ENSURING A MORE EQUITABLE FUTURE:

ADDRESSING SKILLS GAPS THROUGH MULTIPLE, NUANCED SOLUTIONS

Michael Collins
JFF

May 2021

ENSURING A MORE EQUITABLE FUTURE: ADDRESSING SKILLS GAPS THROUGH MULTIPLE, NUANCED SOLUTIONS

INTRODUCTION

Debate over the "skills gap" and how to address it has consumed considerable space in discussions about U.S. higher education, workforce development, and economic strength. The conventional narrative describes a fundamental mismatch between the skills that employers say they need in their employees and the skills that jobseekers possess, most often in what are called STEM fields.[1] The resulting problem is clear: employers can't get the talent they want, and individuals can't get the jobs they want. The implication about higher education is equally clear: U.S. colleges and universities are failing to prepare their students for the workforce.

Much of this debate is both understandable and necessary. The perceived value of a postsecondary credential is increasingly tied to finding a well-paid career. Yet today's global economy presents unique challenges to workforce preparation. The rapidly changing digital landscape requires workers to demonstrate higher-order technological, communications, and critical-thinking skills at levels far greater than what was expected of prior generations. Industry leaders argue that our flawed talent pipeline is causing a worrisome drop in economic competitiveness.[2]

> **The notion of a single STEM-centered "skills gap" as a monolithic challenge is rightly giving way to a more nuanced understanding that promises more specific—and more effective—solutions. We now have sufficient data and analytics to recognize that there is, in fact, an interrelated yet distinctive set of "skills gaps."**

Recently, however, the notion of a single STEM-centered "skills gap" as a monolithic challenge is rightly giving way to a more nuanced understanding that promises more specific—and more effective—solutions. We now have sufficient data and analytics to recognize that there is, in fact, an interrelated yet distinctive set of "skills gaps."[3,4,5] Each arises from different causes, in different industries, different occupations, and different regions, and requires a customized response.

The insistence that there is a single skills gap, particularly in discrete STEM fields (science, technology, engineering, and math), positions it as a technical problem that can be solved rather simply with existing know-how: all we need to do is identify the specific competencies and skills employers are expecting to see in the workforce and ensure that our postsecondary education and training systems are teaching those competencies and skills to all graduates. But when we take this narrow view, we risk oversimplifying the problem—and therefore the solutions. It is not just a set of quantifiable competencies or specific work tasks that workers can or cannot perform. The gap is not a technical problem with a quick fix; it is an adaptive problem with multiple dimensions, requiring individuals and the overall system to adapt their ways.[6]

> **The gap is not a technical problem with a quick fix; it is an adaptive problem with multiple dimensions, requiring individuals and the overall system to adapt their ways.**

Reducing everything to a narrow skills gap in science and math doesn't consider the diverse range of skills that people bring to their work. This especially disadvantages people who have not historically had access to these fields, such as those from Black, Latinx, Indigenous, and/or low-income backgrounds.[7] On the other hand, leaning too far away from technical, or "hard," skills toward people skills or "soft" skills, such as communication and collaboration, disadvantages underrepresented populations in other ways. Bias inevitably comes into play in evaluating who has those skills and who doesn't. Focusing on a singular skills gap does not consider or address the historical and systemic racial and gender inequities in our education and training systems and labor market.

And so great care is needed as we consider which skills and competencies are needed to be successful in both today's labor market and the future of work—and how to ensure more people have them and can communicate them to employers. We must deeply examine skills gaps and the factors driving them in different industries and regions. We need both greater clarity about which skills are truly essential to various careers—and how best to assess their acquisition, objectively, without introducing implicit bias. These efforts must be coupled with a multiplicity of approaches to improving education and training, involving postsecondary institutions, employers, and even government agencies, that are continually assessed for efficacy and equity.

This paper will briefly review the emergent understanding of skills gaps, examine what some in higher education are doing to address these problems, and then turn to what more can be done to provide equitable access to strategies that improve students' employability, shore up the talent pipeline, and ultimately increase the value of postsecondary credentials for all.

EVIDENCE OF A SINGLE SKILLS GAP IS WEAK

Four methods are commonly used to demonstrate the existence of a skills gap: survey research, competency assessments, educational attainment, and labor market analytics. While each of these provides useful information, closer examination reveals a lack of empirical evidence of a single skills gap.

Survey Research

Multiple surveys have long revealed significant differences in perceptions of skills gaps between higher education leaders, employers, and college graduates. The idea of a broad, national skills gap is most dramatically reflected in the difference between what college officials report about their graduates' readiness for the workplace versus what employers have to say. An oft-cited 2014 poll found that 96 percent of college and university chief academic officers rated themselves "somewhat effective" or "very effective" at preparing students for work.[8] In contrast, the same survey found that only one-third of corporate leaders agreed that higher education institutions are graduating students with the skills and competencies their businesses need. Another third disagreed with the statement—17 percent strongly disagreed—and the remaining third was neutral.[9]

By early 2020, far fewer employers—only 11 percent—agreed that higher education was meeting their needs. Notably, the proportion of chief academic officers who indicated their institutions were "very effective" also declined—by 15 percent. This could represent a growing acknowledgment of the need to improve higher education's ability to prepare students for work.[10]

There is some evidence that college graduates themselves believe they're not prepared for work. In one national survey, only 49 percent of graduates with a four-year degree and 43 percent of graduates with a two-year degree say college was very useful in helping them develop marketable skills.[11] In another survey, only 31 percent of recent four-year degree graduates "strongly agree" that they gained "important job-related skills" while completing their bachelor's degrees.[12] Specifically, they reported feeling underprepared in networking and computer software skills. Engineering and sciences graduates were more likely to "strongly agree" that they gained important job-related skills than students in arts and humanities or business.[13]

However, while survey results may provide some insight about people's notions of job readiness, these perceptions are inherently subject to bias and are a far cry from an empirical measurement of a singular skills gap.

