

An Innovative Collaboration between an MD & PhD to Conduct SoTL Research

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Abstract:

In higher education, the Scholarship of Teaching and Learning (SoTL) is considered a valuable faculty contribution and conceptualized as a personal endeavor. In other settings, such as medical education, faculty are focused on the efficacy of systems or programs, rather than individual processes. In this collaborative study between a Family Medicine physician and educational researcher, five years of data (2010-2015) were analyzed within a Family Medicine residency program for two reasons; to examine the benefit of conducting SoTL research within graduate medical education and to better understand the kinds of comments residents gave each other after a two-week period. The results show that the collaborative endeavor was valuable for both the MD and PhD and that such a collaboration has the potential for increasing SoTL work in medical education. Further, residents provide each other valuable feedback, which can be used for early signs of problematic behavior.

Key Words:

Graduate Medical Education, Peer Feedback, SoTL, ACGME Competencies, Qualitative Research.

Introduction

In higher education, the Scholarship of Teaching and Learning (SoTL) is considered a valuable faculty contribution. By engaging in SoTL research, educators learn about what works and does not work from a student perspective and then adjust the teaching and learning environment to better fit their needs (Huber & Morreale, 2002). In other settings, such as medical education, SoTL is conceptualized differently. In these settings, faculty are often more focused on the efficacy of systems or programs, rather than one's own individual process. Reasons for this may be because the field strives for homogeneity and standardization across medical institutions, or, it may be because physicians' role is primarily to care for patients, making the examination of one's teaching process less of a priority. Regardless of the reason, SoTL research, as it is conceptualized in non-medical higher education, has potential to provide clinical-educators with insights into their students, curriculum, and educational environment (Gubbins, 2014). Moreover, engaging in more traditional SoTL research may help provide an alternative pathway to improving medical education.

In an effort to explore what benefit a non-medical higher education SoTL framework might lend to clinicians, this exploratory study analyzed five years of data (2010-2015) that was originally collected as part of a summative evaluation process within a Family Medicine residency program. Initially, the physician initiating the review wanted to provide residents with a more global picture of their clinical performance while on his two-week rotation. However, these data were never systematically analyzed for themes to understand the kinds of data residents were providing to each other. Therefore, in an effort to understand what residents offered in their feedback and what clinical-educators may learn in the process of conducting SoTL research, we focused our inquiry on the following research questions: What kinds of feedback did residents provide to each other after rotating with peers for two-weeks? What, if any, implications are there for engaging in SoTL research for other clinical-educators working in residency programs?

Conceptual Framework

In SoTL research, as it is conceptualized in non-medical higher education, there are several different genres that faculty can engage in, including studying changes in students, frameworks integrated into curricula, etc. (Nelson, 2000). This study represents a new genre, one in which the authors hope to motivate other health science practitioners to explore. Our SoTL research is a manifestation of a new trend in medical education, which includes MDs and PhDs working together to solve educational issues. This kind of collaboration is not new to medical education, but has recently been highlighted as an alternative to developing MDs into high-functioning educational researchers (Stoddard & Brownfield, 2016).

In our study, an educational researcher (PhD) working at the Educational Innovation Institute (EII) at the Medical College of Georgia and a Family Medicine clinician (MD) working in an Academic Health Center, were interested in collaborating to better understand how engaging in SoTL might benefit clinical-educators and their teaching practice, while also trying to understand the comments that residents gave each other at the end of a two-week rotation. In this MD/PhD mentoring relationships, data was discussed, analyzed, and interpreted by both the educational researcher and the

clinician in the effort to better understand the kinds of teaching and learning occurring in the clinical setting. These relationships are meant to be fruitful for the researcher, who learns about the educational practice of clinicians, and clinicians, who learn about the process of conducting and disseminating SoTL research. Our goal in launching this study was to explore the benefits of conducting this kind of work.

