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**Preparing Students for Success in the 21st Century Economy:
Challenges with Aligning Educational Policy and Curricula
with Employer Expectations**

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Introduction

Wisconsin and the nation are struggling with how to address persistent unemployment and an economy recovering too slowly from the Great Recession of 2008. While economists point to a host of reasons for sluggish growth, including low aggregate demand, outsourcing, spending cuts, and so on, some argue a principal culprit is the “skills gap.” The term “skills gap” refers to a structural mismatch between the supply of workers with particular skill sets and the employer demand for qualified workers (Kiviat, 2012; Levine, 2013). Some argue that this gap results in a bottleneck in the labor market that is harmful to economic growth (Sullivan, 2012). Such shortages of skilled workers are viewed as not only a net loss for the U.S. economy in terms of middle-class job creation, but also as a major impediment to economic recovery since employers are unable to ramp up production due to the lack of qualified employees. Based in part on this interpretation of the causes of slow economic growth, the policy response at national and state levels is increasingly focusing on the educational sector as a way to cultivate more skilled workers.

That the educational system and its curricula represent one of the principal means through which economic growth and job creation can be addressed has been widely promoted across the political spectrum. Throughout the 2012 presidential campaign, both President Obama and Mitt Romney claimed that thousands of U.S. employers yearned for skilled workers and that the nation should invest in more advanced vocational training, particularly at the postsecondary level (Davidson, 2012). This focus on educational programs and curricula that cultivate technical, job-ready expertise is a hallmark of current approaches policymakers across the nation favor as they attempt to spur job growth. Yet important questions about the nature of employer expectations and the subsequent implications for the nature of educational programming and curricula remain unanswered. In particular, notwithstanding the ongoing debate about whether a skills gap exists at all (see Levine, 2013; Loritz, Nerad, Sletten, & Cunha, 2013),¹ empirical evidence does not support the assumption that employers’ primary need is technical training of potential workers (Morrison, et al., 2011; Hart Research Associates, 2013).

Regardless of the limited evidence on precisely what skills employers need, especially at the state level, policymakers and educators are taking action to improve the alignment between postsecondary education and workforce needs. For example, in Wisconsin, the Walker administration has paid considerable attention to these issues, including the commitment of \$132 million toward new worker training grants, a new Office of Skills Development, increased state aid to the Wisconsin Technical College System, and the development of an online tool for job seekers called Skills Explorer.

¹ It is important to note that the debate about the skills gap in Wisconsin has become quite contentious, with academic economists and public policy analysts (e.g., Levine, M.V 2013) on the one hand arguing for its non-existence, and others (e.g., Sullivan, T. 2012) arguing the opposite. While the disagreements about whether or not a skills gap truly exists, and especially if it is a fiction being promoted to distract attention from other reasons for sluggish job growth such as low wages and outsourcing, are also underway in the national media (see Kiviat, 2012), the debate has become particularly acrimonious in Wisconsin. This is partly because the skills gap narrative is so strongly and clearly influencing public policy. It is important to note that in this working paper I do not take a position on whether or not a skills gap exists, but instead point to the need to better understand employer expectations on its own merit, as an understudied phenomenon.

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In this working paper I analyze these developments in Wisconsin's education and workforce development policies in light of the research literature on the topic, along with data from a survey of 181 Wisconsin-based employers who were asked about the types of skills they found lacking among job applicants in manufacturing. The evidence suggests that the effects of these policies on economic and job growth could be enhanced by adopting a more comprehensive notion of skills, as well as creating programs and curricula that cultivate these multi-faceted skills in 2- and 4-year college and university classrooms.

The Jobless Recovery and Investments in Human Capital

The broader context for the debate about worker skills and educational policy is that of the Great Recession of 2008 and its lasting repercussions on the nation's economic growth and unemployment rate. Between the peak of employment in 2007 and the low point during the recession in 2009, the U.S. economy lost nearly 9 million jobs (Goodman & Mance, 2011). Although employment has recovered somewhat since then, the Labor Department recently reported 11.3 million individuals were unemployed, yet paradoxically 3.6 million job vacancies existed (U.S. Bureau of Labor Statistics, 2013). As unemployment falls, job vacancies are expected to rise, but at the present time there are more vacancies than expected with a high unemployment rate.² Some suggest that this situation is due to a shortage of qualified workers to fill these vacancies. For example, a 2013 survey by the human resources and research company Manpower Group found that 39% of U.S. employers reported difficulty in filling open positions, especially for jobs in the skilled trades, sales, transportation, engineering, and information technology—a challenge they viewed largely in terms of a workforce lacking marketable skills (Manpower Group, 2013).

