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How Faculty Develop Teaching-Focused Social Capital: Personal Networks and 21st Century Skills Instruction

A Report from the Exploring Multiple Postsecondary Opportunities through Workforce and Education Research (EMPOWER) Project

Abstract

While research shows that relationships or social ties give K12 teachers access to valuable information, knowledge, and advice that improves professional practice and student learning —resources conceptualized as “social capital”—few studies investigate how faculty develop the kinds of ties that help them better teach important 21st century skills like communication, teamwork, problem solving, and self-directed learning. Focusing on college faculty in one U. S. city, this mixed-methods study explores the association between science, technology, and medical (STM) instructor characteristics and personal social networks centered on discussing how to teach important skills. Survey responses (n=244) indicate that teaching experience, institution type, and teaching preparation time are correlated with network patterns linked to improved professional practice, while interview data (n=22) supplement these findings with instructor descriptions of how and why they developed teaching-focused social ties in their professional lives.



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Key Findings

1. College faculty with more teaching experience are less likely to develop teaching-focused social ties centered on the instruction of important 21st century skills, signaling less access to new teaching information
2. Newer faculty members develop more fragile ties in teaching-focused discussion networks, meaning less access to complex, non-routine information on skill instruction
3. Two-year college faculty have teaching-focused discussions with more diverse conversation partners than those in 4-year colleges, which associates with access to more innovative advice and information on teaching 21st century skills
4. Health care faculty develop stronger discussion network ties than energy faculty and therefore have access to more tacit, complex information on skill instruction
5. Faculty report developing these networks through teaching and industry work experiences, professional development initiatives, disciplinary association meetings, and because they have offices close to discussion partners
6. Whether respondents view organizational-based opportunities to discuss 21st century skill instruction as available and accessible depends on their sense of time commitments and the burden of myriad job responsibilities
7. Developing beneficial teaching-focused social network ties demands individual and organizational investment, and can be better supported by purposeful institution and department initiatives focused on creating the time and the space for discussion

Introduction and Background

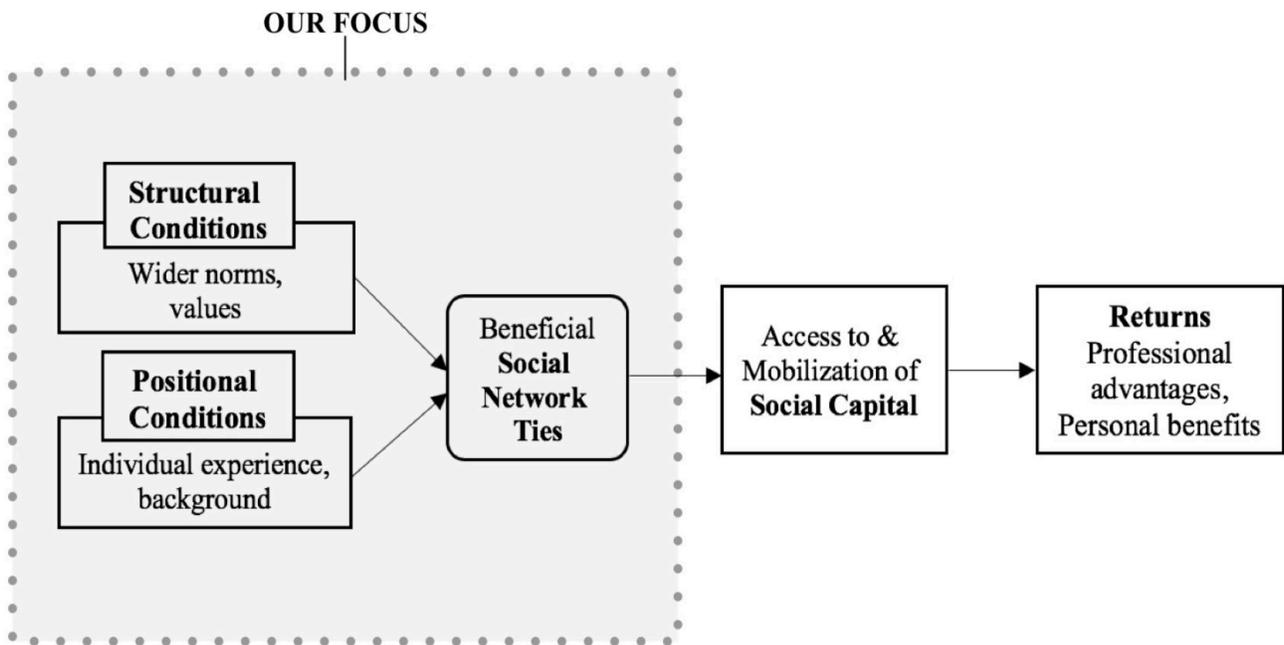
For almost as long as teacher learning has been considered a key facet of successful educational reform (e.g., Borko & Putnam, 1995), scholars have recognized that a teacher's social environment is integral to this learning and, more generally, their professional development (McLaughlin & Talbert, 2001). In light of efforts to reform college instructional practices to improve student retention and teach students valuable "21st century" skills like communication, teamwork, problem-solving, and self-directed learning for life and work (Hora, Benbow, & Oleson, 2016; Pellegrino & Hilton, 2012), the social connections through which faculty learn to become more proficient in their jobs is an issue of continuing significance. In this research brief we focus on how these beneficial social connections develop.¹