Competency Assessments

Competency assessments are also used to measure skills gaps, though some use survey methods to gather data and face similar challenges as the polling cited above. For example, the National Association of Colleges and Employers (NACE), through a task force of career services, human resources, and staffing professionals, developed a definition of career readiness and eight competencies associated with that quality. NACE then surveyed students and employers, revealing that each hold different views about students' levels of proficiency on key competencies. For example, almost 90 percent of graduating seniors rated themselves proficient, or ready for work, in "professionalism and work ethic," while employers gave the recent graduates a significantly lower rating.[14] Employers also rated graduates least proficient in precisely those areas that the employers considered most essential. For example, 93 percent of employers rated "oral and written communication" as essential but rated only 49 percent of college graduates as proficient in those skills.[15]

Proprietary competency assessments, in which students take a series of tests to demonstrate their abilities, are another source of data on skills. Results from the ACT WorkKeys National Career Readiness Certificate assessments showed that gaps were generally associated with lower levels of education; examinees with higher levels of education tended to score higher on levels of readiness for work.[i,16]

Both of these assessments yield useful information; the NACE assessment, like survey research, provides insight into the respondents' perceptions of career readiness, while the WorkKeys assessment measures individuals' performance on a battery of multiple-choice tests. However, as with survey research, neither is a statistically powerful measure of a skills gap.

---

i   ACT maintains a national repository of occupational skill and task data that is representative of the range of occupational titles covered by the Occupational Information Network (O*Net) and levels of education found in the U.S. Bureau of Labor Statistics Standard Occupational Classification (SOC) and skill assessment database. The organization uses this information for ACT WorkKeys, a series of assessments that provide scores for workplace career readiness. Examinees who demonstrate proficiency on three assessments—Graphic Literacy, Workplace Documents, and Applied Math—are able to receive an ACT WorkKeys National Career Readiness Certificate, for which there are different levels of readiness. The results discussed in this paper are from nearly 900,000 examinees who took the ACT WorkKeys National Career Readiness Certificate assessments between June 2017 and July 2019.

Educational Attainment as Proxy for Skills

Because of the association of postsecondary credentials with employability and earnings, educational attainment—by credential level—is often used as a proxy measure of skills. This approach has been accepted because of the solid evidence that median lifetime earnings rise for workers as educational attainment increases.[17] As a result, people who have earned bachelor's degrees and higher-level credentials have historically been characterized as "high skill," those with sub-baccalaureate credentials as "middle skill," and those with high school diplomas or less education as "low skill." However, these terms apply more to the wage premium placed on the level of credential rather than a measure of any specific expertise or capacity.[18,19] For example, occupations such as restaurant servers, home health aides, or farmworkers, are often filled by workers with a high school diploma or less, yet clearly require a specialized set of skills and competencies. Many believe better terminology would be "low wage," not "low skill."[20]

In addition, while on average, earnings increase with additional levels of education, there are striking variations across programs of study, institutions, and the life of a career. Graduates who enter STEM jobs do earn more at every level of education and have higher employment rates when compared with those who enter other fields. The average advertised entry-level salary for STEM jobs requiring a bachelor's degree or higher was $66,123 compared to $52,299 for non-STEM jobs, and it was $47,856 versus $37,424 for sub-baccalaureate STEM and non-STEM jobs.[21] Yet, there is also evidence that liberal arts and humanities majors' earnings tend to catch up across the longer arc of their career.[22] In addition, despite the association of postsecondary credentials with employability and earnings, one-third of associate's degrees pay more in median lifetime earnings than bachelor's degrees.[23]

The fact that a lower-level credential can command greater labor market returns than a higher-level degree and that earnings levels can vary by program of study and across the duration of an individual career are clear indications that educational attainment is not a precise measure of a skills gap.

Labor Market Analytics

Labor market information, such as online job postings, resumes, and worker profiles, is another source of data used to describe skills gaps. Companies like Burning Glass and Emsi use technology to scan millions of current job postings and employer information on websites to identify the skills employers demand to fill jobs. They also scan millions of resumes and worker profiles to identify the credentials that workers report to have earned. This "real-time" labor market information has been used to identify alignment and gaps between employer demand and the supply of skilled workers, with highly specific data results.

Analyzing labor market information, Burning Glass identified skills gaps of 4.4 million openings across 12 career areas, and concluded that there is no single skills gap, but multiple gaps varying by industry and occupation. For example, the company found 44 percent more openings than available workers for health care positions, reflecting a significant skills gap—and a 13 percent surplus of construction and food preparation jobs, reflecting an oversupply of workers.[24] As this analysis and others demonstrate, each skills gap arises from different causes, in different industries and occupations, and from different regions. Each, as a result, requires a customized response.[25]

One notable disadvantage of using online job postings as a measure of skills gaps is inflated credential requirements—some postings may seek degree requirements that are not actually necessary to successfully perform the job. The nonprofit Opportunity@Work and the Harvard Business School's Future of Work Project have argued that millions of Americans are screened out from jobs for which they are qualified because of such practices.[26] We can reasonably conclude that in some cases, a lack of applicants to fill jobs may say more about credential inflation and other employer-screening criteria than a shortage of workers with the right skills.

