Reconsidering College Student Employability: A Cultural Analysis of Educator and Employer Conceptions of Workplace Skills

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In this research article, Ross J. Benbow and Matthew T. Hora explore the employability narrative, a view that focuses on whether colleges and universities provide students with the skills they need to be productively employed after graduation. Using sociocultural theory to problematize this narrative and qualitative methods to foreground the experiences of postsecondary educators and employers, the authors investigate conceptions of essential workplace skills in biotechnology and manufacturing fields. Their results show that though work ethic, technical knowledge, and technical ability represent core competencies valued across these communities, considerable variation exists in how members of different disciplinary and occupational subgroups value and conceptualize important skills. They found that respondents' conceptions of skills were also strongly tied to geography and organizational culture, among other contextual factors. With these results in mind, the authors conclude that skills are best viewed as multifaceted and situated assemblages of knowledge, skill, and disposition—or cultural models—and urge the adoption of more nuanced views among educators, employers, and policy makers that take into account the cultural and contextual forces that shape student success in the workplace.

Keywords: higher education, skills, cultural capital, employability, cultural models

A prevailing narrative shaping discussions about the role and purpose of postsecondary education in the early twenty-first century focuses on graduates' "employability skills" and whether colleges and universities provide students with skills, knowledge, and abilities that will lead to productive employment.

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While the discourse has its roots in 1980s-era concerns about national economic competitiveness and schools' preparation of workers for the "new" economy (e.g., Cappelli, 2015), accountability pressures in education and worries about the rising cost of college in the wake of the 2008 recession have refocused scholars' and policy makers' attention on graduates' place in the labor market. Like the closely related "skills gap" argument (Hora, Benbow, & Oleson, 2016), which imagines a wide mismatch between the skills colleges and universities instill in students and the skills businesses need, the employability narrative effectively frames colleges as solely responsible for giving students skills that would satisfy employer demands, spur economic growth, and facilitate social mobility (Moreau & Leathwood, 2006). This perspective on the role of higher education, which has seen the "employability" concept effectively embedded in coursework, graduation requirements, and accountability frameworks (Clarke, 2017; Holmes, 2013; Tomlinson, 2017), has become one of the most influential narratives shaping postsecondary policy and practice around the world today.

Informing much of the discourse is a panoply of lists of valuable skills that college students should acquire in order to find success, including teamwork, problem-solving, adaptability, work ethic, and conscientiousness (e.g., Partnership for 21st Century Learning, 2018; Pellegrino & Hilton, 2012; Rowan-Kenyon et al., 2017). Some of these skills frameworks and related policy initiatives have proven to be highly influential, such as the framework for twenty-first-century competencies (Pellegrino & Hilton, 2012) in the United States, which centered on cognitive and inter- and intrapersonal competencies; the Mayer Report in Australia, which focused on intellectual abilities, basic skills, and personal attributes (Curtis & MacKenzie, 2001); and the Dearing Report in the United Kingdom, which emphasized numeracy, communication, information technology, and learning how to learn (Dearing, 1997). Based on the need to develop a shared language so that policy makers, educators, employers, and students can avoid "misalignments" between postsecondary education and employer expectations (e.g., Business Higher Education Forum, 2010; Institute for Higher Education Policy, 2014), these skills frameworks and lists are deliberately generic and not tailored to specific disciplines, occupations, or sociocultural contexts (Clarke, 2017). There are a number of critiques of this view, however, including its reliance on all-purpose skills lists separated from occupational settings and the notion that discrete skills alone ensure student success in the labor market.

In this article we problematize the employability narrative by integrating cultural models and cultural capital theories, a framework that allows us to conceptualize skills, knowledge, and abilities as cultural artifacts internalized from one's social (and educational) environment that can then be used to gain position, power, and prestige (Bourdieu, 1986; Lizardo, 2004; Strauss & Quinn, 1997). With this framework, we investigate how 152 educators and employers in particular disciplinary, industrial, and geographic contexts—bio-

technology and manufacturing postsecondary and business organizations in the state of Wisconsin—perceived valuable workplace competencies. Using free lists, inductive thematic analysis, multidimensional scaling (MDS), and network affiliation techniques, we document respondents' insider views about skills, their underlying structure and interconnections, and how contextual factors shaped the way skills were conceptualized.

While results confirm some aspects of extant skills frameworks associated with the employability narrative, we found that study participants did not discuss skills as uniform, distinct, unrelated competencies. Instead, they viewed skills idiosyncratically, as exhibiting differing core and peripheral structures—mapped two-dimensionally with MDS as a dense, central cluster of skills viewed similarly surrounded by an outer, sparser space of unconnected terms (Borgatti, 1998; Borgatti & Everett, 1999)—and also as being inextricably linked to one another and to specific occupational contexts and cultural communities. Based on these findings, as well as the reported prevalence of hiring processes based on assessing applicants' "cultural fit," we raise questions here about how useful generic skills frameworks are for explaining graduate success. With these findings in mind, we argue that postsecondary educators should resist the employability perspective that the accumulation of discrete skills alone can guarantee employment and instead adopt a more nuanced view that takes into account the cultural and contextual forces that shape student disposition, satisfaction, and success.

The Employability Narrative and Skills Lists

While the notion that higher education should primarily focus on workforce training has long been a part of the postsecondary landscape (e.g., Grubb & Lazerson, 2009), the construct of "employability" is a more recent development. Several trends coincided in the 1980s that led to a growing focus on college student employment after graduation: the continued massification of higher education, the growth of market-oriented governing ideologies, and the rise of a knowledge- and technology-driven economy that placed new demands on graduates and workers (Moreau & Leathwood, 2006; Tomlinson, 2012). Perhaps the most important factor driving the graduate employability narrative, however, was a steady drumbeat of employer complaints regarding the skills, knowledge, and abilities of college graduates, a deficiency, some argued, that would ultimately slow economic growth—the skills gap narrative (Cappelli, 2015). The authors of the US Department of Labor's (1991) Secretary's Commission on Achieving Necessary Skills (SCANS) report, for instance, ominously warned that teaching would need to change at all levels; unless it did, "neither our schools, our students, nor our businesses can prosper" (p. vii). The argument that educational systems had not caught up to workplace skills demands was echoed in the Dearing (1997) report in the United Kingdom and in the Mayer Report (Curtis & MacKenzie, 2001) in Aus-

tralia, resulting in a worldwide discourse centered on student employability (Moore & Morton, 2017).

But what precisely does *employability* mean? In early discussions, the construct was often conceptualized as a binary that could be captured by a measurement of employment status: one was either employable or not (Williams, Dodd, Steele, & Randall, 2016). Later scholars argued that employability was a far more complex phenomenon representing a continuous process of personal development rather than simply whether one had a job. One widely cited definition, for example, emphasizes "a set of achievements, skills, understandings and personal attributes, that make graduates more likely to gain employment and be successful in their chosen occupations" (Yorke, 2005, p. 410). This definition best illustrates the prevailing view that employability is a multidimensional construct implicating a person's skills, knowledge, and personality (Fugate, Kinicki, & Ashforth, 2004; Jackson, 2016).

As these concepts have developed, however, the discourse has come to be accompanied by demarcated lists, frameworks, and taxonomies of skills presumed to be valuable in the workplace. To the credit of their authors, many skills frameworks contain an implicit view that "skills" are more complex and varied than the dictionary definition of "the ability to use one's knowledge effectively and readily in execution or performance" (Merriam-Webster, 2018). Instead, scholars have long made distinctions between different types of skills, such as soft and hard skills (Andrews & Higson, 2008) and cognitive and noncognitive skills (Farkas, 2003). A selection of skills frameworks often featured in employability discussions is included in table 1.

Along with pressure from policy makers and business interests to more closely align tertiary programming with employer needs, lists of valuable skills have played an increasingly influential role in shaping higher education policy and practice through labor-market-oriented performance schemes, in which colleges and university funding is dependent on graduate employability metrics; skills- and competency-based curricula, where skill outcomes like "learning to learn" or "self-reliance" are embedded in course and degree program requirements; and work-based learning obligations, in which graduation is conditional on internships or job placements (Hora et al., 2016; Holmes, 2013; Moore & Morton, 2017). The influence of these lists, and of the broader employability narrative, however, has opened up the discourse to considerable critique.

The first critique is that the employability discourse and attendant skills frameworks tend to focus on generic, decontextualized accounts of competence (Andrews & Higson, 2008; Clarke, 2017; Jackson, 2016). Methodologically, skills lists are typically developed by panels of experts—or from surveys with a priori lists of skills that respondents are asked to rank (Suleman, 2017)—with little open-ended input from stakeholders who have firsthand experience of education and workforce development. Skills lists, therefore, are divorced from the occupational, organizational, and sociocultural contexts in which

TABLE 1 *Selection of skills frameworks informing student employability discussions*

Framework for 21st Century Learning	*21st-century competencies**	*Social, emotional, and affective (SEA) factors*	*Forms of graduate capital*	*Characteristics of employability frameworks*
Learning skills	*Cognitive competencies*	*Approach to learning*	*Human capital*	*Capital components*
Creativity	Cognitive processes	Attention control	Knowledge	Human capital
Critical thinking	Knowledge	Growth mind-set	Job performance	Social capital
Problem-solving	Creativity	Metacognition		Cultural capital
			Social capital	Psychological capital
Information skills	*Intrapersonal*	*Intrapersonal skills*	Networks & contacts	
Information literacy	Intellectual openness	Adaptability		*Career management*
Media literacy	Work ethic	Conscientiousness	*Cultural capital*	Signal management
	Positive core self-evaluation	Self-efficacy	Cultural knowledge	Self-management skills
Life and career skills			Cultural awareness	
Adaptability	*Interpersonal*	*Social skills*		*Contextual factors*
Self-direction	Teamwork	Active listening	*Identity capital*	Labor market structure
	Leadership	Collaborative skills	Work identity	Personal circumstances
21st-century themes		Empathy	Career insights	
Global awareness				
Civic literacy			*Psychological capital*	
			Resilience	
			Adaptability	

Note: *The example competencies listed here are "clusters" for each competency group.