Years of research support the importance of relationships to teacher learning. Studies show that social ties shape individuals' access to valuable information, knowledge, and advice, relational resources often theorized as "social capital" (Lin, 2001). In schools, compilations of social ties or "social networks" in which instructors discuss teaching have been linked not only to improved professional development and the ability to cope with change, but also to more effective teaching practices and student achievement (Baker-Doyle & Yoon, 2011; Coburn & Russell, 2008; Moolenaar et al., 2012).

¹ This research brief is an abridged version of Benbow, R. J., & Lee, C. (2018). Teaching-focused social networks among college faculty: Exploring conditions for the development of social capital. *Higher Education*, 1-39.

Scholars using social network analysis (SNA)—a research perspective and set of techniques measuring relationship ties to better understand how social interactions influence behavior (Wasserman & Faust, 1994)—have helped advance this line of inquiry. Work in SNA has established that particular patterns within the social networks of instructors based on network size (i.e. how many people one talks to about teaching), diversity (i.e. how diverse these people are), and tie strength (i.e. how close one feels to these people) constrain and afford access to the kinds of resources that can help one improve professional practice (Roxa & Martensson, 2009). Without access to the social capital that such ties confer, instructional practice and student engagement may suffer and hinder reforms meant to improve teaching and learning in American higher educational institutions and impart valuable skills, knowledge, and abilities to students (e.g., Spillane et al., 2015). Though a growing body of work in SNA examines K-12 educators’ teaching-focused social networks, only a handful of studies similarly examine postsecondary instructors and such skills education (Van Waes et al., 2015). Network research on science, technology, and medical (STM) faculty is similarly nascent. This study, centered on Lin’s (2001) model of how people develop social capital (Figure 1), explores how such beneficial social ties form among these faculty members.

Figure 1. Modeling conditions for social capital development (based on Lin 2001: 246)



Purpose and Methods

This research study used a convergent parallel mixed methods case study approach (Creswell, 2014), based on survey and interview data from college instructors in one large U. S. metropolitan area, to answer the following questions regarding social capital development in faculty social networks:

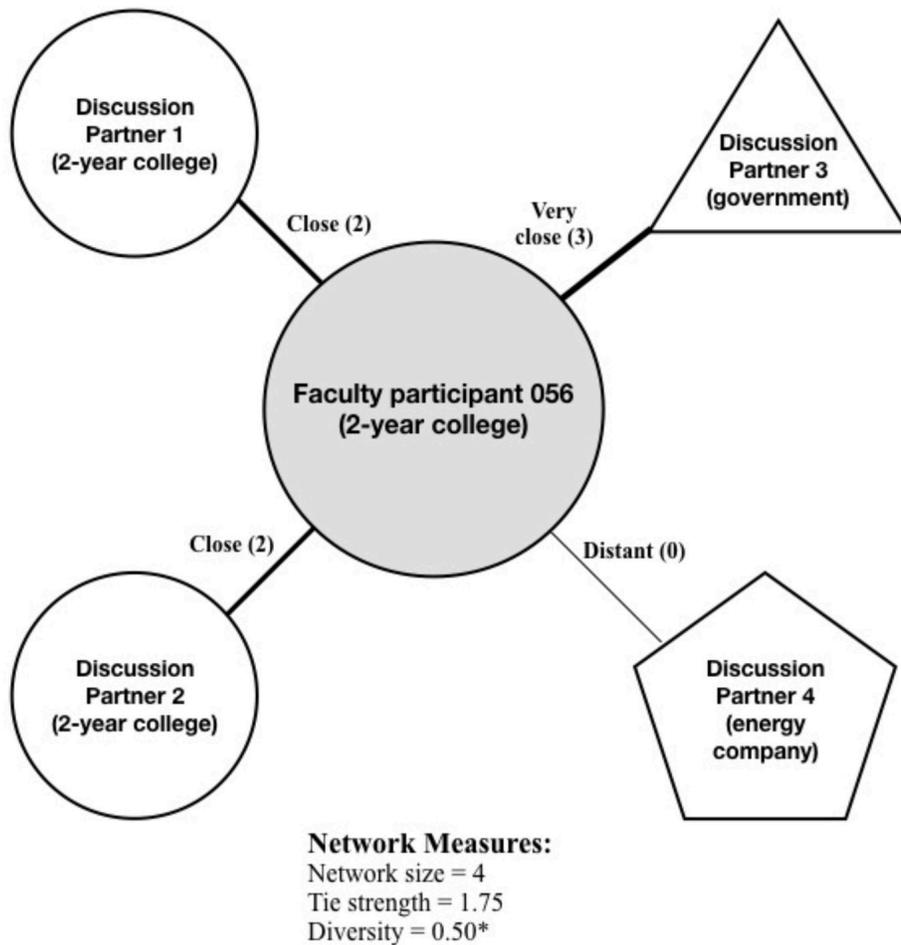
Research Question 1: What conditions are associated with the development of beneficial teaching-focused social ties among college faculty?

Research Question 2: What conditions do faculty members perceive as influencing the development of beneficial teaching-focused social ties in their daily lives?

Using figures from the U.S. Bureau of Labor Statistics (2016) and U.S. Census Bureau (2016), we developed a sample of 1,255 STM college instructors teaching in associate’s- and bachelor-level college programs linked to the most populous energy and nursing occupations in the focal city. In March 2017, we administered an online survey to this sample and 244 faculty members from 17 institutions responded.

The survey included 4 questions gathering indicators for the size, tie strength, and diversity of respondents’ teaching-focused social networks in which respondents discussed “methods or techniques they can use to better teach their students important skills, knowledge, or abilities.” As we discuss below, these indicators have been linked in the literature to the accrual of social capital (Lin, 2001). Following SNA “personal network” techniques meant to gather data on the social ties linked to a central individual (Burt, 1984; Halgin & Borgatti, 2012), respondents reporting that they had such discussions were asked to list between one and six people they talked to about these matters (our measure for network size), how close they felt to each person (tie strength), and each person’s organizational affiliation (network diversity). Figure 2 shows a representative personal social network, which network size, tie strength, and diversity measures, of participant 056.

Figure 2. Example of teaching-focused faculty network centered on teaching 21st century skills



*Network diversity measures for each respondent are based on Krackhardt and Stern’s (1988) E-I Index, a standard SNA measure equaling the number of external network ties minus the number of internal ties divided by the number of internal network ties plus the number of external ties. Here “external” groups include people professionally affiliated with educational institutions at other degree levels and business, government, and advocacy organizations and “internal” groups include people professionally affiliated with college organizations at the same degree level. To ease interpretation of this score, the measure was transformed into a bounded quantity between 0 (total network “homophily”) and 1.00 (total “heterophily”).

At the same time we administered the survey, researchers visited three cooperating college institutions in the city—two four-year universities and one two-year college chosen for their energy and nursing programs and differing student populations—and conducted in-person interviews with a subset of sample energy and health care faculty who had separately responded to recruitment emails asking for qualitative volunteers (n=22). Recorded interviews lasting 60 minutes featured questions about personal teaching-focused discussions regarding teaching important skills, and transcripts were inductively analyzed.

Results

RQ1: What conditions are associated with the development of beneficial teaching-focused social networks among college faculty?

Associations between teaching-related independent variables and faculty social network dependent variables linked to social capital are displayed in Table 1.