WHAT SKILLS ARE IMPORTANT FOR THE ECONOMY, JOBS, AND CIVIC ENGAGEMENT WITHIN AN EVER-CHANGING ENVIRONMENT?

The skills that are needed are not singular. Rather, they include a combination of technical/digital and human skills, and they vary by industry and occupation. Thus, there is no single postsecondary degree or major that categorically prepares graduates for the workplace and for making civic contributions to society. In addition, it is difficult to isolate the impact of skills from postsecondary credentials because of definitional and measurement challenges. Measuring technical skills, such as proficiency in computer programming, is easier than assessing human skills like critical thinking, creative problem-solving, and strong communication. Biases and subjectivity can also influence an assessment of gaps in those areas.

All that said, there are shifts happening in our economy, driven by technology and artificial intelligence, indicating that these human skills will increasingly drive the future of work, becoming critically important for access to good jobs now and in the future. In addition, these skills are highly transferable across occupations and crucial to individual ability to participate in and contribute to other critical elements of society and adult life, such as promoting civic engagement. All postsecondary credentials and majors should ensure that students learn not only the content knowledge of their respective disciplines but also the technical and human skills that will allow students to enter the workforce and be successful throughout a career of continual upskilling and job changing.

It remains important for postsecondary institutions to ensure that students in all majors become familiar with software technology that is pervasive across industries. Employment postings to fill job vacancies validate the importance of technology and business skills, as well as a broader range of soft skills that include collaborating with others. Drawing on 150 million unique U.S. job postings going back over a decade, Burning Glass has been able to identify 14 skills that were in demand in their job postings and associated with a wage premium. Burning Glass organized what they classify as foundational skills into three major groups: digital building block skills, business enabler skills, and human skills (Sidebox 1).[27]

Sidebox 1: Three Major Groups of Foundational Skills

Digital building block skills include analyzing data, managing data, software development, computer programming, and digital security and privacy.

Business enabler skills allow the other skills to be put to work in practical situations, and include project management, business process, communicating data, and digital design.

Human skills, which are often called "soft skills," include critical thinking, creativity, communication, analytical skills, collaboration, and relationship building.

One or more of these foundational skills were in half of all the 22.4 million total job openings in 2017. The average salary in the job postings that requested one or more of these skills was $61,000, which was $8,000 more than the average for all other jobs.[28] Job postings that include digital building block skills and business enabler skills have listed salaries that are 7 percent to 38 percent higher than the average salaries for all other jobs.

As previously noted, human skills, such as communication, critical thinking, and collaboration, by themselves did not lead to salary premiums. Evidence shows, however, that STEM-related skills must be augmented by human skills for employees to be successful in the labor market and in society over the course of a long career. The human skills described here are primarily associated with majors such as the liberal arts. All of this is to say that while graduates with STEM degrees are more likely to have direct experience with work-relevant skills, STEM degrees are not, in themselves, the solution to skills gaps. This raises questions about how non-STEM curricula can ensure that students are also exposed to these practical work-relevant technology and business process skills, and how STEM curricula can be sure to incorporate the development of human skills.

Students need to consider the economic and societal value of their postsecondary credential through multiple lenses that extend beyond their choice of degree and major. The general education components of their degrees, for example, will help them to synthesize and make sense of information from different disciplines. These skills are important for the future of a world of work in which people will need to continuously be learning and expanding their knowledge, and for non-work duties and responsibilities such as making electoral choices and broader civic engagement. Students who can develop and combine technical competencies, such as digital skills, with business skills and human skills are more likely to earn a premium in wages and more likely to advance to more senior-level positions.[29]

This may be challenging to accomplish exclusively within the classroom—pointing to a growing interest in strengthening work readiness opportunities throughout and beyond the traditional postsecondary experience.

INSTITUTIONAL BEST PRACTICES FOR CLOSING SKILLS GAPS

Higher education institutions are implementing multiple strategies to increase the work readiness of their students. Initiatives such as the Quality Assurance Commons are working to help higher education institutions across all disciplines prepare their students to be successful at work.[30] Institutions are also redesigning their career services function to improve their ability to prepare graduates for successful transitions to work. And postsecondary institutions are collaborating with industry to create work-based learning experiences for their students including internships, apprenticeships, and other strategies to address skills gaps.

The widely documented racial and gender disparities that we see in higher education outcomes overall are also seen in strategies to connect students to work. To create more equitable outcomes, postsecondary education must intentionally address barriers that prevent Black, Latinx, Indigenous, underrepresented Asian American and Pacific Islander (AAPI) students, and women from accessing career services and participating in work-based learning opportunities.

Diversify Apprenticeship Programs at Community Colleges to Promote Equity

A form of work-based learning, apprenticeship is a workforce training model that combines paid on-the-job learning and formal classroom or online instruction to help a worker master the knowledge, skills, and competencies needed for career success. Apprenticeship is more than a training program—it's an actual paid job intended to lead a participant further along a career track. Ninety-four percent of apprentices remain employed with their employer after finishing the program, making apprenticeship an excellent opportunity to connect students to the workforce.[31] Yet, unfortunately, apprenticeships remain a predominately White and a predominantly male opportunity; and this imbalance must thus be addressed to maximize their efficacy as a path to the workforce.