We are not the first to make the call for more SoTL research within the health science professions (Beattie, 2000; Glassick, 2000; Gubbins, 2014). In 1990, Boyer and Rice called for faculty to move beyond the “teaching versus research” debate and combine the two forms of scholarship into one. The result of his work was an expanded definition of scholarship that included discovery, integration, application, and teaching (Glassick, 2000). To date, the scholarship of teaching remains one of the more difficult types to interpret and implement, even when faculty are committed to understanding, expanding, and enriching their teaching practice. Furthermore, while this category is difficult for any faculty member to investigate, the skills needed to understand teaching and learning processes is difficult for physicians whose primary responsibility is to care for patients. It is for this reason that an MD collaborated with a PhD in the analysis and sense-making of the data.

Our work represents a combination of two types of scholarship as outlined in the field, the scholarship of teaching and the scholarship of discovery (Glassick, 2000). Historically, the scholarship of discovery has been between basic and clinical scientists (Beattie, 2000), however ours is between an MD and PhD in education. Given that our work focuses on analyzing peer assessment in graduate medical education, we provide a brief overview of the relevant literature in this area.

Peer Assessment

Peer assessment, the process in which learners examine and critique the work of other learners (Evans, 2013), is a common practice in higher education (Ashenafi, 2017), as well as, graduate medical education. However, although data is collected from many team members, faculty perspectives have historically dominated this evaluation process. The Accreditation Council for Graduate Medical Education (ACGME), the accrediting body for resident programs now requires multisource feedback in the assessment of physician competencies as part of the formal evaluation process (Lockyer, 2003). ACGME’s push to include multisource feedback alongside clinician’s feedback, was to remove some of the challenges and barriers to effective assessment practices when only one source of feedback is used (Goldhammer, Baker, Rigg, & Weinstein, 2014). The goal in this effort is to look at a person’s work from a variety of perspectives, including those at the same level in the organizational chart, those above, and those below (Lockyer, 2003). This shift in how formal feedback was delivered and by whom was initiated by experts in the field who felt that the kinds of feedback given to residents by attending physicians lacked perspective from other parties working with the learner. The fear was that one source of feedback could potentially bias ratings and remove the learner’s performance from the context in which it occurred (Donnon, Al Ansari, Al Alawi, & Violato, 2014; Nurudeen et al., 2015).

What has been published about peer feedback in residency programs indicates that residents believe their peers provide a unique contribution beyond that of faculty. They

perceive their peers as having a better understanding of their personal and professional strengths, and challenges because of the amount of time they spend together (Dupras & Edson, 2011). Others have reported that peer feedback seems to make a difference in the overall practice of medicine, including the improvement of patient safety (Strayer, Shy, & Shearer, 2014) and compliance of care (Asao, Mansi, & Banks, 2009). Peer feedback has also been found to be helpful in assisting with the process of identifying residents who may be struggling (Zbieranowski, Takahashi, Verma, & Spadafora, 2013), a particularly salient issue in graduate medical education.

To date, the majority of studies on peer feedback in residency employ quantitative measures (Zhao, Zhang, Chang, & Sun, 2013), which focus narrowly on specific skills, such as professionalism (Arnold, Shue, Kritt, Ginsburg, & Stern, 2005) and interpersonal communication (Qu, Zhao, & Sun, 2010). Few published studies have examined residents' peer feedback through open response formats or qualitative approaches (de la Cruz, Kopec, & Wimsatt, 2015). This uneven approach to data collection most likely stems from the immense amount of time needed to collect, analyze, and synthesize qualitative data. However, working in tandem with an educational researcher who is skilled in qualitative research methods, clinicians can analyze open-ended comments in an appropriate manner and potentially glean deeper insight into the educational process inherent in training physicians.

