporting its economic impacts, (3) is rarely implemented in the United States, or (4) is difficult and resource-intensive to establish and operate. A yellow circle indicates a moderate amount of research and implementation prevalence and feasibility

Intervention Category	Research Prevalence	Research Strength	Implementation Prevalence	Implementation Feasibility
Career coaching				
Cohort programming				
Career pathways initiatives				
Career mentorship Programs				
Career readiness curriculum				
Experiential learning coursework				
Industry-recognized credentials				
Last-mile bootcamps				
Internships				
Job shadowing				
Co-ops				
Apprenticeships				
Subsidized youth employment programs				



COLLEGE-TO-JOBS MATRIX TAKEAWAYS

RESEARCH PREVALENCE

Structured and more established initiatives have larger bodies of research.

Research prevalence demonstrates where the research exists, where the field may be lacking evidence, and, in conjunction with other scores in the matrix, how aligned research is with practice. Stronger (green) interventions tend to be more structured, common, and established (such as internships and apprenticeships), lending themselves to dedicated research over time, whereas weaker (red) interventions tend to be newer and less common (like last-mile bootcamps) or shorter in length and integrated into broader programs, therefore, less likely to be studied on their own (such as job shadowing).

RESEARCH STRENGTH

Only a few interventions have proven economic impacts, although all promote positive student outcomes.

Research strength highlights which interventions have strong, causal evidence illustrating improved economic outcomes, specifically increased earnings and employment. In general, both large and small studies and quantitative and qualitative research suggest that all 13 interventions promote positive outcomes for students, to varying degrees and across various measures. Stronger (green) interventions tend to be both more common and structured in the workplace (e.g., internships and apprenticeships) such that there have been enough participants to support data for causal, quasi-experimental research tied directly to economic outcomes. Similarly structured, but weaker scoring, interventions, such as co-ops, might lend themselves to this research, but tend to engage fewer students and, therefore, present fewer research opportunities. Like research prevalence, weaker (red) interventions in the research strength category may be more nascent (like last-mile bootcamps) or unlikely to demonstrate economic returns on their own (such as job shadowing). Many of the interventions received “yellow” scores because there is strong evidence of improved academic outcomes, but little research on the economic impacts of the programs.



IMPLEMENTATION PREVALENCE

Siloed or unstructured interventions are more common in practice.

Implementation prevalence provides insight into the landscape of college-to-jobs interventions and the extent to which practice is aligned with research. We estimated the prevalence of these interventions at the postsecondary level, specifically as they relate to students' career paths. We acknowledge that some interventions are more common when considered with a broader lens. For example, career mentorship programs exist for individuals of all ages and may not focus on career growth, but they are less prevalent in our narrow case.

Interventions that are more prevalent (green) (like career coaching and internships) tend to exist in siloes or are facilitated through open marketplaces, whereas less prevalent (red) interventions (such as co-ops, apprenticeships) tend to require cross-sector and cross-institutional coordination for adoption at scale. Newer, promising interventions, such as last-mile bootcamps, are beginning to emerge on college campuses, but many programs are struggling to scale as partner organizations are unable to access sustainable public funds.



IMPLEMENTATION FEASIBILITY



Interventions that are higher-touch; require trained staff, funding, cross-organizational, and sector coordination; and culture change are more difficult to put into practice.



Implementation feasibility captures the level of resources an institution or organization might need to implement a high-quality intervention, from funding and staff time to institutional restructuring and community partnerships. The most feasible (green) interventions tend to be lower-touch, low-cost, and build on existing college structures, such as alumni networks or independent marketplaces (e.g., internships, mentoring). However, when these interventions are left unstructured, they can exacerbate inequities between student groups by requiring student resources, including time and social capital, which are not distributed evenly. On the other hand, the "difficult to implement" interventions tend to require higher-touch support for students and trained staff and funding or college restructuring and culture change (such as co-ops and career pathways). Therefore, an intervention may be supported by causal evidence, but if it requires substantial funding and staff support, institutions may not be able to fully implement or sustain it.



For institutions or organizations with limited resources, it is still the case that small investments can lead to substantial gains for students. Such organizations may consider building on existing structures, such as training faculty and staff to become mentors or advisors or adding career readiness content into existing courses. Additionally, employer cost-sharing may help overcome some of the resource constraints for high-impact or promising interventions, such as apprenticeships and credentialing. We address this further in the "Recommendations" section.

Figure 4. Matrix Takeaways

CRITERIA RESEARCH PREVALENCE		
	Intervention Examples	Notes
	<i>Internships, experiential learning</i>	Interventions tend to be more established and common, with structured opportunities for evaluation.
	<i>Last-mile bootcamps, Job shadowing, cohort programs</i>	Interventions are newer, smaller, or difficult to disentangle from other programs for dedicated research studies.

CRITERIA RESEARCH STRENGTH		
	Intervention Examples	Notes
	<i>Internships, apprenticeships</i>	Interventions are more established, structured, and embedded in the workforce, enabling causal studies on economic outcomes.
	<i>Mentorship, career readiness, last-mile bootcamps</i>	Interventions tend to be newer, combined with other interventions, and less likely to be connected to economic outcomes

CRITERIA IMPLEMENTATION PREVALENCE		
	Intervention Examples	Notes
	<i>Career coaching, internships</i>	Interventions tend to involve only one stakeholder and/or require little coordination across institutional actors. They may be facilitated through independent marketplaces.
	<i>Last-mile bootcamps, co-ops, apprenticeships</i>	Interventions are newer or highly structured and may require institutional or cultural change for widespread adoption.

CRITERIA IMPLEMENTATION FEASIBILITY		
	Intervention Examples	Notes
	<i>Internships, job shadowing, mentoring</i>	Interventions are lower-touch, lower-cost, or build on existing college structures or marketplaces.
	<i>Co-ops, apprenticeships, career pathways</i>	Interventions are expensive and require trained staff and institutional buy-in or restructuring. They involve coordination across multiple actors.



Findings

The following findings from our research highlight considerations and challenges that impact the effectiveness of supporting and connecting students to good jobs.

1

The college-to-jobs ecosystem is poorly aligned, making collaboration among stakeholders—including researchers and practitioners—difficult.

Interventions are studied and implemented in piecemeal. Stakeholders in the college-to-jobs ecosystem remain largely siloed. There is a lack of integration between college and employment data—and research on connections between the two. Additionally, an amendment to the 2008 reauthorization of the Higher Education Act prevents the federal government from connecting individual-level data to student and employment outcomes.¹⁶⁵ As a result, institutions and states often only have access to—and therefore, track—data on short-term student and worker outcomes, rather than data across the span of an individual’s career. This longitudinal data is crucial to understanding the trajectories, struggles, and successes of individuals and the impacts of various interventions on their career outcomes.¹⁶⁶ For example, one longitudinal study on postsecondary education and labor market outcomes in the state of Florida used unemployment insurance data and secondary education records to show employment outcomes for disadvantaged youth.¹⁶⁷ The data revealed valuable insights into how learners’ choices about field of study contribute to gaps in achievement and compensation later on in a student’s career. However, more often than not, stakeholders find it challenging to link education and workforce data, making it difficult to understand what works and for whom and where to invest resources to improve student outcomes.

Employers are often overlooked in research and in practice—even though they play a significant role in long-run student success. Most studies don’t take place in the workplace context or follow students into employment settings after graduation. Hardly any evaluations of college-to-jobs interventions measure success in terms of the employers’ incentives, through metrics like retention, return on investment, worker productivity, or other similar measures. Instead, most research centers on academic outcomes for students, especially graduation rates and credential attainment.

In practice, employers are severely under-leveraged in the college-to-jobs system, even though employers have an incentive to participate in and fund talent pipeline initiatives. Postsecondary institutions often struggle to work with employers to align educational offerings with the skills needed by employers,¹⁶⁸ while employers rarely engage with postsecondary institutions in a systematic way. If colleges and employers could work



better together, it would reduce the instability students face in the labor market and improve employers' ability to find workers with relevant skills in a timely fashion.¹⁶⁹

Stakeholders are experimenting with new models that connect students to good-paying jobs; however, research is lagging behind practice.¹⁷⁰ Rather than serving as a nimble and responsive tool for evaluation, current research methods are onerous and expensive. As a result, practitioners and policymakers are wary of applying rigorous evaluations to emerging interventions.¹⁷¹ As new models emerge, such as last-mile bootcamps, the evidence base for these programs remains limited. This means that stakeholders may be investing in and implementing programs that do not produce positive economic outcomes for students, risking students and organizations wasting precious resources. It is important that research becomes more responsive to changes in the market and evaluates new approaches and models as they emerge. This may require thinking beyond randomized control trials (RCTs) and, instead, building data systems to monitor success in real-time.