Although considerable debate exists about the best course of action to spur economic growth, evidence suggests that an effective response is to invest in human capital, which is the term economists use to refer to the knowledge and skills workers acquire through on-the-job experiences, education, and training. A seminal paper co-authored in 1992 by Harvard economics professor Gregory Mankiw demonstrated that in advanced economies such as in the United States, human capital investments effects on economic growth were three times that of physical or infrastructural investments (Mankiw, Romer, & Weil, 1992). Some argue that investments in human capital are especially warranted given the growing strength and prominence of China and India (Cooper, Hersh, & O'Leary, 2012).

Indeed, educational attainment certainly gives the potential job seeker a competitive advantage, but what may really matter is the alignment between the skills obtained while in school and the actual needs of the marketplace. As researchers from the Center on Education and the Workforce at Georgetown University point out: "Not all postsecondary education and training will result in good jobs that pay living wages," in part because of a "continuing mismatch between the postsecondary education production system, the actual training that people need to get, and the jobs that are available" (Carnevale & Smith, 2011, p.1). This predicament raises questions about the types of jobs, training, and skills that are most in demand, and the subsequent implications for the postsecondary programs, curricula, and pedagogy.

² This relationship is known as the Beveridge Curve, which is thought to be an indicator of the efficient functioning of the labor market.

Jobs, Training, and Skills of the 21st Century

Which skills are in demand and what kind of training can teach them cannot be adequately determined without first acknowledging that the nature of work itself is changing. Digital technologies have intensified the globalization of the supply chain, and robotics and other highly sophisticated machinery are revolutionizing the way manufacturers organize and operate the shop floor. As the workforce ages and retirements pick up steam in critical sectors such as management and skilled labor, younger workers will need to be ready to compete in this rapidly evolving economic climate (Competitive Wisconsin, 2012).

In Wisconsin, the economy is becoming increasingly diversified, with the traditional economic base of agriculture and manufacturing making room for new sectors such as health care, biotechnology, retail sales, and professional or technical services (Carnevale & Smith, 2011). While no longer a dominant force in the state's economy, manufacturing continues to play an important role, with more than 14% of the state's employees working in companies such as Briggs & Stratton and Kohler (U.S. Bureau of Economic Analysis, 2013). Yet the demand for middle-skill middle-wage positions that once were the mainstay of the manufacturing sector is disappearing in what some economists call a "hollowing out" of the labor market. Demand now favors high-skill positions that require highly specialized graduate degrees and low-skill positions that require only high school diplomas. Despite this shift, some predict that middle-skill positions will remain essential to the economy, particularly in areas that labor economist Lawrence Katz called the "new artisans"—skilled tradespeople, medical assistants, and so on (Autor & Dorn, 2013).

To be competitive for these middle- and high-skill jobs, researchers agree that some form of training beyond high school will enhance an individual's job prospects and lifetime earnings.³ Analysts at Georgetown University project that Wisconsin will have 925,000 job openings between 2008 and 2018; 61% of these positions will require an associate's degree, some college, a baccalaureate degree, or higher (Carnevale & Smith, 2011).⁴ But given the rising costs of college and the increasing debt load students carry as they enter the workforce, many question *the type* of postsecondary education that is most appropriate—and whether college is "worth it" for all students (e.g., Bennett & Wilezol, 2013). As a result, a pertinent question for students considering what kind of training to acquire is: What types of skills and competencies should graduates of any program acquire to be competitive in the job market?

³ Little debate exists about the value of postsecondary education. The evidence is clear about the overall value of a college education. Research by the College Board demonstrates that in 2012 the unemployment rate for college graduates is 15% less than high school graduates, and during a 40-year working life the median earnings of those with a bachelor's degree (but without an advanced degree) was 65% higher than those with only a high school diploma. Individuals with an associate's degree are 27% higher, and those with "some college" but no degree (e.g., a professional certificate) earned 13% more than high school graduates. But postsecondary education confers benefits beyond salary, including being more likely to have a job with health insurance, being satisfied with one's employment, being an active citizen, and having a healthier lifestyle (Baum, Ma & Payea, 2013).

⁴ Specifically, 704,000 are projected to require "some college," 366,000 to require "Associates degrees," 600,000 to require "Bachelor's degrees" and 255,000 to require "graduate degrees."

Soft vs. Hard Skills

One of the challenges with answering this question is that there are many different ways to think about skills. For example, one common way to conceptualize skills is to view them in terms of technical and task-specific proficiencies (i.e., the “hard” skills), and interpersonal and collaborative abilities (i.e., the “soft” skills). The National Research Council offered another way to conceptualize skills in a 2012 report. *Education for Life and Work* suggested that skills be viewed in three ways: cognitive skills (i.e., knowledge, content-or task-specific), interpersonal, and intrapersonal (Pellegrino & Hilton, 2012). In its 2012 Work Readiness Standards and Benchmarks, the ACT offers yet another way to think about skills. The ACT distinguishes between two types of skills: foundational “cognitive” skills (e.g., applied mathematics, critical thinking) and “noncognitive” skills (e.g., communication and collaboration) as essential for success in the workplace.⁵ In addition to the various ways to conceptualize skills, many different terms are used to refer to them, sometimes interchangeably and without careful definition. Perhaps the most conceptually robust formulation of skills types that avoids this problem is built into the U.S. Department of Labor’s O*NET database of types of aptitudes that are required for success in 965 occupations (U.S. Department of Labor, 2013). The O*NET classification system views worker aptitudes not simply as skills but also as domain knowledge, personal abilities, work values, and work interests, all of which are clearly defined (Carnevale & Smith, 2011). Ultimately, these different approaches highlight that many different types of skills and aptitudes exist, such that the reduction of the notion of “skills” to a single type (e.g., technical expertise) is more the exception than the norm.