Table 1. Associations between conditions and teaching-focused social network variables

VARIABLES	Network Size	Diversity		Tie Strength
	Negative Binomial	Logit	AME	OLS
Positional conditions				
Time preparing to teach	0.085* (0.033)	0.141 (0.142)	0.026 (0.026)	0.014 (0.032)
Time teaching	0.031 (0.035)	-0.061 (0.147)	-0.011 (0.027)	-0.016 (0.030)
Time spent on advising	-0.000 (0.035)	-0.014 (0.135)	-0.003 (0.025)	0.031 (0.033)
Teaching experience	-0.096* (0.048)	-0.028 (0.185)	-0.005 (0.034)	0.117** (0.043)
Structural conditions				
Discipline (Energy)	-0.071 (0.108)	0.372 (0.440)	0.069 (0.081)	-0.336** (0.117)
Institution type (Four-year institution)	-0.162 (0.111)	-1.831*** (0.479)	-0.338*** (0.073)	-0.021 (0.109)
White	0.099 (0.096)	-0.527 (0.395)	-0.097 (0.072)	0.008 (0.092)
Female	0.132 (0.109)	-0.469 (0.464)	-0.087 (0.084)	-0.111 (0.112)
Constant	1.214*** (0.197)	0.607 (0.792)		1.951*** (0.199)
Observations	227	184	184	185
R-squared				0.099
Pseudo R-squared	0.0338	0.127		
Adjusted R-squared				0.0582

Note. Standard errors in parentheses. AME: Estimated Average Marginal Effect *p < 0.05, **p < 0.01, ***p < 0.001.

Network size

Hours spent preparing to teach is positively significant (.05), indicating that the likelihood of an educator having teaching-focused contacts increases significantly when he or she spends more time preparing to teach. Teaching experience is negatively significant to network size (.05), however, meaning the more experienced an educator is, the less likely he or she will develop teaching-focused discussion network ties.

Tie strength

At the same time, teaching experience is positively associated with the closeness of social ties (.01), meaning postsecondary faculty with more years teaching were both more likely to feel closer to their contacts, a factor associated with more innovative professional practice (Roxa & Martensson, 2009). Energy as a discipline is negatively associated with tie strength (.01), as well, suggesting that educators who identify themselves as being in energy-related disciplines tend to feel more distant from their network contacts than those in health care fields.

Diversity

Finally, faculty at 4-year institutions display significantly less network diversity than do their peers at 2-year institutions (.001), perhaps indicating more of a professional insularity among 4-year educators (e.g., Partha & David, 1994) when it comes to teaching-focused discussions on skill instruction.

RQ2: What conditions do faculty members perceive as influencing the development of beneficial teaching-focused social networks in their daily lives?

Instructor interview respondents spoke to a number of factors in their daily lives which allowed teaching-focused social networks to develop or not (Table 2). Here we discuss one of the more salient factors as well as a broader theme, time, that permeated quantitative and qualitative findings.

Table 2. Perspectives on conditions influencing teaching-focused social network development

Condition	N	Description
Teaching experience	9	The length of time one has taught in the higher education sector
Organizational support	8	Institution- or program-level priorities as revealed through teaching-related policies, funding, extra-institutional partnerships, and time allocation
Positional affordance	7	Teaching-related discussions are a part of one's job or official position
Content dependent	6	Opinion that teaching discussion contacts need to be content experts in the disciplinary field
Professional society membership	5	Respondent is an active member of a professional or disciplinary association and regularly attends meetings
Physical proximity	4	Conversations are more or less likely when offices, classrooms, or program facilities are close to one another
Industry background	3	Work experience in private industry helps one develop extra-institutional contacts
Innate ability	2	Opinion that one either is a good teacher or not, and discussions do not help one improve instruction

Note. Conditions listed in order from top to bottom by number of respondents speaking to each.

Organizational resources and teaching experience

Instructor interviewees noted how helpful formal centers for teaching and learning at the college level were for helping them form teaching-focused social connections, though whether or not such resources were seen as readily available differed from respondent to respondent, explained further below. The negative association between years teaching and social network formation in our quantitative analysis was also important in interviews, with a number of faculty respondents explaining the close connection between advice-seeking and teaching experience. One new engineering instructor said, “I certainly talk to other professors since I’m relatively new in the academia world,” while a more experienced instructor told us she spoke to others about teaching less frequently nowadays. “It was more often early on because I wasn’t real familiar with the course,” she told us.