Although stakeholders share an interest in improving economic outcomes for students, no one is held accountable for ensuring that students achieve financial stability.¹⁷²

Postsecondary institutions are largely excused from ensuring long-term economic success for their students.¹⁷³ As a result, they tend to focus on student outcomes during the short time that they attend college, rather than investing in programs that increase the prospect of post-college labor market success.¹⁷⁴ They also are not held accountable for disparities in economic outcomes along student demographic lines, obscuring and removing the urgency for colleges to develop mechanisms for closing equity gaps. Nor are they held accountable for their contributions to regional economic prosperity, despite their power to fuel the regional economy,^{175,176} and they therefore do not prioritize engaging in and adding value to the region in which they are located.¹⁷⁷ Employers also lack accountability for their investment in workforce development and partnership with colleges beyond whatever internal metrics they apply in their decision-making process. The long-term impacts on individual learners, including any who eventually become full-time employees, seldom comes into consideration, despite employers' need to attract and retain skilled workers.¹⁷⁸

Overall, while postsecondary institutions and employers have an inherent interest in, or responsibility to promote, student success, no one is held liable for equipping students with the skills and capabilities needed for a career that leads to financial stability, and very few institutions have stepped up to do so.

2

The college and career navigation process is often a difficult, disjointed experience for students.

Colleges lack integrated career advising services, forcing students to seek out career guidance on their own. Within a college, there are a number of stakeholders—faculty, career offices, student services, alumni, intermediaries—that can offer career advice and guidance. However, students are often left to navigate these disconnected resources on their own. As one survey reports, approximately 50 percent of colleges offer career advising as an optional service, rather than feature it as essential¹⁷⁹ By leaving it up to students, colleges create a divide between those who are familiar with the college ecosystem (or have access to someone who is) and those who are new to the process or have fewer resources, such as first-generation college students—increasing equity gaps among students.^{180, 181} Some colleges, like Bunker Hill Community College, are integrating career advising with other student support services, like academic and financial advising, by assigning every student a “success coach.” However, most colleges are not offering easily accessible, holistic career advising experiences for students.

Combining college-to-jobs interventions amplifies the effectiveness of supporting and connecting students to good jobs. While we evaluated each intervention on its own, we also found that interventions are more likely to improve economic mobility for students when they are braided together. For example, Year Up, a job training program for young adults, includes various interventions as part of its program—including career readiness content, career pathways initiatives, experiential learning, and internships—and has yielded positive outcomes. A RCT facilitated by the federally-sponsored Pathways for Advancing Careers and Education (PACE) Evaluation showed that Year Up participants experience a 30 percent wage gain six years after graduation.¹⁸² However, there is no “one size fits all” approach to combining interventions. Higher education institutions face different realities, based on student demographics, regional labor market needs, and available resources, which they must consider when developing intervention programs.

3

Career interventions are often implemented inequitably, but there are strategies to improve access and success for underserved students.

Communities of color, particularly Black students, have been underserved by the college-to-jobs ecosystem. While strides have been made in increasing representation from underrepresented minority groups in the past two decades¹⁸³, Black students continue to face barriers to participation in career opportunities on college campuses. They may feel stereotyped and discriminated against by professors or experience instances of microaggressions by peers.¹⁸⁴ Disparities become even more apparent when examining participation in separate interventions, such as



internships. In one study, NACE found that Black students received disproportionately fewer paid internships, and more unpaid internships, than their peers.¹⁸⁵ Economic disparities persist after students leave college and are fully immersed in the workforce, as well. Fifty four percent of Black Americans between the ages of 25 and 40 have student loans compared to 39 percent of White Americans in that age group,¹⁸⁶ which may help explain why the median net worth for Black households with college graduates in their thirties has fallen to \$8,000, while their white peers have seen median net worth grow to \$138,000 as recent as 2019.¹⁸⁷

HBCUs and MSIs play a crucial role in preparing Black and Brown students for careers, but they are historically under-resourced. Although HBCUs make up three percent of America's colleges and universities, they produce almost 20 percent of all Black graduates and 25 percent of Black graduates in the STEM fields.¹⁸⁸ HBCUs also foster a community of belonging for Black students—four in 10 Black HBCU graduates (40 percent) report financial well-being, compared with fewer than three in 10 (29 percent) Black graduates of other schools.¹⁸⁹ However, for decades, HBCUs and MSIs have had to grapple with financial challenges.¹⁹⁰ While the federal government has provided more funding and forgiven debt obligations, that has only partially offset a history of underinvestment by Washington and the states. That has left HBCUs more heavily reliant on tuition to underpin their finances, making them more vulnerable to swings in enrollment.¹⁹¹ In addition, when making appropriations, state governments are more likely to prioritize predominantly white institutions (PWIs) and flagship institutions over HBCUs.¹⁹² Over the past few years, progress has been made in prioritizing funding for HBCUs, however more support and funding is needed from the federal government and public- and private-sector donors.¹⁹³

Support structures and wraparound services are necessary for interventions to succeed. Students face vastly different circumstances, with some struggling to meet basic needs, such as food and housing, transportation, and textbooks. Program success depends on schools and employers identifying students who are struggling and providing them with the resources and wraparound support services they need to engage fully.¹⁹⁴ Otherwise, institutions risk losing individuals who might benefit most from college-to-jobs interventions. For example, the City University of New York (CUNY) launched a program known as the Accelerated Study in Associate Programs (ASAP) in 2007. ASAP provides full-time, low-income community college students with comprehensive wraparound supports.¹⁹⁵ In a RCT study, ASAP was shown to nearly double graduation rates—highlighting the significance wraparound supports have in advancing the prospect of student success.¹⁹⁶

Additionally, education is not necessarily the only responsibility that students are balancing when they are enrolled. Adults over the age of 25 represent roughly 33 percent of enrollment in the U.S. higher education system¹⁹⁷, and 43 percent of full-



time and 81 percent of part-time students are employed while pursuing their degree.¹⁹⁸ Institutions must factor in the realities and needs of those students—including the challenge of reentry to college or childcare requirements—when designing programs to ensure that students are able to attain postsecondary persistence and completion. This could include offering classes outside of working hours to accommodate adult working learners and providing childcare facilities on campus for learners with children.

College-to-job interventions must be designed around equity; otherwise, they will produce unequal outcomes and exacerbate socioeconomic gaps. Stakeholders run the risk of replicating systemic inequities that produce racial and socioeconomic disparities if they do not intentionally build interventions around equity principles. Institutions must ensure all students are made aware of career opportunities as they plan their initial courses of study—as underrepresented groups may be less likely to know what programs are available to them. Colleges could also consider required career-readiness courses that expose students to data resources, offer curriculum related to the job search and interview processes, and provide other practicums within the first year or two of college. Institutions must also insist that all work-based learning opportunities (e.g., internships, apprenticeships) result in compensation or credit towards a degree. Research demonstrates that unpaid internships may exacerbate the inequality that college-to-jobs interventions were intended to improve.¹⁹⁹

To ensure success, stakeholders should focus on meeting student needs and circumstances. For example, one company, Mainstay, offers an artificially intelligent “chatbot” that communicates with students to answer college-related questions, such as how to handle registration holds and refile the FAFSA. Researchers conducted a RCT at Georgia State University (GSU) that found that messaging students about specific administrative processes can increase the likelihood that students complete required tasks and visit an advisor.²⁰⁰ By using text-based nudging, GSU structured its processes around natural student behavior patterns.



Recommendations

Higher education institutions, employers, policymakers, and researchers can take immediate short- and long-term actions to improve college-to-jobs transitions for students. Both individually and collectively, stakeholders must work to ensure our postsecondary education system lives up to its economic mobility promise.

