APPLIED RESEARCH

Developing an Educator Network: The Effect of a Teaching Scholars Program in the Health Professions on Networking and Productivity

Anna S. Moses
Office of Educational Development, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA

Diane Heestand Skinner
College of Health Related Professions, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA

Elizabeth Hicks
Office of Educational Development, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA

Patricia S. O’Sullivan
Office of Medical Education, University of California, San Francisco, San Francisco, California, USA

Background: Teaching Scholars Programs are designed to enhance productivity and faculty retention. The formation of an increased network may be a facilitative mechanism. Purposes: This study determined if participants increased their educational network and if the increase affected productivity. Methods: Researchers interviewed Teaching Scholars participants for pre- and postparticipation members of their educational network and issues related to network formation and conducted a structured vita analysis. Researchers used social network analysis (SNA) to describe the networks and regression to determine the relationship between network and productivity. Results: Educational networks increased with participation (p < .001) but showed little or no effect on productivity. SNA revealed a decrease of participants with no network, increase in connections among participants, and increase in connections to central services personnel. Researchers identified six themes from the participants’ comments. Conclusions: This relatively modest program demonstrated a small effect on productivity through the increased network.

Health science universities across the country have developed longitudinal faculty programs to enhance the teaching and scholarship skills of educators. Academic Medicine’s November 2006 issue on medical education fellowships provides overviews of some of these programs. In the introductory article, Searle et al.1 reported that one purpose of these programs is to create a core of faculty who will make educational change possible. Gruppen et al.2 stated that creating “a scholarly community may be one of the most significant and lasting consequences of intensive faculty development programs,” arguing that the scholarly atmosphere of entire institutions benefit from such communities (p. 993).

These scholarly communities are effective in overcoming challenges posed by the changes facing medical education today:3 Faculty retention is one such challenge. Bickel and Brown4 reported factors that contribute to a shortage of faculty, including retiring Baby Boomers, increasing student enrollments, and decreasing resident interest in academic medicine. Woods et al.5 reported that family medicine faculty’s networking was positively associated with their retention. Scholarly communities could help increase faculty retention by providing a supportive network.

Literature indicates that faculty with scholarly networks are more productive. Finkelstein6 found that off-campus relationships with colleagues were a key factor in predicting a faculty member’s research productivity. Bland et al.7 found a positive relationship between productive faculty and those faculty who reported that they had a “well-developed network of colleagues with whom [they] discuss research projects and education” (p. 229). Morzinski and Fisher8 found that faculty
development programs helped enrollees to build important career relationships.

Researchers are examining professional relationships through the lens of network mapping,9 used for years to analyze social relationships. The business community has used social network mapping to describe how employees share knowledge and identify specific areas that could cause company knowledge sharing to breakdown.10 Social network mapping may be a valuable tool for visually conceptualizing the structure of the networks built through faculty development programs.

PURPOSES
The purpose of this study was threefold. First, we wanted to determine if participation in the Teaching Scholars Program (TSP), a longitudinal faculty development program at our institution, resulted in a larger network of colleagues interested in education. If so, we also wanted to determine what types of colleagues—departmental, campus-wide, administrators, national contacts—were involved. Second, we wanted to identify themes related to building this network through TSP. Finally, we wanted to determine if an increase in participants’ educational networks was associated with increased productivity as measured with a curriculum vita (CV) analysis.

METHODS
This is a descriptive study based on data collected during interviews with individuals who completed the TSP at the University of Arkansas for Medical Sciences from 1998 to 2004. The TSP sought to improve the teaching skills of faculty in five health professions colleges and to nurture the development of a group of faculty who actively engage in the scholarship of teaching. The format included three components: nine monthly 3-hr workshops on topics related to teaching and educational research; approximately four annual lectures by nationally known health professions educators; and completion of a project in the subsequent two years. During the 1st year, the program was available to College of Medicine faculty only; since then, the program has also included participants from the Colleges of Nursing, Pharmacy, Health-Related Professions, and Public Health.