The importance of time

Indeed, “time” had a number of connotations that figured prominently in both statistical and qualitative analyses. Instructor interviewees reminded us that time in particular was a finite resource, and growing more so in often cash-strapped higher educational institutions. When asked if there were any challenges to forming teaching-focused social networks that helped him better teach important skills, for example, one health instructor said he and other instructors did not “see each other very often because we have 20 other million things...the biggest barrier is how busy we are.”

Insights and Recommendations

Results point to several important insights and recommendations for STM college instructors, administrators, and scholars.

I. Years of teaching experience predict teaching-focused social network discussions

STM college faculty with more years of instruction were more likely to have smaller, stronger teaching-focused social networks centered on discussing skills instruction than newer faculty. Such networks are characterized in the literature, somewhat contradictorily, by reduced access to new information (Roxå & Mårtensson, 2009) and increased access to more complex, non-routine information (Coburn & Russell, 2008). Our interviewees suggest that teaching experience helped mitigate faculty members’ apprehension of their classroom teaching skill, thus limiting advice seeking behavior (and, possibly, social capital accrual) through potentially new sources of professional information.

II. Teaching-focused discussion, and possibly student learning, varies by discipline and institution type

Findings show that 2-year STM college faculty have teaching-focused discussions with more organizationally diverse people than faculty in 4-year colleges, while health care faculty develop stronger discussion network ties than energy faculty. While stronger ties, as noted, associate with the exchange of more complex information between social network members, the diversity of discussion partners can also be beneficial to faculty members. People usually establish social ties with others who are similar to themselves (Marsden, 1987), and information coming from such relationships is more often redundant than information coming from relationships with alters with different attributes (Burt, 2000). Greater network diversity, however, often offers the individual access to a wider variety of information and resources that can lead to more innovation and change in practice (Burt, 2004). In light of past research, this may indicate that 2-year faculty have more diverse insights about teaching and learning than faculty in 4-year colleges and that student experiences, although not entirely defined by classroom learning, may fluctuate accordingly.

III. Time allocation associates with the development of teaching-focused social capital

Unexpectedly, our regression analysis shows a strong association between a particular kind of STM faculty time allocation—the number of hours each week faculty members prepare to teach—and social capital accrual through increased network size. While this suggests an important distinction between fixed teaching hours, ordinarily prescribed by one’s academic unit, and the hours a faculty member chooses to spend outside of a course preparing, it also highlights the view that teaching-focused discussions, and the exchange of information they allow, are a form of teaching “preparation”

(Van Waes et al., 2016). At the same time, STM interview respondents expressed the view that time, including one's workload and sense of being continually overburdened, was one of the more significant factors constraining teaching-focused conversations. Importantly, these findings speak to studies linking faculty time allocation to individual-, departmental-, institutional- and even disciplinary-level factors (e.g., Singell & Lillydahl, 1996), reminding us that social capital development demands extensive personal and organizational investment (Lin, 2001).

IV. College leaders can encourage teaching-focused social networks, social capital, and 21st century skill instruction across disciplines

This study supplements and extends existing research showing that faculty members' use of time is determined not only by individual-level factors, but also by departmental- and institutional-level factors. In light of these findings, administrators and policymakers hoping to encourage the development of beneficial relationships among STM college faculty that improve skills instruction may find they are more successful by openly and determinedly promoting the importance of teaching-focused social ties, in both formal and informal spaces, among faculty teaching in their institutions. Leaders may also benefit by more closely aligning departmental and institutional professional development measures, be they teaching conferences, mentorship programs, peer assessment, or campus-wide opportunities, as closely as possible with faculty teaching experiences and teaching, research, and service commitments.

Conclusion

While it is clear that social ties have a significant influence on K12 teacher practice and student learning, it is important to build a research base exploring social networks in the higher education sector, including questions of how such networks, once developed, can facilitate the instruction of important noncognitive skills for life and work in STM fields. Such a research base will lead to a better understanding of the social experiences of college instructors in their daily lives. These interactions are important building blocks for improved knowledge and practice, which in turn can lead to more effective student engagement and achievement. "In this manner," as Biancani and McFarland (2013: 156) argued, "we better learn how a university system functions and potentially can be altered."

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