Methods

Context of the Study

In 2010, a Family Medicine physician in a Southern Academic Health Center decided to shift the way his residents were receiving feedback in his rotations. Rather than just relying on his own observations and interactions with residents, or making his residents wait until the end of the year, he decided to provide his residents with peer feedback after completing a two-week in-patient (hospital) rotation. At the beginning of each rotation, the clinician oriented the residents to this activity, informing them that they would be providing their peers with feedback on their clinical performance at the end of two-weeks. Advanced notice is considered an important practice when initiating a system of peer feedback (Lockyer, 2003). Residents were subsequently reminded of this throughout the two-weeks they worked together in the hospital. Then, at the end of the two weeks, residents were given a Likert-like scale asking them to rate how well their peers performed on the ACGME competency, *Interpersonal and Communication Skills*. This competency is the only one that ACGME requires Family Medicine residency programs to provide residents with multisource feedback (Zhao et al., 2013). Additionally, the clinician included space for residents to provide additional comments to their peers on anything else they thought was important to share. This open response section seemed to be an invitation for residents to comment on each other's performance in a variety of ways and the content was used in the analysis of this study.

Data on each resident were collated and de-identified before being shared in a one-on-one evaluation meeting at the end of the two weeks. Peer feedback was shared in this manner because best practice suggests that any written feedback should be orally explained and discussed with the person being assessed (Van den Berg, Admiraal, & Pilot, 2006). The data were then sent to the program director who stored the residents'

data in a computer for future analysis. In total, participants in this study included 10 cohorts of Family Medicine residents (N = 45) who rotated with the clinician in his Family Medicine residency program during the five years of data collection (2010-2015).

Data Collection & Analysis

To glean a better understanding of residents' comments, data were analyzed using content analysis (Hsieh & Shannon, 2005), in which a priori coding was developed out of the ACGME competencies. Content analyses is an appropriate method for analysis when researchers are trying to understand large amounts of text. In this case, text is defined as the open-response comments written by residents during the peer feedback process. We used the ACGME competencies as our codes because residents in graduate medical education are oriented to these competencies and therefore serve as an organizing framework for resident professional development.

In addition to the MD working on this project, a second educational researcher was included to help with reliability checks in the data analysis. To establish reliability between two researchers, approximately 10% of the data was individually coded and compared, which yielded a kappa coefficient of .58, a score that is considered acceptable (Bazeley & Jackson, 2013). Discrepancies were discussed between the two researchers and codes were revised until the researchers reached 100% agreement. Thereafter, the two researchers coded approximately half of the data. Comments that did not fit into the ACGME framework were given new categories and coded into themes and sub-themes. The MD was not included in this part of the research process, in large part because coding and qualitative analysis is time consuming and requires large amounts of time to produce. Rather, we used the clinician as consultant who gave us approval for moving forward with the analyses, encouragement to explore new themes, insights into why residents might have said what they did, and feedback on the results. Future endeavors might explore the inclusion of the clinician in the actual data analysis (i.e. coding) and investigate the extent to which this is helpful in understanding the results of a study.

The data revealed that although the vast majority of comments referenced ACGME's *Interpersonal and Communication Skills*, the residents also commented to a lesser extent on four of the five other ACGME competencies. Additionally, residents commented on each other's growth and development over the two-week period and provided their peers with concrete suggestions for improvement, which was not a part of the ACGME competencies. The following results section is organized by ACGME competency from the competency that received the highest to the one receiving the least percentage of comments, and describes aspects of the competency that were addressed. The discussion section captures the second level of analysis, the clinical-educator's experience in working with a PhD on a SoTL research project.

Results

Interpersonal and Communication Skills

Of the total number of comments, 61% were classified as *Interpersonal and Communication Skills*, in which residents must demonstrate skills that result in the effective exchange of information and collaboration with patients, their families, and

health professionals. The analysis indicates that residents commented on their peers' ability to communicate and display leadership on the team. Many of the comments highlighted whether the resident asked useful questions that led the team in important discussions. For example, residents made comments such as: "He asks important questions that are helpful for the other residents" and "He asks very intelligent, pertinent questions." The ability to ask important questions helps team members think through their cases, and prompts the team's thinking in new ways.

