

A Skills Map for Indiana

Tanya Hall: Economic Research Analyst, Indiana Business Research Center, Kelley School of Business, Indiana University

Carol O. Rogers: Deputy Director, Indiana Business Research Center, Kelley School of Business, Indiana University

Since the end of the Great Recession, firms have increasingly cited the presence of a skills gap as a key factor in the sluggish hiring levels. A 2013 survey found that 39 percent of U.S. businesses cited difficulties in finding qualified talent.¹ This mismatch forces job seekers to search longer to find work and leaves vacant positions open longer because it is harder for employers to find qualified applicants.²

The problem seems especially acute in manufacturing, where advanced techniques are dramatically increasing the demand for postsecondary skills in addition to experience.³ The Georgetown Center for Education and Workforce estimates that of the 55 million projected new U.S. jobs between 2010 and 2020, two-thirds will likely require at least some postsecondary education—with more than half of these (middle-skill jobs) requiring workers with an associate degree or postsecondary vocational certificate.⁴

In Indiana, of the nearly 1.1 million job vacancies projected for the current decade, 60 percent will require some postsecondary education, with 38 percent requiring an associate degree or more.⁵ The Alliance for Science and Technology Research in America (ASTRA) reported that Indiana will have demand for 123,000 STEM-related jobs by 2018, and the National Skills Coalition projects Indiana to have a total of 550,000 middle-skill job openings by 2020 (half of all openings).

Complaints about Indiana's skills mismatch tend to come from the state's prominent industry clusters, especially advanced manufacturing and health care. These are key drivers of the Indiana economy, along with life sciences, defense and aerospace, logistics, and energy. In these high

value-added clusters, the occupational skill requirements are notably different than in many other sectors, and they change more rapidly.

Manufacturers recruiting STEM workers have noted a significant shortage of technicians and skilled workers to implement the new technologies that are necessary to stay competitive in their fields. For example, with increased automation and innovation, skilled workers such as maintenance engineers are needed to operate and fix the machines.⁶ A 2005 American Association of Manufacturers survey found that 35 percent of manufacturers expected a shortage of scientists and engineers, but twice as many anticipated a shortage of skilled production workers—primarily middle-skill workers.⁷

Similarly, hospital administrators report increasing reliance on technical specialties. The pressure to operate more efficiently in an environment of declining reimbursements forces hospitals and other health care facilities to focus more on technology-based procedures, in both patient care and administration, to improve financial performance.⁸

These technical skills, termed “hard” skills, are just one piece of the puzzle, however; employers are also looking for “soft” skills—abilities in areas such as communication, problem solving, professionalism, interpersonal interaction, work flexibility and adaptability, as well as overall work ethic, attitude and reliability. In fact, among manufacturing firms, the most serious skills deficiencies were ranked as inadequate problem-solving skills, followed by a lack of basic technical/vocational training, with inadequate basic employability skills in third place.⁹

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The ideal employee would be a “renaissance technician” with well-developed critical thinking and problem-solving skills, strong familiarity with several technical disciplines (developed in an applications framework) and the decision-making skills to optimize production in a complex industrial environment.¹⁰

Slightly more than half of the employers responding to a 2013 workforce skills survey indicated that additional job training or continuing education would benefit most of their workers.¹¹ Another 18 percent said it would benefit half of their workers. However, many businesses lack intensive in-house training programs and would like to have academic institutions fill the knowledge gap.

For example, life science firms would like academic institutions to develop post-baccalaureate curricula geared toward industry-specific topics. High priority topics include FDA regulations (including good manufacturing practices, good laboratory practices and quality

assurance), project management, an overview of the pharmaceutical and medical device industries, and the U.S. health care delivery system.

Job Training: From On-the-Job to In-the-Classroom

On-the-job training has gradually been replaced by formal education programs over the past 30 years.¹² To stay afloat during challenging economic times, many firms have focused on productivity and adopted lean business practices—which eliminated many on-the-job training programs. Businesses now prefer to hire a new employee who’s able to hit the ground running, possessing a usable skill set and needing only light on-the-job training to get up to speed. They are no longer willing or able to mold non-skilled workers into skilled workers (especially in mass numbers), which translates into more demand for workers with higher levels of educational attainment.¹³

Interestingly, the perceived presence and severity of a skills gap depends on a firm’s willingness and ability to train its prospective workforce. An example from a report by the Boston Consulting Group on the U.S. manufacturing sector aptly illustrates the point:

“Say that two companies are having difficulty recruiting a pipe welder. Company A is a large industrial conglomerate, has training infrastructure, and works with a community college to develop curricula. Company A says it does not perceive a skills shortage because it can “build” a pipe welder by training a high school graduate or by hiring through its partnership with the community college. Company B, by contrast, is a small automotive supplier that lacks the resources for training programs. It says that there is a skills shortage because its available options may be more limited. If it does not have a relationship

with the community college or an established apprenticeship program, the most likely way for Company B to hire a pipe welder is to compete for one by offering high pay.”¹⁴

Thus, much of the burden of closing the skills gap has shifted to the (mostly public) educational system.

