

The Surgery Fellow's Education Workshop: A Pilot Study to Determine the Feasibility of Training Senior Learners to Teach in the Operating Room

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Abstract. *Background* In 2013, we developed an education workshop to enhance the teaching skills of surgical fellows. We sought to investigate the feasibility of the monthly educational workshop format and its effect on participant teaching skills. *Study Design* Surgical and medical education faculty created a broadly applicable curriculum developed from evidence-based teaching principles, delivered across 8 monthly 90-minute weekday sessions. Workshop feasibility and effect were assessed using evaluations, attendance records, and a variety of self-reported surveys. Each session was associated with a specified education action plan to be completed between sessions. *Results* A total of 13 fellows intended to participate. More than 60% attendance was achieved in 7 of 8 sessions. In all, 11 of 13 fellows were engaged (actual attendance or excused absence) across 75% or more of the sessions. Mean participant satisfaction scores ranged from 4.0 to 4.9 on a 5 point Likert scale across 87.5% of sessions. Postworkshop surveys showed increased understanding of the following: (1) knowledge gaps related to education; (2) the role of education for academic surgeons; (3) educational tools to improve teaching performance; and (4) perceived knowledge and attitudes about teaching in the operating room. An action plan was performed in 43% of cases; the most common reason for nonparticipation was lack of time (38%). *Conclusions* Our pilot supports the feasibility of an educational workshop series to enhance fellow's educational skills in the area of intraoperative teaching. Participant engagement and satisfaction were high in this self-selected group of initial trainees. Sessions were effective, resulting in a thoughtful self-assessment of teaching skills.

Keywords: fellow; education workshop; teaching skills.

1. Introduction

Education is a key component of academic medicine. Academic faculty are largely responsible for medical students, residents, and fellows receiving the necessary instruction and guidance to deliver medical care that is safe and high in quality. Duty hour restrictions implemented over the past decade have not only influenced clinical exposure for trainees but also forced faculty to be more effective and efficient in their teaching.^{1, 2, 3 and 4} Although outstanding surgical teachers exist in every institution, the great majority approach trainees in the operating room (OR) without a clear educational plan, often relying on skills learned during the course of their own careers. Moreover, surgical training has historically valued procedural "quantity" as a means to master the technical aspects of an operation rather than a specifically designed educational plan.⁵ The lack of formalized instruction in surgical teaching has resulted in significant variability in faculty teaching skills.⁶ This

variability, coupled with an increased emphasis on OR efficiency, may unintentionally undermine a surgical trainee's education.

Although an abundance of literature exists to improve medical teaching, strategies are often focused on classroom didactics, inpatient medicine or outpatient encounters which often do not easily translate to intraoperative teaching. The physical and cultural differences of the OR require that surgical teaching be performed with an enhanced set of skills.⁵ and ⁷ To our knowledge, programs to coach academic surgical faculty in their operative teaching are greatly lacking. Although deliberate approaches to surgical training have been developed,⁸ senior surgical faculty may be resistant to implementing new methods of teaching as their years of experience have allowed them to formulate educational techniques that have become habitually ingrained.

Surgical fellows, on the other hand, represent a group of learners on the cusp of academic careers who may be open to adopting new educational strategies and approaches. Although most fellowships typically devote significant time to honing clinical and research talents, few protect time for formal instruction in teaching, even though fellows entering academic settings would be expected to participate in the educational mission. Moreover, their future teaching evaluations may be used for performance evaluations, salary incentives, evidence weighed during promotion, and as criteria for institutional awards. For these reasons, fellowship should be a time to craft teaching proficiency, as well as clinical and research acumen.

This pilot study examines the feasibility of a series of focused education workshops for surgical subspecialty fellows. We hypothesize that participation in the workshop is feasible and engaging for surgical fellows in busy training programs. In addition, we anticipate that workshop participation improves knowledge of teaching skills and enhances teaching performance.