Sources: Partnership for 21st Century Learning (2018); Pellegrino and Hilton (2012); Rowan-Kenyon, Savitz-Romer, Weilundemo Ott, Swan, and Liu (2017); Tomlinson (2017); Williams, Dodd, Steele, and Randall (2016).

such competencies are cultivated, assigned value, and deployed (Clarke, 2017; Jackson, 2016). This is especially problematic when one considers the unique norms and practices that differentiate disciplinary and professional groups, entry into which involves complex and time-consuming processes of enculturation (Lave & Wenger, 1991). Indeed, research in different contexts has shown that competencies cannot be adequately understood or cultivated outside specific disciplinary settings (e.g., Dannels, Palmerton, & Gaffney, 2017). In part to capture new perspectives on this issue, some scholars have begun to use interview and other field methods to allow employers, educators, and students to articulate skills needs in their own language and voice, thereby enhancing the ecological validity of resulting data (Andrews & Higson, 2008).

An associated critique is that treating skills as distinct, individualistic traits conveys an inaccurate picture of how skills, knowledge, and abilities are valued in practice and internalized via cognitive processes. In practice, both students and employers view skills as "synergetic compilations" of competencies (Andrews & Higson, 2008, p. 419), or clusters of interconnected skills that build on, relate to, and work in cooperation with one another as individuals perform various tasks. Indeed, research suggests that this notion mirrors how information is stored in the human memory as interconnected neural networks that encode particular memories, sensations, and information. As the saying goes, neurons that fire together wire together (Lowel & Singer, 1992); repeated activations of these neural networks become strong, habituated forms of thought and behavior. An important idea in cognitive psychology is that the particular environmental and sociocultural contexts in which the information or skill was originally encoded become perennially associated with it, such that certain stimuli become triggers for specific neural networks (Brown, Collins, & Duguid, 1989). When such cognitive networks are either associated with or internalized through specific communities or socially sanctioned practices, they can be considered "cultural models," mental representations of particular knowledge, norms, or behaviors that are socially distributed (Strauss & Quinn, 1997).

Perhaps most importantly, the employability discourse has also been critiqued for equating students' possession of the "right" skills with employment, thereby ignoring the role business cycles, corporate hiring practices, social networks, cultural capital, and structural inequalities play in influencing access to education and job opportunities (Holmes, 2013). A singular focus on the supply side of the education-workforce equation assumes that the demand side is unproblematic, despite ample evidence regarding inequalities in higher education access, retention, and outcomes (e.g., Bastedo & Jaquette, 2011; Davies & Guppy, 1997; Jacobs, 1996; Reay, Davies, David, & Ball, 2001) and hiring discrimination along race, class, and gender lines (e.g., Bertrand & Mullainathan, 2004; Gorman, 2005; Moss & Tilly, 1996; Pager, Bonikowski, & Western, 2009; Rivera, 2012; Rivera & Tilcsik, 2016; Rooth, 2010). In response to this critique, some have linked the employability narrative not only to growing

corporate-oriented perspectives in higher education but also to the dehumanizing view that people are simply "bundles of skills" to sell on the job market (Urciuoli, 2008). In response, alternative views of employability have incorporated elements of both the labor market and personal development (e.g., Williams et al., 2016), emphasizing that, for real people in the real world, entering a profession involves undergoing a series of intellectual and social development phases within particular economic circumstances (Fugate et al., 2004; Jackson, 2016).

A Cultural Framework for Skill Internalization and Practice

In light of these critiques, we draw on two distinct yet related theories, including cultural models theory from cognitive anthropology and cultural capital theory from sociology, to examine how different disciplinary and role groups define and value important workplace competencies.

First, we conceptualize skills as knowledge and abilities acquired from one's sociocultural environment, modeled after caregivers and role models from the community, and cognitively internalized through education, a perspective that asserts a claim on both the origins and the location of "skills" within a person. A key idea in cultural models theory is that these cognitive structures are complex neural networks embedded in the situations from which they derive (Strauss & Quinn, 1997). Shouldering much of the cognitive burden inherent in our complex, day-to-day interactions (e.g., DiMaggio, 1997), these models act as encultured, shared theories of how "people, events, and objects fit together" (Ferrare & Hora, 2014, p. 793), cued by specific features of our environment and as heterogeneous as the variable social settings in which we interact. As such, cognitive activity is viewed not solely as an "in the head" phenomena but as one that is "distributed—stretched over, not divided among—mind, body, activity and culturally organized settings" (Lave, 1988, p. 1). In this way, situations, material items, and other actors are principle components of, as well as affordances and constraints on, reasoning and practice (Resnick, 1991), so much so that human action can be better understood as it is reflected in shared norms and common understandings (Lave, 1988). There are a variety of ways to study such culturally shaped competencies, such as free-listing (respondents list terms they associate with certain social or cultural categories) and pile-sorting (respondents group such terms by similarities or differences) exercises that explore the content and underlying structure of cultural domains (Borgatti, 1994). In this study we view conceptions of essential workplace skills as distinct cultural domains for particular role groups—educators and employers in manufacturing and biotechnology fields.

Second, a core idea in sociology, which we link to cultural capital theory, is that status attainment is dictated not only by credentials or academic knowledge but also by social connections, inequitable structural forces, and personal characteristics (e.g., race or class) that can act as a "signal" to employers

tacitly communicating an individual's perceived predilections and abilities (Farkas, 2003). Bourdieu (1986, p. 46), in particular, argued that the influential theory of human capital reduced these complex interactions in the social world to an ahistorical "mercantile exchange." Instead, he focused on how the transmission of cultural capital—unequally embodied attributes and embodied competencies that are valued and rewarded within particular social settings and contexts—acts as a form of social currency in the labor market, a focus that has been embraced by some scholars of employability (e.g., Clarke, 2017; Tomlinson, 2017). Understood in a relative rather than an absolute sense (e.g., Prieur & Savage, 2011), cultural capital accrued through socialization and learning experiences allows an individual to advance in her social field, gaining competitive advantage or prestige depending on the situation and setting (Bourdieu & Passeron, 1977).

With the view that skills are internalized forms of culturally bounded competence that can be deployed as cultural capital in the labor market (Lizardo, 2004), we sought to interrogate the employability narrative by documenting the insider views of those most closely involved in the education and the employment of postsecondary graduates: higher educators and employers. In specific reference to these subgroups, we answer three research questions: (1) What skills are valued and how are they conceptualized by educators and employers? (2) How are these valued skills structured among educators and employers? (3) What contextual factors, if any, impact how educators and employers conceptualize, structure, and use valued skills?

Methods

The qualitative case study (Yin, 2013) we report on focused on conceptions of valuable workplace skills among two role groups (educators and employers) within two disciplinary and industrial sectors (advanced manufacturing and biotechnology) in the state of Wisconsin. We selected these fields because they encompass science, technology, engineering, and mathematics (STEM) occupations that analysts consider to be important drivers of the US economy (Carnevale, Smith, & Melton, 2011) and also because they represent a traditional cornerstone of Wisconsin's economy (manufacturing) as well as a rapidly growing industry (biotechnology). Seeking to describe insider perspectives, we regarded respondent views as comprising unique domains of cultural knowledge for a group, the distinctiveness, content, and structure of which was an open, empirical question.

Sampling and Data Collection

Using Wisconsin's Economic Development regional guidelines (Forward Wisconsin, 2016), we began by focusing on hub cities within six demarcated state regions with high concentrations of firms in the two sectors as well as on associate- and bachelor-level college and university programs channeling students

into these sectors. For manufacturing, the latter included educational programs in the applied sciences, electronic systems, mechanical and industrial engineering, and industrial automation; for biotechnology, we included programs in biochemistry, biology, microbiology, and biotechnology. Wisconsin hub cities and regions included Madison in the southern region; Wausau in the central region; Green Bay in the eastern region; Milwaukee in the southeastern region; Superior in the northern region; and La Crosse in the western region.

Using a nonrandom purposive sampling technique, we created sampling frames for employers and educators in and around each of the six hub cities from state and industry-specific lists of firms and from higher education institution web pages. We then contacted these educators and employers via telephone and e-mail to request their participation. Ultimately, 75 employers representing 52 companies and 77 educators representing 17 postsecondary education institutions participated in the study. Of the companies, 43 were manufacturing firms and 9 were biotechnology firms. Of the postsecondary institutions, 8 were associate-level institutions and 9 were bachelor-level institutions. Tenure-track faculty, contingent faculty, and associate deans participated as educators; human resource coordinators, chief executive officers, supervisors, and workplace trainers participated as employers (table 2).

A team of three researchers conducted interviews between late 2013 and early 2015 using a semistructured protocol that included a free list exercise and several open-ended questions. Free list exercises elicit words, terms, or phrases that individuals and groups use to refer to a specific conceptual sphere or cultural domain (Borgatti, 1998). For our free list, we asked respondents to verbally provide, in single words or short phrases, the skills that immediately came to mind that they thought were necessary for people to succeed in their sector's workplace. Following this exercise, we asked respondents questions that focused on views and conceptions of workplace skills they found to be valuable teaching and training practices, and hiring procedures. Interviews lasted approximately forty-five minutes and were recorded and transcribed for analysis.

Data Analysis

Our analyses began with a review of the raw free list data, which revealed that twenty-four respondents had not provided information in a usable form because they did not understand the free list question, refused to be recorded, or believed their occupation or organizational role did not allow them to comment on valued skills. This resulted in a final count of 128 free lists for analysis. Then, because respondents listed "native" terms that were closely related but phrased differently (e.g., "work ethic," "hard worker," "dependable worker"), two analysts reviewed the raw data independently to develop lists of standardized terms and then met several times to discuss these terms before collaboratively developing a final list of ninety-four standardized terms (Quinlan,

TABLE 2 *Description of sample*

	Interview *n*	*Percentage* *%*	*Free-list* *n*	*Percentage* *%*
Total	152	100.0	128	100.0
Gender				
Male	92	60.5	80	62.5
Female	60	39.5	48	37.5
Region				
Southern	48	31.6	47	36.7
Central	27	17.8	26	20.3
Eastern	27	17.8	19	14.8
Southeastern	18	11.8	15	11.7
Northern	20	13.2	16	12.5
Western	12	7.9	5	3.9
Employers				
All employers	75	49.3	65	50.8
Manufacturing	64	42.1	56	43.8
Biotechnology	11	7.2	9	7.0
Educators				
All educators	77	50.7	63	49.2
Manufacturing	32	21.1	40	31.3
Biotechnology	36	23.7	23	18.0
No subgroup affiliation	9	5.9	-	-

2005). Using Anthropac (Borgatti, 1996), a software program designed to collect and analyze cultural domain–oriented information, we then analyzed data to derive term salience, a measure used in cognitive anthropology that reflects the average order and percentile rank of a term across all respondent lists (Smith & Borgatti, 1997). Salience is computed as

$$s_j = 1 \frac{r_j 1}{n1}$$

$$s_j = \frac{n r_j}{n1}$$

where r_j = position of item j in the list and n = number of items per list. To identify the overall saliency index, the average s_j across respondents is calculated. We conducted the free list analysis for role subgroups within disciplines (e.g., manufacturing educators and employers), the results of which are presented through saliency scores for each role and disciplinary subgroup.

