Teaching and Learning Employability Skills in Career and Technical Education

Industry, Educator, and Student Perspectives

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Industry, Educator, and Student Perspectives

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To my parents, William and Mildred, teachers who taught me to value education and inspired me to share the value of educators

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Introduction: Employability Skills in the Twenty-First Century Workforce

Abstract The broad literature on workforce "skills gaps" describes how employers want to hire young workers who have the right employability skills or "soft skills." Most employers are willing to "train up" high school students or recent graduates who possess the necessary personal and interpersonal skills. Existing employability skills frameworks identify (1) personal responsibility, (2) work ethic, (3) teamwork and helping behaviors, (4) leadership and conflict management, and (5) social skills as industry-desired personal qualities and interpersonal skills. High school career and technical education (CTE) courses can help fill those gaps. Such skills are often transmitted within families so it is key to understand how these skills can be learned in K-12 education in order to prepare cohorts of young people to enter the workforce.

"Employability Skills That People Have Forgotten"

Lisa is a vice president of a small woman-owned defense contractor. She entered manufacturing right out of high school working on an assembly line up north for a video game manufacturer. She later joined the military and got training in electronics and returned to the same company as a technician. She eventually decided it was too cold up north and moved to Florida. "Without a job. Just packed up my things and said, 'That looks warm. I think I'll go there.'" She worked for several Tampa Bay area manufacturers before deciding to go to the University of South

Florida (USF) in Tampa and get a bachelor's degree in business. She went back and worked for different area defense contractors and commercial manuscripts and decided "maybe my bachelor's degree wasn't quite enough" so she went back to USF to get her MBA. After her MBA, she got a master's degree in management and worked her way up to vice president of operations in different companies.

When asked what skills her company is looking for, Lisa said they wanted workers with a background in electronics who were proficient in computer-aided design (CAD) and computer-aided manufacturing (CAM) software like AutoCAD and Pro/ENGINEER. They wanted people with manual skills like soldering and intuitive ability like print reading along with "base level things that a lot of people have forgotten" like math skills, "reading ruler skills," basic algebra, and computer skills. But she was most concerned about "employability skills that people have forgotten, good communication skills, good writing skills that we don't get taught in school."

The interviewer followed up on that point and asked Lisa how employees could be better prepared for technician jobs. Lisa sighed, took a long, exasperated pause, and responded:

> Um, and that seems to be the thing that we keep missing over and over again. We hired people and we have people that come in and interview and a lot of times it's not the technical skill that they miss out on in the interview. It's the culture piece. You can bring in 20 people that have the technical background or the technical expertise that fits the job and it's the culture fit a lot of times. It is the being able to communicate how well they're going to fit the company, right? People can't convey how well they're going to work you know and their personality because really culture is the personality of the company and being able to convey their own personality, so that you can assess how their personality is going to mesh with the personality of the company.

Twenty-three of the 26 employers interviewed for this study mentioned finding workers with the right "cultural fit" (or a similar term) as an important challenge to overcome in recruiting. These employers defined "culture" as the personality of the company and "fit" as the personality of worker with respect to that culture. Employers described the ideal worker as possessing good technical knowledge and ability along with employability skills, particularly related to the unique needs of their company and fit within their company. But employers acknowledged this ideal worker

was rare so they were more willing to sacrifice technical skills for strong employability skills, most notably, the "right attitude" as evidenced by qualities like personal responsibility and a strong work ethic and the ability to "fit" in by demonstrating interpersonal skills like teamwork, leadership, and the social skills needed to get along with coworkers. Russell jokingly used a war metaphor, "spray and pray" to describe his company's recruiting strategy of maximizing exposure through placement agencies and employment websites (i.e. Monster.com) to "see what kind of resumes float." He noted his preference to recruit and hire local workers, but he is willing to pay to relocate someone with "the right skillset, both technical fit as well as cultural fit." Employers were eager to say "We'll train them up" if they found workers with the right employability skills but without the technical skills.

