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Social Networks and Skills Instruction: A Pilot Study of STEM College Educators and Employers in Wisconsin and New York

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Abstract

Research indicates that teamwork, communication, self-directed learning, and problem-solving skills are strongly linked to individual academic and professional success, yet little is known regarding how college educators and employer trainers learn to better teach or train others in these valuable skills in postsecondary and employment STEM contexts. This pilot study uses social network analysis—a research perspective studying relationships or "social ties" to better understand the ways interactions influence behavior—to explore the dimensions of educator and trainer discussions regarding methods for helping students or employees acquire important skills. The study also examines whether educators and employers believe such discussions influence their instruction. A descriptive analysis of data from online surveys collected from educators (n=192) and employers (n=70) in technology and manufacturing fields in southern Wisconsin and western New York indicates respondents frequently engage in such teaching- and training-focused discussions with people inside and outside their colleges and businesses. Though more college educators are involved in such conversations than employers, employer trainers who engage in such conversations do so with individuals affiliated with more diverse organizations. Results also indicate that educators and employers who have these discussions do so at a similar frequency. Finally, most educators and employers with teaching- and training-focused social networks perceive them to be beneficial to their teamwork, communication, self-directed learning, and problem-solving instruction. In light of these findings, leaders hoping to further develop teaching- and training-focused social networks in education and employment fields may find more success in openly promoting the importance of such social ties as well as providing more opportunities for intra- and interorganizational professional development in instruction.

Keywords: social networks, higher education, workforce training, social capital, skills

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Research consistently shows that relationships or "social ties" shape an individual's access to valuable information, knowledge, and advice in school (e.g., Daly, 2010) and the workplace (e.g., Carpenter, Li, & Jiang, 2012; Cross & Parker, 2004). Often theorized as "social capital," (Bourdieu, 1986; Lin, 1999), these relational resources can help one accrue professional advantage. Social network analysis—a research perspective and set of techniques studying social ties to better understand how interactions influence behavior (Wasserman & Faust, 1994)—has advanced this line of inquiry in significant ways. Here we extend that inquiry into the world of on-the-job worker training and postsecondary education.

Social network analysis is based on three key assumptions: First, actors and the actions they take are interdependent; second, social ties between individuals, compilations of which are called "social networks," are a conduit for material and nonmaterial resources; and, third, the social networks in which individuals are nested constrain and support their actions (Wasserman & Faust, 1994, p. 4). Social network analyses typically rely on precise data gathered from respondents on the characteristics of their social ties including who respondents speak to about certain topics, how often they speak with these contacts, and the contacts' professional or demographic attributes (Halgin & Borgatti, 2011).

Focusing on teachers as social learners, research in educational settings has linked advice-seeking through social contacts to improved teaching practices (Borko, 2004; Lieberman, 2000), the ability to cope with change (Spillane & Louis, 2002), professional development (Lieberman, 1995), and student learning gains (Goddard, Goddard, & Tschannen-Moran, 2007; Yasumoto, Uekawa, & Bidwell, 2001). In industrial settings, although we know of no work looking specifically at employer trainers, advice-seeking through social networks has been linked to higher levels of individual (Burt, 2004) and organizational innovation (Miles, Miles, & Snow, 2005; Nelson, 1993), the increased transfer of training by trainees (e.g., Van den Bossche & Segers, 2013), as well as knowledge creation and increased individual professional prospects (Aviv, Erlich, Ravid, & Geva, 2003; Ibarra, 1995; Singh, 2005; Staber, 2004). Social network analysis has also established that particular patterns within individual personal social networks based on network size (e.g., Burt, 1992; Smither, London, & Reilly, 2005), interorganizational contact (e.g., Mehra, Kilduff, & Brass, 2001), and strength of ties (Baer, 2010; Granovetter, 1973, 1983) constrain and support a person's social access to material and nonmaterial resources.