We also present unstandardized terms uttered by respondents for three focal salient skill terms, as well as subgroup bar graphs in which the *y*-axis includes terms ordered by salience for the entire study sample and the *x*-axis depicts saliency scores (Borgatti, 1998). These analyses are presented below in answer to Question 1.

We analyzed responses to the interview questions using an inductive coding approach. Through multiple group readings of several transcripts, we began by developing codes through a priori research interests (e.g., valued skills) and emergent themes from the data (Charmaz, 2014). After discussing and testing multiple versions of the preliminary code list, three analysts simultaneously applied twenty-seven codes across nine thematic categories (Saldaña, 2013).

Next, we began second cycle coding focused on text coded as "valued skillsets" and "contextual factors" that we analyzed using a combination of a priori codes (e.g., the most salient skills) and inductively derived codes. During this phase, we assigned respondent statements to each code and compared successive instances of an idea to previous instances to confirm or alter emerging code definitions. After separately coding 10 percent of the data, analysts met to discuss differences and then collaboratively arrived at a final code list that one analyst used to code the remainder of the text fragments. These analyses are presented below in answers to Questions 1 and 3.

We also developed a participant-by-skill code matrix in which each cell indicates whether participant *i* spoke to skill *j* or not in her free list, converting this to an item-by-item matrix of co-occurrences in which different skills more often mentioned by the same participants accrued higher similarity scores (Borgatti, 1998). We used this proximity matrix to create MDS graphs in UCINET for each subgroup (Borgatti, Everett, & Freeman, 2002).[1] MDS graphs (Borg & Groenen, 2005) represent correlations among objects (here skills) as distances in a two-dimensional space. In nonmetric MDS, the graph displays the best possible configuration of the objects, although distances between objects are not linearly scaled but instead based on rank order. Here, the closer skill terms are to one another in a graph, the more often they were mentioned together by the participants in each subgroup. With reference to free list salience scores for each subgroup, we also circle "core" skills (commonly shared within the domain) and "peripheral" skills (more idiosyncratic) exhibited for each subgroup on these MDS graphs (Borgatti, 1998). Core skills for each subgroup are identified as terms with salience scores of .200 or above, an arbitrary cutoff point meant to encompass frequently mentioned skills in each subgroup for comparative purposes.

Finally, during the coding process we unexpectedly discovered a number of respondent reports regarding skill structure that we refer to as *skill-to-skill connections* and coded explicit references to these statements. Here, we marked instances of specific skills being connected, counted the number of respondents by subgroup making references to connections between particular skills

(teamwork and communication), and then developed a skill-to-skill similarity matrix in which each cell represents the proportion of subgroup members who reported instances of specific skills connecting to one another. We used NetDraw (Borgatti, 2002) to create network affiliation graphs from these similarity matrices for each educator and employer subgroup.[2] Each graph shows skills linked by lines of varying thickness that represent the proportion of respondents who referred to the particular skills being connected (DeJordy, Borgatti, Roussin, & Halgin, 2007). Thicker lines represent terms that were connected to one another more often. Along with MDS graphs, this analysis is presented below in answer to Question 2.

Study Limitations

Several limitations should be taken into account when considering our results. First, the small and self-selected nature of the sample precludes a generalization of the results to larger populations of employers and educators. Second, the employer sample is weighted heavily toward manufacturing representatives, as the biotechnology industry is proportionally much smaller in Wisconsin. Third, the interview protocol directed respondents to consider entry-level positions while answering the questions but did not indicate the specific experience or education required for these positions. While the occupations commonly referenced by participants included those requiring some postsecondary training but not a bachelor's degree, respondents could have answered the interview questions thinking of differing positions with differing educational requirements. Finally, it is important to point out that these data do not include the views of students and employees, those whose futures depend on the issues addressed in this article. While our focus is warranted given the difficulty in accessing employee populations and the rich insider knowledge (and power) educators and employers have regarding graduates' skills and successes, future research efforts would benefit from perspectives that allow scholars and practitioners to better understand students and employees as agents rather than subjects.

Results and Analysis

Question 1: What skills are valued and how are they conceptualized by educators and employers?

First, we report findings which demonstrate that study respondents valued and conceptualized essential workplace competencies in unique ways depending on their role and disciplinary affiliation. We report data from the free list exercise for the 128 respondents who provided usable terms using the saliency scores—a measure representing the content of each group's cultural domains for essential workplace competencies (Borgatti, 1994; Quinlan, 2005)—for the top fourteen standardized terms in each subgroup (table 3).

TABLE 3 *Employer and educator free-list saliency results by subgroup domain*

Manufacturing employers (n = 56)			*Biotechnology employers (n = 9)*		
Term	*Salience*	*Freq. %*	*Term*	*Salience*	*Freq. %*
Work ethic	**.374**	**58.9**	**Experience**	**.422**	**44.4**
Technical ability	**.333**	**53.6**	**Lifelong learning**	**.368**	**44.4**
Technical knowledge	**.305**	**41.1**	**Technical ability**	**.255**	**55.6**
Lifelong learning	.139	23.2	**Problem-solving**	**.222**	**22.2**
Problem-solving	.128	19.6	**Communication**	**.221**	**44.4**
Adaptable	.127	19.6	Work ethic	.199	33.3
Interpersonal	.126	21.4	Detail oriented	.187	33.3
Communication	.115	19.6	Self-motivated	.183	33.3
Teamwork	.108	17.9	Background	.116	33.3
Attitude	.108	16.1	Adaptable	.111	22.2
Self-motivated	.105	17.9	Intelligent	.111	11.1
Hands-on	.069	12.5	Teamwork	.106	22.2
Innovative	.065	14.3	Innovative	.093	11.1
Experience	.057	7.1	Attitude	.083	11.1

Manufacturing educators (n = 40)			*Biotechnology educator*s (n = *23)*		
Term	*Salience*	*Freq. %*	*Term*	*Salience*	*Freq. %*
Technical ability	**.301**	**52.5**	**Technical ability**	**.473**	**60.9**
Problem-solving	**.281**	**37.5**	**Technical knowledge**	**.272**	**43.5**
Technical knowledge	**.237**	**35.0**	**Work ethic**	**.239**	**39.1**
Work ethic	**.230**	**37.5**	**Critical thinking**	**.239**	**34.8**
Teamwork	**.203**	**35.0**	**Detail oriented**	**.222**	**34.8**
Communication	.180	32.5	**Communication**	**.206**	**34.8**
Self-motivated	.128	22.5	Teamwork	.191	30.4
Innovative	.127	20.0	Innovative	.184	26.1
Hands-on	.100	10.0	Problem-solving	.164	30.4
Detail oriented	.094	12.5	Lifelong learning	.093	17.4
Troubleshoot	.090	12.5	Troubleshoot	.078	17.4
Adaptable	.079	17.5	Interpersonal	.047	8.7
Efficient	.074	12.5	Self-motivated	.045	13.0
Lifelong learning	.073	12.5	Hands-on	.043	4.3

Note: "Core" skill terms are in bold.

These data indicate that members of each subgroup considered a delimited group of competencies as especially essential for the workplace, though each subgroup also varied in the composition and ordering of skills in their collective free lists. The manufacturing employers viewed three skills as highly salient, with scores of higher than .200 (work ethic, technical ability, and technical knowledge), while biotechnology employers had five mostly different skills in their high salience group (experience, lifelong learning, technical ability, problem-solving, and communication). Similar variability is evident in the two educator subgroups.

The variability between and among subgroups is also evident using bargraphing techniques. Here, for ease of comparison, we order the fourteen most salient skills across the entire sample on the *y*-axis (from lowest saliency at the bottom to highest at the top) with term saliency scores for each subgroup on the *x*-axis (figure 1).

Variation is evidenced by different bar spans where skills considered to be of low salience by one subgroup sample were considered highly salient by the other subgroup. Here, for instance, we can see that "lifelong learning" was considered a much more salient term among biotechnology employers (.368) than among manufacturing employers (.139).

To explore how respondents conceptualized essential workplace skills, we examine in greater depth three of the competencies that were highly salient across the sample: work ethic, technical ability, and problem-solving. We first report some of the native terms provided in the free list exercise, then follow with important themes from the interview data.

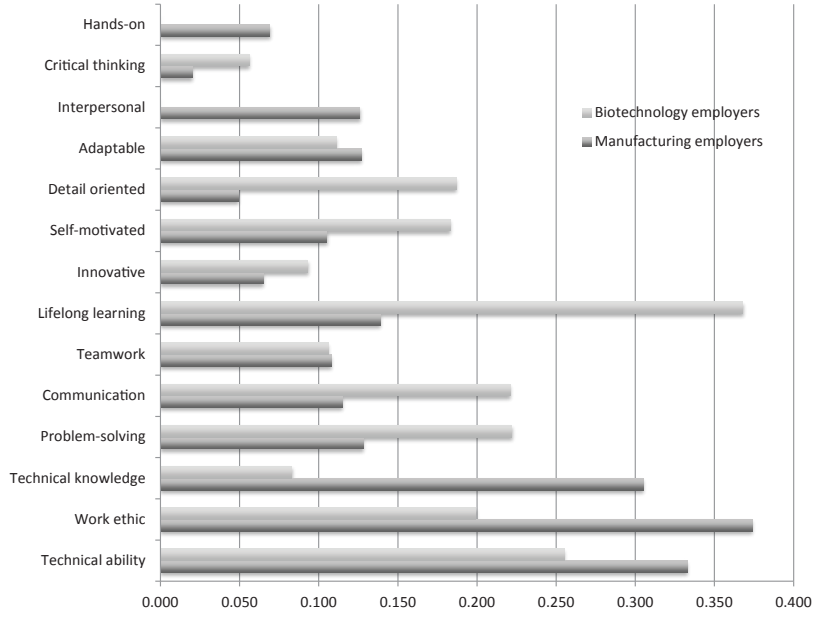
— Work Ethic

Work ethic plays an important role in how respondents across sectors think about and define success in workplace fields. While the term was reported verbatim by twenty respondents, a number of other linked terms were subsumed under work ethic for the purposes of the free list analysis. For manufacturing employers, the most frequently mentioned terms included "prompt," "attendance," "quality considerations," "dedicated," and "hard work." Biotechnology employers discussed work ethic with less frequency, using the terms "prompt," "responsible," "reliable," and "integrity." Manufacturing educators reported terms including "getting your hands dirty," "prompt," "productive," and "performing quality work," and biotechnology educators mentioned terms such as "punctual," "integrity," "quality work," and "being reliable."