Indeed, this multi-dimensional view of skills (beyond just technical expertise) is consistent with what employers argue they desire in the workforce. A 2011 national survey of manufacturing executives revealed that the most serious skills deficiencies were in the areas of problem-solving (52% of respondents), basic technical training (43%), basic employability skills such as work ethic (40%), and technology skills (36%) (Morrison, et al. k, 2011). In a national survey of employers, the American Association of Colleges and Universities found that 93% of respondents agreed that “a candidate’s demonstrated capacity to think critically, communicate clearly, and solve complex problems” is essential for their success in the workplace (Hart Research Associates, 2013) Furthermore, despite the increasing reliance on technology to perform routinized tasks, computers are less adept at performing non-routine tasks such as abstract reasoning, problem-solving, and manual tasks that require interpersonal skills, which underscores need for workers with a combination of skill types in this age of computerization (Autor & Dorn, 2013).

Programs, Curricula, and Pedagogy to Meet Needs

The next question then becomes what type of education and training will best enable students to be competitive in the job market over the course of their working lives? Part of this calculation entails evaluating which programs and/or majors are more or less likely to lead to employment.⁶ Indeed, much of the focus on the relationship between education and the

⁵ Note that this way of conceptualizing skills is questionable given that cognition is implicated in most human activity, such that a “noncognitive” skill set may not entirely make sense. For example, see Wilson, 2002.

⁶ These questions are not hypothetical, but instead have real implications for policy, with governors of states such as Florida considering differential tuition rates for students majoring in marketable (i.e., STEM programs) fields.

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workforce is on the content of courses (e.g., chemistry, welding, or English literature) that is certainly a critical issue. However, I suggest that another consideration—that of the types of pedagogy utilized in (or outside of) the classroom—is under-appreciated as a factor that makes students “job ready” or not. That is, instructional design and pedagogy merit as much consideration as the content of the curriculum, largely because it is through instruction that skills and abilities of all kinds can be developed.

First, interactive instruction is a general instructional approach that entails teachers engaging students in constructing their own understanding of the material. Based on evidence from research on how people learn, this alternative to traditional lecturing includes strategies such as real-world problem-solving, hands-on activities and projects, and small group work where students articulate their reasoning with one another (Brown & Cocking, 2000). Classes that are well-designed and executed in this manner can blend rigorous instruction in content as well as the development of durable interpersonal and critical thinking skills.

Second, apprenticeship is an age-old model where students learn a craft by working on authentic problems under an expert’s guidance. Formal apprenticeships continue to be a core part of educational systems in countries such as Germany, and in many cases they combine on-the-job training with classroom instruction. This approach is becoming increasingly popular in U.S. high schools and 2-year colleges. This model of blending academic training in fundamental skills (e.g., literacy, mathematics) with real-world training frequently results in students who are highly sought after by employers. While policymakers frequently promote apprenticeship programs as part of workforce development efforts, a focus on the types of pedagogy used by instructors and built into the curriculum is much less common.

Workforce Development and Educational Policy in Wisconsin

Wisconsin has directly addressed the perceived need for more skilled workers through workforce development policy, which has substantial implications for various aspects of postsecondary funding and curricula. In March 2013 Governor Walker signed Wisconsin Act 9, also known as “Wisconsin Fast Forward,” which included funding for a new labor market information system, a new Office of Skills Development at the Department of Workforce Development, increased funding for the Wisconsin Technical College System, and \$15 million for new workforce training grants (Wisconsin Legislature, 2013). Office of Skills Development Director Scott Jansen articulated a goal of “reinventing the workforce” to meet the needs of companies. Jansen said a distinctive aspect of the new workforce development grants is that “businesses will drive what the curriculum will be” (Clark, 2013). For example, Jansen noted that the first step in administering these grants will be to work with technical colleges and private schools that provide training programs in skill areas perceived as experiencing a labor shortage including welding, commercial trucking, and health care. In addition to Act 9, Governor Walker proposed new investments for the 2013-2014 legislative session that largely focus on skills training. These bills include technical education incentive grants and scholarships for students, youth apprenticeship programs, and tuition reimbursement (Office of the Governor of Wisconsin, 2013).