Community colleges, with an influx of federal funding, are paving the way and increasingly developing apprenticeships as a strategy to connect students to work. The American Association of Community Colleges has partnered with the U.S. Department of Labor to launch a major initiative, the Virtual Apprentice Network, to increase the number of apprentices entering the workforce.[32] Additionally, the Department of Labor has recently awarded the Colorado Community College System a $2 million grant as part of the "Apprenticeship: Closing the Skills Gap Program." The funds will support IT and cybersecurity apprenticeships in Colorado. The Colorado system's 13 colleges will join with JFF (Jobs for the Future) and the Emily Griffith Technical College to begin implementation in the Denver metropolitan area before scaling statewide. The program is expected to support 1,600 IT apprenticeships across the state.[ii]

---

ii   CCCS receives $2 million grant to build 1,600 IT apprenticeships over four years. Colorado Community College System press release, March 5, 2020. Available at *https://www.cccs.edu/press-releases/cccs-receives-2-million-grant-to-build-1600-it-apprenticeships-over-four-years/*.

However, strengthening apprenticeships requires recruiting and retaining a more diverse student population. Historically, apprenticeships have predominantly served White men, and diversity remains low. Only 12 percent of new apprentices in federally administered programs in 2019 were women. Of the 75 percent of new apprentices who disclosed their race/ethnicity in 2019, 76 percent were White, 18 percent were Black, 2 percent were Indigenous, 3 percent were AAPI, and 1 percent reported multiple races/ethnicities. 31 percent were Latinx, a population distributed among the racial categories above as well as the 25 percent of respondents who did not provide a race/ethnicity.[33]

The growth of Registered Apprenticeship programs must also address the wage differentials and imbalances inherent in a wide range of industries. On the surface, as Registered Apprenticeships have expanded from the trades and manufacturing into a broader range of industries, this trend has been accompanied by an expansion to a more diverse population. However, wages for Registered Apprenticeship programs are based on average wages for full-time entry-level workers in those industries, which means that the wage differentials and inequities we see in our economy are often replicated.[34] Specifically, Black, Latinx, Indigenous, underrepresented AAPI, and women apprentices generally earn a lower wage than other apprentices, both within specific fields and as a result of these populations (Black students and women in particular) being more likely to participate in lower-wage apprenticeship fields, such as housekeeping.[35] This illuminates a need to monitor earnings at a disaggregated level within and across industries as these apprenticeships evolve. To help close this gap, policymakers must strive to reduce occupational segregation and fund equity-focused intermediary organizations to help recruit underserved populations and coordinate access to supportive services such as public benefits, child care, and transportation assistance.

Community colleges are also working to increase the diversity in apprenticeship programs. As an example, College of the Canyons, a public community college in Santa Clara, California, offers a program called the Strong Workforce Apprenticeship Group in partnership with Goodwill Industries, a highly regarded nonprofit that focuses significant attention on equity. This focus includes the development of strong cross-sector partnerships to attract and retain students of color. These partners include community-based organizations and veterans' associations that conduct targeted recruitment, government agencies that offer funding support for training learners, and employer associations to provide direct connections to employment. The program characterizes itself as

> **To help close this gap, policymakers must strive to reduce occupational segregation and fund equity-focused intermediary organizations to help recruit underserved populations and coordinate access to supportive services such as public benefits, child care, and transportation assistance.**

"a solution to the "skills gap."[36] In November 2019, 18 apprentices graduated from its material coordinator program, which provides a career pathway for entry-level workers in fulfillment companies. Fourteen of these graduates identify as Black and/or Latinx. This program prepares students for careers as material coordinators in the distribution and fulfillment industry, which have an average annual wage of $51,450.[37]

Expand Access to Paid Internship Experiences

Internships are also a popular strategy to connect student learning in postsecondary institutions to the realities of the workplace. Students can put their learning into action on the job and perform occupation-specific tasks while experiencing the culture of the workplace. Internships test students' technical and human skills and can provide valuable insights into whether the industry, occupation, or employer are a good fit. Internships can also provide critical social capital yielding valuable connections to industry professionals who can be instrumental in providing access to employment opportunities throughout students' careers.[38]

Once again, however, for this approach to meaningfully and equitably contribute to improving students' readiness for work, postsecondary institutions must address barriers to equitable internship access for students of color and students from low-income backgrounds. Internships are often unpaid, and not offered to students at scale; many students may not even be aware that internships are an option. The recent abrupt transition to remote work in many fields due to the pandemic further complicates awareness of and access to internship opportunities, particularly those conducted virtually.

Students of color, first generation college-goers, and students from low-income backgrounds are less likely to have the kind of social capital that provides information about the importance of internships and the personal connections sometimes necessary to secure one. These students are also more likely to have to work while attending college than their higher-income counterparts, and are not able to forgo their permanent jobs for temporary internships, many of which are unpaid. Scheduling is another barrier. Many conventional internships do not accommodate students' complicated schedules as they attempt to juggle school, work, and family responsibilities.

Bunker Hill Community College's Learn and Earn internship is an example of an approach that addresses these barriers to equity: connecting students with paid internships, offering course credit, funding transportation costs, and providing mentorship and networking opportunities for all interns. The college designed an internship to accommodate its diverse student body, of whom 25 percent are White, 25 percent Black, 25 percent Latinx, 15 percent underrepresented AAPI, and 10 percent who report multiple racial/ethnic identities. Two-thirds of the students are adults, two-thirds work, and half are parents. Over 150 Learn and Earn students a year earn $18 an hour and a one-time transportation stipend of up to $500 to work in large corporations, small businesses, nonprofits, and civic organizations, directly applying what they learn in the classroom on the job. Since 2016, 11 Bunker Hill Community College partner companies have hired student interns into full-time jobs.[39]

In another example of an equity-driven approach to internships, the North Carolina Governor's Historically Black Colleges and Universities Internship program appropriates state dollars to connect students attending the 10 Historically Black Colleges and Universities in North Carolina to Fortune 500 companies.[iii] Fifty students' salaries are covered at a minimum of $15 an hour for 40 hours a week. The students are able to apply and strengthen their technical skills and human skills in positions with corporate employers like AT&T, Cisco Systems, Inc., IBM, Toshiba, and others.