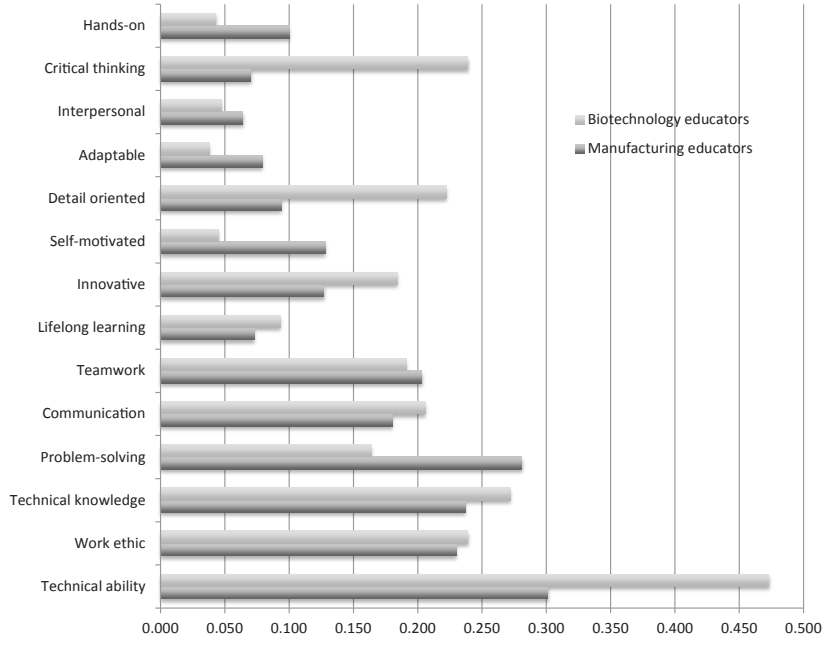
Significantly, many employers and educators in both sectors described work ethic more as an ingrained character trait than a malleable, learned competency, a finding that ties closely to conceptions of the moral value of work in the Protestant tradition (Furnham, 1984). In particular, many respondents tied work ethic to an employee's background and upbringing. "The difference between [a good and great employee] is work ethic, hands down," said one biotechnology employer. "They can be as brilliant as a person can be,

FIGURE 1 *Comparative skill saliency bar graphs by employer and educator subgroup domains*

Employers



Educators



but the one employee will do the job that they're assigned and then that's it, [and] the next one will do that same job and ask for more." Among manufacturing employers, a background in farming was often considered a sign of a good work ethic. As one manufacturing supervisor said, "If they grew up on [a] farm, generally they're hard workers, they work from dawn to dusk." The respondent's colleague agreed, referring to the work ethic acquired from a rural upbringing as "internal values." The imagery of working with one's hands was a notable theme in respondent descriptions of the character of work ethic, especially among manufacturing employers and educators, as was the subtle class-based contrast between physical labor in the blue-collar work world and tidier, more intellectual white-collar forms of employment.

— Technical Ability

Widely discussed in terms of the ability to perform procedures or tasks that were specific to particular occupations, disciplines, or workplaces, "technical ability" was only directly referenced by one respondent, with most respondents discussing more specific technical subjects or areas. For manufacturing employers, the most frequently reported term that was subsumed under technical ability was "mechanical aptitude," followed by "computer skills," and "technical skills." Specific technical skills discussed by manufacturers included "machining CNC" (the ability to run computer numerical control equipment) and "reading blueprints." For biotechnology employers, terms reported for technical ability included the tolerance for "repetitive" bench work, "lab skills," and keeping a "good notebook." For manufacturing educators, important technical abilities included "mechanical aptitude," "technical skills," "computer skills," and "data analysis," while biotechnology educators valued "computer skills," "data analysis," and "laboratory technique."

One theme related to technical ability was how respondents described it as much as an identity or a state of mind as a set of specific manual capacities. This state of mind, some suggested, allowed individuals to either understand (and enjoy) technical work or not. Several manufacturing employers said that an individual's particular sociocultural background and interests outside of work indicated whether or not they had technical ability. According to one manufacturing employer, "The guy who's a welder, in one sense, may go home and work on his truck at night . . . just as a piece of who they are." Echoing the view that an agricultural background was indicative of a strong work ethic, several respondents suggested that individuals who had worked on farms or were interested in cars—usually *men* with a mechanical "style of life" (Bidwell, 1989, pp. 129, 130)—were perceived as being most encultured into a milieu of technical ability.

— Problem-Solving

"Problem-solving" was mentioned verbatim by twenty-seven respondents, indicating its value across group cultural domains. For manufacturing employ-

ers, other similar terms referenced included "analytic thinking," "thinking on one's feet," and "investigation," and biotechnology employers used phrases such as "analytic" and "strategic thinking." Manufacturing educators discussed "thinking on one's feet," "asking the right questions," and "mechanical thinking," and one biotechnology educator talked about "clear thinking on the job."

The most pervasive theme regarding problem-solving centered on the notion of adequately framing a problem in ways that made it possible to detect its root causes and devise solutions. A manufacturing employer spoke of this ability in terms of situational recognition and of perceiving "the unobvious," whether in a broken machine or a dysfunctional system. Other respondents emphasized that this type of problem-solving was not about applying calculations or predetermined "fixes" to a situation. Instead, it entailed "thinking outside of the box" to determine the types of information required to find solutions and ultimately solve the problem. In this way, our respondents' discussions of this skill are consistent with prior research on the nature of problem-solving in the engineering workplace (Jonassen, Strobel, & Lee, 2006). Ill-defined problems require the ability to accurately diagnose conditions and select optimal solutions.

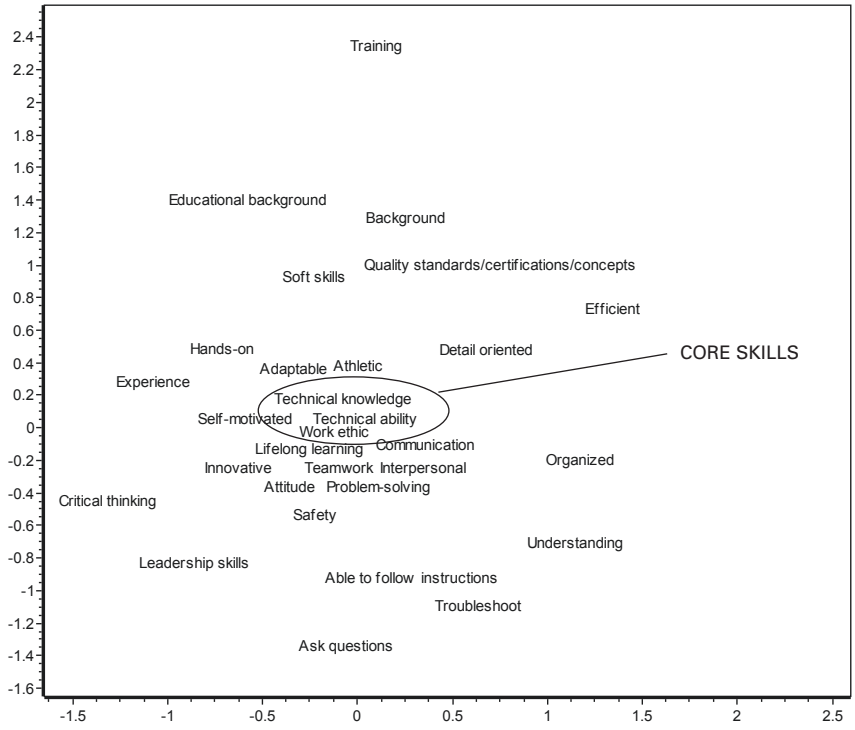
Question 2: How are valued skills structured among educators and employers?

To examine the structure of skill terms within subgroup cultural domains (Borgatti, 1994; Quinlan, 2005), we created MDS graphs from free list data that help depict structural similarities and differences between reference terms. "Core" skills, or those that are more often mentioned and more similar to one another, are clustered toward the center of the graphs, while terms that are considered less similar among members of the subgroup are arranged around the periphery (Borgatti, 1998).

After viewing these MDS analyses and revisiting free list saliency results (table 3) and bar graphs (figure 1), we identified "core" workplace skills for each subgroup, defined here as terms with salience scores of .200 or above (table 3). Core workplace skills, circled in each subgroup MDS graph, are displayed in figure 2.

Much as distinct social groups collectively perceive certain foods (Libertino, Ferraris, Osornio, & Hough, 2012) or plants (Quinlan, 2005) as more salient in the cultural domain than do other groups, these data suggest that certain sets of workplace competencies are seen as particularly critical among some subgroups. We consider these core assemblages to be cultural models, defined as socially distributed neural networks storing knowledge, skill, and ability. The relative placement of skill terms illustrates these cultural models in different ways among the subgroups. Mirroring free list results, for instance, we can see that technical knowledge is centrally located and tightly connected to other important skill terms among manufacturing employers, even though it lies on the far periphery of the biotechnology employer graph, signifying its low association with other terms among members of this subgroup. Training,

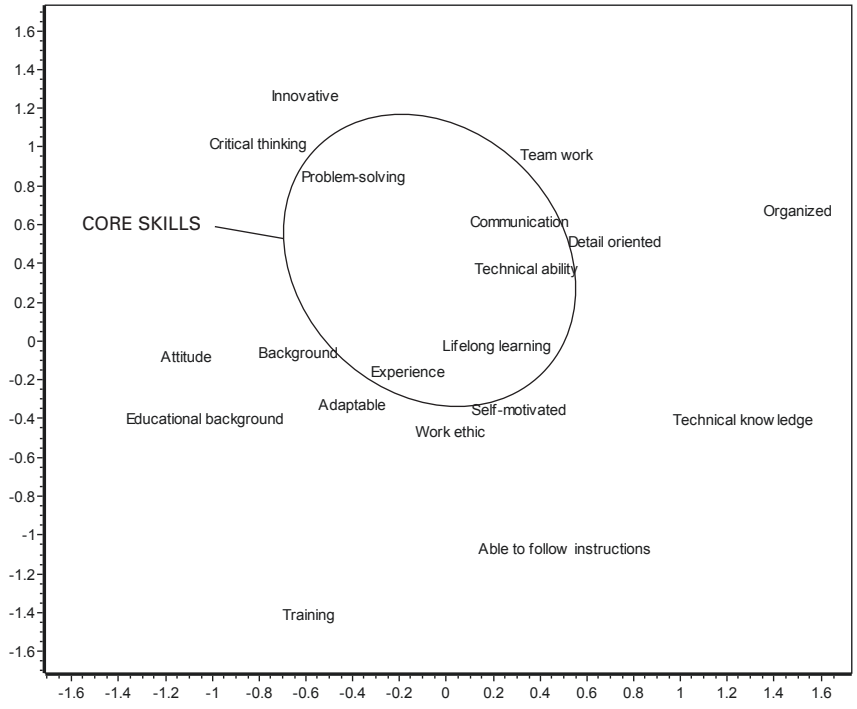
FIGURE 2A *MDS skill analyses by subgroup domain: Manufacturing employers (Stress 0.117)*