This new legislation and its component activities neatly encapsulate the current policy environment in Wisconsin for workforce development and postsecondary education. These policies and initiatives clearly focus on designing educational programs and curricula, primarily

if not exclusively at the 2-year college level, based on a singular goal—“to educate students for potential career opportunities” (Sullivan, 2012, p. 86). Although Act 9 does not directly mention the colleges and universities that make up the University of Wisconsin System, the emphasis on workforce and economic development by the public and policymakers is clearly shaping the way that postsecondary institutions view their missions. For example, the university system announced \$22.5 million in grants related to workforce issues in November 2013 (University of Wisconsin System, 2013).

Challenges Associated with Current Policy Analysis and Legislation

While Act 9 and subsequent activities represent a laudable approach to workforce development in Wisconsin, several challenges exist in regard to the current policy environment. These include limitations in analyses that inform workforce development policy, which are in some cases carried over directly into the language and intent of subsequent initiatives.

First, the term “skill” is used in a variety of ways in policy and media circles, thus resulting in a lack of clarity regarding what is intended or captured by the word.⁷ In a report issued by the Competitive Wisconsin consortium, researchers use “skill” synonymously with entire industry sectors (e.g., manufacturing, health care), but with no specification regarding the types of skills needed for these fields (Competitive Wisconsin, 2012). For example, Competitive Wisconsin in its 2012 Be Bold 2 report views a skills “cluster” as grouping two or more occupations that share similar skills, although the report never specifies the precise nature of these proficiencies. Instead, an industry sector such as health care is viewed as a skills cluster in and of itself. Similarly, in policies such as Act 9, the term “skill” is undefined and its various manifestations (e.g., hard, soft) are left unaddressed.

In this conceptual vacuum, a common assumption that employer expectations pertain primarily, if not solely, to technical expertise underlays some of the policy analysis and public rhetoric surrounding workforce development. For example, in advocating for more students to attend technical colleges, Wisconsin Manufacturers and Commerce argues that “technical skills” are the primary set needed to get a manufacturing job that requires more than a high school diploma but less than a bachelor’s degree (Morgan, 2013). This assumption is further evident in that most policy recommendations fail to address the development of the so-called “soft” skills and instead focus on technical training. Without terminological clarity regarding the types of skills employers desire, it is difficult to determine precisely what is needed to meet the workforce-related challenges of the 21st century.

Second, further complicating policymakers’ and educators’ attempts to better align employer expectations for workers’ skills and the educational curricula is the lack of empirical data about these expectations. For example, no data on employer expectations, either across multiple sectors or focused on a single industry, exist for Wisconsin. The Manufacturing Careers Partnership is addressing this very problem by canvassing employers to identify their expectations for worker skills and to forge partnerships between employers and local technical colleges (Manufacturing Careers Partnership, 2013).

⁷ In addition, the term “skills gap” is used very loosely and often without being defined. Toward addressing this issue, the ACT released in 2011 a report titled “A better measure of skills gaps: Utilizing ACT skill profile and assessment data for strategic skills research” (ACT, 2011).

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Third, related to the assumption that employer expectations center on technical expertise, the types of programs and curricula being discussed in relation to state policy tend to center on traditional vocational training initiatives. While excellent career and vocational training programs exist throughout the state, many do not pay substantial and/or explicit attention to the development of non-technical skills. For example, the Wisconsin Youth Apprenticeship program for manufacturing requires expertise in skill areas such as welding, machining, and safety, but no such requirements are in place for skills related to collaborative work, problem-solving, or critical thinking (Wisconsin Department of Workforce Development, 2013). A promising development is the widespread promotion of apprenticeships, which, as noted, embody key principles of the learning sciences. What remains unexplored are the types of classroom pedagogy instructors in 2- and 4-year colleges and universities can adopt to facilitate student expertise in a variety of skill sets.

Ultimately, imprecise or incomplete conceptions of what employers and policymakers mean by the term “skills” and the paucity of evidence about the precise nature of employer expectations are problematic when assumptions about these very phenomena are shaping public policy and curricular recommendations.

Evidence from the Field: What are Manufacturers Experiencing?

In light of the importance of the skills gap for workforce development and educational policy in Wisconsin and nationally, it is important to understand precisely what employers need as they begin hiring in a recovering economy. While statistical analyses of large datasets are more common in studies about the labor market, research that captures the actual experiences and sentiments of people “in the field” provides an important complement to studies that necessarily lack such attention to context and individual experience. This observation is not intended to promote any particular methodological approach to the analysis of education-workforce alignment over another. Indeed, the utilization of a diversity of data types and analytic techniques, or what is known as methodological pluralism in the social sciences, is widely recognized as a promising approach to address our most intractable and complex problems, especially in the educational sector (Johnson & Onwuegbuzie, 2004). I make this observation because the debate about the skills gap in Wisconsin has also become one about research methodology. For some critics of the skills gap meme, research that is not based on statistical analyses of large datasets is considered insufficient grounds upon which to claim the existence of a skills gap (Levine, 2013). An argument on the existence (or lack thereof) of a skills gap is not advanced in this working paper, but I do argue that qualitative data such as that obtained through interviews, job-site observations, and archival analyses can be useful complements to other types of analyses.