Higher Education Institutions

1

Colleges must put access to good jobs at the center of their mission and integrate career-connected learning across their institutions. Career readiness should not be siloed in a career office; rather, it should be a core education component that is embedded throughout the student experience. That requires:

- A. Integrating experiential learning into coursework.** To prepare students for the workplace—which requires soft skills that are rarely taught in the traditional classroom setting—faculty should embed within their courses experiential learning opportunities that mimic the workplace or take place on the job. This may include assigning students to team-based projects or providing opportunities for students to engage with tools and processes used by employers in the field. For example, at California State University, a public Hispanic Serving Institution, an undergraduate computer networking course was redesigned to feature collaborative, open-ended systems design challenges.²⁰¹
- B. Providing for-credit and paid career readiness opportunities.** Colleges should invest in career interventions that are integrated into degree pathways—such as for-credit career readiness courses or internships—or are extracurricular, but paid. This will expand access to such learning opportunities to students with fewer resources, who may not have time to devote to non-credit courses or unpaid immersion opportunities. Braven partners with public universities to embed career education, including a for-credit career readiness course, into the higher education experience of first-generation college students, students of color, and students from low-income backgrounds.²⁰²
- C. Mapping courses and majors to in-demand careers.** Courses, majors, and career pathways should be intentionally aligned with the skills and competencies required for long-run career success, and departments should be measured on student outcomes over time. This requires faculty to work with employers to continuously evaluate and align coursework to meet the changing demands of the labor market. At the University of South Florida, for example, faculty were recently required to review curricula and engage in skills-mapping exercises, which resulted in updated course content and major requirements to prepare liberal arts students for project management roles.²⁰³



D. Combining academic, career, and financial advising. Academic, career, and financial coaching should be integrated—and required—so that all students have one-stop, holistic support, sometimes called “success coaching.” Providing training for faculty in advising, which they can leverage in their engagements with students, can be a cost-effective method of scaling coaching and will ensure students’ coursework is connected to their career goals. Lorain County Community College trains its faculty and staff to provide career advising, and each student receives individualized and holistic academic and career support.²⁰⁴

2

Colleges should institutionalize engagement with employers and other partners to improve collaboration, including by:

- A. Creating a “go-to place” for employers to engage with the institution and student body.** Institutions should create hubs for employers to easily acquire information about partnering with the school and hiring students for career immersion experiences. In addition to making information clearer and more accessible, institutions may consider designating industry engagement staff to work with employers and connect them with opportunities. For example, Pima Community College in Arizona maintains a “Business & Industry” hub on its website, which provides a variety of resources for employers seeking to engage with students and program staff, including contact information for the Employer Engagement and Career Services team.²⁰⁵
- B. Participating in regional economic entities at the leadership level.** College leaders should participate in regional workforce bodies to foster relationships with industry, build credibility and rapport within the workforce ecosystem, and stay abreast of labor market trends. This may include serving on the statewide Workforce Investment Board, chambers of commerce, or the boards of leading employers in the region. For example, Mississippi Gulf Coast Community College President Mary Graham serves on the statewide Workforce Investment Board, as well as the boards of the Gulf Coast Business Council and one of the state’s two electric utilities.²⁰⁶
- C. Leveraging national networks to learn and share best practices.** Institutions should invest in knowledge sharing with other colleges across the country, many of which face similar challenges. Creating and participating in organizations that work to experiment, develop, document, and disseminate best practices can accelerate colleges’ ability to respond to these problems. For example, the National Center for Inquiry and Investment convened several rural community colleges to launch the Rural Guided Pathways Project,²⁰⁷ through which they are studying and advancing economic mobility in rural areas. UNCF hosts an Institute for Capacity Building,²⁰⁸ which supports HBCUs in continuous improvement.



3

Institutions must design career interventions with equity and diversity in mind.

Colleges must keep in mind the diverse needs of their students—such as food, housing, transportation, and childcare—when designing interventions. In addition to ensuring courses and programs are flexible, credit-bearing, and/or paid, colleges should provide supports and structured mentoring networks and cohort programs that empower marginalized student groups. For example, the ASAP program at CUNY equips students with comprehensive wrap-around services such as intensive advising, tutoring, last-dollar tuition and fee assistance, as well as free textbooks and transportation, to ensure they can overcome key barriers to success and complete their degree or transfer to a four-year college within three years.²⁰⁹

Employers

4

Engage with community colleges, HBCUs, and MSIs to diversify their workforce.

Employers should collaborate with local community colleges, HBCUs, and MSIs—expanding their student engagement and recruitment beyond their traditional sources of talents, such as four-year institutions—and commit to hiring qualified graduates from these institutions. They can leverage tools, like Handshake, to partner with a broader swath of schools and reach more students about career opportunities. While businesses have varied levels of resources and needs, there are several models they can pursue, from low-touch opportunities (e.g., career mentoring) to more recourse-intensive activities (e.g., designing and managing apprenticeships). They may also collaborate with other employers and organizations to pool resources and reach more students at scale. For example, in South Carolina, ISHPI Information Technologies Inc. and Integer Technologies LLC, partnered with South Carolina State University, a consortium of HBCUs, and the Urban Institute to develop a degree-based registered apprenticeship program in cybersecurity, which combines paid work-based learning with academic instruction and culminates in a two- or four-year degree.²¹⁰

5

Develop structured, paid career immersion experiences. Employers should ensure that on-the-job programs, including internships, are clearly structured and aligned with learning and equity goals—that is, provide substantial and equitable opportunities for students to build career skills. Such programs must be designed around the principle that they create attractive benefits for both learners and businesses alike. That will allow businesses to pay students a fair wage and, potentially, subsidies for transportation to ensure that all students can afford to participate, not just those with needed resources at hand. They should also provide students with a network of supports, including a trained supervisor and mentor. For example, the Massachusetts Competitive Partnership, which represents some of Boston's largest companies, partnered with Bunker Hill Community College to launch a Learn and Earn program, which provides paid, credit-bearing internships and mentorship to community college students.²¹¹

6

Provide human, physical, and financial resources to support job-aligned programs.

Employers should help education institutions fund the establishment and operation of new programs, such as credentialing tracks, and provide “in-kind” resources, such as staff for guest lectures and equipment for training, to colleges to develop job-aligned programs. Resource-intensive interventions, like co-ops and industry-recognized credentialing programs, are relatively rare, likely because of the financial constraints of these programs. Given the historical dearth of government funding for these interventions, employers must invest in promising programs if they hope to build the talent pipeline they need for growth—and they can leverage such engagement as entrepreneurial opportunities to expand their business’ reach. For example, California State University San Marcos partners with local companies, each of which pay \$1500 and provide equipment and facilities, to enable teams of college seniors to complete a “senior experience” project for the company.²¹²

Policymakers

7

Policymakers should increase college accountability and transparency around student economic outcomes, including by:

- A. Requiring institutions to track and report student economic outcomes.** Policymakers at the state and federal levels should mandate the collection of disaggregated, longitudinal student employment and earnings outcomes and make these data public, including through an expanded College Scorecard. They must also ensure these data are distributed to students and families so that they can inform student decision-making. Virginia, for example, collects a substantial amount of student outcomes data, including wage data,²¹³ and recently passed a law requiring the state Department of Education and school boards to distribute this information to high school students.²¹⁴
- B. Building statewide longitudinal data systems (SLDSs).** State policymakers should design and update cross-agency education and employment data systems to track post-college economic outcomes, including short- and long-term earnings, time to employment and employment status over time, and career satisfaction and health. Iowa, for example, has been building a comprehensive SLDS for several decades, with the support of federal grants. The state developed an interactive dashboard that allows the public to explore Iowa Community College student outcomes by academic program.²¹⁵



8

Provide federal support for programs that improve employment prospects. Federal policymakers should direct funds to programs and services that improve student economic outcomes, instead of rewarding “seat time”—especially in the case of programs that have little value to students or society. Federal resources should be tied to performance, which will require rethinking what is fundable under Title IV of the Higher Education Act. Federal policymakers should consider:

- A. Expanding student aid to include high-quality credentialing programs, paired with strong reporting requirements (e.g., Pell grants for short-term programs).
- B. Funding work-based learning opportunities (e.g., subsize youth employment programs) or providing incentives to businesses to develop earn-and-learn programs (e.g., the apprenticeship levy in the United Kingdom²¹⁶).
- C. Opening funding for non-traditional actors, such as intermediaries and high-quality non- and for-profit providers, to partner with colleges, accompanied by strong safeguards, which may enable promising models to scale (e.g., the Educational Quality through Innovative Partnerships (EQUIP) model²¹⁷).
- D. Providing additional capacity-building funds for HBCUs and other MSIs (e.g., increasing federal appropriations).
- E. Funding sector partnerships between industry, education, and community organizations (a similar economic development model as the Trade Adjustment Assistance Community College and Career Training grants).