Purpose

This book addresses the problem of work force "skills gaps" and how high school career and technical education (CTE) courses can help fill those gaps by teaching students the employability skills or "soft skills" desired in the workplace. These skills can prepare students to get a job in a science, technology, engineering, or mathematics (STEM) field and/or attend college right out of high school. STEM employers need to hire young workers with the right technical skills to replace an aging technical workforce. Most employers in this study are active on K-12 and higher education advisory boards and host internships and apprenticeships to help train young workers. Almost all are willing to train up high school students or recent graduates who possess the necessary personal and interpersonal skills. Employability skills include the cultural capital students need to apply and benefit from their academic skills and cognitive ability. These skills are necessary to be competitive for the estimated 30 million jobs in the United States that do not require a bachelor's degree yet pay an average of $55,000 a year (Carnevale, Strohl, Ridley et al. 2018).

Research for this book was part of a larger research project funded by the National Science Foundation, titled "Successful Academic and Employment Pathways in Advanced Technologies" (DUE #1104214) on which I served as Principal Investigator. This project is heretofore referred to as PathTech Tampa Bay. The goal of PathTech Tampa Bay was to examine pathways from high school into the workforce

through engineering technology associates of science (AS) and associates of applied science (AAS) degree programs at community colleges. This study included fieldwork in high schools, community colleges, and STEM businesses in the Tampa Bay area. The resulting PathTech Tampa Bay study was a holistic examination of secondary and post-secondary pathways into what are generally considered to be "good tech jobs" that acknowledge the challenges individuals face within education and employment sectors.

This book addresses three major research gaps in contemporary education research in order to better understand how employability skills are taught and learned in CTE classrooms. First, research on K-12 STEM education generally focuses on *academic* STEM courses, traditional math and science courses (i.e. algebra, calculus, chemistry, physics) that center around a theoretical approach to learning core concepts (Gottfried, Bozick, and Srinivasan 2014). There is far less research on *applied* STEM courses that focused on the practical application of academic STEM knowledge and concepts to "real world job experiences." Applied STEM CTE courses address the stated need for "organized educational activities" that contribute to overall student development including employability skills, technical skills, and job-specific skills (Perkins IV 2006:4). From a policy perspective, we also know relatively little about how the federal Carl D. Perkins Career and Technical Education Act (Perkins IV), recently Perkins V reauthorization, and subsequent state policies such as Florida's Career and Professional Education (CAPE) Act prepare high school students for the workforce, particularly STEM careers (Wang 2013). The CAPE Act required all Florida school districts in the state to establish at least one career academy with the goals of encouraging partnerships between K-12 education and industry and promoting industry-recognized certifications (Dixon, Cotner, Wilson et al. 2011). Career academies deftly balance college preparatory and career readiness to cater to students who plan to work and/or attend college after high school. Career academy proponents and CTE observers believe these programs represent a hard push against the twentieth-century K-12 focus on College for All (Attewell, Lavin, Domina et al. 2007) as opposed to career readiness.

Second, the current research focus on academic STEM courses generally presumes STEM pathways in which students transition directly from high school math and sciences into STEM bachelor's degree programs

at four-year universities en route to STEM careers that require a bachelor's degree. Research does not account for delayed transitions from high school to higher education in which students work full-time before enrolling in a community college or university. Research also often fails to account for students' economic resources or part-time or full-time employment while enrolled in college (Bozick 2007) or explore the potential benefits for STEM undergraduates who work part-time in STEM jobs as opposed to retail or food service jobs (Tyson 2012). This study finds that STEM employers hire or seek to hire recent high school graduates part-time or full-time with the right employability skills and are willing to train them and guide them through their pathways to associates, bachelor's, or even masters and other advanced degrees.

Third, despite the growing discussion of skills gaps and employability skills frameworks, much of the contemporary research is still exploratory seeking to understand exactly what employability skills are desired by employers and perhaps higher education faculty and administrators. Through employer interviews, this study describes the employability skills employers expect potential workers to possess. This study takes the additional step of examining employers' perspectives on why these skills are necessary and how they are utilized. In addition, little research addresses how high school students can learn the personal and interpersonal skills necessary for the workplace as well as the strategies teachers use to teach these skills. Interviews with teachers and students examine how employability skills are taught by teachers and learned by students.

