WHITE PAPER

Motivation Matters:

Career Challenges Broaden Participation in High-Skills Coursework, like STEM, and in High-Opportunity Careers

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About the Authors

Jane Kubasik
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With a background in business and finance, Jane has since dedicated nearly 15 years to developing smart employer-education partnerships that help young people connect their education to personally rewarding, viable career choices.

Since 2001, Jane has led multiple national and regional educator-employer collaborations designed to connect classroom learning to promising careers. These cross-sector alliances are grounded in research, utilize collaborative designs, and embed evaluations for evidenced-based performance management. Jane has led multiple cross-sector projects that deliver progress in student understanding, interest, identity development, and skills critical to career success, with a special focus on STEM.

Her groundbreaking approach to forging productive partnerships and alliances is featured in numerous education and business publications, including a 2009 Harvard Business School case study, "Leading for Equity", and a 2014 University of Phoenix report, "Investment Criteria for STEM Education: What Counts for Excellence in STEM Programs?" Jane is also the co-author of a 2011 Aspen Institute paper, "Why One Size Does Not Fit All: Strategic Spending and Collaboration for College and Career Readiness". She has been a featured presenter at events aiming to inspire progress with fresh insights as to what works in effective partnerships for student motivation.

Laura Paxton Hassner
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Laura joined the 114th Partnership in 2011 to leverage her expertise in corporate turnarounds and change management to improve the strategic collaboration between educators and employers.

In her role as Director of Innovation, Laura ensures that research, market, and field-based insights relevant to educator and employer cross-sector collaboration inform impactful program designs and continuous improvements. By integrating cutting-edge research into all aspects of the organization, she works to deepen the 114th's brand and expand its impact. Her efforts safeguard 114th Partnership program and service quality and affordability as the organization expands to new markets and users.

Laura is currently also pursuing an executive MBA from the Haas School of Business at the University of California, Berkeley. Laura applies her classroom learnings in real-time, by designing and customizing the case study process to the unique needs of learners in secondary, post-secondary, workforce development, and employment settings. These short, structured career challenges enable instructors to bring real-world examples of on-the-job tasks drawn from high-opportunity careers directly to their learners.

"Many job openings are not being filled because not enough applicants possess the high skills needed."

To broaden participation in high-opportunity careers, this paper proposes strengthening Career and Technical Education programs and integrating career-based problem solving into academic courses. Personal interest and experience are primary motivators to engagement in challenging coursework and demanding careers. More employer-educator partnerships should support the occupational identity development inherent in young people as a means to leverage career aspirations to influence secondary and post-secondary course-taking outcomes.

Narrowing the Opportunity Gap

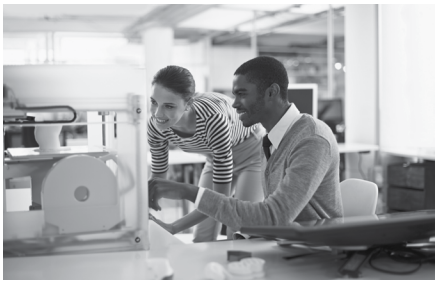
Years of effort to recruit talent for high-demand careers has led to very little change.[1,2] Too few adults are employed in high-opportunity careers,[3,4] those which are well-paid, generally offer benefits,[5] and match an employee's talents and skills.[6] A staggering 42 percent of adults earn less than $15 per hour, with more than 54 percent of Blacks/African Americans and almost 60 percent of Hispanics/Latinos trapped in jobs that barely cover their cost of living.[7,8,9]

Nearly all of today's "good" jobs require that employees possess high skills.[10] More than 70 percent of these jobs—including those not formally considered STEM[11] jobs[12]—require STEM and communications skills[13] such as technology use, quantitative reasoning, and problem-solving.[14]

A well-documented skills gap[15]—and resulting talent shortage —shows that many job openings are not being filled because not enough applicants possess the high skills needed.[16] STEM jobs are growing at a rate of three times that of non-STEM jobs with an estimated 2.4 million STEM jobs unfilled by 2018.[17,18,19] Further, despite a sustained effort to increase student participation in STEM fields, with a particular emphasis placed on underrepresented students, our nation's STEM workforce is no more diverse today than it was fifteen years ago.[20] Diversity matters, as research from a recent McKinsey & Company report found that diverse companies are 35 percent more likely to outperform their industry.[21]