Although interorganizational research long has been an area of interest in social network analysis circles (Aviv et al., 2003; Lahtinen, 2013; Powell, Koput, & Smith-Doerr, 1996; Staber, 2004), few if any scholars have investigated such relationships among postsecondary educators and employer trainers in regard to teaching and training in important "soft" or "non-cognitive" skills such as communication, problem solving, self-directed learning, and teamwork that have been the focus of much recent research and discussion (e.g., Pellegrino & Hilton, 2012). Discussions about the "alignment" of educational and business interests in students and employees acquiring these skills (e.g., Cleary, Kerrigan, & Van Noy, 2017), and about instructional reform in essential science, technology, engineering, and mathematics (STEM) fields (e.g., Handelsman, Miller, & Pfund, 2007; Singer & Schweingruber, 2012; Wieman, Perkins, & Gilbert, 2010), make comparisons between educator and employer knowledge and use of training practices of greater importance. The significance of instruction-focused social ties to the professional practice of educators (Fleming, Goldman, Correli, & Taylor, 2016; Pataraia, Margaryan, Falconer, & Littlejohn, 2015; Roxå & Mårtensson, 2009a, 2009b; Van Waes, Van den Bossche, Moolenaar, De Maeyer, & Van Petegem, 2015; Van Waes, Moolenaar, Daly, Heldens, Donche, Van Petegem, & Van den Bossche, 2016; Van Waes, De Maeyer, Moolenaar, Van Petegem, & Van den Bossche, 2018), as well as the dearth of research on how social networks influence instructional practice of employer trainers, also raises a few important questions. First, do postsecondary educators and training professionals in STEM fields discuss techniques or strategies for helping students or employees acquire important non-cognitive skills and, if so, with whom? Second, how, if at all, do STEM educators and employers believe these kinds of teaching- and training-related discussions influence their instruction in these important skills?

With these questions in mind, this pilot study gathers “ego” network data (Halgin & Borgatti, 2011) from postsecondary instructors and employers to better understand whether they discuss how to teach and train others and, if so, how they perceive what they glean from such network discussions influencing their instruction in communication, problem solving, self-directed learning, and teamwork. Our descriptive data are from technology and manufacturing sectors, STEM fields that have received considerable policymaker and scholarly attention in the last decade (e.g., Carnevale, Smith, & Melton, 2011; Rothwell, 2013, 2014).

Theoretical Framework

Our formulization and analysis of these questions is based on the concept of *social capital*, defined as valuable, actionable resources accessed through social ties (Bourdieu, 1986; Coleman, 1988; Lin, 1999). These resources, which social network analysts envision are embedded in certain social networks, come in many forms, whether through a friendly tip on a job opening, the trust of a supervisor during contract negotiations, or, importantly for our purposes, another person’s insight on the effectiveness of a particular instructional or training method to teach a skill (e.g., Frank, Zhao, & Borman, 2004). While social capital allows individuals to develop skills and practices that can be socially or professionally advantageous (Coleman, 1988), it is unequally distributed from individual to individual and by no means “a natural … or even a social given” (Bourdieu, 1986, p. 286). Instead, ties that facilitate the flow of beneficial information, knowledge, and advice—which we focus on in this paper specifically in regard to teaching and training—are differentially accessed and mobilized depending on an individual’s social position and on broader, structural norms (Lin, 1999, pp. 41–42).

The operationalization of this concept depends on established theories regarding which specific social network characteristics give individuals access to beneficial advice, information, knowledge, or support from contacts. To explore and compare educator and employer teaching-and training-focused networks, we measure three important network characteristics the literature associates with social capital accrual. The first of these social network measures, *network size*, or the number of contacts in an individual's social network, is well correlated with the opportunity and desire to improve instruction through innovative practice (Roxå & Mårtensson, 2009a; Van Waes et al., 2015). *Network diversity* is our second network indicator, represented by whether individuals discuss teaching and training practices with others across organizational boundaries. Research shows network diversity offers access to a wider variety of information and resources (Burt, 2004; Mehra et al., 2001; Reagans & McEvily, 2003). Finally, studies show that higher network *tie strength*, representing a scaled measure of how often an individual speaks with members of her or his social network, relates to the more efficient exchange of complex, nonroutine information (Coburn & Russell, 2008; Reagans & McEvily, 2003). Conversely, stronger ties have been shown to represent greater network overlaps among respondents and their contacts, which in turn limit one's access to new, nonredundant information (Granovetter, 1973).