9

Provide state resources for career services and industry-education partnerships, tied to student outcomes. State policymakers should support career advancement initiatives at state four-year and two-year institutions, including by:

- A. Providing appropriations for student support services, like career counseling, which have seen declining state funds over the past ten years, while holding schools accountable for student economic and education outcomes.²¹⁸
- B. Providing grants for students to attend community college tuition- and fee-free, including through “promise” programs, which have been shown to increase college access.²¹⁹
- C. Developing subsidy programs for businesses to develop structured, paid work-based learning opportunities that lead to high-quality jobs.
- D. Supporting employer-education-community partnerships through competitive regional grants to incentivize collaboration and sector alignment.



Researchers

10

Researchers should conduct longitudinal studies focused on labor market outcomes. The research on career-connected learning in the college ecosystem has largely failed to answer the most important question: how do programs impact student employment outcomes? To answer this question, researchers must conduct rigorous, long-term studies focused on student employment and earnings over time to build a stronger body of evidence around the economic effects of these interventions. Researchers should also align on a shared language for these interventions to build a consistent and comparable evidence base.

11

Build research-practice partnerships with postsecondary institutions. Researchers and institutions should consider developing internal or external research-practice partnerships to study new student interventions as they are implemented, both to strengthen the research base for programs and continuously improve them. For example, faculty researchers might partner with institution leaders to study the economic outcomes of a cohort of students enrolling in a new college bootcamp offering. Not only will this add to the (scarce) evidence base around college bootcamps, but it will also inform institution practices and investments.

The opportunities for future research, experimenting with new models, and building on and scaling effective interventions are vast. Fundamentally, this requires a rethinking of the purpose of college, and the responsibility of stakeholders across the postsecondary ecosystem to help students move from education to the workforce.

The College-to-Jobs Playbook

Intervention Summaries



Also known as:
Career advising
Career counseling
Career guidance

OUR DEFINITION

One-on-one counseling between an advisor and a student, which may involve helping students develop career navigation skills and access career information, reviewing job application materials, and connecting students to professional opportunities. Advisors may include career counselors, faculty, alumni, or other trained staff.

Overview of Research Evidence



Strong evidence that career coaching (including the integration of career exploration activities) increases students' self-efficacy, human capital, independence, and adaptability.^{1, 2}



Strong evidence that integrated, sustained advising improves college persistence and graduation, academic achievement, and postsecondary degree attainment.^{3,4,5,6}



Minimal evidence that career coaching impacts students' economic outcomes, including job placement and future earnings, although it may impact job satisfaction.⁷

Implementation and Design Considerations

Integrate career advising with academic, financial, and basic needs counseling and coordinate across student support providers.^{8,9,10,11}

Build personalized, trusting relationships with students to help them become active participants in their education and career journeys.^{12,13}

Start advising early on in a student's college career and sustain it proactively throughout to create more opportunities for interaction and intervention.¹⁴

Embed positive incentives into the advising structure to encourage continued student participation.¹⁵

Research Highlight

Bettinger & Baker (2014): A randomized study of InsideTrack, a student coaching service, found that students who were assigned to a coach were more likely to persist during the coaching period and more likely to be attending the university one year after the coaching had ended than students who were not assigned a coach.¹⁶

Promising Models for Study

At Lorain County Community College (LCCC) in Ohio, students receive long-term, individualized advising from an assigned advisor who facilitates regular outreach and meetings and monitors their progress to completion. LCCC provides customized support for specific student cohorts and communities, such as full-time Pell-eligible students and Hispanic/Latino students.¹⁷

New Horizons

Training faculty members to serve as career advisors may be an effective career coaching approach, enabling students to relate their coursework and out-of-class experiences to career goals.¹⁸

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Career Immersion Career Mentorship Programs

Also known as:
**Faculty
mentorship
programs**

OUR DEFINITION

Targeted programs that foster personal relationships between college students and college alumni, faculty, staff, or local employers, designed to help students strengthen their ties with industry professionals, grow their knowledge of potential career paths, make informed career decisions, and build their social networks. Overview of Research Evidence:

Overview of Research Evidence



Moderate evidence that career mentorship programs promote postsecondary students' career self-efficacy, which includes positive outcomes in self-efficacy with respect to in career selection, job applications, professional skills and competencies, and growing personal and professional networks.^{1,2,3,4,5,6,7,8}



Moderate evidence that formal workplace mentorship programs improve professional, on-the-job skills of current employees, however, few studies have conducted similar research on prospective employees who are postsecondary students.⁹



Moderate evidence that formal mentorship programs have a greater impact on women than on men in promoting positive labor market and educational outcomes.^{10,11}

Implementation and Design Considerations

College alumni or peer student career mentoring programs can both help current students with their career self-efficacy and continue to engage school alumni or more students with the institution.^{12,13,14,15}

Cultural taxation for faculty of color: The potential barriers that limit students of color's success could be mitigated by mentorship of faculty who share similar backgrounds or experiences, however, faculty of color believe that their sense of social responsibility to students of color may come at a cost to their career advancement.^{16,17,18}

Mentor matching and structure is important for both student and mentor success: Pairing students with faculty, alumni, peer, or industry mentors may be more successful when students are paired based on their career interests, rather than simply shared school or college majors, and when there are mentor meeting structures in place, such as suggested topics to discuss or job recommendations.^{19,20,21}

Research Highlight

Crisp, Gloria (2010): This study uses structural equation modeling analysis to examine the impact of mentoring on persistence among a random sample of community college students in the United States. The results indicate that mentoring "significantly predicted the degree to which students became socially and academically integrated," and also indirectly influenced persistence among students.²²

Promising Models for Study

The B.R.I.D.G.E.S. Program is designed for racially underrepresented freshmen, sophomore, and transfer students at Mississippi State University (MSU). Each student is assigned a MSU faculty or staff mentor for a year who provides the student with professional and personal skills, resources, and guidance to aid in the student's growth and success at MSU.²³

New Horizons

University of Manitoba launched an Indigenous Career Mentor Program (ICMP) in fall of 2022, linking Indigenous mentors to Indigenous students in fields ranging from aerospace to healthcare to not-for-profit industries. The mentors supply career guidance, industry information, and advice from their own experiences to mentees.²⁴

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OUR DEFINITION

Structured sequences of connected education and training programs that provide students with basic skills and occupational knowledge aligned with industry needs. A basic career pathway model includes multiple entry and exit points that result in stackable credentials, aligned with labor market demands. Includes: Guided pathways, meta-majors

Overview of Research Evidence

Strong evidence that career pathways initiatives can improve credit accumulation, academic performance, and credential attainment, although there is mixed evidence about the impact of career pathways on college degree attainment.^{1,2,3,4}



Strong evidence that career pathways programs can increase short-term employment and short-term earnings, although impacts vary drastically by program area and length.^{5,6,7,8,9}



Minimal evidence that career pathways increase long-term employment and earnings outcomes.^{10,11}

Implementation and Design Considerations

Intentionally structure pathways to help students further their education and secure employment in high-demand fields.¹²

Deliver contextualized or integrated basic skills instruction to ensure entry into career fields.¹³

Provide comprehensive support to students to improve completion of credentials.¹⁴

Leverage employer-education partnerships to align pathways to industry needs.^{15,16}

Identify and explicitly address racial disparities in student outcomes.^{17,18}

Research Highlight

Strawn, Peck & Schwartz (2021): A meta-analysis of 46 experimental and quasi-experimental impact evaluations of career pathways programs, mostly carried out at technical and community colleges, found that career pathways programs increased credential attainment, overall employment rates, employment in targeted industries, and short-term earnings for program participants.¹⁹

Promising Models

The Integrated Basic Education and Skills Training (I-BEST), developed by the Washington State Board for Community and Technical Colleges in conjunction with the state's community and technical colleges, integrates basic skills and technical skills instruction to increase the rate at which adult basic education and English-as-a-second-language students advance to college-level programs and complete postsecondary credentials.²⁰

New Horizons

California Community Colleges launched the Self-Employment Pathways in the Gig Economy project to prepare students to become freelancers and independent contractors in the growing gig economy.²¹

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Career Readiness Curriculum

OUR DEFINITION

Content that provides instruction, materials, and other support mechanisms to help students gain competencies in career and social skills, including leadership, communication, professionalism, critical thinking, teamwork, and career- and self-development skills. Pedagogy may also include a focus on applied career practices like resume creation or interview preparation.