Employers, educators, and young people themselves largely agree that secondary and post-secondary graduates are underprepared[22,23,24,25,26] and often unable to apply their knowledge to real-world settings.[27] And, too few students enroll and persist in the high-skills post-secondary[28] programs like mathematics, computer science, engineering, business, and healthcare that are needed to prepare for high-opportunity careers.[29,30,31,32] This stems from the fact that not enough students complete the foundational high-skills coursework in high school[33] - such as Algebra II,[34] advanced science, or certain elective courses - that incorporate the thinking skills[35] strongly correlated to high-opportunity jobs.[36,37]

"Too few solutions target *why* young people today do not pursue the coursework they need to develop high skills and secure rewarding jobs."



Motivation Matters

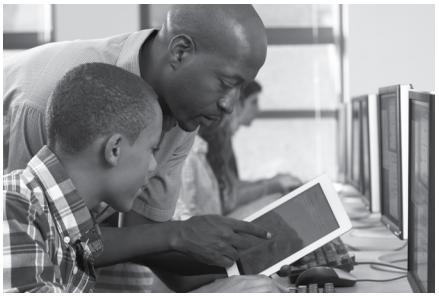
Current solutions to narrow the opportunity gap over-emphasize economics – like high salaries for workers or lost revenue for employers. Too few solutions target *why* young people today do not pursue the coursework they need to develop high skills and secure rewarding jobs.[38] Research demonstrates that young people must be able to relate what they are learning to their own backgrounds.[39]

To be motivated to pursue a career, students must be informed about the career and knowledgeable about the pathway needed to prepare them for that career. Underrepresented students are less likely to amass the social capital[40,41] of family networks, formal and informal mentorships, and access to insider knowledge associated with today's good jobs.[42,43] Data on immigrant Hispanic/Latino students, whose families often have low levels of formal schooling, suggest that they may be particularly unaware of how high-skills coursework connects to their future career aspirations, especially in mathematics.[44] Underrepresented adolescent girls often lack adequate academic and career-oriented information, choose not to pursue STEM subjects, or are actively discouraged from taking the coursework that prepares them for STEM careers.[45]

Lacking social capital, learners are often forced to navigate post-secondary choices and career options alone, often without the benefit of counseling or other supports.[46,47] Without clarity on their future career goals, students have difficulty deciding what to study or how to progress towards degree completion. As a result, they are less likely to persevere, with only 36 percent of first-time community college students earning a post-secondary credential within a six-year period.[48]

TAKEAWAY #1: Evidence continues to mount that personal interest and experience are primary motivators to engagement in challenging coursework and demanding careers.

"Jobs in high-growth, high-opportunity careers must be tied to a meaningful purpose to help motivate students to complete high-skills coursework."



Purpose-Driven Careers

Tying jobs in high-growth, high-opportunity careers to a meaningful purpose helps motivate students to complete high-skills coursework. Today's young people seek careers that meet personal and social as well as professional goals.[49] 60 percent of millennials actively screen potential employers for a sense of purpose and social responsibility.[50] And, digital-native Gen Z-ers, most of whom are currently enrolled in K-12 schools, are even more globally-oriented[51] than their millennial predecessors, "determined to take charge of their future and also primed to create solutions."[52] Companies are paying attention, expanding traditional measures of profit, return on investment, and shareholder value to include environmental and social dimensions.[53]

Purpose-driven jobs will soon be amongst the fastest growing occupations.[54] Studies show young people from traditionally underserved populations demonstrate heightened preferences for degrees and jobs with explicit social benefits – like social work.[55,56,57,58] 70 percent of college students come from underrepresented populations or are women, yet they hold less than 45 percent of STEM degrees.[59]