Residents also showed appreciation when their peers presented their patients well, and praised each other for presenting in a "concise manner." Comments in this vein suggest that residents notice and rely on each other's ability to clearly communicate in a team setting, which may be particularly important in settings where professionals must rely on each other in the process of caring for patients. Additionally, residents commented on their peers' willingness to engage in teaching activities. For example, one resident commented, "She not only volunteered to help, but ACTUALLY helped (i.e. putting in orders and updating the [patient] list)," emphasizing that the resident was invested in the process of assisting others, an important role that residents play when working on a team.

Other comments in this category referenced the presence or lack of residents' leadership ability, typically speaking to skills such as "efficiency," "ability to manage time and delegation of responsibility," and the resident's ability "to keep track of the status of all the patients on the service." Comments such as these suggest that residents appreciate it when their peers think about the role of each team member and provide opportunities for them to contribute to patient care. In a team based profession, such as medicine, it is important to have someone in the group take responsibility and maintain an overview of what needs to be done, when, and how. Residents who are able to do this, provide an important service to the team.

And finally, although the majority of these comments on leadership were positive, residents also wrote some that were disparaging, such as one in which a peer was clearly frustrated with the residents' rigidity: "[He] is well organized, [but] sometimes lacking in flexibility. He is not always open to other people's ideas and tends to micromanage." These kinds of comments provide insight into the way the resident communicates and interacts with others on the team, and may identify important leadership skills that need greater attention. Attending physicians must identify and address such behavior in part because the attending physician is ultimately responsible for patient care, but also because after residency, physicians are considered independently competent.

Professionalism

Professionalism, in which residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles was represented by 16% of the total comments and tended to focus on residents' demonstration of compassion, humility and respect for others. For example, many residents commented on how their peers' compassion translated to patient care. As one resident wrote, "[He] is heavily invested in patient care, and takes good care of his patients." These were observations that residents made about each other as they witnessed patient-physician

interactions in the hospital. Residents also commented when compassion was not seen, often in their peers' interaction with those beyond the patient. In one example, a resident indicated, "[The resident] is a passionate physician, but I have noticed that at times he has not treated family members with sympathy or empathy." Comments such as these point to peers' holding each other to high standards even outside the context of the patient encounter. Furthermore, that residents have access to interactions that an attending physician may not, thus providing feedback on another dimension of the residents' professionalism.

Residents also described *professionalism* in terms of respecting others, which included comments such as showing up on time and following orders. Punctuality was particularly important, and residents made numerous comments, such as "[The resident] always gets her work done on time" and "[She] arrives earlier than 6 a.m. to make sure her work is done." When a resident did not demonstrate punctuality, peers complained that this skill was lacking, such as a comment in which a resident did not follow through with a task in a timely manner, "[This resident] has to be told multiple times to do something. I told him to talk to the patient's family member at 7:00 a.m. and [he] did not talk to them until 10:00 am." Although punctuality is not one of the ACGME indicators, it is one way in which residents operationalized what it means demonstrate respect for others and what it means to be a part of a team. For an attending physician who has a high case load of patients, it may be difficult to keep track of when residents start and end their work day, therefore comments such as these provide a useful means for identifying potentially problematic behavior.

Medical Knowledge

Medical Knowledge, in which residents must demonstrate knowledge of established and evolving knowledge in the sciences and apply this knowledge to patient care, was represented by 8% of the total comments. Comments in this category were usually characterized by a statement that signified whether the resident had a wide body of knowledge. For example, "The resident is very knowledgeable" or "has good foundational knowledge" were commonly used phrases. Typically, these comments were stated in isolated terms, but in some instances, the residents explained why having a solid foundation was valuable to the team. For example, one resident stated, "[The resident] has become a strong source of information for medical resources and clinical experience, which has been vital in managing patients and ensuring successful dispositions." These expanded comments provide a snapshot into whether residents are able to apply their knowledge base to clinical decision-making.