Overview of Research Evidence



Strong evidence that career readiness curriculum improves career decision-making skills, self-efficacy, career confidence, vocational identity, and career satisfaction, especially for minoritized groups^{1,2,3,4,5}



Mixed evidence that career readiness content increases academic outcomes such as persistence in college, graduation rates, and cumulative GPA.^{6,7}



Minimal evidence of impacts on student employment and earnings post-graduation, although employability models and employer demands include career readiness skills^{8,9}

Implementation and Design Considerations

Curricula should be structured around specific career-readiness goals, including career exploration, career planning, and skill development^{10,11}

Career readiness content should be credit-bearing, which benefits students and institutions, because the intervention pays for itself, allows colleges to deliver career services at scale, and enables students to accumulate credits¹²

Research Highlight

Folsom, et. al. (2005): Researchers compared student participants in a career development course at Florida State University to a matched sample of non-course participants after five years, and found that women participants graduated college in less time than non-participants, while men took longer to graduate but had higher GPAs than male non-participants.¹³

Promising Models for Study

Virginia Commonwealth University (VCU) developed an Interdisciplinary Career Readiness Skills Minor, an 18-credit pathway designed to help students across industries acquire the eight National Association of Colleges and Employers (NACE) career readiness competencies.¹⁴

New Horizons

Community colleges are awarding credits to students who pass the CT WorkKeys National Career Readiness Certificate, receiving National Career Readiness Certificates.¹⁵

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Career Awareness Cohort Programming

Also known as:
**Learning
communities**

OUR DEFINITION

Career-focused learning program structures in which small groups of students are enrolled together in two or more linked courses that connect to specific industries, careers, or fields of study.

Overview of Research Evidence



Strong evidence that cohort programs increase student persistence and academic achievement, including for historically underrepresented populations.^{1,2,3,4,5}



Moderate evidence that cohort models increase student engagement and satisfaction with their college experience.^{6,7}



Mixed evidence that cohort programs impact college completion and degree attainment.^{8,9,10,11}



Minimal evidence that cohort models impact economic outcomes, including employment and earnings.¹²

Implementation and Design Considerations

Cohort models may be most successful when combined with student supports, like career exploration and coaching services, although this may increase costs and management complexities.¹³

Research Highlight

Weiss, et al. (2015): A randomized trial of over 1,500 students at Kingsborough Community College indicates that learning communities' positive effects on short-term academic progress (credit accumulation) are maintained seven years after random assignment. The study provides some limited evidence that the program positively affected graduation rates, particularly for those students without remedial English needs, over this period.¹⁴

Promising Models for Study

Bunker Hill Community College's Learning Communities enable students to learn in a supportive environment that fosters stronger relationships among students and faculty. Students benefit from interdisciplinary learning experiences, teacher-to-student mentoring, peer mentoring, and integrated support services, such as success coach advisors.¹⁵

New Horizons

Virtual cohort programs may allow students to build supportive communities and relationships with faculty, peers, and advisors across distances.¹⁶

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Also known as:
**Registered
 Apprenticeships,
 Industry-recognized
 apprenticeships**

OUR DEFINITION

Industry-driven training programs that combine paid, on-the-job learning with classroom instruction and result in nationally recognized, portable credentials. Colleges may co-design curricula, provide academic instruction, or administer and operate the apprenticeship program, in partnership with local businesses.

Overview of Research Evidence



Strong evidence that apprenticeships have a positive impact on students' employment outcomes across a wide range of geographical sites and industry programs ^{1,2,3}



Mixed—but mostly strong—evidence on improved students' earnings post-apprenticeship. Studies that show slight negative association between apprenticeships and earnings were conducted during an unusually deep recession. These positive associations also extend to students' fringe benefits in their jobs. ^{4,5,6,7,8}



Mixed evidence that apprenticeships have a positive impact on students' educational outcomes ^{9,10}

Implementation and Design Considerations

No “one size fits all” program design, but communication is key to success: Successful apprenticeship programs can span a wide range of program lengths and costs across different industries and hinges on the quality of relationships between key people at the college and employer involved in the program and removing barriers for employers to participate, for example, establishing a central point of contact at the college. ^{11,12,13}

Good programs are difficult to run well: Apprenticeship programs take substantial time and technical or staff assistance to implement and see results. These programs also take time to see positive impacts, even among earlier and later apprentice cohorts in the same program ¹⁴

Outcomes differ by gender where there is more overwhelming positive earning, employment, and academic outcomes for males than for females. Women in apprenticeships face different challenges such as facing harassment in more male-dominant industries and obtaining childcare. ^{15,16}

Research Highlight

Reed, et. al. (2012): Using data from Unemployment Insurance records, the authors compared those who had completed a registered apprenticeship (RA) program with nonparticipants. They estimated the impact of program participation on earnings and employment using regression models that controlled for demographic characteristics and earnings and employment before the start of the program, and reported outcomes six years after program enrollment for 57,924 people in six states, and nine years after program enrollment for 45,366 people in five states. The study found that employment rates were 8.6 percentage points higher among RA participants than nonparticipants both six and nine years after program enrollment, and RA participants earned more than nonparticipants at both follow-up periods. ¹⁷

Promising Models for Study

A consortium of South Carolina Historically Black Colleges and Universities (HBCUs), the Urban Institute, and businesses collaborated to develop a degree-based apprenticeship program in secure software development. The program enables students to gain meaningful paid work experience while simultaneously advancing toward a bachelor's degree.¹⁸

New Horizons

Youth apprenticeship programs offer high school students the opportunity to combine in-the-classroom learning with on-the-job exposure, providing work-based opportunities for students at a young age. Although youth apprenticeships take place predominantly in high school, they provide students with the experience and skills to make informed college and career decisions.¹⁹

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OUR DEFINITION

Longer-term (1-3 semesters), full-time work-based learning experiences at an organization that align with students' majors, are centrally organized by the college or faculty, and may provide academic credit to the students.

Overview of Research Evidence



Strong evidence that co-ops have a positive impact on students' employment and earnings, however, these findings may be limited to students' co-op completion rather than only co-op participation^{1,2,3}



Positive returns on employment and earnings exist mainly for STEM co-op participants. There is **moderate evidence** that income premiums exist for business students, and little evidence that income premiums exist for arts or social science programs.⁴



Moderate evidence that co-ops have a positive impact on students' career self-efficacy, meaning that co-op students feel more empowered and confident to pursue a career in their co-op industry after having participated in the co-op program^{5,6,7}

Implementation and Design Considerations

Can be a tool to diversify the workforce and higher education:

Although co-op participation is lower for underrepresented students, underrepresented students who do participate in co-ops have higher labor market and academic outcomes^{8,9}

Women face unique challenges in engineering co-ops:

Women face a unique combination of positive personal and professional growth coupled with lack of support or seclusion from predominantly male work environments. Additionally, women tend to receive lower employment and earning benefits than their male counterparts^{10,11}

Co-op participation may be driven by the labor market:

Lower academically performing students tend to participate in co-ops at a higher rate during periods of poor labor market prospects, which could help gauge institution co-op management needs¹²

Research Highlight

Wynoch, Rosalie, et al (2019): This study uses linear estimation models and quasi-experimental data to estimate the impacts of co-op programs on income or other post-graduation benefits. The results indicate that co-op programs positively impact participants' transition into the labor force and their incomes within the labor force, and that it may also contribute to overcoming wage gaps related to race, gender, or immigration status.¹³

Promising Models for Study

The University of Cincinnati has provided co-op opportunities for its students for nearly 100 years. Students alternate between academic semesters and semesters spent working full-time in organizations within their chosen field, from startups to large corporations and nonprofits, allowing them to gain vital on-the-job experience while receiving academic instruction and earning wages.¹⁴

New Horizons

Encouraging alumni entrepreneurs who start their own businesses to host current co-op students may lead to more positive co-op experiences for both students and employers.¹⁵

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Career Immersion Internships

Also known as:
***Paid internships,
unpaid internships,
internships for credit,
micro-internships***

OUR DEFINITION

Short-term work experiences that help students gain entry-level exposure and applied experience in a particular industry, field, or organization.