With approval of the Institutional Review Board, we contacted each eligible TSP participant to complete a semistructured interview. Details of the construction of the interview are reported elsewhere.11 One researcher (AM) conducted all interviews. Each interview took an average of 40 min. Scholars’ responses to three questions provided the qualitative information for this study: (a) “Please describe your network of educators before you began TSP,” (b) “To what extent did your network of educators change since you completed TSP?” and (c) “With whom have you become involved as a result of the Teaching Scholars opportunity?”

Network Analysis
Membership. We operationalized the network as follows: We counted once each person or group whom the participant mentioned as part of his or her network when responding to the three questions. We entered the quantitative information into a database, calculated descriptive statistics, and compared the pre- to post-TSP changes with a Wilcoxon test using SPSS Version 13.0.

Network mapping. One researcher (AM) used Ucinet,12 a network mapping software package, to analyze visually the TSP participants’ networks, including creating two network maps to represent the TSP participants’ pre- and post-TSP network and examining the maps to determine the numbers and kinds of connections that had developed. Key indicators examined were isolated members and cut points. Cut points represent people who, if removed from the network, would disconnect parts of the network.13

Network themes. One researcher (POS) reviewed participant comments using open coding methodology—a repetitive process of conceptualizing, reducing, and grouping data—which resulted in several themes. The research team reviewed the comments to reach consensus on these themes.

CV Analysis
We coded the CVs to obtain a productivity score related to educational activities, such as presentations, publications, and leadership roles, for each TSP participant. To code, we used a combination of methods described by Morzinski and Schubot14 and Gruppen and others.15 We added categories for educational materials and education-related workshops to and omitted the grant development category from Morzinski and Schubot’s codes, which included peer-reviewed publications and presentations, leadership roles at national conferences and their own institutions, teaching awards, and grant development. We created a total productivity score summing the results for these categories.

Since we were evaluating a program that spanned a number of years, we did not compile scores by year but used a model developed by Gruppen’s group. We grouped scores in 2-year periods beginning July 1 and ending the following June 30. For each scholar, we identified a pre period (the two academic years before TSP participation) and a post period (the 2-year period preceding the interviews).

Two scorers (AM and EH) analyzed the vitas. We set up initial coding categories and scoring criteria, individually scored the same two vitas, then compared our results and revised the categories and scoring criteria. We then rescored those two vitas and scored an additional three vitas, again comparing scores and further revising scoring criteria. We then rescored those five vitas along with five others and again compared scores and discussed scoring discrepancies and modified the codes as needed. We each scored all of the remaining vitas, compared scores, and reached consensus on any discrepancies.

RESULTS
Thirty-six of the 43 (88%) eligible TSP graduates completed interviews. Two refused, and 5 never responded to requests. All nonparticipants were from the College of Medicine, which
made up two thirds of all TSP participants and nearly two thirds of the study participants. Therefore, despite its nonparticipants, the college had appropriate representation in this study. The Colleges of Pharmacy and Health-Related Professions had five respondents each, and Nursing had three. Study participants had a mean age of 49.7 (SD = 8.4) with 10.6 (SD = 8.0) years of teaching; slightly over half were female.

During the interviews, scholars identified individuals and groups at the course, department, college, university, and outside of the university level as part of their network prior to TSP. They identified an average of 2.2 (SD = 2.3) people and groups they considered as those with whom they talked about education, their educator network. The modal response was none or “zero,” with “very limited” as the next most frequently chosen option. After TSP, this educator network grew significantly to 7.7 (SD = 5.6) people and groups (p < .001), and the mode was 4. Only one scholar reported no network post-TSP.

Figures 1 and 2 show the two network maps created from TSP scholars’ educational network before TSP (Figure 1) and their network at the time of interview (Figure 2). Visual inspection revealed three findings. First, the number of TSP scholars with no network connections decreased from five to one. Second, the number of direct connections among TSP scholars increased from 6 to 36. Third, the number of connections between scholars and people working in central service offices (Educational Development, Academic Computing, Continuing Medical Education, and Library) increased from 6 to 70 connections.