Thus, I report findings from a survey of 181 Wisconsin manufacturers administered by Wisconsin Manufacturers and Commerce staff as part of a statewide “listening tour” of companies conducted during the winter of 2011-2012.⁸ While the data reported here are based on a single industry, the results are consistent with the research literature across multiple sectors. To

⁸ Wisconsin Manufacturers and Commerce is a statewide chamber of commerce, and the state’s largest business and trade organization. The WMC is involved in policy development and legislative affairs, as well as research and advocacy on business-related issues. The companies included in the survey range in size from six to 5,000 employees with an average size of 343. Most respondents to this survey were chief executive officers of companies.

complement these survey data, I provide insights from a new interview-based study on employer expectations initiated in March 2013 through the University of Wisconsin–Madison Center for Education and Work.

Demand for New Employees

First, survey respondents were asked whether they were actually hiring. One hundred fifty-three or 85% of the respondents indicated that they were seeking new employees. One hundred twenty-seven (70%) reported that the available positions were new, while 108 (60%) stated that they were filling existing openings.⁹ These responses are consistent with reports that the manufacturing sector is rebounding and adding workers at a high rate (Institute for Supply Management, 2013; Newman, 2013).

Difficulties Finding Skilled Applicants in the Labor Market

Next, survey respondents reported whether they were experiencing difficulties in finding qualified applicants for these positions. One hundred thirty-four (74%) stated that they found it difficult to attract applicants with the requisite skills for the open positions. Respondents also could indicate for which specific job titles qualified applicants were particularly tough to find (Figure 1).

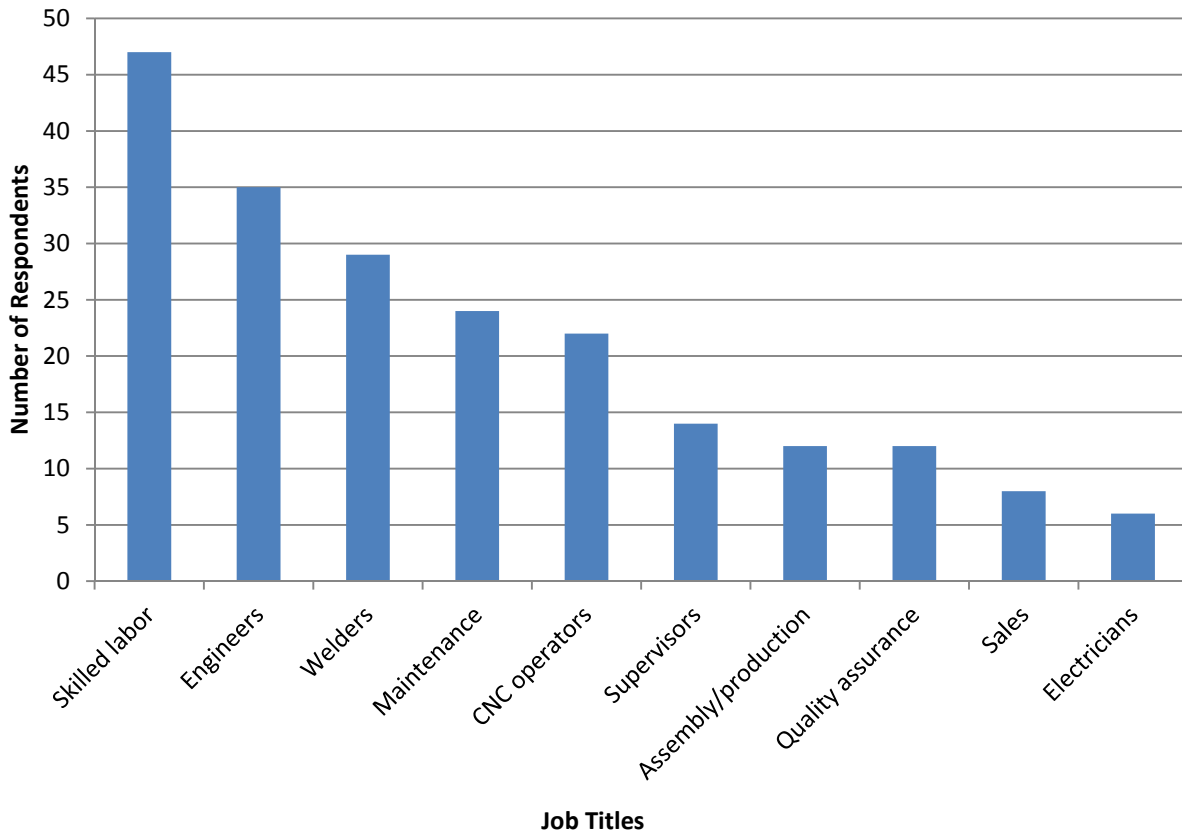


Figure 1. Manufacturers’ reported difficulty in finding job applicants

⁹ Seventy-eight respondents indicated that they were hiring for new and currently available positions.