Methods and Data Sources

We rely on a mixed-methods, comparative case study approach (Bartlett & Vavrus, 2016; Creswell, 2014; Yin, 2013)—distinguished by the investigation of a specific bounded issue or concrete problem using quantitative and qualitative methods—to answer our research questions. Based on data collected as part of a wider pilot study on workforce-oriented postsecondary instruction and training in southern Wisconsin and western New York, our analysis focuses on social network-oriented questions and open text responses on online surveys collected from educators (*n*=192) and employers (*n*=70) in linked technology and manufacturing fields.

Sampling

Using U.S. Bureau of Labor Statistics (2016) data on employment and national occupational projections, the U.S. Department of Labor's Employment and Training Administration's Occupational Information Network (2016) or O*Net, as well as state-level workforce information, we identified specific STEM-credentialed associate's-degree-level ("2-year") and baccalaureate-level ("4-year") occupations in information technology and manufacturing to link companies and college programs in southern Wisconsin and western New York. We began by finding the most populous college-credentialed STEM occupations in southern Wisconsin and western New York based on employment analyses of "metropolitan statistical areas" that the Bureau of Labor Statistics uses to show the number of particular jobs in specific regions, as well as O*Net profiles of particular jobs that detail the knowledge, skills, and training people need to perform these jobs. In 2016, for instance, data show that 4,830 "computer systems analysts" were employed in the Milwaukee-Waukesha-West Allis metropolitan statistical area (U.S. Bureau of Labor Statistics, 2016), an occupation that O*Net (2016) describes as needing a 2-year or 4-year college degree as well as advanced technical and mathematics skills.

Having identified by region the information technology and manufacturing STEM-credentialed occupations with the most employees, we used O*Net, which lists education and training programs in each region for specific occupations, and federal employment figures, which show how specific occupations cluster in specific kinds of businesses, to identify (1) 2-

and 4-year credentialed STEM programs for each information technology and manufacturing occupation and (2) North American Industry Classification System codes representing companies that employ clusters of people in these high-employment STEM occupations.

For the 2-year and 4-year degree programs in southern Wisconsin and western New York, we gathered college instructor email addresses from these educational programs websites. For employers, we used state-level workforce websites in Wisconsin (Wisconsin Department of Workforce Development, 2016) and New York (New York State Department of Labor, 2016) to obtain contact information for for-profit companies fitting the North American Industry Classification System codes in which the target occupations were most clustered. We supplemented this state-level data with employer contact information from LinkedIn, Facebook, and other web-based resources for executive, human resources, and instructional professionals at each company who appeared knowledgeable about company training or who directly trained employees in the focal STEM occupations (Table 1).

Table 1. **Southern Wisconsin and Western New York Sampling Design**

Industry	2- and 4-year Credentialed Occupations	Occupational Designations	Possible 2- and 4-year College Program Sites	Possible Company Sites
Information Technology	• Computer user support specialists • Software developers • Computer programmers • Computer systems analysts	• Computer systems design and related services • Software publishing	• Madison College • Rochester Institute of Technology • University of Rochester • University of Wisconsin–Madison	• Epic • Fiserve Inc. • Johnson Controls • PDS • Raven Software • Strategem Inc. • Zebra Technologies
Manufacturing	• Industrial machinery mechanics • Computer-controlled machine tool operators • Electrical engineers • Mechanical engineers	• Machinery • Computer and electronic products • Transportation equipment	• Erie Community College • Milwaukee Area Technical College • Syracuse University • University of Wisconsin–La Crosse • Western Technical College	• Absolute Precision • Commodore Technology • Marathon Electric • Professional Power Products • Riverside Automation • Sydor Optics