The map in Figure 2 clearly shows that one TSP participant remained completely disconnected from the network, and two scholars had small networks that were disconnected from the main TSP network. There were 32 cut points in the network, representing 29 TSP participants, one central services personnel, one University of Arkansas for Medical Sciences faculty member, and one national organization.

Qualitative analysis of the three questions regarding the participants’ networks generated several themes:

**Like-minded people.** TSP put the scholars in contact with other individuals with similar interests. One scholar indicated that TSP gave him an “identity.”

**Confidence to expand network.** Many scholars prior to TSP had no involvement in educational activities outside their departments. TSP provided participants with a network to broaden their careers. One scholar called TSP a “cornerstone” when referring to his growth in relationships through TSP. Some scholars felt they now had the basis for establishing a contact that they would not have established previously.

**Better knowledge of resources and people.** Scholars drew upon the education faculty whom they met through TSP as well as from each other for teaching resources. For example, one faculty member outside of medicine sends her students to a simulation lab run by a physician she met in TSP.

**Very local education networks.** In this theme, the scholars spoke about how being in TSP affected the very narrow network that they saw as their education world. One scholar described feeling like he was on an island, unable to share his interest in education with the faculty in his local network; TSP did not help him “develop a sufficient cadre of fellows to carry out things [in his own department].” Another described being primarily interested in his local network and did not expect it to grow much more. These comments highlighted limitations of TSP in expanding faculty’s local education networks.

**Regional and national networks.** As one scholar put it, “[I] attended meetings [I] never would have and [these meetings were] directly down the line of what I do every day. Pretty valuable meetings for me.” Another described his involvement with a program directors’ organization with which he would not have otherwise participated. He then had the opportunity to speak to his professional society about educational issues. Frequently, scholars noted that participation in TSP opened new
TABLE 1
Comparisons of pre–post teaching scholars program (TSP) curriculum vita analysis

<table>
<thead>
<tr>
<th></th>
<th>Pre-TSP M (SD)</th>
<th>Post-TSP M (SD)</th>
<th>d</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>3.09 (4.77)</td>
<td>4.80 (4.89)</td>
<td>0.36</td>
<td>.12</td>
</tr>
<tr>
<td>Publications of Educational Research in a Peer-Reviewed Journal</td>
<td>0.23 (0.65)</td>
<td>0.37 (0.81)</td>
<td>0.22</td>
<td>.44</td>
</tr>
<tr>
<td>Presentation and/or Abstract of Educational Research at a Peer-Reviewed Regional or National Meeting</td>
<td>0.34 (0.64)</td>
<td>0.69 (1.10)</td>
<td>0.55</td>
<td>.09</td>
</tr>
<tr>
<td>Leadership in a Regional or National Education-Related Organization</td>
<td>0.51 (0.82)</td>
<td>1.31 (2.25)</td>
<td>0.98</td>
<td>.04</td>
</tr>
<tr>
<td>Leadership in College-Wide or University-Wide Education-Related Committee</td>
<td>1.31 (3.18)</td>
<td>1.97 (2.66)</td>
<td>0.21</td>
<td>.30</td>
</tr>
<tr>
<td>Educational Materials Development</td>
<td>0.09 (0.37)</td>
<td>0.09 (0.37)</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Education-Related Workshop at Regional or National Meeting</td>
<td>0.03 (0.17)</td>
<td>0.09 (0.28)</td>
<td>0.35</td>
<td>.32</td>
</tr>
<tr>
<td>Teaching Awards</td>
<td>0.57 (1.17)</td>
<td>0.29 (0.52)</td>
<td>0.24</td>
<td>.14</td>
</tr>
</tbody>
</table>

contacts for them that they would not have had or even have considered. The scholars saw these as networking experiences directly related to TSP.

*No expansion.* Six scholars identified no change in their education network. This theme has several subthemes. One is “not a right match.” This lack of change may have resulted because they did not voluntarily participate in the program but were required to participate because of poor student ratings of their teaching. One scholar felt the program did not match well with the revenue generation expectations of his department. Another subtheme is “too isolated.” Some scholars were the only participant from their college in their class, making it hard for them to sustain a network. Often these scholars worked in facilities away from the main campus.