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These responses indicate that for this sample of manufacturers, demand for new employees is centered on discrete job categories. In breaking down “demand” to more specific jobs, each with corresponding requirements for training and skill sets, a nuanced view of the types of skills employers desire is obtained. In particular, demand appears high for general skilled labor, various types of engineers, welders, maintenance workers, and computer numerically controlled (CNC) machine operators.¹⁰

For each of these position categories, a distinct type of postsecondary training is required. For example, engineers generally require a baccalaureate degree or higher, whereas welders may require a high school diploma and some specialized vocational training. The unique nature of each of these position types also influences the challenges associated with recruitment. In one interview, a manufacturer noted that a search to fill a position that required operating custom-built machinery in their factory was open for more than 8 months until they realized that it was unlikely that an external candidate would know how to use the machine. Eventually they trained an internal candidate. Another employer observed that intangibles such as company culture often factor into their hiring decisions, such that the successful applicant would have a certain set of hard and soft skills that would match the company. When applicant suitability with company culture is a priority, one employer characterized the search process as “like looking for a needle in a haystack.”

Specific Skills that Employers Desire in the Applicant Pool

Survey respondents were also asked the following question: “If you are having trouble hiring, why?” As shown in Figure 2, response options included academic (e.g., reading, math) and general (e.g., social, general education, work ethic) skill sets. In addition, respondents were provided with an “other” category, which many filled out with some combination of “technical” or “mechanical” skills.¹¹

¹⁰ These data are based on responses to an open-ended question asking respondents about the types of jobs they were having difficulty filling. Respondents used a variety of names and titles to describe most position categories so that the analysis entailed re-coding each response to standardize position names. For example, respondents used the following terms for the category titled “engineers”: “engineers,” “engineering,” “electrical engineers,” “production engineers,” and “engrs.”

¹¹ Given the fact that respondents were not provided with the response option for “technical” or “mechanical” skills, these results likely underrepresent the importance of these skill sets for employers. That said, the results still indicate that other types of skills register with employers as equally or more important for their businesses.

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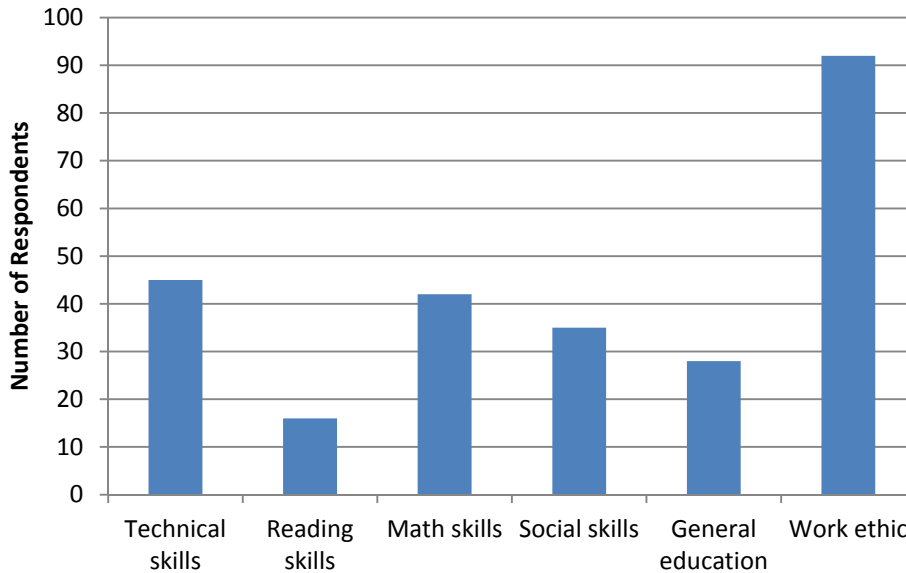


Figure 2: Types of skills lacking in applicant pool

These results provide insights into the types of skills that Wisconsin manufacturers most desire out of their workforce. First, technical skills are considered by 25% of respondents as a factor impeding hiring, followed closely by mathematic skills (23%) and social skills (19%). However, the results underscore the importance of one type of skill in particular—that of work ethic. Work ethic is a complex idea and means different things to different people. For one employer, a good work ethic simply meant consistently showing up to work on time, whereas for another it also entailed being diligent, hard-working, and committed to the company. In any case, the large number of respondents claiming that poor work ethic is a major reason inhibiting their hiring underscores the important role that non-technical skills such as these play in the hiring process. The importance of work ethic, as well as employers’ desire for multiple skill sets is illustrated by the following observation made by a Wisconsin Manufacturers and Commerce staff person who conducted several focus groups.