Note: UCINET evaluates the Kruskal's Stress value of each graph, a nonstatistical measure representing how well the visualization represents the actual proximity scores between objects where a range for acceptable stress lies between 0.00 (perfect) and 0.2 (poor) (Kruskal & Wish, 1978). This stress value is displayed for each subgroup graph.

on the other hand, is the most distantly located—and therefore most loosely connected—skill term in both employer graphs. While detail oriented is positioned on the outskirts of the skills graph for manufacturing educators, it is one of several closely bound core skill terms for biotechnology educators, suggesting it is both more important and more connected to other workplace competencies for biotechnology educators than manufacturing educators. The comparative density of all skill terms within each graph, though partly a function of sample size, also indicates differing levels of connectivity between members of each subgroup, with manufacturing educators displaying a much more cohesive (or commonly perceived) skill domain than biotechnology educators, to use one example. Given the variation in how different role and disciplinary groups conceptualize and prioritize specific competencies, these data illustrate the inherent limitations of workplace skills lists that treat skills as discrete and individualized units similarly valued across cultural domains.

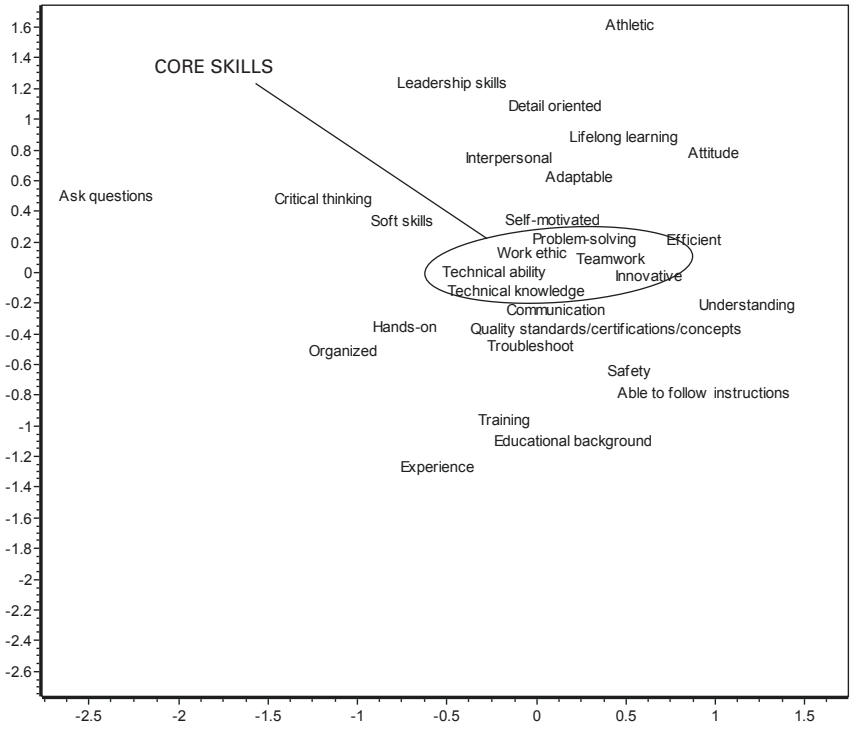
FIGURE 2B *MDS skill analyses by subgroup domain: Biotechnology employers (Stress 0.060)*



Core and periphery configurations were not the only structural qualities of valuable skills. Based on our discovery during data collection that respondents often spoke of skills as interconnected, we also analyzed interview text to examine the degree to which respondents referenced connections between and among specific skills. Ultimately, forty-three educators and thirty-seven employers explicitly mentioned connections between competencies. Using these tallies of explicit skill-to-skill connections, we create network affiliation graphs to visually represent how members of the four subgroups connected or did not connect valued skills to one another (DeJordy et al., 2007). In figure 3, each node represents a skill term, and lines between nodes represent explicit statements by participants connecting skill terms to one another. Thicker lines represent connections made by greater proportions of participants in each subgroup.

These data indicate that participants often described valuable competencies as inextricably bound, in some cases so strongly that it made little sense to discuss one skill without the other. Affiliation graphs display these interconnections among groups in various ways. The manufacturing employer network,

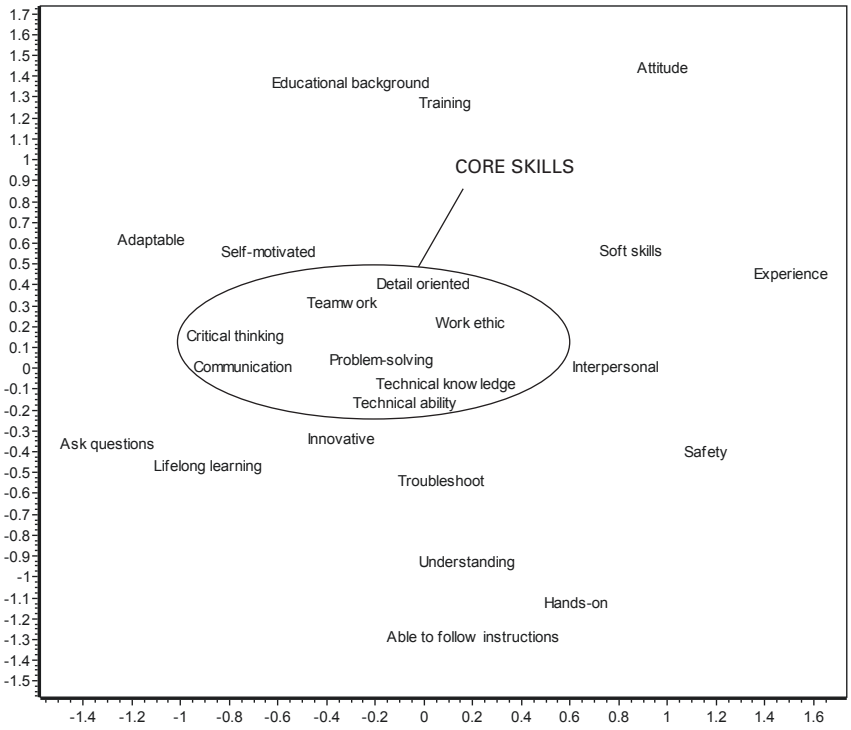
FIGURE 2C *MDS skill analyses by subgroup domain: Manufacturing educators (Stress 0.105)*



for instance, shows an array of ties centered around teamwork, adaptable, and attitude, among other skill terms, while the biotechnology educator network shows a strong set of connections between innovation, critical thinking, and problem-solving, as well as an isolated dyad linking detail oriented and technical ability. Among biotechnology employers, lifelong learning retains strong bonds with both technical knowledge and adaptable, and experience, otherwise unconnected to other skills, is strongly tied to technical ability. The manufacturing educator network shows problem-solving retaining a wide array of different skill-to-skill connections, with a concentrated triad between it, technical knowledge, and technical ability.

A few important skill terms are consistently linked across varying subgroups. This was particularly the case with teamwork and communication, which were explicitly linked by twenty-two respondents. Manufacturing and biotechnology educators and manufacturing employers believed that working well with coworkers depended on effective communication. Two different manufacturing employers, for example, emphasized how cross-functional teams were becoming more common in the engineering workplace, such that

FIGURE 2D *MDS skill analyses by subgroup domain: Biotechnology educators (Stress 0.086)*

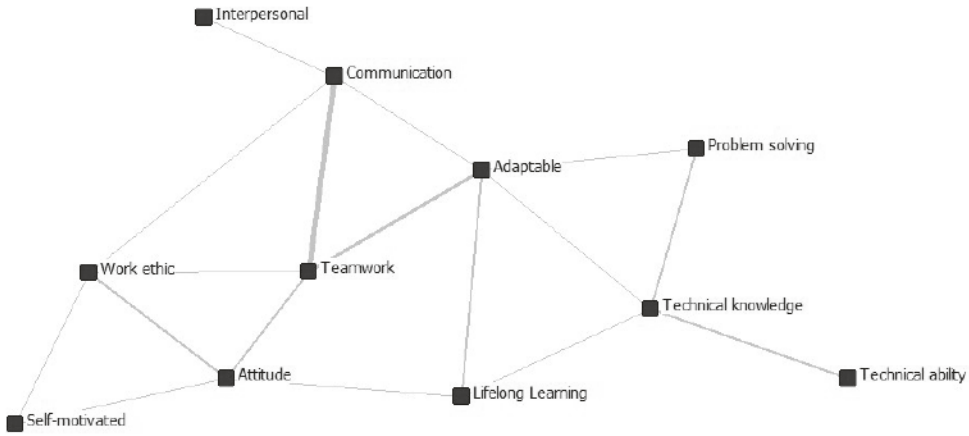


engineers had to communicate effectively with personnel from sales, production, and business administration. The value of communication skills in these workplaces was inextricably linked to specific work contexts, suggesting that communication across disciplinary and professional boundaries is especially important. Affiliation graphs for manufacturing employers and biotechnology educators, in particular, display the strong connections participants made between these two skills.