Recommendations

To address the skills gap challenge, studies point toward multi-pronged approaches. Some focus on students in the K-12 education system, while others seek to increase retention and completion rates for postsecondary education. Other approaches focus on adults with no postsecondary credential: those with some post-high-school education who never completed a degree, as well as helping adults with no postsecondary education to earn at least a high-quality certificate.¹⁵ And finally and inevitably, affordability of post secondary education is a critical need.

1. Developing a More Holistic K-12 Approach

A more holistic approach to K-12 education is needed to equip young adults with the broad range of skills required to succeed in the 21st century economy. Numerous studies have observed that today’s young adults are weak in oral and written communications, critical thinking, problem-solving and creativity, and professionalism skills.

A focus on college readiness alone does not equip young people with all of the skills and abilities they will need in the workplace or to successfully transition into adulthood. Therefore, the current education reform movement should broaden significantly, adopting a “post-high-school credential for all” goal while reincorporating career-focused learning, historically known as vocational programs. This goal should not be limited to only a

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bachelor’s or higher degree. Rather, it should embrace the completion of certificates and associate degrees—the bare minimum a student should obtain before entering the workforce.

The bottom line is that many high school and college students do not see a clear link between their coursework and a career path they can build a future on. Indiana needs more early emphasis on career options and defining explicit pathways that can equip young people to reach their goals.

The college readiness pathway would be the current curriculum with the inclusion of Core 40 classes in a career and technical education (CTE) format. The career readiness pathway could be the CTE program, allowing students to pick a career cluster of interest and including applications or work-based learning experiences. Courses in the CTE pathway should also allow students to fulfill the Common Core standards and Core 40 coursework. Students and their parents would be given the option of which pathway will be their primary pursuit at the end of the 10th grade, following two years of career

guidance and participation in CTE courses within the career cluster of interest.

An example from the FutureWorks report may help illustrate how this career readiness pathway could work. At the end of the 10th grade, students could be given the option to enroll into a CTE program in their field of interest. This could be a three-year program. In the first two years, students complete their high school requirements and earn a diploma; in the third year they complete a high-quality, industry-recognized credential from a community college that can flow directly into an associate degree program or a career-oriented job with advancement opportunities.

During the CTE program, students should receive career counseling, job shadowing and opportunities to work on projects or problems designed by industry partners. Likewise, each CTE program should be designed in collaboration with industry leaders and have opportunities for more intensive work-based learning, such as internships. As the student moves into the postsecondary portion of the CTE program, the college should continue to expand on the previously learned skills and knowledge, with input from industry leaders and trade associations. They should also provide structured part-time employment opportunities linked to the student's program of study.

A prototype of this type of program is the engineering cooperative education program at Purdue University; however, it would be scaled appropriately for certificate-level students. Upon earning a certificate, the knowledge and skills earned should allow a graduate to enter the workforce or have enough postsecondary credits to easily transition into an associate degree program if desired.

Another variation of a three-year CTE program could entail a partnership with a polytechnical

institute at a four-year institution. The institute would be based in an appropriate school or college at the institution (e.g., School of Business, College of Agriculture) and have a rigorous, multi-disciplinary, three-year curriculum that would lead to a polytechnical degree. Here a student would apply for admission at the end of their sophomore or junior year of high school. The sending school could finance the first year of study and award the high school diploma at the completion of year one.

The student could then be eligible for an Early Graduation Scholarship or for other special financial support for the student's next two years at the polytechnical institute. Students would be in cohorts of 20-25 individuals and move through a very structured program with a block schedule and fixed course sequences (like their high school experience). At the time of admission, students would know their three-year schedule and competency expectations. Completion of the program would then yield a unique degree—e.g., Associate of Polytechnical Sciences—which would allow the graduate to either enter the workforce or continue education toward a bachelor's degree in polytechnical sciences or another technical degree program.

The use of CTE programs to equip students for the workforce is gaining traction among states. Unfortunately, CTE programs around the nation do not have a universal approach. Recently, Indiana revised its CTE programs to create pathways to career clusters with several ending with the option to obtain certificates.

Indiana's K-12 CTE program has much untapped potential and could be a great tool to bridge the skills gap; however, identifying successful approaches to enrolling and retaining students in the program is needed. In fact, the Indiana Works Councils recently announced the availability of \$4.3 million in grant funding for

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Innovative Career and Technical Education Curriculum—to foster and scale the most innovative and effective CTE curriculum models in the state. There is also a CTE Awareness grant initiative underway to help the regional Works Councils fund CTE awareness. Both of these grants will be helpful in propelling CTE as an attractive educational program within Indiana.