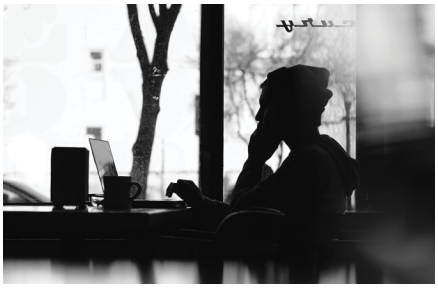
Task Relevance

Educational psychologists posit that self-efficacy[60] (the belief that one can do the work) and a growth mindset[61] (the belief that intelligence is like a muscle to be developed) are important factors in student success. Too little attention, however, has been paid to compelling research on students' perceptions of task relevance (the *desire* to do the work)—although studies show it is a major determinant of whether students choose to enroll in high-skills courses later in their educational pursuits.[62,63,64]

Students benefit from opportunities to connect their schoolwork with their short- and long-term personal goals.[65] Surveys continue to emphasize that students are disengaged, particularly in high school.[66] Students report that they do not see how what they are learning in the classroom connects to their lives, a fact that one study directly links to a primary reason that students drop out.[67] Educators are challenged to keep students engaged in ways that meet their developmental needs with "activities that take them out of their comfort zones, challenge them, place them among adult workers in authentic settings, and ask them to perform."[68]

TAKEAWAY #2: Adapting the graduate school "case study" methodology (i.e. "career challenges") to forge explicit connections between course objectives and meaningful career problem-solving scenarios shows promise.

"To support students as they form their occupational identity, employers and educators must seek ways to connect learning to the interests, motivations, and humanitarian aspirations of today's young people."



The Power of Occupational Identity

Occupational identity, the relationship one develops between self-image and one's career, forms during adolescence,[69] a period that begins during puberty and continues well into the twenties.[70] Young people, are actively forming their self-image—who they are, what they care about, and what their ultimate place in the world will be.[71,72] They seek occupations that interest them and offer the possibility of success.[73] Over two-thirds of secondary students indicate that the greatest influences on their career plans are their own interests and experiences—greater than the influence of parents, teachers, or social media.[74,75] Adolescents who progress in shaping their occupational identities[76] and who connect their educational pursuits with career goals are much more likely to persist in high-skills coursework[77] and obtain post-secondary credentials.[78,79] Furthermore, research demonstrates that: "establishing a strong, self-chosen, positive, and flexible occupational identity appears to be an important contributor to occupational success, social adaptation, and psychological well-being."[80]

Adolescents from families with low educational attainment tend to not make the explicit connection between their educational choices and their career aspirations.[81] Thus, it becomes all the more critical to serve those young people who lack this support network. Increased goal clarity also makes those aged 14 through 30 less prone to depression and unproductive behavior.[82]

Traditionally, occupational identity was developed through part-time jobs that offered young people valuable work experience,[83] exposure to career options, and opportunities to experiment with different careers.[84] Most of today's adolescents, however, have little access to work,[85] and they miss out on opportunities to connect what they are learning in school to the real world. Although teens may say they want to work,[86] fewer than ever hold part-time jobs. Those who do work predominately earn low wages for low-skills work,[87] with little opportunity for skill improvement. Teens now depend more heavily on school to provide early work experience, exposure to jobs, and career counseling, as well as the kind of learning that traditionally takes place at work rather than in the classroom.[88]

To support students as they form their occupational identity, employers and educators must seek ways to connect learning to the interests, motivations, and humanitarian aspirations of today's young people.

TAKEAWAY#3: Fewer young people than ever are employed and those who have jobs are not building skills.

"Too few secondary courses integrate academics with real-world problem solving."

Connecting Academics to Meaningful Careers

Real-World Problem Solving

Young people who can connect their desire for career experimentation to what they are learning in schools are more likely to engage in high-skills coursework, coursework that allows them to explore their talents and interests while weighing them against career possibilities.[89,90] Yet, too few secondary courses integrate high-skills courses with real-world problem solving so that students can apply academic learning to workplace challenges. In a recent survey, only 25 percent of educators felt that their existing school curriculum "adequately prepar[es] students for a STEM career".[91] Similarly, too few Career and Technical Education (CTE) programs infuse high-quality academics: "It is widely understood that the main point of CTE is to keep them motivated to stay through high school graduation, not to give them genuine preparation for and an initial experience of the workforce."[92] Newer models incorporating real-world problem solving that delivers results are eclipsing traditional CTE. CTE is starting to change, but academic courses often remain siloed from specific career applications.