“While technical skills training is required, and soft skills are lacking, the most significant issue facing manufacturers in hiring and retention is work ethic. This was the clear consensus and nearly unanimous opinion of the 14 companies present at three listening sessions last week.”

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Additionally, respondents could indicate that non-skill factors were impeding hiring such as industry image, low wages, drug and alcohol abuse, and location (see Figure 3).

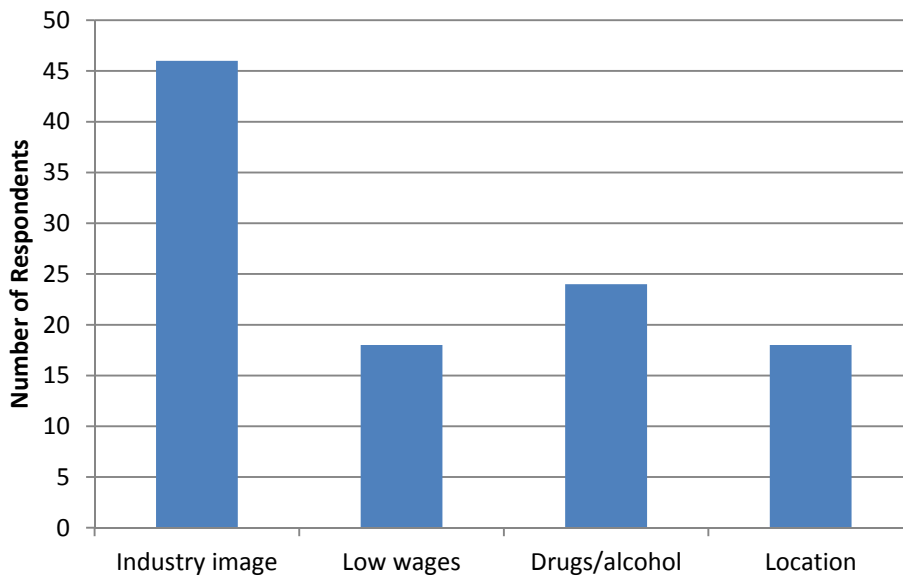


Figure 3. Non-work-skill factors that impede hiring

Wisconsin manufacturers face two important issues. First, technical skills are not the primary issue facing their need for qualified applicants. Second, the difficulty in finding skilled applicants is rather complex, involving a range of factors that include individuals' work ethic and the poor image of the manufacturing industry. These results suggest that policymakers, employers, and educators should not focus only on technical skills, whether on their absence in the labor pool as a cause of sluggish economic growth or on the development of those skills as the sole goal of workforce development and education policy.

What Types of Educational Preparation is Required for Available Positions?

Finally, respondents reported on the types of educational preparation required for positions open at their companies (see Figure 4).

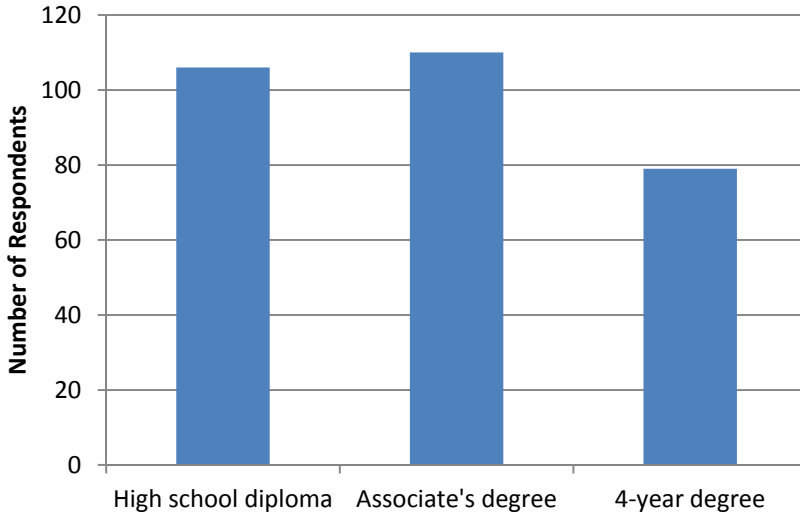


Figure 4. Manufacturers’ desired education level for employees

These results indicate that a majority of respondents feel that a high school diploma (59%) or an associate’s degree (61%) is required for employment at their companies. In addition, almost half of the respondents (44%) reported that a baccalaureate degree is necessary to obtain a position. These data are consistent with prior research suggesting that 61% of the future job openings in Wisconsin will require some sort of postsecondary education (Carnevale & Smith, 2011).