With lists of individual educators and employers thus identified, researchers emailed letters with links to online surveys in November 2016 to 763 educators and 663 workplace trainers and human resources representatives across southern Wisconsin and western New York. A total of 192 educators completed the survey for a response rate of 25.16%, while 70 employers completed the survey for a response rate of 10.56%. The overall response rate across both groups was 18.38%. Descriptive statistics for both groups are displayed in Table 2.

Table 2. **Descriptive statistics for survey sample**

Measure	**Educator**			**Employer**		
	N	**Mean**	**SD**	**N**	**Mean**	**SD**
Gender						
Female	29	0.16		16	0.23	
Male	147	0.83	0.42	54	0.77	0.42
Transgender	2	0.01		0	0	
Race						
White	142	0.80	0.40	64	0.93	0.26
Non-white	36	0.20		5	0.07	
Discipline						
Manufacturing	67	0.63	0.48	33	0.47	0.50
Information Technology	116	0.37		37	0.53	
Region						
Wisconsin	129	0.67	0.48	62	0.89	0.32
New York	63	0.33		8	0.11	
Institution or type						
2-year	32	0.17	0.83			
4-year	151	0.83				

Survey Instrument and Analysis

Online surveys included questions collecting data for the wider study as well one section gathering simple social network indicators for the size, diversity, and strength of respondents' teaching- and training-focused social networks, conventional network measures associated with the accrual of social capital (e.g., Burt, 2004; Lin, 1999; Reagans & McEvily, 2003; Roxå & Mårtensson, 2009a). These items followed established social network analysis ego data collection techniques (Burt, 1985; Halgin & Borgatti, 2012) that allow respondents to characterize their own social stimuli—formal or informal, within or outside their organizations—based on their own perceptions of the networks' influence. We chose this approach because our goal is to better understand how patterns in individual respondent instruction-focused social networks associate with teaching and training techniques (Wasserman & Faust, 1994).

To capture respondents' personal networks without over-burdening surveys, we began with two name generator questions adapted from Burt's "important discussions" General Social Survey prompt (Burt, 1985). These items limited respondents to six contacts, which researchers have shown is the optimal maximum for focused, personal network prompts (e.g., Marsden, 1990). Respondents first answered, with a yes or no, this question: "From time to time, employers/ educators discuss with others what methods or techniques they can use to better train/teach their employees/students on important skills. Looking back over the last year, is there anyone with whom you have discussed this matter?" Those answering "no" skipped to the next survey section, while those answering "yes" were directed to this name generator: "Please type in the first names or initials of up to six people with whom you have discussed methods or techniques you can use to better train/teach your employees/students on important skills over the last year. If you have talked to more than six people about this matter, please choose the six people you have talked to most frequently." The number of contacts instructors listed here acted as our measure for network size (Freeman, Roeder, & Mulholland, 1979). Respondents then described each contact's organizational affiliation, information that helps measure the diversity of instruction-focused networks (e.g., Baker-Doyle & Yoon, 2011). The affiliation could have been with the respondent's own campus or company or an educational, business, or governmental organization, categories loosely based on the North American Industry Classification System. Respondents next reported how frequently they communicated with each listed instruction-focused discussion contact over the previous year, a common social network measure of the strength of ties (1=less than once a month, 2=at least once a month, 3=at least once a week, 4=almost every day) (Burt, 1985).