When analyzing the vita productivity scores, we found that the participants’ educational productivity scores increased from 3.1 ($SD = 4.8$) to 4.8 ($SD = 4.9$; $p = .12, d = 0.36$), an increase that was not statistically significant. Although several of the categories—publications, presentations, local leadership roles, and workshops at regional and national meetings—increased, the only productivity category that increased significantly was the leadership in regional or national, education-related organization category. The category score for educational materials development remained the same and the teaching awards declined. (See Table 1.)

**DISCUSSION**

This work supports that programs like TSP contribute to the expansion of an individual’s education network, although it shows no evidence for an increase in productivity. It highlights both the strengths of bringing diverse groups together and the drawbacks of not focusing on smaller units. Clearly, networks generally expanded much wider than participants ever expected—one described it as an “exponential, dramatic growth.” The size of the post-TSP network contributes significantly to explaining the post-period educational productivity even when controlling for previous productivity, network, and time out of the program.

One theme, “very local networks,” seems to highlight a way in which TSP did not improve networks. Programs should perhaps be more proactive in helping scholars in insolated environments. However, this may be an underdeveloped concept. We did not probe to determine if the intensity of the working relationship and the quality of the network changed as a result. This is an area needing further exploration.

We found social network mapping to be an informative approach in analyzing changes in professional networks. This analysis supported the conclusions from traditional analyses including the increased network and evidence of isolation. However, it also generated new information. Through the network maps, we observed an increase in interscholar networking. This finding supported our belief that the TSP had facilitated the creation of a group of faculty interested in teaching and the scholarship of teaching. We noted the increase in scholar contact with staff and faculty in central services. This contact perhaps provided the TSP participants with the support they needed to sustain their engagement in the scholarship of teaching.

Through social network mapping, we recognized a potential problem. If any of those individuals representing cut points in the network were to leave our institution, a division in the overall TSP network could result. The network map helps us advocate for new connections to adjust the network should individuals leave.

The change in educational productivity was small for those participating in TSP but was related to the network gained through TSP. We should recognize that educational productivity, such as publications, presentations, and workshops related to education, may not have been a high priority for many of these educators. In the early years of the program, participants...
were often those most active in education on campus. Over the years, the participants were younger faculty members interested in becoming educators who likely will value this type of productivity. A few scholars enrolled to improve their teaching evaluations and thus may not be particularly concerned with educational productivity. The greatest growth occurred in leadership in regional or national education-related organization, which may represent a form of scholarly productivity enhanced by relationships with others.

This study has limitations. There was no control group. The TSP participants may have experienced the same network growth and increased productivity as their careers developed, even if they had not participated in TSP. We explored these issues further. We found that the variable years teaching was negatively correlated with the pre-TSP network \( (r = -0.16, p = 0.18) \). If time alone could account for larger networks, we would have expected a positive correlation. For counting members of the network, we used a relatively insensitive measure. However, even this measure showed significant change over the course of TSP. The numbers came from responses to open-ended questions and perhaps with prompting could have described networks with more detail. The verbal comments indicate that the majority of scholars recognize a dramatic change in their educator network. Since some participants described their pre-TSP network after a number of years had passed, they may have underestimated the number of network members.

The results of this study inform program implementers. We previously described the success of our program on others with whom our participants interact.\(^{11}\) We acknowledge that this particular program, which only had nine meetings and a project, had low impact on productivity. Yet we believe that this study has elucidated much about what programs like ours can do to enhance the important construct of networking. First, when designing a program, expose participants to the diverse individuals interested in education in your institution. Second, encourage discussion of education opportunities and instill confidence in scholars to participate in them. Third, work more directly with those faculty members who feel isolated to build their local networks or strengthen their ties to the TSP network.

TSPs can provide valuable resources for expanding and enriching an individual’s educational network, although our findings do not support an increase in productivity. TSP sponsors should focus on enhancing these networking opportunities for their faculty.

REFERENCES