Recommendations

Based on the data presented in this working paper, it is clear that no single skill is in demand by employers. Instead, clusters of desired skills encompass a variety of skill types. These results are consistent with much of the research literature and policy analysis on skills development and workplace expectations. Effective public policy can help ensure Wisconsin students have the skills to succeed in the globally competitive 21st century economy. Toward achieving this goal, I offer five recommendations to educators and policymakers.

Recommendation 1. Develop a comprehensive view of “skills” that extends beyond a singular focus on technical, task-specific skills.

The evidence is clear that employers seek workers who exhibit proficiencies in a variety of skill types, including foundational and technical skills specific to a particular industry or field, as well as more broad-based skills including collaboration, communication, abstract reasoning, and a strong work ethic.

Thus, instead of assuming that only technical, content- or task-specific proficiency is necessary for students’ success, policymakers must recognize that a sole focus on these skills would do students a disservice in terms of preparing them for the workplace. The implications of

adopting such a comprehensive view of skills are twofold: (1) support workforce development initiatives that target multiple skill types, and (2) encourage educational curricula and pedagogy that facilitate expertise in a variety of skill areas.

Recommendation 2. Support workforce development initiatives based on how well they reflect this comprehensive view of skills.

Based on this comprehensive view of what constitutes skills, policymakers and those engaged in workforce development initiatives, such as the new Office of Skills Development, should support programs that target student proficiencies in a variety of skill sets. For example, a certificate program in welding should not only focus on the technical aspects of shielded metal arc welding, but should also offer students opportunities to gain experience working in teams, solving authentic problems in real-world situations, and communicating with customers and co-workers. This proposition requires program designers to balance the needs of student employability and the imperative to provide educational experiences that cultivate fundamental intellectual skills.

Recommendation 3. Encourage interactive instruction and apprenticeship-type experiences that cultivate a diverse range of skills.

Next, ways to cultivate a broad range of skill types in and out of the classroom are well-known and should be supported through workforce development grants and educational policy. These include interactive instruction and apprenticeship programs. While the real-world learning experiences apprenticeships afford are widely promoted, less attention is paid to how students' classroom experiences can cultivate skills that will benefit them as they enter the workforce.

Pedagogical approaches such as peer instruction and problem-based learning are already at the heart of educational reform initiatives, particularly in the science, technology, engineering, and mathematics disciplines, as they cultivate not only content knowledge, but also skills in critical thinking, problem-solving, and communication. In this moment of attention on workforce development, policymakers have the opportunity to advocate effective instructional practices that have the dual benefit of enhancing student learning and cultivating within student skill sets that employers widely desire. Toward achieving this goal, resources should be allocated to support teacher professional development in interactive teaching methods at 2- and 4-year colleges and universities, with care taken to tailor such initiatives to the needs of each institution.

Recommendation 4. The perception that many job applicants and employees lack a strong work ethic is widespread, and should be addressed by policymakers, educators, and the community at large.

It is clear from the literature and the data reported in this working paper that the work ethic of many employees is perceived as a considerable problem in today's labor market. Given the multi-faceted influences that shape an individual's approach to work, addressing this problem is not the responsibility of a single entity but instead will require the efforts of the community at large. In terms of educator's roles, however, some promising examples of addressing work ethic issues in the classroom do exist. For example, instructors at Wisconsin Indianhead Technical College explicitly focus on work ethic by strictly enforcing classroom rules, using assessments based on group work that fosters a sense of responsibility for one's peers, and holding high standards for the quality of all student work.

Recommendation 5. Expand views of the purpose of higher education to include both vocational preparation as well as fundamental intellectual development.

While students, parents, and taxpayers who support public institutions of higher education naturally want to know if and how attending Wisconsin's colleges or universities will help graduates find well-paying jobs, viewing the purpose of higher education solely through the lens of vocational preparation is a limited perspective. This is especially true if such preparation is synonymous with a sole focus on developing technical ability in a particular field. Instead, to be truly competitive in the job market of the 21st century, students should be acquiring those technical abilities as well as more transferable abilities, such as critical thinking and communication, that can be used throughout a career. Acquiring such a diversified skill set is important given that during the course of their lives students will need to utilize a variety of proficiencies as jobs, industries, and careers evolve. A focus on cultivating technical expertise as well as fostering overall intellectual development is consistent with employer expectations and broader views of the purpose of higher education that go beyond simply preparing students for the job market (Mamerow & Conrad, 2012).

Next Steps

With support from the National Science Foundation, a new study addressing the gaps in the literature highlighted in this working paper is being conducted by the Center for Education and Work at University of Wisconsin–Madison. This 3-year interview-based study will use interviews and site visits with more than 90 Wisconsin employers and educators to identify employer expectations related to worker skills and whether educators are cognizant of these expectations and integrating them into their program curricula. The results from this study will provide Wisconsin educators and policymakers with rich, state-specific empirical data regarding the nature of the alignment (or misalignment) between employer expectations and the postsecondary curricula.

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