Overview of Research Evidence



Strong evidence that internships have a positive impact on college students' academic outcomes, including higher GPA, higher college retention rates, higher likelihood of attending graduate school, and higher inclination for lifelong learning.^{1,2}



Strong evidence that internships contribute to higher earnings after college, however, there is to be variation in impact on earnings, depending on whether the internship is paid or unpaid or voluntary or mandatory.^{3,4,5,6,7,8}



Mixed evidence about how internships contribute to increasing human capital; that is, whether they contribute more for increasing skills for future jobs or to better understand how to function and interact in a particular field or workplace.^{9,10}



Strong evidence that internships also benefit employers because the intern performs needed job tasks and because the intern's role may save the organization recruitment and training costs.^{11,12}

Implementation and Design Considerations

Employers should consider clarity in expectations, learning outcomes, job tasks, feedback, mentorship, and other guidance to ensure more positive outcomes from both the student and employer perspective.^{13,14,15,16}

Paid internships tend to be associated with more positive students labor market outcomes, although this may vary by industry.¹⁷

Internship participation may vary by students' gender, ethnicity, and first generation status: Women and underrepresented students are more likely to engage in humanities- and social sciences-related fields of study and related internships, which tend to be unpaid, compared to STEM counterparts.^{18,19} Lower income students may also opt to engage in paid jobs rather than an unpaid internship experience to supplement financial needs.²⁰

Research Highlight

Margaryan et al. (2020): This study provides causal evidence of the effects of student internships on students' transition to the labor market and earnings. Using longitudinal data from the German Centre for Research on Higher Education and Research Studies (DZHW), the authors find that student internships in firms increases earnings by around six percent in the short and medium term and suggests that graduates who completed an internship face a lower risk of unemployment during the first year of their careers. The findings suggest that internships combined with university education can better incorporate labor market demands in higher education.²¹

Promising Models for Study

The Foundation for California Community Colleges partners with the California Film Commission to provide paid internship opportunities for students interested in the entertainment industry, offering students first-hand experience in art, camera, grip, wardrobe, and production.²²

New Horizons

Micro-internships are shorter-term, paid internships typically geared toward students who are new to the workforce and who are looking for work experience in a specific field.²³ Already-existing resources such as crowd-sourcing platforms could be repurposed into micro-internship opportunities by incorporating evidence-based best practices of traditional internships, such as clear structure, expectations, and mentorship.²⁴

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Career Immersion Job Shadowing

Also known as:
Externships

OUR DEFINITION

Informal, short-term, usually unpaid experiences wherein students follow and closely observe employees to better understand the day-to-day rigors of their job and company. These may range from one-time experiences to longer term, more regular experiences with a company or specific employee.

Overview of Research Evidence



Moderate evidence that job shadowing has a positive impact on students' career self-efficacy, defined as students' perceptions of their confidence and ability to perform in their chosen career ^{1,2,3,4}



Mixed evidence that job shadowing has a positive impact on students' developing professional skills for the workforce, such as in teaching, hospitality, and nursing fields. This may be due to job shadowing experiences being too brief to provide a significant benefit to students ^{5,6,7,8,9}



Minimal evidence that job shadowing supports positive outcomes in students' retention in educational programs employment post-graduation¹⁰

Implementation and Design Considerations

Employers should consider operational benefits of hosting students and current employees in job shadowing opportunities. Longer-term job shadowing programs may minimize impacts of staffing shortages,¹¹ allow employees to gain exposure to new departments within an organization,¹² and provide more opportunities to underrepresented students, such as students with disabilities ¹³

Remote or online job shadowing experiences could be an effective method to scale career immersion opportunities, however, students who participate in face-to-face job shadowing experiences tend to have marginally greater career self-efficacy than students who participate in virtual job shadowing experiences ¹⁴

Research Highlight

Neumark, et al (2006): This study provides causal evidence that job shadowing positively affects high school students' college enrollment, and a positive—but not significant—association between job shadowing and employment. Using longitudinal data from the 1997 National Longitudinal Survey of Youth (NLSY97), the Neumark, et al study observed the impact on high school students' college enrollment and post-high school employment based on a range of school-to-work interventions. Although this research focuses on high school—rather than postsecondary—students and many of the other school-to-work interventions have a greater association between college enrollment and post-high school employment, this study highlights data that could be used for future research on job shadowing in postsecondary institutions.

Promising Models for Study

UC San Diego Health collaborates with Southwestern Community College, City College, and Grossmont Community College to provide under-resourced community college nursing students with structured job shadowing and career support experiences. Students shadow nurses and participate in workshops over a 12-week period to better understand the professional clinical nurse role.¹⁵

New Horizons

Virtual job shadowing and related career immersion experiences may help more students gain exposure to different kinds of business operations and cultures, even if they are not physically co-located with these companies. Employers should also consider how they may provide these opportunities to expand access for underrepresented potential employees.¹⁶

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Subsidized Youth Employment Programs

Also known as:
Subsidized job programs

OUR DEFINITION

Publicly-funded initiatives in which students are paid to attend school in the summer or paid for practicum experiences in non-apprenticeship “learn and earn” models. In other settings, subsidized job programs may include general experiences where students are paid for related classroom and work-based learning experiences.

Overview of Research Evidence



Strong evidence that subsidized summer youth employment programs reduce the arrest rates and lower the probability of being arrested for a crime during the summer months, especially among “at-risk” youth ^{1,2,3,4,5}



Mixed evidence that subsidized summer youth employment programs improve educational achievement or completion. ^{6,7,8}



Mixed evidence that subsidized summer youth employment programs improve employment opportunities and earnings, however, some research suggests that elements such as writing recommendation letters for participants can improve employment outcomes. ^{9,10,11}

Promising evidence of socio-emotional skill development: summer youth employment programs have a positive impact on students career self-efficacy and work readiness habits

Implementation and Design Considerations

Positive academic and labor market outcomes for certain student groups: Youth of a legal high school dropout age and who had a higher rate of school absences prior to the summer youth employment program benefit more academically from participating in youth employment programs ^{12,13}

Obtaining funding is challenging: Studies focus on larger metropolitan areas where youth employment programs are more robust and where there may be more opportunities for youth employment funding. Other institutions—such as community colleges—may find it challenging to fund similar employment programs. ¹⁴

Research Highlight

Modestino Sasser and Paulsen (2022): A randomized evaluation of the Boston Summer Youth Employment Program (SYEP), which provides out-of-school early work experience for high schoolers, found that participants are 4.4 percent more likely to graduate on time and 2.5 percent less likely to drop out in the years after participating in SYEP. In particular, SYEP seemed to positively impact attendance rates, college aspirations, work habits, and social skills which contributed to these improved outcomes. ¹⁵

Promising Models for Study

One Summer Chicago connects companies, governments, and local institutions to offer youth aged 14-24 employment and internship opportunities. It is the second largest summer employment program, offering badges in 21st century skills, career readiness, goal planning, attendance, and financial responsibility. Participants can market their work readiness to potential employers with these badges. Currently the program serves over 31,000 youth every year.¹⁶

New Horizons

At the onset of the COVID-19 crisis, some subsidized youth employment programs engaged youth as community crisis responders, hiring them to design and assist with testing, outreach, and food and PPE delivery strategies.¹⁷

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Career Skillbuilding Experiential Learning

Also known as:
project-based learning,
simulation-based
learning, experience-
based learning

OUR DEFINITION

Coursework wherein students learn by actively engaging in hands-on, real-world, or simulated real-world projects, either in the classroom or within companies. These projects are intended to provide learners with both 'hard' and 'soft' skills.

Overview of Research Evidence



Strong evidence that experiential coursework has a positive impact on student learning, including content knowledge and retention and skill attainment, such as problem-solving, collaboration and communication skills.^{1,2,3,4,5,6}



Strong evidence that experiential learning improves academic outcomes, including course performance, course completion, and degree attainment.^{7,8,9,10,11}



Minimal evidence of the causal impacts of experiential learning on economic outcomes, such as employment rates and earnings.

Implementation and Design Considerations

Educational institutions should establish instructional goals at the outset. Doing so will help them choose an instructional model, as there are many options for experiential learning.