Table 3's descriptive statistics compare social network indicators across educator and employer survey groups. The first social network measure, "Yes to Contacts," is a dummy measure indicating whether respondents reported discussing methods or techniques for training or teaching important skills. The next two rows show the mean number of contacts listed across all respondents, and then just among those who reported the existence of a training- or teaching-focused social network. We created descriptive percentages of diversity measures in three ways. Looking at all contacts listed by each employer and educator respondent, we reported (1) the percentage of employers and educators listing at least one contact from outside their own *organization*, (2) the percentage of employers and educators listing at least one contact from outside their own *field* (i.e., employer contacts listing contacts affiliated with educational, governmental, or not-for-profit organizations, or educators listing contacts affiliated with governmental or for-profit organizations), and (3) the percentage of employers listing at least one *educator* contact and the percentage of educators listing at least one *employer* discussion contact. The frequency measure, representing tie strength, captures how often respondents reported speaking to teaching- or training-focused discussion contacts over the previous year. Because our sample size for employers did not support a multiple regression analysis allowing us to compare employer independent and dependent variable associations with educator associations, we used Welch's t-test and a binomial proportion test to compare the means of social network measures between employers and educators, technology and manufacturing employers, and technology and manufacturing educators.

The last item of the social network section on our survey asked respondents for an open-ended text response to this question: "How, if at all, do you think your relationships with these people have influenced your methods or techniques for training/teaching your employees/students communication, self-directed learning, problem solving, or teamwork skills?" The authors collected responses to this open-ended text question, separated them into educator and employer groups, and counted how many respondents with social networks in each category clearly indicated that these social networks positively influenced their teaching or training of the skills, including those who reported that such discussions were only “minimally” or “somewhat” influential. Those who did not answer the question and those who answered that discussions did not influence their teaching were grouped together, with final results reported in the last row of Table 3. The first author analyzed the content of educator and employer positive responses using coding at the manifest level (Charmaz, 2014) as well as the constant comparative method (Glaser & Strauss, 1967). Second cycle analytic methods based on repetition among educator or employer respondents and the association of emergent categories to our research questions and social capital framework followed (Ryan & Bernard, 2003), allowing us to distill the textual data into a few observations about how educators and trainers perceived these social ties influencing their teaching and training.

Findings

Employer and Educator Networks

As reported in Table 3, just over 46% of employer respondents reported having contacts with whom they spoke about techniques for skills instruction in the previous year. The mean network size for all employers was 1.58 contacts, while the mean network size for those reporting training-focused contacts was 3.52. Almost 90% of educator respondents reported having contacts with whom they discussed techniques for skills instruction, a significant difference (at the 0.001 level) from the percentage of employers who reported such discussions. The average network size for all educators was 3.74 contacts, also a significance difference (at the 0.001 level) from employers, while the average network size for those educators reporting discussion contacts was 4.15.

Sixty-five percent of employers listed at least one contact affiliated with an organization outside of the respondent’s own company, which represents a significant difference (at the 0.001 level) from the 26% of educators listing at least one contact affiliated with an outside organization. Thirty-five percent of employers listed at least one contact outside the for-profit field, also a significant difference (at the .001 level), while 10% listed at least one contact at an educational organization. Ten percent of educators listed at least one contact affiliated with organizations outside education, while 7% listed at least one contact affiliated with a private company. The average frequency of training-focused discussions reported among employers was 1.9, or just under “at least once a month.” The average frequency of instruction-focused discussions reported among educators was 1.89, very similar to employers’ discussions at just under “at least once a month.”

Similar statistics are displayed in Table 3 for manufacturing- and technology-oriented employers and educators. Here, 57% of technology employers reported training-focused discussion contacts, a significant difference (at the 0.05 level) from manufacturing employers, while 93% percent of technology educators reported teaching-focused discussion contacts, a significant difference (at the 0.05 level) from manufacturing educators, 84% of whom reported discussion contacts.