Other comments in the *Medical Knowledge* category referenced the residents' ability to recognize his/her limitations and then fill their knowledge gaps. For example, one resident commented "She is smart and when she doesn't know something she looks it up" meaning the resident is willing to take initiative and address her knowledge gaps. Other comments were similar, such as "[He] is obviously reading [medical literature] as he is able to discuss plans based on evidence in present literature." Comments about how well-prepared a resident is or how willing they are to address their knowledge gaps have great potential for identifying residents who are continuing to learn about the medical profession and those who are not. While this is an important behavior in

graduate medical education, it is difficult to monitor in resident training because so many attending physicians are mired in patient care.

Practice-based Learning and Improvement

Practice-based Learning and Improvement, in which residents must demonstrate the ability to investigate, evaluate and assess their care of patients, was represented by 6% of the total comments and most often referenced residents' ability to incorporate formative evaluation feedback into their daily practice. The majority of the comments spoke to the residents' ability to incorporate feedback given to them by someone else on the team. For example, several comments referenced a resident's ability to incorporate feedback given by other team members: "[The resident] takes feedback well from everyone and usually tries to change" and, other comments, such as, "[This resident] takes constructive feedback well."

Likewise, residents spoke to their peers' lack of ability to take feedback from other team members. These comments were typically couched in this way, "[The resident] has a questionable ability to take criticisms constructively" and "She could improve by not getting defensive when receiving feedback." Peers' observations of how well feedback is taken and incorporated into the formative evaluation process may provide clinical-educators with important information on the extent to which the resident is "growth-minded" and open to criticism. Attending physicians want residents to understand how important it is to listen to other's comments and consider their value for future practice. A resident who is unwilling to do so waves a red flag signaling they may not be malleable and open to changing their practice.

Growth & Learning

Finally, while the ACGME competencies captured 91% of the total comments, a separate category not affiliated with the competencies, *Growth & Learning*, captured the other 9%. These comments spoke directly to whether residents saw their peers grow and develop over the two weeks they worked together. In some cases, these comments referenced whether the resident was improving at an acceptable pace, such as "[The resident] is a hardworking intern who demonstrated significant improvement over his first two weeks" or "[He is] progressing nicely and will be ready to manage a Family Medicine in-service team very soon." In other cases, residents noted further development that needed to take place. For example, one resident commented, "The progression from worker bee to leader involves delegation He's proven he can do it all, now he needs to show that can manage a team of worker bees efficiently." These comments suggest that residents are observing and tracking their peers' growth as they work together and feel they have evidence that speaks to each other's development.

While tracking peers' growth and development is not a part of the ACGME competencies, over the two-week period, many of the residents were observing their peers and indicating where they saw significant growth during this time period. This role is typically reserved for the clinical-educator, but given the high workload many experience, residents' observations may be a useful contribution.

Discussion

This study examined five-years of data (2010-2015) that was collected by a clinical-educator as part of a summative evaluation in a Family Medicine residency program. Although it is not novel for residents to provide informal and formal feedback to each other, what is novel is that it was initiated by a physician at the end of a two-week rotation as a way to give residents the opportunity to take their feedback into the next rotation. The data reveal that although residents were asked to rate each other's performance in only one ACGME area, they made comments on several other competencies within an open-response section that was included at the bottom of the quantitative measure of resident performance. These comments largely fell within ACGME's competency framework used to assess resident performance, but were couched in terms of how well the resident was able to function and contribute to a team-based environment. Additionally, residents commented on their peers' growth and development during the two-week period, suggesting that residents analyze their peers' development over time and have insights they want to share. This finding was surprising to both the MD and PhD, and has great potential for other clinical-educators who are interested in helping residents get a sense of their professional growth in short time periods from the perspective of their peers.