2. Retaining Postsecondary Students

Addressing the needs of current postsecondary enrollees and the adult workforce likely requires less radical change than the K-12 educational system. Approximately 70 percent of American high school graduates now go to college within two years of graduating; yet, by their mid-twenties, only four out of 10 adults have obtained either an associate or bachelor's degree, while roughly 10 percent have earned a certificate.

Overall, the U.S. now has the highest college-dropout rate in the industrialized world. Students drop out of college for many reasons, including under-preparation for the required coursework, financial pressures, and the competing demands of family or jobs. A major reason, however, is that too many do not see a clear, transparent connection between their program of study and tangible opportunities in the labor market.¹⁶ In addition, a

growing number of these students no longer attend college in traditional ways; thus, innovative approaches are needed to retain students and help them to complete degrees.

Lumina Foundation strongly advocates a student-centered higher education system with multiple approaches. It recommends taking advantage of the proliferation of competency-based models¹⁷ and open courseware to create new pathways to degrees, expanding the availability of prior learning assessments and other innovative approaches to accelerate progress toward degrees. These approaches could help colleges serve many more students and also appeal to adult learners who return to complete their degrees.

3. Adult Learners: Helping Them Succeed

When developing programs aimed at adult learners, colleges should expect returning students to require a strong dose of remediation. Tying in remediation with coursework—rather than as separate courses—may be one promising approach to this issue. Indiana’s Ivy Tech Community College has created a College for Working Adults that utilizes these innovative recommendations; however, the program could be expanded to more areas of study and more locations for adult learners to participate.

Through a Shifting Gears grant from the Joyce Foundation, Ivy Tech developed five pilots that contextualized basic-skills instruction within occupational programs to help students gain the academic foundation needed to move from initial technical certificates to more advanced ones and then into degree programs.¹⁸ This was an innovative approach to reaching adult learners and Ivy Tech did experience higher completion and persistence rates. However, it required one-on-one interaction between staff and at-risk students, and the contextualization of

basic skills required significant time, effort and collaboration between developmental educators, career and technical faculty, and workforce partners. Ivy Tech has indicated that increased funding would be needed to continue this effort.¹⁹

Another recommendation in this vein: improve Associate of Applied Sciences (AAS) programs that allow graduates to easily matriculate into bachelor’s degree programs with a similar applied learning format, retaining credits obtained en route to the higher degree. The program would focus on technical program areas, addressing skills and knowledge needed in the workplace rather than liberal arts. Thus, the distinguishing characteristic would be learning in an applications context—not the traditional academic framework. It is envisioned that this program would be designed for seamless transfer from the AAS degree that was once considered “terminal” and non-transferrable. If designed correctly, such programs could be natural extensions of the CTE programs mentioned earlier—maintaining the applied learning format while enhancing knowledge and skill levels.

4. Improving Affordability

Reviewed studies presented several policy recommendations to make higher education more affordable, as well as make technical education more enticing to students. One option would be to expand eligibility for financial aid for sub-baccalaureate degrees and part-time students, and expand upon federal on-the-job training assistance program opportunities.

Another option would be to establish and support statewide Lifelong Learning Account programs.²⁰ These programs would allow workers to set aside funds via payroll withholding for continuing education—matched by their employer—to be redeemed at a college or university to offset the

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expenditures associated with higher education.²¹ Incentives designed to increase the appeal of technical education could be designed in a way to link public and private sectors in support of technical education and attainment, engage postsecondary institutions, and reflect regional needs by being state-led but locally administered.

Conclusion

Indiana is not alone in its transformation into a knowledge economy, one that is less reliant on low-skill workers.²² Since employers desire workers with the right technical skills who can be productive without a steep learning curve, the education system shoulders an immense burden in tackling the skills gap.

The K-12 system needs to strengthen vocational education by creating a system of career-focused pathways spanning the last two years of high school and at least one

year of postsecondary education or training that leads to an industry-recognized credential. These career pathways need to be firmly linked to community colleges and four-year, career-oriented majors. Many other countries place far more emphasis on vocational training than the United States; likewise, they have superior postsecondary attainment rates due to more diverse, robust pathways to careers and practical-minded postsecondary options than the U.S.²³

However, in order to truly make these approaches effective, employers will need to become full partners in the effort to prepare young adults and displaced workers for success. Expected roles for businesses would include assistance in program development and implementation, such as setting standards, designing the programs of study, advising young people and providing expanded opportunities for work-based learning.²⁴

Employer involvement could be expanded more robustly to the college level, where business leaders could serve as adjunct professors or even become close collaborators in developing courses to train students on skills needed in the workforce. Even if employers may not have the funds to provide intensive on-the-job training, they could help shape the future workforce by collaborating closely with the education community. The Indiana Career Council and the Indiana Works Councils, which began their work in 2013, include in their missions greater involvement by the business community. More on those efforts can be found at www.in.gov/icc/ and www.in.gov/irwc/.

Notes

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