---

iii   The state funds are divided evenly across the colleges. For additional information, see: North Carolina Governor's Historically Black Colleges and Universities Internship Program, *https://www.northcarolina.edu/offices-and-services/government-relations/north-carolina-governors-historically-black-colleges-and-universities-internship-program/*.

Excelencia in Education, a nonprofit organization that focuses on improving success outcomes for Latinx students, has recognized Florida International University (FIU), a Hispanic-Serving Institution, for the work it has done to improve the employability of its students, including growing internships and micro-internships—short-term, paid, professional assignments that provide students with job-related experience.[40] Specifically, FIU's career services department adopted culturally relevant practices such as more closely engaging parents, prioritized securing funding for its internship offerings, and partnered with a nonprofit organization called INROADS dedicated to placing and supporting underrepresented students in corporations. As a result of these efforts, in 2016-17, over 6,000 students participated in an internship, up from 4,700 students in 2014-2015. This is a significant and growing proportion of the approximately 11,000 students who graduate from FIU each year. Among 2018 graduates, 56 percent of interns received offers for full-time employment from their internship employer.

Colleges and universities are also making more creative use of federal work-study to provide skills and preparation for full-time jobs. For example, Northern Arizona University has partnered with employers to offer jobs to work-study participants, and institutions including the University of Iowa, Bennington College, and Clemson University have reviewed their on-campus work-study offerings with a focus on integrating more in-demand industries and high-value skills.[41]

In addition, postsecondary institutions are turning to technology-enabled solutions to address the challenges of scale as well as, more recently, the reduction in the number of in-person internships due to the coronavirus pandemic. For example, institutions are using technology platforms like Handshake[42] and Parker Dewey[43] to connect their students to internships and micro-internships.

Better Integrate Career Services Within the Institution and Deliver High-Demand Skills

Postsecondary institutions are also restructuring their career services to improve their ability to prepare students for a turbulent, rapidly evolving labor market. Historically, career services have been housed in student affairs, and students primarily utilized the resource only in their final year, when they were actively on the job market. Today, a growing number of career services offices are a more prominent part of the student experience, housed within academic affairs, their own division, or even directly in the office of the president.[44] Relocating career services within academic affairs increases the opportunity for collaboration between faculty, academic and career advisers, and industry leaders, and creates opportunities for aligning the skills and competencies learned in academic disciplines with the needs of employers. The arrangement also facilitates collaboration in identifying internships for students.

For some colleges, repositioning career services is central to the institution's value proposition. Rollins College, a small liberal arts college in Winter Park, Florida, has responded to a mandate from its president to bolster its career services function. The college has redesigned its career services to be a more central part of the student experience by making the case that liberal arts and relevance to the workplace are not mutually exclusive, but complementary.[iv] In 2015, less than 4 percent of Rollins first-year students voluntarily set up one-on-one appointments with career services. By 2019, 80 percent of the first-year class had engaged with career services, either through one-on-one appointments or through new collaborations with faculty to have career liaisons present in classrooms. In a 2014 survey of recent Rollins graduates, only 70 percent of students reported a single interaction with career services over their four years. Five years later, 91 percent of graduating seniors reported interacting with career services over their four years, and 100 percent of faculty reported interacting with students around career plans.[45]

Georgia State University, which graduates the second-highest number of Black bachelor's degree students in the nation, has also situated career services at the core of its mission.[46] In the fall of 2019, it rolled out its College to Career initiative, which is, as at Rollins, a part of the institution's Quality Enhancement Plan. Career preparation is now integrated throughout the university's curriculum. Students are introduced to career readiness starting in their first year, and every student has an electronic portfolio in which they document artifacts that demonstrate their readiness for work, such as work samples, letters of recommendation, professional certifications, and relevant class presentations, papers, or projects. Over 700,000 artifacts were posted the first year the portfolios were implemented.

Build Strong Postsecondary-Industry Relationships

Postsecondary institutions and industry partnerships are an important strategy to close the gap between what colleges produce in their students and what employers expect in their employees. The speed of technological change and job creation and destruction is ever increasing, and postsecondary institutions have struggled to keep pace with the pressing demands for the continuous innovation and upgrading of skills needed in the marketplace. College-industry partnerships are an example of a promising strategy used to address the gap between postsecondary supply and employer demand, and produce graduates who are ready for work.

For example, technology companies like Google are partnering with community colleges and JFF to offer the Google IT certificate, a credential that students can earn to increase their chances for employment in IT fields. Over 100 community colleges in 15 states are implementing the certificate program to provide their students with access to IT credentials, skills, and potential employers.[v]

University of Central Florida has a long-standing partnership with Lockheed Martin called the College Work Experience Program that provides students with hands-on work experience. The program is a paid year-round learning and work experience for full-time students.[47] Students collaborate on

---

iv   The redesign, called R-Compass: Preparing Students for Lives and Careers After Graduation, integrated career-focused initiatives throughout the college's programming as a part of the college's Quality Enhancement Plan (a component of the accreditation reaffirmation process). For additional information, see: Rollins College Quality Enhancement Plan (R-Compass), Rollins College, *https://www.rollins.edu/provost/quality-enhancement-plan/*.

v   States involved in this program include Arizona, California, Colorado, Florida, Illinois, Kentucky, Louisiana, Michigan, Minnesota, New Mexico, New York, Ohio, Texas, Virginia, and Wisconsin. See: *https://www.jff.org/what-we-do/impact-stories/grow-google/*.

real projects with Lockheed Martin employees that give students experience while they test different potential avenues for their careers.