Contrasts do emerge among the connection data, however, that underline how varying contexts can lead to different perceptions of important skills. For instance, six educators explicitly linked critical thinking and problem-solving, while only one employer did the same. In a representative example, a biology instructor described teaching students how to objectively observe a process, recognize regularities within it, and use what one knew of these regularities to solve new problems: "What we want them to be able to do is, when they encounter something they've never seen before, kind of fall back on those fundamentals and kind of figure it out. There are consistent patterns, and if they can recognize those patterns and put together a model and figure it out, then

FIGURE 3A *Affiliation graphs modeling subgroup skill-to-skill connections: Employers*

Manufacturing employers



Biotechnology employers

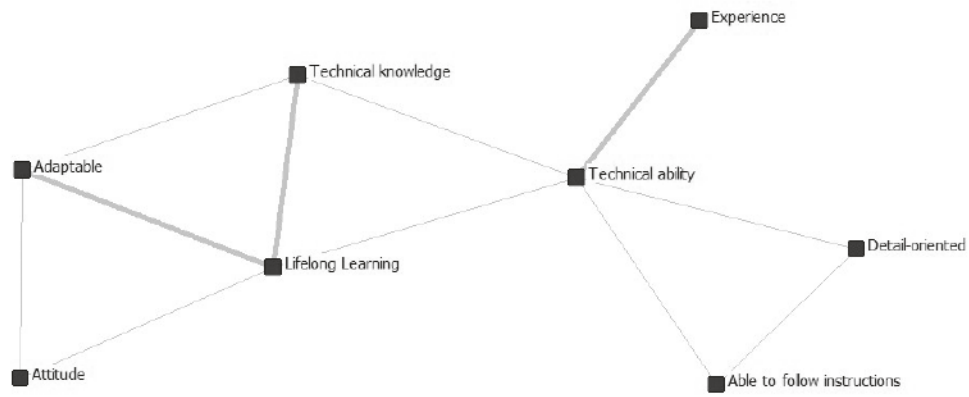
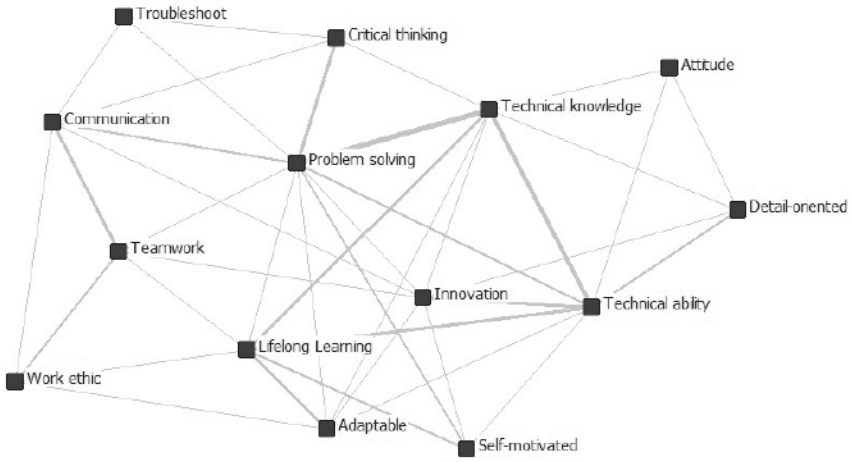
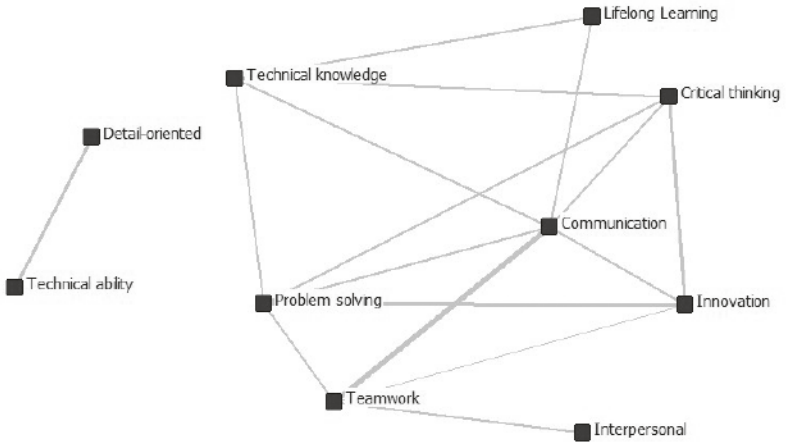


FIGURE 3B *Affiliation graphs modeling subgroup skill-to-skill connections: Educators*

Manufacturing educators



Biotechnology educators



they're fine." Similarly, while no educators explicitly connected adaptability and teamwork, six employers tied the skills together. Among these employers, this combination was often linked to the number of employees in their firms. "We are a small company. We only have thirty employees," one manufacturing employer told us. "So learning to adjust to who you're working with at any given time is a necessity." These data indicate, again, that developing a better understanding of contextual factors (e.g., discipline, workplace tasks, company size) can give us a unique perspective on how respondents conceptualize competencies.

Question 3: What contextual factors impact how educators and employers conceptualize, structure, and use valued skills?

Finally, instead of embracing the implicit contention in the employability narrative that skills are uniformly defined and independent of context, we examined data to explore how educators and employers, operating in unique settings, may differentially conceptualize or assign value to certain skills. Results show a number of situational factors influencing how respondents defined and deployed skills-related cultural models, including personal background, generational status, organizational culture, public governance, geography, and occupational categories. While space limitations do not allow us to examine all these contexts in detail, we offer a brief synopsis, based on inductive thematic analysis of interview data, of how educators and employers described two prominent culturally oriented themes from the data: organizational culture and geography.

— Organizational Culture

Many employers in the study spoke of the importance of job applicants matching an organization's "culture," which they reported as a major influence on which skills were valued and prioritized during the hiring process. While varying definitions were offered, which is consistent with the variety of interpretations of the construct in the literature (Martin, 2002), organizational culture was generally viewed as a combination of the norms and practices that exist within particular departments. One employer spoke about the "strong personalities" of staff within the department where there was a job opening, saying that this aspect of organizational culture affected her approach to hiring because she would need to find applicants who "fit" this unique culture. Another employer called the last phase of employment vetting the "cultural phase" and told us that his hiring team consistently asked if applicants would "interact well with the people that they'll be asked to interact with." In particular, hiring managers told us they sought to match specific applicant dispositions (e.g., tastes, personality traits) and various interpersonal and intrapersonal skills to their organization's culture. Similarly, one biology instructor described this trend by noting how newer biotechnology firms look for employees willing to work longer hours: "You work at a startup company and . . . you wanna work

very hard in order to make something work. That could be totally different if you're going into a bachelor's-level position at [a more established company] in Madison where it could be just a real nine-to-five job."

The traits that were most frequently reported as playing a key role in estimations of cultural fit included personality (e.g., a "good" or "respectful" personality matching existing staff), communication and teamwork, and a strong work ethic. While technical knowledge and ability were generally highly valued, a candidate's educational credentials and technical background took a backseat to estimations of cultural fit for positions in which a person could be trained to perform a routinized task or use a particular machine. Thus, the unique customs, workplace tasks, and personalities of existing staff largely dictated which attributes and competencies employers valued during the hiring process. This finding confirms prior research on the subjective aspects of hiring, where cultural capital acts as a strategic resource that can shape a person's acquisition, or not, of position and prestige and employment discrimination based on race (e.g., Moss & Tilly, 1996), class (e.g., Rivera & Tilcsik, 2016), and gender (e.g., Gorman, 2005) can be justified simply as "cultural matching" (Rivera, 2012). Indeed, the tendency of some manufacturing employers in our study to use masculine third-person pronouns and possessive determiners (*he*, *him*, *his*) to describe typical employee attitudes, skills, and behaviors suggests that women may continue to be disadvantaged in this regard, especially in male-dominated fields.

— Geographic Location

Educators and employers also reported that geographic location was an important factor influencing their views on workplace competencies. According to respondents, various regions of the state were strongly associated with distinct skills and attributes. Work ethic, for instance, was associated not only with rural areas of the state but also with manufacturing centers in northeast Wisconsin's Fox Valley and Milwaukee. Others pinned a strong work ethic to Wisconsin people more generally. "I think a lot of the history of people who've lived in Wisconsin have tended to have good work habits, whatever those are," one engineering professor explained.

Such regional and state contrasts in valued (and prevalent) competencies support research showing the ways conceptions of skill can vary according to geographic space (e.g., Holt, 2008), as well as how space may bestow prestige on certain individuals over others. Taking our cue from cultural geographers and ecological economists who have shown how complex social, economic, and environmental realities are often intertwined (e.g., Berkes & Folke, 2000), we conceptualize how the values and norms in one social or cultural context—based in a geographic location like northeastern Wisconsin, for instance, where manufacturing companies have supported a good proportion of the local populace for generations (Wisconsin Cartographers' Guild, 1998)—may bestow prestige on individuals who possess certain manufacturing-related skills. This

status, however, is not conferred on those same skills in other geographical contexts, like Madison, where highly technical administrative and scientific competencies are more highly valued because the state's government and flagship university have been centered in the city since the nineteenth century (Current, 2001; Wisconsin Cartographers' Guild, 1998).

Some employers and educators also told us that the nature of local industry—whether it was biotechnology in Madison or metal manufacturing in the southeastern part of state—was an important determinant of both skill privation (whether local workers did not have certain competencies) and skill profusion (whether local workers had certain competencies). In regard to skill profusion, one manufacturing human resources director in eastern Wisconsin told us, "We've been a region . . . because of that core metal manufacturing, machining, metal fabrication skill set, [where] work has come here from companies that require those . . . skills." Other participants indicated that the perceived shallowness of the local worker pool forced them to bring on people lacking technical competencies (but with the capacity to learn quickly) or to hire from other parts of the state. According to educators, these kinds of local industry needs directly shaped curriculum and instruction via company advisory boards and student demand in technical colleges, in particular. Cultural models for workplace skills can thus be viewed as strongly tied to place.

Conclusions and Implications

Our goal in this article is to problematize the employability discourse, along with those ubiquitous lists of valuable workplace skills college students should acquire, using a culturally oriented analysis of the way insiders actually think about and use these skills in real-world settings. While the employability narrative conceives of higher education as a venue in which discrete, generic attributes should be instilled for employment purposes, our data raise questions about this worldview and the widespread notion that getting a job is simply a matter of a student possessing the "right" skills. While we advance no claims of generalizability beyond our sample, we highlight implications of the study for research, policy, and practice moving forward.

Reconceptualizing Skills as Multifaceted and Situated Cultural Models

Our evidence demonstrates that workplace competencies are more nuanced, value based, contextual, and cultural than the employability skills discourse acknowledges. Indeed, the postsecondary and workforce stakeholders with whom we spoke discussed "skills" in ways that offer two objections to this narrative: first, that they are not stand-alone bits of individualized aptitude but instead are interconnected assemblages of skill, knowledge, and ability; and second, that they cannot be adequately understood if divorced from specific geographic, professional, and cultural contexts.