Connecting with industry partners is a critical component of high-quality experiential learning, particularly for designing projects and activities, as well as integrating projects in the workplace.¹²

Pair classroom instruction and time for student reflection with experiential coursework to provide structure to experiential learning and prepare students for their chosen industry, while also providing students space for personal and academic growth.^{13,14}

Facilitators should be trained in experiential learning pedagogies, as faculty support is a critical element for success.

Research Highlight

Chen and Yang (2019): The authors conducted a meta-analysis of journal articles on project-based learning. They analyzed 46 effect sizes from 30 journal articles over a 20-year period (1998-2017), which resulted in a sample of 12,585 students from 189 schools in nine countries. Their analysis showed a medium to large positive effect size of project-based learning on student academic achievement compared to regular classroom instruction. These results were impacted by subject area, school location, hours of instruction, and IT support.¹⁵

Promising Models for Study

Worcester Polytechnic Institute provides a project-based learning track that aims to provide students with not only technical skills, but also soft skills like empathy, leadership, confidence, collaboration, and critical thinking. A set of surveys of alumni from the program conducted in 2012 showed feelings that the projects affected their professional lives, character development, and global perspectives, especially if they had completed a project off campus.^{16,17}

New Horizons

New virtual reality, artificial intelligence, and augmented reality technologies have the potential to transform experiential learning by creating even more realistic simulation-based learning experiences. Little research has been done, however, on the value-add of including such technologies, especially from a cost perspective.

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Career Skillbuilding Industry Recognized Credentials

Also known as:
stackable credentials,
portable credentials,
industry-based
credentials,
credentials of value

OUR DEFINITION

Industry-recognized credentials are certificates, certifications, and licenses that signify the attainment of skills and competencies needed for a career in a given industry or occupational area. They are generally based on standards developed or endorsed by employers or industry associations.

Overview of Research Evidence



Moderate evidence that industry-recognized credentials have positive effects on academic outcomes such as graduation rates and future college enrollment.¹



Moderate evidence that completers of credentials, including stacked credentials, see higher wages and increased employment, although this varies by field.^{2,3,4,5}



Minimal evidence that credentials close equity gaps, as male completers may see greater employment and earnings returns than female completers.^{6,7,8}

Implementation and Design Considerations

Educational institutions should consider serving as benchmarking authorities for verifying credentials, otherwise variations in quality lead to a lack of legitimacy of the credential.

Engagement from employers when designing the credential is critical to ensure credential earners are attaining skills required by the job market they seek to enter.

A rigorous assessment approach should be an anchor of credential design, with innovative opportunities for learners to demonstrate their acquisition of skills.

Research Highlight

Meyer, Bird, and Castleman (2022): This study uses a comparative individual fixed effects strategy and administrative panel dataset of enrollment and employment in Virginia to determine causal estimates of stacking credentials among working adults. Their findings indicate that attaining stacking credentials increases employment by four percentage points and quarterly wages by \$375. They also identify that these returns are higher in health sectors and for individuals who complement their credentials with a college education.⁹

Promising Models for Study

WorkCred is supporting five community colleges in developing and implementing Certificate+Degree programs, which embed industry-recognized credentials in degree pathways, allowing students to master “occupationally-relevant skills” that provide them with earning opportunities while they pursue their associate’s degree.¹⁰

New Horizons

Micro-credentials are short, focused, competency-based certifications that demonstrate mastery in a specific area. They are typically more flexible and faster to complete than other types of credentials, providing potentially promising opportunities for students to customize their learning pathways. Some evidence exists that attaining micro-credentials increases students' earnings.¹¹

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OUR DEFINITION

Programs in or affiliated with a college that provide accelerated training in a specific skill set, geared towards teaching technical, job-focused skills. The programs are often the crucial final step before students enter the workforce.

Overview of Research Evidence

Minimal evidence that bootcamps in a college setting improve students' economic outcomes, although there is **moderate evidence** that independent coding bootcamps increase job placement rates and employment opportunities.^{1,2,3}



Minimal evidence that bootcamps promote college persistence and graduation, academic achievement, and postsecondary degree attainment.

Also known as:

Bootcamps, short-term training programs

Implementation and Design Considerations

Colleges are just beginning to experiment with the last-mile bootcamp model: Last-mile bootcamps are a relatively new college program offering, with the first programs cropping up in 2016. As a result, there is very little research published on these types of programs and higher education institutions are just beginning to evaluate and experiment with program models.^{4,5,6}

Focus on third-party, for-profit coding bootcamps:

Most of the research that does exist on bootcamps focuses on third-party programs that serve as alternative pathways to college and/or occur outside of the college context. The research that is published on these third-party bootcamps focuses predominantly on coding bootcamps^{7,8,9,10,11,12} although findings from this research may provide insight on last-mile bootcamp outcomes.

There are three popular last-mile bootcamp models: Colleges may operate their own bootcamps for college credit or partner with independent bootcamps to offer either credit-bearing or non-credit bearing programs, sometimes through the extension school department.¹³

Research Highlight

We are not aware of any causal studies that examine the impact of bootcamps in a college setting. That said, one study **Joshi, Savi** (2019) out of the University of Pennsylvania evaluated the technical job placement rates for graduates of coding bootcamps through regression analysis and propensity-score matching. The results found that attending a bootcamp significantly positively increased the chances of finding a future technical role, and also may have diminished any penalties from having a non-technical background or undergraduate degree.¹⁴

Promising Models for Study

Cuyahoga Community College's bootcamp program, Cleveland Codes, prepares students for careers in web application and development through a 14-week hybrid IT Fast Track Program. The program helps students develop key skills in programming and development. Although students have to fund the program themselves, they earn college credit and four certifications through industry-recognized exams.^{15,16}

New Horizons

Employer partnerships are emerging as an alternative financing model for last-mile bootcamps. For example, the University of Montana offers a 12-week bootcamp in partnership with Cognizant-ATG, a tech firm located in Missoula. The program is a 30-hour-a-week commitment and teaches students skills in system analysis, data analytics, project management, and information infrastructure. Cognizant-ATG fully funds the program and students are typically offered a full time position at the completion of the program.¹⁷

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Appendix

Figure 5. Research Strength for Papers, Reports, and Dissertations.

COUNTA of Title Intervention Category (13)	Study Rigor			Grand Total
	Causal	Descriptive	Other	
Apprenticeships	4	17	3	24
Career coaching	6	18	9	33
Career Mentorship Programs	2	18		20
Career pathways initiatives (includes. meta-majors, guided pathways)	4	16	14	34
Career readiness curriculum	4	11	6	21
Co-ops	3	7	3	13
Cohort programming	2	7	2	11
Experiential Learning Coursework (includes simulation-based learning, project-based learning)	2	27	8	37
Industry-recognized credentials	2	9	3	14
Internships	9	37	10	56
Job shadowing	2	8	2	12
Last-mile bootcamps	2	7	1	10
Youth employment programs (e.g. subsidized summer jobs programs)	11	6	3	20
Grand Total	53	188	64	305

Note: We only looked at papers, reports, and dissertations to evaluate research strength. The “other” category refers to landscape overviews, frameworks, or other kinds of articles that are not about specific experimental research. This table does not include online articles in the total counts.



Figure 6. Methodology table for matrix variables.

Each intervention was graded on a scale from 1 to 3 (1 = low, 2 = moderate, 3 = high).