Postsecondary and industry partnerships could further align expectations by jointly collaborating on learning outcomes that integrate three distinct but related sets of knowledge and skills: the knowledge and technical skills students learn in their academic disciplines; the human skills, including critical thinking and problem solving, that have relevance in and outside of students' academic disciplines; and the occupation-specific skills that are needed for success at work.

Despite examples of strong postsecondary and industry partnerships, including those presented here, wide-scale infrastructure and incentives for such collaboration have yet to be created. There are some principles, however, that can guide efforts to address postsecondary and industry misalignment on work readiness.

Principles to Guide Best Practices

As this paper has indicated, the multifaceted evidence on the misalignment of postsecondary supply and employer demand suggests there are basic principles to guide best practices in closing real and perceived skills gaps:

1. **Recognize that there is not one skills gap, but many:** Any search for a "silver bullet" or "one-size-fits-all" approach is likely to be futile. We must reconcile ourselves to a multi-level, multi-dimensional strategy that will take time and persistence to be successful.

2. **Respond with many different programs**: An apprenticeship may work for some workers, while an internship is better for others. Avoid trying to rank the responses that might be available, instead supporting proven strategies of all kinds through a robust, culturally competent, and faculty-connected career services function.

3. **Seek federal/state/institutional/industry partnerships:** Collaboration between postsecondary institutions, industry, and policymakers at the local, state, and federal level will be critical to creating the infrastructure and incentives necessary to improve communication on aligning postsecondary and industry expectations on work readiness.

4. **Keep equity in mind at all times:** If we create greater inequality by "solving the skills gap problem," we will simply be generating a new problem or exacerbating existing problems that will further need to be addressed.

CONCLUSION

Recognizing the complexity of skills gaps as an array of related but distinct challenges does not make the overall problem any less substantial. Regardless of the debate about what constitutes a skills gap and how to measure it, employers routinely communicate that they cannot find the workers they need. Moreover, there can be little doubt that the speed of technological change, with its concomitant rapidity of jobs creation and destruction, requires improved alignment between postsecondary education and work. We certainly must strive to ensure that graduates have the knowledge and skills they need to access good jobs and that employers have the capable workers they need to be competitive in the marketplace. A fuller and more subtle understanding of the taxonomy of skills gaps will inform a more effective and targeted multi-faceted approach to addressing the problem.

Rhetoric regarding a singular skills gap, paired with the rising cost of college and the staggering level of student loan debt, has led to an overvaluing of STEM-related majors that is more likely to result in employment and higher earnings directly after college. This approach, however, is short-sighted, given the evidence that liberal arts and humanities graduates' earnings tend to catch up across the longer arcs of their careers, and that they may be better prepared for a future of work in which continuous learning will be more important than specific occupations and specific technical skills. These considerations should caution against a tendency to attempt to solve the skills gap by privileging technical STEM skills, which might provide more remunerative first jobs out of college, over human skills engendered by the liberal arts, which might better prepare students for jobs that have yet to be created over long and varied careers.

Complete understanding of the value proposition of postsecondary credentials and skills must also be based on a broader understanding of the skills gap than the questionable assertion that employers cannot find qualified workers. As noted above, Harvard Business School's Managing the Future of Work initiative and the nonprofit organization Opportunity@Work have both documented that millions of skilled Americans are locked out of employment opportunities because of inflated degree requirements rather than lack of skills.[,]

The equity implications of how skills gaps and earnings are associated are also consequential. Black and Latinx learners are overrepresented in majors that lead to lower-wage work in comparison to their White peers. Low wages, however, should not be considered representative of lack of skills. The earnings differential faced by Black and Latinx learners who select an education major over a STEM major is a function of the social construction of skills, which value STEM over helping professions. A strong argument can be made that educators are highly skilled, and the fact that they earn less is more political than skills-based. Moreover, Black, Latinx, Indigenous, and underrepresented AAPI degree holders are more likely to be unemployed or underemployed and earning less on the dollar in comparison to their White peers across all levels and types of degrees, suggesting that discrimination—not skill—is the determining factor driving such persistent disparities.

By embracing a more subtle and incisive understanding of skills gaps as an adaptive problem that is ambiguous and variable from occupation to occupation, the postsecondary field can improve the national discourse on the skills gap and formulate more nuanced and effective solutions, including taking an equitable approach to strengthening career services, work-based learning opportunities,

and connections to industry. However, time is of the essence. The goal of supporting students to attain useful skills through postsecondary credentials that will allow them to navigate an economy that is constantly in flux grows more challenging by the day. The implications for students' ability to secure a sustainable career and achieve a better life are significant. To ensure that Black, Latinx, Indigenous, underrepresented AAPI students, and women reap equitable benefits of a valuable postsecondary experience, it is more important than ever before that institutions, industry leaders, and policymakers take a broad, informed view of skills gaps, and form partnerships that lead toward solving them.