Academically-focused CTE, such as linked learning, which fuses traditional academic learning with high-quality career-themed pathways, benefits students as they learn how their skills are used. Students participating in linked learning complete more coursework and have lower dropout rates and higher graduation rates than their non-participating peers. In the California State University system, these students go on to achieve higher overall GPAs, results that hold for female and Hispanic/Latino students.[93] It is important, however, that these programs emphasize mastery of high skills versus the traditional "vocational" training model focused on occupation-specific skill attainment. A peer-reviewed study in the *Journal of Human Resources* concluded that: "The advantages of vocational training in smoothing entry into the labor market have to be set against disadvantages later in life."[94] As the economy changes, this research suggests that vocationally-trained students lack the general skills they need to adapt to a changing labor market.[95]

Students struggle most in abstract coursework such as mathematics,[96,97] where they must anchor new information in prior knowledge or experience. Students with limited personal experience, or who come from environments low in social capital, are especially vulnerable if those connections are lacking.[98] Relating content to the cultural background of students "prompts student involvement" while the reverse causes "student resistance".[99]

Many educators recognize the importance of active learning,[100] understanding that adolescents need relevant explanations to make connections and develop interests.[101] Yet, educators often lack high-quality, accessible instructional resources[102] that go beyond traditional textbook and lecture-based instruction to support students in drawing connections across courses or in applying their classroom learnings to real-world challenges. As a result, instructors may have difficulty helping students apply academic skills to analyze, evaluate, create, and communicate solutions relevant to their career goals, although these processes are proven to capture and cultivate student interest.[103,104]

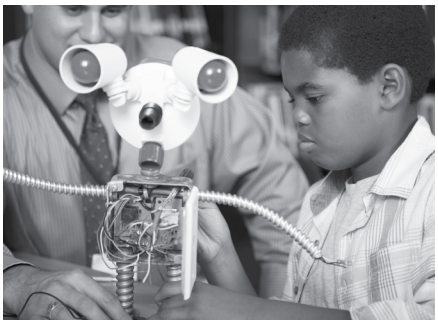
"To broaden engagement in the high-skills courses that lead to the most career opportunities, educators and employers must help students analyze, evaluate, create, and communicate solutions relevant to those careers."

Translating abstract learning into real-world career applications helps students both to master traditional material at a deeper level and to perceive learning as relevant and engaging,[105] a dynamic that influences their long-term occupational identity as well as their post-secondary goals. While 77 percent of high school students report wanting to simulate real-world scenarios, only 12 percent report having the opportunity to do so.[106] Workplace experience is important for boosting a post-secondary student's self-confidence as well: college students with paid or unpaid workplace experience are significantly more likely to feel prepared for the workplace after graduation.[107]

Often called deeper or problem-based learning, this instructional strategy integrates traditional content with creative applied problem-solving,[108] emphasizing *why* content matters.[109] It reduces educational disparities and provides adolescents with the skills to be successful in work and life.[110] By involving students and requiring that they interact with their own learning, students find that their interest is maintained.[111] Students are encouraged to understand multiple perspectives by applying and transferring their knowledge and skills to different scenarios,[112,113] pre-worked case studies,[114] examples, and problem sets. Initially, they receive scaffolding support and step-by-step modeling as they work through problem-solving exercises, with concepts clearly explained along the way.[115] They then proceed to a deeper level of understanding by applying their learning to scenarios with less structure,[116] such as ambiguous, classroom-based challenges or real-world opportunities like internships and employment.

As a result, students report being more engaged, indicating that the "inquiry-based activities make the content easier to remember."[117] Engaged students have harnessed their internal motivation to pursue their goals.[118] Compared to traditionally-taught peers, these students scored higher on all metrics, including their ability to solve complex problems, work effectively in teams, communicate, and be able to learn and to make connections across disciplines and to the "real world".[119] Not surprisingly, linking content to real-world career applications benefits students who are most at risk of dropping out, leading to measurably improved attendance rates, academic course-taking, and on-time graduation rates.[120] Students participating in deeper learning graduated at an 8 percent higher rate than comparison peers, and were more likely to attend post-secondary institutions, that, in turn, were more selective, four-year degree granting institutions.[121]

To broaden engagement in the high-skills courses that lead to the most career opportunities, educators and employers must help students analyze, evaluate, create, and communicate solutions relevant to those careers. Classroom speakers, field trips, work-based learning opportunities, and Career and Technical Education[122] courses must integrate more high-skills problem-solving content in order to support the development of higher-order thinking skills. In the same way, high-skills courses must integrate more career applications. Both need effective, career-based resources to enhance the student motivation that precedes and accelerates learning.