Table 3. **Descriptive statistics of social network responses**

Measure	All Employers	All Educators	Manufacturing Employers	Technology Employers	Manufacturing Educators	Technology Educators
Existence of social network						
% yes to contacts	0.46	0.90***	0.33	0.57*	0.84	0.93*
Network size						
# contacts (all)	1.58	3.74***	1.42	1.72	3.71	3.75
# contacts (yes)	3.52	4.15	4.27	3.10	4.42	4.02
Diversity						
% of contacts outside organization[a]	0.65***	0.26	0.45	0.75	0.26	0.26
% of contacts outside organization's field[b]	0.35***	0.10	0.18	0.45	0.14	0.08
% of contacts with educator/employer	0.10	0.07	0.09	0.10	0.12	0.04
Tie strength						
Frequency of communication with contacts about teaching[c]	1.90	1.89	2.14	1.78	1.81	1.93
Network influence						
Yes, these discussions influence instruction of skills	0.75	0.86	0.64	0.81	0.86	0.85
N	70	192	33	37	69	123

* p<0.05, ** p<0.01, *** p<0.001

[a]This row lists the percentage of employer or educator respondents reporting at least one contact as being affiliated with an organization *outside* the respondent's organization.

[b]This row lists the percentage of (1) employers reporting at least one contact as being affiliated with organizations that are not for profit companies or governmental or educational organizations, and (2) educators reporting at least one contact as being affiliated with organizations that are not educational in nature.

[c]"Frequency of communication with contacts about teaching" ranges from 1 (less than once a month) to 4 (almost every day).

Perceptions of Network Influence on Teaching and Training

Educator and employer survey respondents who reported having teaching- or training-oriented discussions were asked a final open-ended text response question regarding how, if at all, their reported relationships influenced their instruction of communication, problem-solving, teamwork, and self-directed learning. One hundred and forty-eight educators reported that these discussions influenced their teaching (about 86% of educator respondents reporting teaching-focused social networks) while 24 employers reported that these discussions influenced their training (about 75% of employer respondents reporting training-focused social networks).

Educators reported ways their relationships helped them improve their craft, typically with contacts serving as an important outlet or "sounding board" to discuss challenges and opportunities regarding how to teach non-cognitive skills, which in turn allowed them to:

(1) learn new and more effective teaching methods (regarding course design, syllabi, assessment, class assignments and activities, content presentation, etc.),
(2) hear multiple perspectives on different issues, methods, or techniques,
(3) practice reflecting on and articulating their own teaching philosophy and reasoning,
(4) provide *and* receive feedback, and
(5) receive social support and inspiration through shared experiences and interests.

Some educators reported that sharing teaching perspectives and experiences seemed to improve their instructional technique and give them some perspective on similarities across classrooms. "Sharing classroom experiences helps confirm or deny things you might notice in your classroom," one college instructor wrote. "If others observe their students exhibiting similar behaviors, you begin to understand that what you're seeing is not unique." A few educators also mentioned that such conversations provided the motivation to continually improve their teaching. One instructor wrote of conversations with her contact in this way: "We both profit immensely from brainstorming together and sharing best practices as we continue to grow as educators."

While employer data offer less breadth than educator data, a general theme among the 24 positive employer responses was that training contacts provided respondents with new ways of viewing skills training, filling gaps in the way respondents were thinking about training in their own companies. "[My contacts] provided additional perspectives that I was not aware of," one employer wrote, "and allowed me to develop the strongest course possible." These kinds of opportunities, other employer respondents suggested, made it easier to develop training experiences better crafted to specific professional or industry groups, including technology-focused employees or younger employees. With regard to the former, one technology employer pointed out the importance of tapping diverse viewpoints to keep up with developments in her field. "[My social network] allowed me to understand the challenges and some solutions of other technology professionals who also face a dynamic industry," she told us.

Implications and Conclusions

This analysis supports prior research (e.g., Van Waes et al., 2015) showing that college educators talk to others about their teaching, and indicates that employer trainers have similar discussions. Such teaching-focused discussions, research shows, help educators gain social capital that can improve professional practice (e.g., Daly, Moolenaar, Bolivar, & Burke, 2010; Frank et al., 2004). Employer reports on the influence of instruction-focused networks on their own skill instruction suggest respondents in this study believe similar benefits accrue to employer trainers as well.