This study finds that high school teachers infuse soft skill development into the CTE curriculum through a regimented daily routine that balances daily and weekly individual and small group hands-on activities with time for students to work on semester- or year-long group projects. Students describe how they learned skills and traits such as (1) personal responsibility, (2) work ethic, (3) teamwork and helping behaviors, (4) leadership and conflict management, and (5) social skills. These are industry-desired personal qualities and interpersonal skills identified by employers and educators according to existing employability skills frameworks (US Department of Education 2018).

The Desire for Employability Skills

Colleges and employers desire expect young people to demonstrate college preparation and career readiness along three domains of knowledge, skills, and dispositions: (a) academic; (b) occupational; and (c) technical. Academic skills include academic proficiency in math, science, and related areas. Technical skills include the unique knowledge necessary to perform necessary tasks in different work environments, usually affirmed by credentials. Much of the research and workforce focus on skills is directed toward academic skills to prepare students for college and technical needed to prepare young people for careers. Occupational or generalizable employability skills are typically considered noncognitive or "soft" skills related to ability and willingness to learn and perform (Stone and Lewis 2012). Soft skills include interpersonal skills and abilities that help people qualify for and fulfill certain positions. Leadership, management, and interpersonal skills are most valued by employers of large companies (Right Management 2014). With technological innovations developing at record speed, technical skills quickly become obsolete, employers began to emphasize noncognitive skills in order to remain competitive locally and globally (Stasz 1997). A survey conducted by the Manpower Group reveals that employers struggle to fill jobs in high-tech manufacturing not only due greater need for a STEM-educated workforce, but also due to a notable gap in workplace competencies or "soft skills" (Right Management 2014). According to a report by Deloitte (2015), 600,000 jobs in manufacturing went unfilled in 2011 due to a skills shortage and they projected that number would increase to 2 million in this next decade.

The US Department of Labor (1991) initiated this current focus on employability skills by appointing the Secretary's Commission on Achieving Necessary Skills (SCANS) to determine the demands of the workplace and the extent to which young people were prepared to meet those demands and succeed in the workplace. The report, titled *What Work Requires of Schools* identified changes in the nature of work that required young workers to have foundational literacy and computational skills along with the right personal skills as well as five competencies that encompassed that included the interpersonal skills to work well with others. The report concluded that US high schools must help students to develop these foundational skills and competencies in order for prepare young people for a high-performance workplace. SCANS also introduced

the idea of a *Learning a Living* system, a model by which schools and the private sector create an productive economy (US Department of Labor 1992).

Despite the roots of employability as an issue related to educational preparation for the labor market, employability is generally understood as a component of the broader knowledge, skills, and aptitudes individuals possess and how they use those assets to get and keep jobs (Hillage and Pollard 1998; Yorke 2004). This understanding of employability as an individual characteristic is a broader societal trend akin to unemployment being understood as an individual problem (Brown, Hesketh, and Williams 2004; Garsten and Jacobsson 2004). Demographic changes, emergent technologies, and overall societal changes have fueled a transition out of the twentieth-century economy into the twenty-first century economy in which employability skills are essential. Yarnall and Remold (2019) explain how large-scale retirements, technological change, and less long-term job security are industry-wide trends that have increased the importance of employability skills. Large-scale changes in the workforce that have led to labor market shortages requiring employers in male-dominant STEM fields to recruit women as well as underrepresented minorities. More companies are relying on cloud-based information technology and lean manufacturing thus increasing the need for collaboration and communication on the job. Technology is always changing as are job requirements over time. Employers need workers who can continuously learn on the job. In a world with less job security, workers have to quickly adapt to changing workplace contexts and different expectations. The rising need for these personal and interpersonal skills means industry and educators have to figure out how to teach workers these skills in order to prepare them for the changing workforce.