Cultural models offer a productive way to speak about skills that are atten-

tive to these findings, as cognitive and embodied theories of relationships among people, ideas, and events that are developed through the repeated activation of unique neural networks in relation to specific situations (Strauss & Quinn, 1997). Such models do not necessarily dictate behavior but do act to "frame experience, supplying interpretations of that experience and inferences about it, and goals for action" (Quinn & Holland, 1987, p. 6). When combined with internalized declarative (knowing *what*) and procedural knowledge (knowing *how*)—two elements commonly associated with the idea of "skill" (Merriam-Webster, 2018)—cultural models can translate into habituated action as a form of practical reason (Strauss & Quinn, 1997). Instead of acting as fixed rules or scripts for behavior, however, cultural models and the cognitive schemata that comprise them can take on different configurations or causal forms depending on the situation, or trigger, that leads to their activation. In this way, viewing skills as multifaceted, interconnected, and situated cultural models links an individual's knowledge and abilities inextricably with their historic *and* contemporary social and cultural environments.

Work ethic, a competency rooted in cultural, social, and dispositional factors, is a prime example of this complexity. Though there were subtle differences in how work ethic was described among biotechnology or manufacturing educators and employers, the term has a special cachet among many of the Wisconsinites we spoke to, one that stems from the state's blue-collar, agricultural traditions that defy easy categorization. Indeed, some have argued that work ethic may not even be a fixed attribute at all but instead a multidimensional trait that evolves over time and changes with the individual and situation (Wentworth & Chell, 1997). Technical ability, lifelong learning, communication, and teamwork, we believe, are similarly complex cultural models as unworthy of the mechanical label "skills" as they are deserving of careful, nuanced, and contextualized analysis.

With this in mind, it is important to recognize that conceptions of whether one possesses or does not possess certain competencies are tied very closely to occupational and disciplinary communities. In such spheres, which are not dissimilar from communities of practice (Lave & Wenger, 1991) or occupational communities (Van Maanen & Barley, 1984), particular cultural models for and about work are honed through repeated practice and passed down through the generations. Furthermore, these communities define the criterion for entrance into the profession, such that cultural models can act as a form of internalized and embodied cultural capital that allow one to "purchase" position and prestige (Lizardo, 2004). While the employability skills discourse has usually portrayed the judgment of skills, knowledge, and ability in acultural, technocratic terms, our study suggests that such assessment would be more accurately defined by a fundamental arbitrariness equating subjective judgment with common sense (Bourdieu & Passeron, 1977). By deconstructing and evaluating competencies in this way, the employability discourse advances a narrative devoid of human context or cultural meaning.

Power, Equity, and Neoliberalism in Postsecondary and Workforce Fields

Of course, the role that much wider historical, political, and economic realities play in the daily conception of valued competencies figures prominently in the employability narrative. Postsecondary policy reforms around "skills" can partly be understood as the result of market-driven movements and discourses that have been influential in the United States since the late 1970s (Grubb & Lazerson, 2009; Harvey, 2005). By means financial and rhetorical, these market-centered norms have led to growing pressure on public colleges and universities to align their values and practices more closely with the needs of the business community, which, Urciuoli (2008) argues, most stands to benefit from "socially embedded [skills] discourses in which workers become . . . entrepreneurial agents responsible for company success" (p. 213). According to this logic, individual, contextualized, and culturally determined traits and dispositions are reconceived as commodified, testable units, objective "'things' that can be acquired and measured and possess an inherent capacity to bring about desired outcomes . . . that can be measured in dollars" (Urciuoli, 2008, p. 212). The implication of this discourse for higher education is straightforward. While educator and employer participants in this study told us it took practice, support, and time to truly develop the valued and complex skills discussed above, the discrete, testable skills imagined in recent market-oriented discourses seem more amenable to the shorter-term, and cheaper, kinds of training programs supported by many policy makers and businesses (Hora et al., 2016).

With this in mind, we believe practitioners, scholars, and administrators in colleges and universities should be skeptical of the notion of employment offered by the employability discourse and attendant skills frameworks and, more generally, of the role that higher education can play in helping students succeed in the job market. Indeed, considering that other research in multicultural and transnational contexts shows that conceptions and expressions of important skills vary between historical, social, and cultural settings (Fanta-Vagenshtein, 2013; Golden, 2015; Hecht & Shin, 2015; Kirchgasler, 2018), and that even well-tested modes of skill assessment are context-specific (e.g., Earley & Ang, 2003; Greenfield, 1997), this skepticism should extend to increasingly common skill measurement methods used for postsecondary enrollment, employment, the military, and school placement (Kyllonen, 2013; also see Duckworth, 2016). Further field research on occupation- and discipline-specific views of valuable skills, as well as the perceived mutability of personality traits, will be vital in this regard, as will discussions about how to better provide students with the kind of social and cultural capital they need not only to lead satisfying careers but also to make a difference in the lives of others. Particular attention must also be paid to evidence-based forms of curriculum and instruction—especially through active learning that cultivates informed inquiry, creativity, and transfer—that can enhance students' learned acumen as well as their ability to continue learning and growing as they move between

and among any number of social and cultural spaces through their lives (e.g., Brown et al., 1989). Culture and context, simply put, should be our focus.

This reminds us of the stakes involved. One of the core ideas animating Bourdieu's work on education is that schooling is a prominent venue for the reproduction of cultural, social, and economic inequality (Bourdieu & Passeron, 1977). Those who control the curriculum and thus the valued forms of cultural capital in a course of study, he noted, effectively manage the "logic of its transmission" to the next generation, usually in ways that favor those with power (Bourdieu, 1986, p. 249). In thinking about how different competencies are internalized by students via formal schooling and then transferred into employment fields, we believe it is useful—and deeply democratic—to think of skills such as work ethic, communication, and lifelong learning not as unassailable measures of an individual's capability or merit, but as habituated cultural models necessarily defined and valued by particular groups at particular times for particular reasons. In so doing, we begin to utilize a language for talking about processes of student socialization and education that emphasizes not only the role that culture plays in shaping success, but also the essential capriciousness of the employability skills narrative. Considering the narrative's profound influence on education policy as well as how we look at the goals of higher education, this, in and of itself, is a meaningful feat.

Notes

1. Using the program's default MDS starting configuration (Torsca, which generates initial graph points based on a principle components analysis of the input data), UCINET algorithms run various graph iterations until they find one iteration representing the best possible fit between the observations in the matrix of co-occurrences and the graphed distances. UCINET evaluates this fit for each graph with Kruskal's Stress value (Kruskal & Wish, 1978), explained further in figure 2B.
2. To ease the comparison between affiliation graphs representing subgroups of divergent sample sizes (i.e., there are sixty-four manufacturing employers included but only eleven biotechnology employers), we only included skill-to-skill connections in displays when these connections were mentioned by 3 percent or more of subgroup participants.

References

Andrews, J., & Higson, H. (2008). Graduate employability, "soft skills" versus "hard" business knowledge: A European study. *Higher Education in Europe, 33*(4), 411–422. doi: 10.1080/03797720802522627

Bastedo, M. N., & Jaquette, O. (2011). Running in place: Low-income students and the dynamics of higher education stratification. *Educational Evaluation and Policy Analysis, 33*(3), 318–339. doi: 10.3102/01623737114067/8

Berkes, F., & Folke, C. (2000). Linking social and ecological systems for resilience and sustainability. In F. Berkes, C. Folke, & J. Colding (Eds.), *Linking social and ecological systems: Management practices and social mechanisms for building resilience* (pp. 1–25). Cambridge, UK: Cambridge University Press.

Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *American Economic Review, 94*(4), 991–1013.
Bidwell, C. E. (1989). The meaning of educational attainment. *Research in Sociology of Education and Socialization, 8*, 117–138.
Borg, I., & Groenen, P. J. (2005). *Modern multidimensional scaling: Theory and applications.* New York: Springer.
Borgatti, S. P. (1994). Cultural domain analysis. *Journal of Quantitative Anthropology, 4*(4), 261–278.
Borgatti, S. P. (1996). *Anthropac 4.* Natick, MA: Analytic Technologies.
Borgatti, S. P. (1998). Elicitation techniques for cultural domain analysis. In J. Schensul & M. LeCompte (Eds.), *The ethnographers toolkit* (Vol. 3; pp. 1–26). Walnut Creek, CA: Altimira Press.
Borgatti, S. P. (2002). *NetDraw: Graph visualization software.* Natick, MA: Analytic Technologies.
Borgatti, S. P., & Everett, M. G. (1999). Models of core/periphery structures. *Social Networks, 21*(4), 375–395.
Borgatti, S. P., Everett, M. G., & Freeman, L. C. (2002). *UCINET for windows: Software for social network analysis.* Cambridge, MA: Analytic Technologies.
Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). New York: Greenwood Press.
Bourdieu, P., & Passeron, J. C. (1977). *Reproduction in education, culture and society.* Thousand Oaks, CA: Sage.
Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42.
Business Higher Education Forum. (2010). *Aligning education and workforce goals to foster economic development. Proceedings from cities for success: A BHEF leadership summit.* Retrieved from http://www.bhef.com/publications/aligning-education-and-workforce-goals-foster-economic-development
Cappelli, P. H. (2015). Skill gaps, skill shortages, and skill mismatches: Evidence and arguments for the United States. *ILR Review, 68*(2), 251–290. doi: 10.1177/0019793914564961
Carnevale, A. P., Smith, N., & Melton, M. (2011). *Science, technology, engineering, mathematics.* Washington, DC: Georgetown University Center on Education and the Workforce.
Charmaz, K. (2014). *Constructing grounded theory.* Thousand Oaks, CA: Sage.
Clarke, M. (2017). Rethinking graduate employability: The role of capital, individual attributes and context. *Studies in Higher Education*, 1–15. doi: 10.1080/03075079.2017.1294152
Current, R. N. (2001). *Wisconsin: A history.* Champaign: University of Illinois Press.
Curtis, D., & McKenzie, P. (2001). *Employability skills for Australian industry: Literature review and framework development.* Melbourne: Australian Council for Educational Research.
Dannels, D. P., Palmerton, P. R., & Gaffney, A. L. (2017). *Oral communication in the disciplines: A resource for teacher development and training.* Anderson, SC: Parlor Press.
Davies, S., & Guppy, N. (1997). Fields of study, college selectivity, and student inequalities in higher education. *Social Forces, 75*(4), 1417–1438.
Dearing, R. (1997). *Higher education in the learning society.* London: National Committee of Inquiry into Higher Education.
DeJordy, R., Borgatti, S. P., Roussin, C., & Halgin, D. S. (2007). Visualizing proximity data. *Field Methods, 19*(3), 239–263. doi: 10.1177/1525822X07302104
DiMaggio, P. (1997). Culture and cognition. *Annual Review of Sociology, 23*(1), 263–287.
Duckworth, A. (2016, March 27). Don't grade schools on grit. *The New York Times.*

Retrieved from http://www.nytimes.com/2016/03/27/opinion/sunday/dont-grade-schools-on-grit.html

Earley, P. C., & Ang, S. (2003). *Cultural intelligence: Individual interactions across cultures.* Palo Alto, CA: Stanford University Press.