Yet, expanding deeper learning to benefit all students, particularly underrepresented students, faces significant obstacles. Employers who offer career-learning opportunities lack standardized benchmarks for quality, and most do not have sufficient capacity to serve all students. Absent robust participation from area employers, teachers lack sufficient instructional resources to offer problem-based learning. And, educators in central offices require support for logistical implementation of work-based learning opportunities so that all students have access to them. [123]

TAKEAWAY#4: Employers and educators need high-quality and affordable alternatives to connect meaningful, high-growth career opportunities to the thinking, problem solving and communication skills taught in today's secondary and post-secondary education settings.

Scalable Solutions

Too few existing solutions, tied to student outcomes and integrating high-skills academics with career applications, reach today's 16.3 million high school students.[124,125] Although 88 percent of employers feel that it is important that college students graduate with the knowledge and skills sufficient to "complete an applied learning project", only 14 percent of employers find new graduates capable of doing so.[126] Indeed, 74 percent of students surveyed by the Adecco Group, the world's largest professional staffing company, "felt that their schools failed to fully prepare them for the professional world."[127] Scaling requires that these solutions be high-quality, broadly available, easy to adopt, and suitable for solving relevant problems.[128] Teachers benefit from support to integrate classroom learning with contemporary career applications.[129,130] Yet, many programs have limited availability due to high fiscal cost, equipment requirements, or time constraints facing teachers and central office support staff.[131,132]

Students especially need support as they complete required gateway academic courses and vet elective options like career and technical programs or advanced academic classes. Underrepresented populations in particular lack access to high-quality, affordable instructional resources. For example, only half of eighth-grade science teachers who teach Black/African-American students indicate they have all or most of the resources they need compared to 65 percent of those who teach white students. 67 percent of those who teach higher income students report having such resources, compared to only 56 percent of those who teach lower income students.[133]

"Employers play a key role in helping young people to identify personally relevant and viable career interests that link to high-skills coursework."

Effective Partnerships Pave the Way

Effective employer-educator partnerships that produce high-quality and broadly available, affordable resources can help educators to engage their students as they master critical skills. Fusing classroom learning with real-world experience personalizes learning.[134] Infusing career experimentation into the gateway courses that reach most students, such as state-mandated math, science, technology, and English language arts, can give students a motivational lens through which to make informed choices about their ongoing education and future careers. It also provides an answer to students' desire for more career exploration opportunities.[135]

Most school leaders welcome employer input on curriculum and professional development because of its proven effectiveness.[136,137] Superintendents are increasingly seeking to change the historical patterns of engaging with employers,[138] stating that their highest priority was for businesses to "help them to understand how to develop in students the skills required to succeed in the workforce."[139,140]

While 70 percent of businesses are in partnership with schools in some way,[141] successful examples of scalable employer-educator partnerships are challenging to find. Pacific Gas and Electric Company's PowerPathway™ initiative established a network of education programs focused on building capacity for skilled energy workers.[142] Other examples include schools whose teaching focuses on skills required for specific careers, like High Tech High Schools, Project Lead the Way, and Big Picture Schools or "early college high schools" whose thematic focus on STEM skills and partnering with employers provides opportunities for students to engage in on-the-job tasks.[143]

For employers to realize their goal of reducing talent shortages, students must graduate skilled *and* motivated. Employers play a key role in helping young people to identify personally relevant and viable career interests that link to high-skills coursework.

TAKEAWAY#5: To ensure high quality resources reach today's young people across educational settings, employers and educators should co-develop career challenges in formats that easily integrate into secondary and post-secondary courses and community volunteer events.