By embracing a more subtle and incisive understanding of skills gaps as an adaptive problem that is ambiguous and variable from occupation to occupation, the postsecondary field can improve the national discourse on the skills gap and formulate more nuanced and effective solutions, including taking an equitable approach to strengthening career services, work-based learning opportunities, and connections to industry.

ENDNOTES

1   Levesque, E. M. (December 2019). Understanding the skills gap—and what employers can do about it (Rep.). Retrieved 2020, from Brookings website: *https://www.brookings.edu/research/understanding-the-skills-gap-and-what-employers-can-do-about-it/*

2   Jamrisko, M., & Martin, E. (June 2020). U.S. Slumps to 10th Spot in World Competitiveness Rankings. Retrieved 2021, from Bloomberg website: *https://www.bloomberg.com/news/articles/2020-06-16/u-s-slumps-to-10th-spot-in-world-competitiveness-rankings*

3   The Skills Gap: A National Issue that Requires a Regional Focus (Rep.). (December 2013). Retrieved 2021, from EMSI website: *https://www.economicmodeling.com/wp-content/uploads/EMSI-SkillsGap-Brief.pdf*

4   Marshall, W., & Craig, R. (March 2019). The dangers of skills-gap skepticism. Retrieved 2021, from The Hill website: *https://thehill.com/opinion/finance/436350-the-dangers-of-skills-gap-skepticism*

5   Bessen, J. (August 2014). Employers Aren't Just Whining – the "Skills Gap" Is Real. *Harvard Business Review.* Retrieved 2021 from *https://hbr.org/2014/08/employers-arent-just-whining-the-skills-gap-is-real*

6   Heifetz, R., & Linsky, M. (June 2002). A Survival Guide for Leaders. *Harvard Business Review.*

7   Goger, A., & Jackson, L. (September 2020). The labor market doesn't have a 'skills gap'—it has an opportunity gap (Rep.). Retrieved 2021, from Brookings website: *https://www.brookings.edu/blog/the-avenue/2020/09/09/the-labor-market-doesnt-have-a-skills-gap-it-has-an-opportunity-gap/*

8   Jaschik, S. (January 2014). Pressure on the provosts: 2014 survey of chief academic Officers: Inside Higher Ed. Retrieved 2021, from Inside Higher Ed website: *https://www.insidehighered.com/news/survey/pressure-provosts-2014-survey-chief-academic-officers?*

9   2013 Lumina study of the American public's opinion on higher education and U.S. business leaders' poll on higher education (Rep.). (February 2014). Retrieved 2021, from Gallup and Lumina Foundation website: *http://www.gallup.com/file/services/176759/2013%20Gallup-Lumina%20Foundation%20Report.pdf*

10 Busteed, B. (January 2021). University academic leaders are losing confidence in student work readiness-and that's good news. Retrieved 2021, from Forbes website: *https://www.forbes.com/sites/brandonbusteed/2020/01/23/university-academic-leaders-are-losing-confidence-in-student-work-readiness–and-thats-good-news*

11 The value of a college education on the American worker. (October 2016). Retrieved 2021, from Pew website: *https://www.pewsocialtrends.org/2016/10/06/5-the-value-of-a-college-education/*

12 Clark, J. (July 2020). College alumni see room for job-skill improvement. Retrieved February 26, 2021, from Gallup website: *https://news.gallup.com/poll/315500/college-alumni-room-job-skill-improvement.aspx*

13 Ibid.

14 Are college graduates "career ready"? (February 2018). Retrieved 2021, from NACE website: *https://www.naceweb.org/career-readiness/competencies/are-college-graduates-career-ready/*

15 Job Outlook 2020 (Rep.). (November 2019). Retrieved 2021, from NACE website: *https://www.naceweb.org/store/2019/job-outlook-2020/*

16 Assessments - ACT WorkKeys. (n.d.). Retrieved 2020, from ACT website: *http://www.act.org/content/act/en/products-and-services/workkeys-for-employers/assessments.html*

17 Carnevale, A. P., Rose, S. J., & Cheah, B. (2011). The College Payoff: Education, Occupations, Lifetime Earnings (Rep.). Georgetown University Center on Education and the Workforce.

18 Autor, D. (April 2010). The Polarization of Job Opportunities in the U.S. Labor Market: Implications for Employment and Earnings (Rep.). Retrieved 2021, from Center for American Progress and the Hamilton Project website: *https://www.americanprogress.org/wp-content/uploads/issues/2010/04/pdf/job_polarization_execsumm.pdf*

19 Ibid.

20 Auguste, B. (February 2019). Low wage, not low skill: Why devaluing our workers matters. Retrieved February 26, 2021, from Forbes website: *https://www.forbes.com/sites/byronauguste/2019/02/07/low-wage-not-low-skill-why-devaluing-our-workers-matters/*

21 Real-Time Insight Into The Market For Entry-Level STEM Jobs and STEM Careers. (February 2014). Retrieved 2021, from Burning Glass website: *https://www.burning-glass.com/research-project/stem/*

22 Ranking ROI Of 4,500 US Colleges And Universities (Rep.). (2019). Retrieved 2021, from Georgetown University Center on Education and Workforce website: *https://cew.georgetown.edu/cew-reports/collegeroi/*

23 Carnevale, A. P., Rose, S. J., & Cheah, B. (2011). The College Payoff: Education, Occupations, Lifetime Earnings (Rep.). Georgetown University Center on Education and the Workforce.