IDENTIFYING EMPLOYABILITY SKILLS

Much like CTE coursetaking, soft skill acquisition is associated with positive academic, economic, and employment outcomes in conjunction with cognitive and/or academic skills (Mobius and Rosenblat 2006) and employment and occupational status (Borghans, Duckworth, Heckman et al. 2008; Waddell 2006). Yet the enduring challenge for researchers is that noncognitive skills are difficult to define and conceptualize. West, Kraft, Finn et al. (2016:149) claim "non-cognitive" is now a "catchall term" for all skills that cannot be assessed by traditional measures of

knowledge and cognitive ability. Without agreement on how to measure, teach, and emphasize skills, educators struggle to determine how to utilize existing research to support students, evaluate teachers, and conduct school-level interventions.

This book draws from interviews with employers in high-tech and manufacturing to identify industry-desired skills. I also draw from the US Department of Education (USDOE) Office of Career, Technical, and Adult Education (OCTAE) Employability Skills Framework compiled from an inventory of 18 existing employability standards and assessments. The framework includes skills that employers and educators believe prepare students to get a job and/or attend college right out of high school (US Department of Education 2018). This study focuses on *effective relationships*, or more specifically, *personal qualities* and *interpersonal skills*. *Personal qualities* help employees to establish effective relationships and participate in the workplace. These personal skills include personal responsibility and work ethic. *Interpersonal skills* "include the ability to collaborate as a member of a team or work independently, as appropriate…and contribute to the overarching goals of the workplace." These skills include teamwork and helping behaviors, leadership and conflict negotiation, and social skills needed to respect individual differences.

Personal Skills

These noncognitive skills include a range of positive traits and characteristics associated with success through childhood into adulthood including progression through K-12 education and transitions into higher education and the workforce (Borghans et al. 2008). Sociology research focus on psychological characteristics that influence a person's orientation toward learning and work along with social skills necessary to perform across educational and work contexts (Xie, Fang, and Shauman 2015). Some of these personal skills include the ability to communicate effectively, etiquette, flexibility, professionalism, and positive attitude (Robles 2012). This more recent focus traditionally complements an enduring research focus on how intelligence and cognitive factors influence success. Bowles and Gintis (1976) and Jencks, Bartlett, Corcoran et al. (1979) established the basis for contending that noncognitive skill development matches or even supersedes cognitive skill development with respect to educational and employment outcomes and particularly with respect to moving up socioeconomic ladders.

Sociology research on noncognitive skills focuses on the acquisition and development of individual characteristics that influence a person's orientation toward learning and work along with social skills necessary to perform across educational and work contexts (Xie et al. 2015). These personal soft skills are often predicated on a certain cultural capital (Bourdieu 1986). In their review of Pierre Bourdieu's English-language work on cultural capital in education, Lareau and Weininger (2003) critique a tendency of sociologists of education and other scholars to "partition" the effects of cultural capital from educational skills, ability, or achievement. Lareau and Weininger (2003) contend this boundary between academic and technical skills and social competence stands in opposition to Bourdieu's insistence that cultural capital is an "amalgamation" of social status and skills.

Soft skills are as important as technical skills (or hard skills) because "the productivity of hard skills stems from their combination with soft skills" (Balcar 2016:453). In other words, soft skills help students and workers optimize their technical skills. Yet soft skills are difficult to measure particularly outside the context of a particular task or job. This places the onus on employers to only hire workers they perceive to have the proper soft skills. Teaching soft skills in conjunction with a particular job or task comes with a risk in that such skills develop slowly over one's lifetime. Employers are looking to hire workers who are competent in applying soft skills to job-relevant tasks because waiting for soft skills linked to a specific job to develop over a career could be "slow and expensive" at a huge investment to the employer (Balcar 2016:456). Soft skills training programs are among the first to be cut because only recently has there been evidence that soft skills make a difference in workplace outcomes (Caudron 1999). This explains the hesitance of many employers to hire young people right out of high school as opposed to hiring older workers with more education and/or experience who presumably had more time to develop personal qualities and interpersonal skills in higher education and/or workplace contexts.

Employers believe that positive personal qualities including the "willingness to learn" and "work ethic" are keys to long-term career success and the "smooth functioning of any workplace" (Yarnall and Remold 2019:23) Skills frameworks developed over the last three decades have coalesced around a core set of personal qualities identified by employers. The USDOE OCTAE Employability Skills Framework (US Department of Education 2018) personal qualities include a set of nine behaviors and