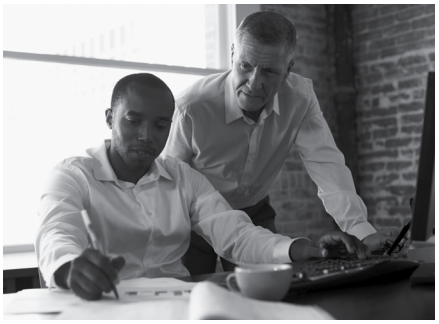
Summary[144]

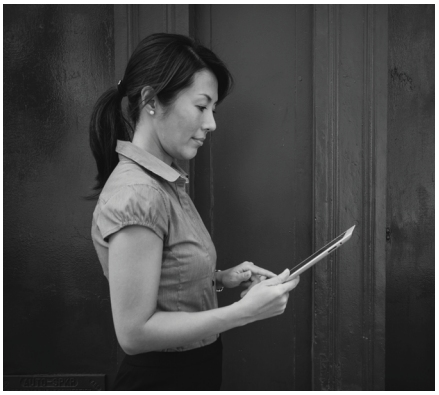
Between 2018 and 2022, an estimated 16.8 million students will graduate from our nation's high schools.[145] In order to successfully transition to post-secondary education and the workplace, students must be both prepared to meet the challenges they will encounter along their professional pathways, as well as inspired to overcome them.

Evidence continues to mount that personal interest and experience are primary motivators to engagement in challenging coursework and demanding careers. Employers and educators need high-quality and affordable alternatives to connect meaningful, high-growth career opportunities to the thinking, problem solving, and communication skills taught in today's secondary and post-secondary education settings. This is more important today than ever, as fewer young people are employed and those who have jobs are not building skills. Adapting the graduate school "case study" methodology (i.e. "career challenges") to forge explicit connections between course objectives and meaningful career problem solving scenarios shows promise. To ensure high quality resources reach today's young people across educational settings, employers and educators should co-develop career challenges in formats that easily integrate into secondary and post-secondary courses and community volunteer events.

The 114th Partnership helps employers and educators provide equitable, high-quality opportunities for adolescent learners to access crucial information from employers and to apply what they are learning in the classroom to on-the-job tasks from high-opportunity careers. These experiences help unlock young people's intrinsic motivation, which subsequently drives course enrollment, course completion, and career pursuit.

“Three complementary partnership programs foster concrete connections between high-skills coursework and high-opportunity careers.”





114th Partnership High-Skills Solutions

Named for the meridian that bridges the Great Continental Divide, the 114th Partnership is a nonprofit intermediary organization that works with educators and employers to help young people navigate education and career pathways.

Three complementary partnership programs foster concrete connections between high-skills coursework and high-opportunity careers. Each research-based program, co-developed with educators and employers, articulates mutually valued outcomes and features easy-to-implement designs.

The 114th Partnership prioritizes program implementation in predominately underrepresented student populations, particularly Black/African American and Hispanic/Latino. Grant-funded community projects serve populations with 65 percent or more traditionally underrepresented students.

Spark 101 STEM Skills Videos equip professional educators to integrate course objectives with on-the-job tasks from high-opportunity careers. These ten-minute interactive videos, co-developed with employers, are the only free resource of their kind. Students apply academic skills to analyze, evaluate, create, and communicate their solutions to the featured employer challenges. Educators are supported with usage guides and customizable lesson plans.

114th Professional Challenges equip employee volunteers to shape students’ career interests with real workplace scenarios. Live challenges provide hands-on coaching and mentoring as an alternative to traditional presentations and internships. Challenges feature on-the-job tasks drawn from high-opportunity careers and are offered in 1-, 4- and 20-hour formats. Volunteers are supported by customized, ready-to-use materials for use in the workplace, in the classroom, or online.

Accelerated Impact helps communities engage educators and employers to motivate their young people to pursue high-skills coursework tied to regionally relevant high-opportunity careers. Serving as a specialized intermediary, the program helps educators, employers, and other aligned nonprofit partners to strengthen outcomes in motivation, course enrollment, post-secondary credentials, and employment.

We are well on our way to enlisting 500 employers and 30,000 educators to inspire at least 1,000,000 secondary students to acquire the skills to pursue personally meaningful, high-opportunity careers.

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