In discussions with the clinical-educator on this study, he indicated that the themes generated in the analysis were representative of the kinds of behaviors he had seen when working with residents. The comments provided breadth and depth to his own assessment and concrete examples for discussion in the one-on-one evaluations. In our discussion about using peer feedback in his teaching, he shared a story about one of the residents who was captured in the data. The resident had burned out while in a Surgery residency and subsequently started her career over in the Family Medicine program. Initially, her peers found her brash, insensitive, short-tempered, and difficult to work with, such that the first time she went through the one-on-one peer feedback process, she broke down in tears because it was the first time she saw herself from an outside perspective. The physicians in surgery had given her high marks on her interpersonal and communication skills, yet her peers in Family Medicine found her skills lacking. Throughout her residency program, she rotated with the MD six times and each time she was exposed to feedback from her peers. However, about halfway through her residency, she realized that perhaps her peers may have perspective worth considering and by the end of the residency she had changed her method of communicating. The MD indicated that the resident's peers' comments were influential in helping her interact in ways that were compassionate and respectful and she was grateful to make these professional adjustments.

Early identification of problematic behavior is considered crucial to the remediation process for residents because it gives them an opportunity to make adjustments throughout their residency program (Zbieranowski et al., 2013). The MD on this study believes that peers' contribution to their colleague's development is helpful because it provides perspective that otherwise would not be offered. Further, he indicated this collaborative kind of SoTL research is valuable in helping him identify themes around potential problem behaviors in his residents and anticipate how to address them as he is assigned new teams. He explained further,

I am only with his residents for a few hours per day, but their peers are with them all day long, through the good and bad, the yelling and screaming, and all the commotion that can happen in a stressful situation. That was the stuff that came through in the peer evaluations that were very valuable. That was what came out of the themes in the analysis. For me, I wanted to know what was happening when I wasn't there.

As a result of this SoTL endeavor, he now takes these five-years of analyzed peer-feedback data and gives it to his residents after the one-on-one evaluation meetings. The purpose of giving them the analyzed report is two-fold. First, he wants to model good teaching practice with his residents because he feels it is important to demonstrate inquiry into one's teaching, even though a physician's primary responsibility is to ensure high-level patient care. Second, he provides his residents with a copy because he wants to demonstrate that problem behavior is essentially timeless. His hope is to help his residents identify these issues in their peers early, and if possible, assist them in correcting them while they are still in training. This SoTL research endeavor has also been valuable for the PhD who learned about graduate medical education, the potential for residents to conduct ethnographic research in their clinical settings, and the contribution that such collaboration can have in contributing to SoTL conversations.

However, we have a few other thoughts on both the implications of the results and the collaborative process that we would like to share. Future SoTL studies between MDs and PhDs may want to include the MD in the data collection process, as well as the analysis. For example, it would have been helpful to include interviews or focus group data in this study on peer feedback (Ashenafi, 2017), both as a way to expand the data set, but also as another opportunity to mentor the MD into research. Data collected through these means would help contextualize the kinds of comments that peers made. Further, this kind of a mixed method study would help researchers and clinical-educators understand *why* residents shared the comments they did and what comments they omitted (de la Cruz et al., 2015). This is important because the MD expressed that despite the ongoing reassurance that the comments would be anonymous and there would be no retribution, he felt his residents were somewhat hesitant in sharing all of their thoughts.

Additionally, other studies indicate residents need explicit assistance in how to provide constructive feedback. In this case, they were asked to provide feedback on residents' clinical performance, however many of them also provided teaching performance feedback, suggesting that residents found it difficult to untangle the two types. Previous research indicates that some residents do not feel adequately prepared to provide feedback without explicit instruction (Kraut, Yarris, & Sargeant, 2015). Therefore, residents may need assistance in thinking about how to frame their observations, what to pay attention to, and how to think about a peers' behavior in the context of professional development. Formal training on how to assess learners both as teachers and clinicians has potential to benefit residents who will eventually find themselves in more senior positions and responsible for providing others with formal performance feedback (Patocka, Meyers, & Delaney, 2011).

And finally, given that this was a retrospective analysis, it is unknown how long the residents in this study worked together prior to being asked to comment on each other's performance. Although, the clinical-educator requested that residents only comment on their peers' performance during the immediate two-weeks, it is unclear whether the observations made were limited to this time frame. Future research should examine how time spent together is a potential benefit or challenge to the peer feedback process, and what influence time spent has on peers' willingness to share their perspective.

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