<p>Research Prevalence</p> <p>Question</p> <p>How well-studied is this topic?</p> <p>Methodology</p> <p>We classified each of the interventions by counting the number of papers, reports, and other literature from Google Scholar, ERIC (Education Resources Information Center), and CLEAR (Clearinghouse for Labor Evaluation and Research).</p> <p>We created a normalized score from the three counts (Google Scholar, ERIC, and CLEAR) and used the sum of those three normalized scores to arrive at a total score for each intervention. Based on the total sums for all 13 interventions, we assigned the aforementioned 1-3 scores to the top 25th percentile of scores (3), the interquartile range of scores (2), and the bottom 25th percentile of scores (1).</p>	<p>Research Strength</p> <p>Question</p> <p>Does research support the claim that this leads to positive labor market outcomes?</p> <p>Methodology</p> <p>We classified each intervention by its (1) h-index* from Web of Science search queries using the Boolean search terms outlined above (meaning there are h papers that have been cited at least h times) and (2) the number of citations in the top 10 most cited peer-reviewed papers for that intervention.</p> <p>We then calculated the normalized equivalent of those two variables based on their respective means and standard deviations across the 13 interventions. We added the sum of the normalized scores for the two variables to arrive at a total sum. Based on the total sums for all 13 interventions, we assigned the aforementioned 1-3 scores to the top 25th percentile of scores (3), the interquartile range of scores (2), and the bottom 25th percentile of scores (1).</p> <p>We also factored the outcome domain into the research strength scores. For example, an intervention with an initially lower research strength score, but with majority studies that focused on labor market outcomes could score higher than an intervention with an initially higher research strength score with primarily descriptive studies that focused on academic outcomes.</p> <p>Finally, we solicited input from researchers and other experts on their estimate of the research strength of each intervention and re-evaluated any mismatched scores.</p> <p>*The h-index is based on the depth of years of your product subscription and your selected timespan. Source items that are not part of your subscription will not be factored into the calculation.</p>
<p>Implementation Prevalence</p> <p>Question</p> <p>How many students benefit?</p> <p>Methodology</p> <p>We tallied the Google Search results for each intervention. We also examined Google Search trends over time to estimate changes in the field.</p> <p>Based on the total results for all 13 interventions, we assigned the aforementioned 1-3 scores to the top 25th percentile of scores (3), the interquartile range of scores (2), and the bottom 25th percentile of scores (1).</p>	
<p>Implementation Feasibility</p> <p>Question</p> <p>How difficult is it to implement effectively?</p> <p>Methodology</p> <p>We classified each of the interventions based on estimated startup and operational costs in the research, necessary funding sources, number of stakeholders involved, and the effort or institutional demand required of each stakeholder.</p> <p>Based on the total sums for all 13 interventions, we assigned the aforementioned 1-3 scores to the top 25th percentile of scores (3), the interquartile range of scores (2), and the bottom 25th percentile of scores (1).</p>	



Figure 7. Strength of Research Criteria and Counts.

Intervention Category	h-index	Number of citations in top 10 cited papers in Web of Science search
Apprenticeships	27	1178
Career coaching	7	142
Career Mentorship Programs	11	385
Career pathways initiatives	17	389
Career readiness curriculum	2	23
Co-ops	16	496
Cohort programming	38	2710
Experiential Learning Coursework	49	6672
Industry-recognized credentials	4	64
Internships	50	2248
Job shadowing	10	219
Last-mile bootcamps	2	12
Youth employment programs (e.g. subsidized summer jobs programs)	3	38

Figure 8. Prevalence of Research Criteria and Counts.

Intervention Category	Count from ERIC	Count from CLEAR	Results on Google Scholar
Apprenticeships	2725	25	305000
Career coaching	64	57	5890
Career Mentorship Programs	50	14	2020
Career pathways initiatives	799	126	16600
Career readiness curriculum	118	297	418
Co-ops	2207	6	17800
Cohort programming	249	309	15100
Experiential Learning Coursework	8386	2	18900
Industry-recognized credentials	47	162	1200
Internships	5144	18	285000
Job shadowing	112	0	13800
Last-mile bootcamps	14	0	9140
Youth employment programs (e.g. subsidized summer jobs programs)	84	162	5210



Figure 9. Prevalence in Practice Criteria and Counts.

Intervention Category	Google Search Results (June 2022)
Apprenticeships	389,000,000
Career coaching	2,840,000
Career Mentorship Programs	10,900
Career pathways initiatives	5,630,000
Career readiness curriculum	14,200
Co-ops	63,300,000
Cohort programming	240,000,000
Experiential Learning Coursework	113,000
Industry-recognized credentials	41,600
Internships	446,000,000
Job shadowing	1,030,000
Last-mile bootcamps	3,350
Youth employment programs (e.g. subsidized summer jobs programs)	347,000

Figure 10. Implementation Feasibility Criteria and Counts.

Intervention Category	Cost to start up (per pupil)	Cost and funding sources to operate (per pupil)	Effort to start up	Effort to operate
Apprenticeships	3	3	2	3
Career coaching	2	2	2	2
Career Mentorship Programs	1	1	1	2
Career pathways initiatives	3	3	3	3
Career readiness curriculum	2	1	2	2
Co-ops	3	3	1	2
Cohort programming	2	2	2	2
Experiential Learning Coursework	2	2	2	2
Industry-recognized credentials	3	3	3	3
Internships	3	3	1	2
Job shadowing	1	1	1	1
Last-mile bootcamps	3	3	2	3
Youth employment programs (e.g. subsidized summer jobs programs)	3	3	2	3

Note: 3 = high, 2 = moderate, 1 = low



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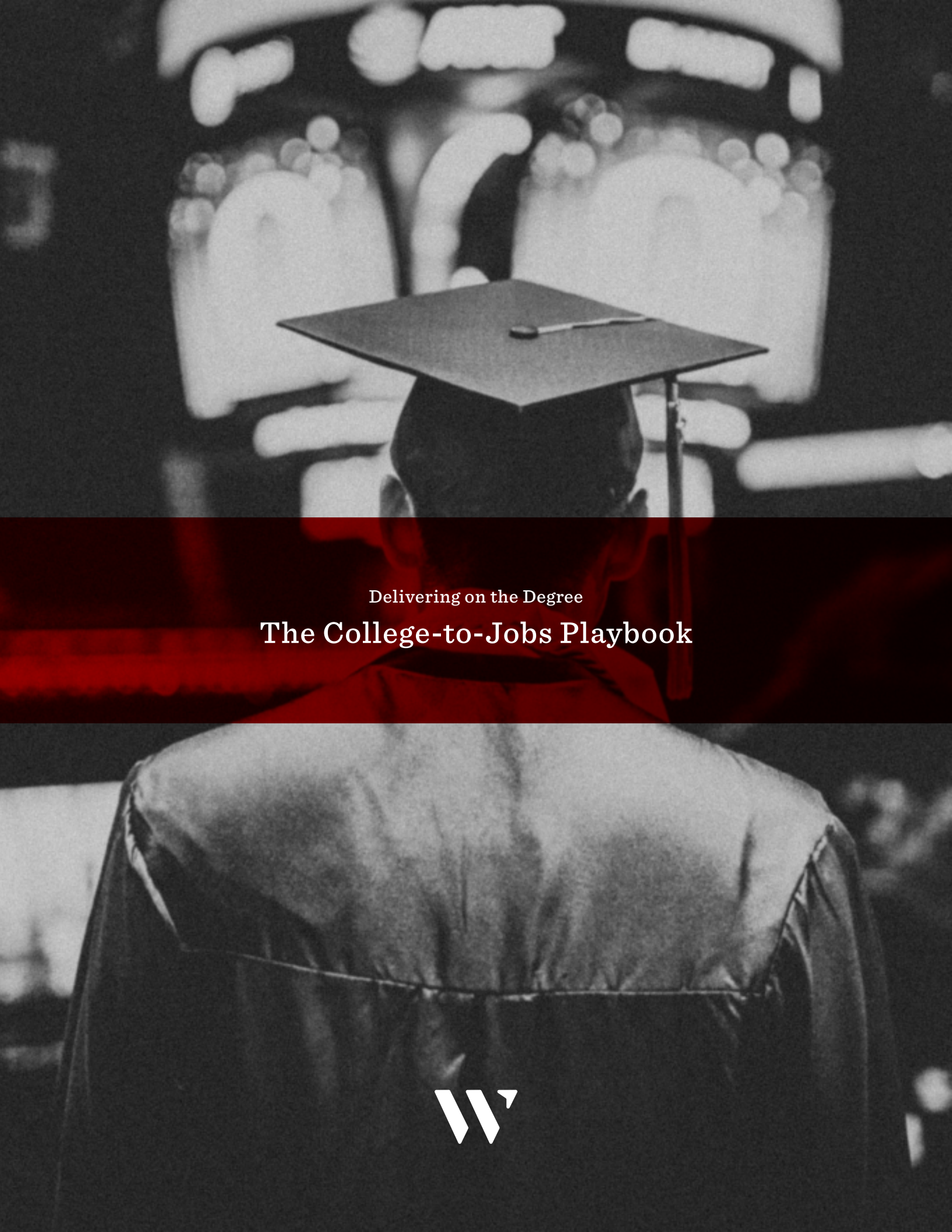
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