24 Different Skills, Different Gaps: Measuring and Closing the Skills Gaps (Rep.). (March 2018). Retrieved 2021, from Burning Glass website: *https://www.burning-glass.com/research-project/skills-gap-different-skills-different-gaps/*

25 The Skills Gap: A National Issue that Requires a Regional Focus (Rep.). (December 2013). Retrieved 2021, from EMSI website: *https://www.economicmodeling.com/wp-content/uploads/EMSI-SkillsGap-Brief.pdf*

26 Gillen, A. (August 2020). Credential inflation: What's causing it and what can we do about it? Retrieved 2021, from *https://www.jamesgmartin.center/2020/08/credential-inflation-whats-causing-it-and-what-can-we-do-about-it/*

27   The New Foundational Skills of the Digital Economy: Developing the Professionals of the Future (Rep.). (2020). Retrieved 2021, from Burning Glass website: *https://www.burning-glass.com/wp-content/uploads/New_Foundational_Skills.pdf*

28   Ibid.

29   Carnevale, A. P., Fasules, M. L., & Campbell, K. P. (2020). Workplace Basics: The Competencies Employers Want (Rep.). Retrieved 2021, from Georgetown Center on Education and the Workforce website: *https://cew.georgetown.edu/cew-reports/competencies/*

30   QACommons. (December 2020). Retrieved 2021, from QA Commons website: *https://theqacommons.org/*

31   U.S. Department of Labor Announces campaign to share the benefits of apprenticeships with job seekers and employers. (September 2020). Retrieved 2021, from US Department of Labor website: *https://www.dol.gov/newsroom/releases/eta/eta20200918*

32   U.S. Department of Labor looks to community colleges to build the nation's workforce. (January 2019). Retrieved 2021, from AACC website: *https://www.aacc.nche.edu/2019/01/28/us-department-of-labor-looks-to-community-colleges-to-build-the-nations-workforce/*

33   Data and statistics: Registered apprenticeship national results. (n.d.). Retrieved 2021, from US Department of Labor website: *https://www.dol.gov/agencies/eta/apprenticeship/about/statistics*

34   Ajilore, O., & Zessoules, D. (December 2018). Wage gaps and outcomes in apprenticeship programs. Retrieved 2021, from Center for American Progress website: *https://www.americanprogress.org/issues/economy/reports/2018/12/12/462019/wage-gaps-outcomes-apprenticeship-programs/*

35   Hanks, A., McGrew, A., & Zessoules, D. (July 2018). The apprenticeship wage and participation gap. Retrieved 2021, from Center for American Progress website: *https://www.americanprogress.org/issues/economy/reports/2018/07/11/453321/apprenticeship-wage-participation-gap/*

36   Strong Workforce Apprenticeship Group. (2020). Retrieved 2021, from *https://sw-apprenticeshipgroup.com/*

37   Cooper, C., Sedgwick, S., & Mitra, S. (2017). Goods on the Move! Trade and Logistics in Southern California (Rep.). Retrieved 2021, from Los Angeles County Economic Development Corporation website: *https://laedc.org/wp-content/uploads/2017/06/TL_20170515_Final.pdf*

38   Boutselis, P. (April 2018). Value of internships for college students. Retrieved 2021, from Southern New Hampshire University website: *https://www.snhu.edu/about-us/newsroom/2018/04/value-of-an-internship*

39   Hoffman, N., & Collins, M. L. (2020). Teaching students about the world of work: A challenge to postsecondary educators. In *Teaching students about the world of work: A challenge to postsecondary educators* (p. 47). Cambridge, MA: Harvard Education Press.

40   Martinez, J., & Santiago, D. A. (July 2020). Tapping Latino Talent: How HSIs are Preparing Latino Students for the Workforce (Rep.). Retrieved 2021, from Excelencia in Education website: *https://www.edexcelencia.org/research/publications/tapping-latino-talent*

41   Weissman, S. (January 2020). How colleges are making work-study programs more equitable. Retrieved 2021, from Higher Ed Jobs website: *https://www.higheredjobs.com/Articles/articleDisplay.cfm?ID=2131&Title=How+Colleges+Are+Making+Work-Study+Programs+More+Equitable*

42   Handshake. (n.d.). Retrieved 2021, from *https://joinhandshake.com/*

43   Parker Dewey: Connecting talent and employers: Micro-internship and freelance gigs for college students. (n.d.). Retrieved 2021, from *https://www.parkerdewey.com/*

44   2019-20 Career Services Benchmark Survey Report for Colleges and Universities (Rep.). (August 2020). Retrieved 2021, from NACE website: *https://www.naceweb.org/store/2020/nace-career-services-benchmark-report/*

45   Zelaya-Leon, T. (May 2020). Career preparation: From afterthought to center stage. Retrieved 2021, from NACE website: *https://www.naceweb.org/career-development/organizational-structure/career-preparation-from-afterthought-to-center-stage/*

46   Kroth, M. (2019). More than a Major. Retrieved 2021, from Georgia State University website: *https://news.gsu.edu/magazine/summer2019/more-than-a-major*

47   Lockheed Martin Work Experience Program. (n.d.). Retrieved 2021, from University of Central Florida website: *https://career.ucf.edu/lockheed-martin/*

48   Fuller, J., Raman, M., Sage-Given, E., & Davarzani, L. (December 2020). How Businesses Can Find "Hidden Workers". H*arvard Business Review.* Retrieved 2021, from *https://hbr.org/2020/12/how-businesses-can-find-hidden-workers*

49   Why the "skills gap" is really an opportunity gap. (n.d.). Retrieved 2021, from Opportunity@Work website: *https://opportunityatwork.org/problem/*