While we cannot generalize our results to the wider population of postsecondary educators or employer trainers, findings indicate educators who engage in such discussions do so with more contacts than employers, suggesting increased access to new information (Roxå & Mårtensson, 2009a). Employers who engage in such discussions, however, speak with a more diverse array of people, organizationally speaking, than educators, which, research has shown, can lead to more innovation and change in professional practice (Burt, 2004). Educators and employers in technology-connected programs and businesses in our sample reported more teaching- and training-discussion contacts than manufacturing-connected educators and employers, perhaps pointing to a more network-oriented field in technology than in manufacturing. Still, manufacturing educators, more than any other group of respondents in our survey, reported a higher proportion of connections to employers, suggesting that educators linked to manufacturing may benefit most from diverse, interorganizational expertise and associated social capital. Furthermore, educator and employer respondents in the sample speak to teaching- and training-contacts with about the same (low) frequency, indicating a generally similar “tie strength” among discussion networks and similar access to social capital associated with complex, nonroutine information (Coburn & Russell, 2008).

With these basic indicators of educator and employer social networks in mind, we also analyzed respondent perceptions regarding how, if at all, such discussions influenced the teaching of or training in valuable skills. Though a slightly higher percentage of educators than employers with social networks (86% versus 75%) described teaching- and training-focused ties as a positive influence on their instruction, this difference was not significant; findings therefore indicate a generally similar perception among most educator and employer respondents engaging in such discussions that they allow one to accrue social capital and are beneficial to the teaching and training of communication, teamwork, problem solving, and self-directed learning. Respondent descriptions of how these social networks are beneficial also track somewhat with previous studies on the links between instruction and college teaching-focused discussions (Pataraia et al., 2015; Van Waes et al., 2016) though, again, this is the first study, to our knowledge, to explore whether workplace trainers are influenced by such discussions. Educators described such conversations as providing them with valuable information, feedback, motivation, and social support, and both educators and employers described discussions that allowed them to benefit from others’ experiences as well as provide contacts tips based on their own.

In light of these findings, leaders hoping to encourage the development of social capital among postsecondary educators and workforce trainers—which in turn could lead to higher levels of communication, teamwork, problem solving, and self-directed learning skills in students and employees—may find more success in openly promoting the importance of teaching- and training-focused social ties as well as providing more opportunities for intra- and interorganizational professional development. While almost 78% of respondents in this study reported having teaching- or training-focused discussions of some kind over the last year, results indicate that there is room for further social network development among educators and employers.

Limitations and Scholarly Significance

These findings should be interpreted with several limitations in mind. First, we obtained our results from two large geographical areas, and from STEM instructors and employers representing two broad industry-related groups, thereby limiting the generalizability of our findings. Second, we had to truncate social network data collection on surveys to reduce respondent burden, which prohibited us from using more advanced diversity, strength, and structural personal network measures in our analysis. Third, due to the sample size, especially on the employer side, we could not apply comparative regression analyses or adjust for a number of measures that could generate more powerful and sophisticated insights into how valuable social ties—and therefore social capital—associate with teaching- and training-practices among postsecondary instructors and training representatives in linked STEM fields. Low response rates among employers, especially, present a profound limit to the claims we can make based on this data.

Still, as research from educational contexts continues to show the connection between social networks and improved instruction, this study contributes by drawing on empirical data to explore and compare educator and employer teaching- and training-focused ties in regard to important non-cognitive skills. Future research can build on this study by expanding samples and data collection techniques to include more in-depth and robust social tie measures as well as indicators that would allow scholars to test the association between patterns in teaching- and training-focused networks and particular aspects of professional practice, including, most importantly, instruction. Such analyses, we hope, will help scholars better understand the association between social capital, on the one hand, and student and employee engagement and achievement, on the other.

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