Fanta-Vagenshtein, Y. (2013). Culture in context: The role of culture on cognitive skills expression. *Journal of Cognition and Culture, 13*(3–4), 313–327. doi: 10.1163/15685373-12342096

Farkas, G. (2003). Cognitive skills and noncognitive traits and behaviors in stratification processes. *Annual Review of Sociology, 29*(1), 541–562. doi: 10.1146/annurev.soc.29.010202.100023

Ferrare, J. J., & Hora, M. T. (2014). Cultural models of teaching and learning in math and science: Exploring the intersections of culture, cognition, and pedagogical situations. *Journal of Higher Education, 85*(6), 792–825. doi: 10.1353/jhe.2014.0030

Forward Wisconsin. (2016). *Wisconsin economic development regional organizations.* Retrieved from http://www.forwardwisconsin.com/map.php

Fugate, M., Kinicki, A. J., & Ashforth, B. E. (2004). Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational Behavior, 65*(1), 14–38. doi: 10.1016/j.jvb.2003.10.005

Furnham, A. (1984). The Protestant work ethic: A review of the psychological literature. *European Journal of Social Psychology, 14*(1), 87–104.

Golden, N. A. (2015). "There's still that window that's open": The problem with "grit." *Urban Education, 52*(3), 1–28. doi: 10.1177/0042085915613557

Gorman, E. H. (2005). Gender stereotypes, same-gender preferences, and organizational variation in the hiring of women: Evidence from law firms. *American Sociological Review, 70*(4), 702–728. doi: 10.1177/000312240507000408

Greenfield, P. M. (1997). You can't take it with you: Why ability assessments don't cross cultures. *American Psychologist, 52*(10), 1115.

Grubb, W. N., & Lazerson, M. (2009). *The education gospel.* Cambridge, MA: Harvard University Press.

Harvey, D. (2005). *A brief history of neoliberalism.* Oxford, UK: Oxford University Press.

Hecht, M. L., & Shin, Y. (2015). Culture and social and emotional competencies. In J. Durlak, C. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *Handbook of social and emotional learning: Research and practice* (pp. 50–64). New York: Guilford Press.

Holmes, L. (2013). Competing perspectives on graduate employability: Possession, position or process? *Studies in Higher Education, 38*(4), 538–554. doi: 10.1080/03075079.2011.587140

Holt, L. (2008). Embodied social capital and geographic perspectives: Performing the habitus. *Progress in Human Geography*, 32(2), 227–246. doi: 10.1177/0309132507087648

Hora, M. T., Benbow, R. J., & Oleson, A. (2016). *Beyond the skills gap: Preparing college students for life and work.* Cambridge, MA: Harvard Education Press.

Institute for Higher Education Policy. (2014). *Aligning postsecondary education and workforce strategies to drive attainment.* Retrieved from http://www.ihep.org/sites/default/files/uploads/docs/pubs/ihep_workforce_alignment_final_1.pdf

Jackson, D. (2016). Re-conceptualising graduate employability: The importance of pre-professional identity. *Higher Education Research & Development, 35*(5), 925–939. doi: 10.1080/ 07294360.2016.1139551

Jacobs, J. A. (1996). Gender inequality and higher education. *Annual Review of Sociology, 22*(1), 153–185. doi: 10.1146/annurev.soc.22.1.153

Jonassen, D., Strobel, J., & Lee, C. B. (2006). Everyday problem solving in engineering: Lessons for engineering educators. *Journal of Engineering Education, 95*(2), 139–151. doi: 10.1002/j.2168-9830.2006.tb00885

Kirchgasler, C. (2018). True grit? Making a scientific object and pedagogical tool. *American Educational Research Journal, 55*(4), 693–720. doi: 10.3102/0002831217752244
Kruskal, J. B., & Wish, M. (1978). *Multidimensional scaling.* Thousand Oaks, CA: Sage.
Kyllonen, P. C. (2013). Soft skills for the workplace. *Change: The Magazine of Higher Learning, 45*(6), 16–23.
Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life.* Cambridge, UK: Cambridge University Press.
Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* Cambridge, UK: Cambridge University Press.
Libertino, L., Ferraris, D., Osornio, M. L., & Hough, G. (2012). Analysis of data from a free-listing study of menus by different income-level populations. *Food Quality and Preference, 24*(2), 269–275. doi: 10.1016/j.foodqual.2011.11.003
Lizardo, O. (2004). The cognitive origins of Bourdieu's habitus. *Journal for the Theory of Social Behavior,* 34(4), 375–401. doi: 10.1111/j.1468-5914.2004.00255
Lowel, S., & Singer, W. (1992). Selection of intrinsic horizontal connections in the visual cortex by correlated neuronal activity. *Science, 255*(5041), 209–212. doi: 10.1126/science.1372754
Martin, J. (2002). *Organizational culture: Mapping the terrain.* Thousand Oaks, CA: Sage.
Merriam-Webster. (2018). *Merriam-Webster's dictionary.* Springfield, MA: Author. Retrieved from https://www.merriam-webster.com/dictionary/skills
Moore, T., & Morton, J. (2017). The myth of job readiness? Written communication, employability, and the "skills gap" in higher education. *Studies in Higher Education, 42*(3), 591–609. doi: 10.1080/03075079.2015.1067602
Moreau, M. P., & Leathwood, C. (2006). Graduates' employment and the discourse of employability: A critical analysis. *Journal of Education and Work, 19*(4), 305–324. doi: 10.1080/13639080600867083
Moss, P., & Tilly, C. (1996). "Soft" skills and race: An investigation of black men's employment problems. *Work and Occupations, 23*(3), 252–276. doi: 10.1177/0730888496023003002
Pager, D., Bonikowski, B., & Western, B. (2009). Discrimination in a low-wage labor market: A field experiment. *American Sociological Review, 74*(5), 777–799. doi: 10.1177/000312240907400505
Partnership for 21st Century Learning. (2018). *P21 framework definitions.* Retrieved from http://www.p21.org
Pellegrino, J. W., & Hilton, M. L. (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century.* Washington, DC: National Academies Press.
Prieur, A., & Savage, M. (2011). Updating cultural capital theory: A discussion based on studies in Denmark and in Britain. *Poetics, 39*(6), 566–580. doi: 10.1016/j.poetic.2011.09.002
Quinlan, M. (2005). Considerations for collecting freelists in the field: Examples from ethobotany. *Field Methods, 17*(3), 219–234. doi: 10.1177/1525822X05277460
Quinn, N., & Holland, D. (1987). Culture and cognition. In D. Holland & N. Quinn (Eds.), *Cultural models in language and thought* (pp. 3–42). New York: Cambridge University Press.
Reay, D., Davies, J., David, M., & Ball, S. J. (2001). Choices of degree or degrees of choice? Class, "race," and the higher education choice process. *Sociology, 35*(4), 855–874. doi: 10.1177/0038038501035004004
Resnick, L. (1991). Shared cognition: Thinking as social practice. In L. Resnick, J. Levine, & S. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 1–20). Washington, DC: American Psychological Association
Rivera, L. A. (2012). Hiring as cultural matching: The case of elite professional service firms. *American Sociological Review, 77*(6): 999–1022. doi: 10.1177/0003122412463213

Rivera, L. A., & Tilcsik, A. (2016). Class advantage, commitment penalty: The gendered effect of social class signals in an elite labor market. *American Sociological Review*, *81*(6), 1097–1131. doi: 10.1177/0003122416668154

Rooth, D. O. (2010). Automatic associations and discrimination in hiring: Real world evidence. *Labour Economics*, *17*(3), 523–534. doi: 10.1016/j.labeco.2009.04.005

Rowan-Kenyon, H. T., Savitz-Romer, M., Weilundemo Ott, M., Swan, A. K., & Liu, P. P. (2017). Finding conceptual coherence: Trends and alignment in the scholarship on noncognitive skills and their role in college success and career readiness. In M. B. Paulsen (Ed.), *Higher education: Handbook of theory and research* (Vol. 32; pp. 141–179). New York: Springer.

Saldaña, J. (2013). *The coding manual for qualitative researchers*. Los Angeles: Sage.

Smith, J. J., & Borgatti, S. P. (1997). Salience counts—and so does accuracy: Correcting and updating a measure for free-list-item salience. *Journal of Linguistic Anthropology*, *7*, 208–209. doi: 10.1525/jlin.1997.7.2.208

Strauss, C., & Quinn, N. (1997). *A cognitive theory of cultural meaning*. Cambridge, UK: Cambridge University Press.

Suleman, F. (2017). The employability skills of higher education graduates: Insights into conceptual frameworks and methodological options. *Higher Education*, *76*(2), 263–278. doi: 10.1007/s10734-017-0207-0

Tomlinson, M. (2012). Graduate employability: A review of conceptual and empirical themes. *Higher Education Policy*, *25*(4), 407–431.

Tomlinson, M. (2017). Forms of graduate capital and their relationship to graduate employability. *Education + Training*, *59*(4), 338–352. doi: 10.1108/ET-05-2016-0090

Urciuoli, B. (2008). Skills and selves in the new workplace. *American Ethnologist*, *35*(2), 211–228. doi: 10.1111/j.1548-1425.2008.00031

US Department of Labor. (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: Government Printing Office.

Van Maanen, J., & Barley, S. (1984). Occupational communities: Culture and control in organizations. *Research in Organizational Behavior*, *6*, 287–365.

Wentworth, D. K., & Chell, R. M. (1997). American college students and the Protestant work ethic. *Journal of Social Psychology*, *137*(3), 284–296.

Williams, S., Dodd, L. J., Steele, C., & Randall, R. (2016). A systematic review of current understandings of employability. *Journal of Education and Work*, *29*(8), 877–901. doi: 10.1080/13639080.2015.1102210

Wisconsin Cartographers' Guild. (1998). *Wisconsin's past and present: A historical atlas*. Madison: University of Wisconsin Press.

Yin, R. K. (2013). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.

Yorke, M. (2005). *Employability in higher education: What it is, what it is not*. York, UK: Higher Education Academy.

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