2. Method

Workshop Curriculum

We engaged a diverse group of faculty with surgical and medical education backgrounds to participate in the workshop (Online Appendix 1). All faculty were involved in the development of course curriculum, participant self-assessment or testing, and course delivery. The curriculum was grounded in principles of adult learning theory⁹ and ¹⁰ and modeled using several active learning techniques. The content of the course was specifically directed at teaching in the context of surgical procedures (Table 1). As few learners in surgical disciplines have undergone training in education theory or practice, instruction in learning theories and assessment, delivering feedback, direct observation of trainees, teaching models, and debriefing was included. In addition, we incorporated discussions on intraoperative team leadership, the integration of education within the academic career and its effect on promotion, and the creation of teaching plans within the OR. No more than 60 minutes of preparatory work was assigned per session. During each module, time was allotted for the following: (1) reflections from the prior assignment; (2) didactic instruction; (3) small group interactive sessions; and (4) the development of a specified education action plan based on the session content, to be completed within 4 weeks. The purpose of the action plan was to implement the skills and knowledge acquired during each module into a real-world operative setting. The action plan reinforced the core knowledge gained as well as provided opportunity to practice the new skill.

Workshop Participants

As part of this pilot program, workshop participants were identified and recommended through a solicitation of Fellowship Directors in surgical departments and divisions at the University of Michigan. Participants were eligible if they had completed a surgical residency and were now engaged in a surgical fellowship training program. Fellowship programs included those who were both accredited and nonaccredited, but all had a long history of education in our institution. Participation was voluntary.

Assessments

The feasibility of the workshop was evaluated through attendance, attention to learner's teaching skills and education knowledge base, learner satisfaction, and the application of material. Attendance was strongly encouraged but not mandatory. Attendance was logged at every module. Legitimate

absences (e.g., maternity leave, job interview, out of hospital commitments, emergent clinical service, and emergent required presence in the OR) were designated as “excused” whereas other absences were considered “unexcused.” This determination was made by the Course Director. Before the initiation of the workshop, perceived participant teaching skills were initially assessed through a baseline 34-item self-assessment survey using a web-based platform. This survey queried learners on their teaching aspirations, challenges, and past experience and also tested fundamental knowledge about specific education strategies that would be covered in subsequent workshop modules. All participants who completed the survey were included in the workshop feasibility analysis, regardless of subsequent attendance. A similar postworkshop survey was performed at the conclusion of the course.

At the completion of each course module, participant satisfaction, educational influence, and perceived change in teaching practice was anonymously evaluated using a 5 point Likert scale that included the following 4 key questions: (1) I have a better understanding of the role of education in the OR; (2) I am able to identify key knowledge gaps related to my teaching skills; (3) This educational activity changed your knowledge or attitudes about teaching in the OR; and (4) I have a better understanding of the tools required to —. (The “blank” made reference to the topic of the specific module.) Lastly, the participants attending each module were asked to complete a brief 6-question web-based survey about the established action goal from each module. The survey queried the participant about action plan completion, reasons for incompleteness, and the plan’s effect on the fellow’s teaching skills. In addition, the survey asked whether the action plan was a valuable exercise. Analyses included descriptive statistics.

3. Results

Overall, 6 faculty members from the University of Michigan Medical School comprised the course faculty (Online Appendix 1). All faculty agreed to focus their content, as much as possible, to the surgical or procedural domain (Table 1). The curriculum was held monthly and delivered over 8 sessions of 90 minutes. A total of 13 surgical fellows were referred for workshop participation. The fellow cohort represented <15% of all surgical fellows training during the 2013 to 2014 academic year at our institution. All 13 fellows completed a pretest survey and were thus included in our analysis. Baseline demographics are described in Table 2. All participants planned a career in academic medicine with expected engagement in all the following missions: clinical service, education, and research. This remained constant as ascertained through group discussion.

Attendance stratified by course module is summarized in Table 1. More than 60% attendance was achieved in 7 of 8 sessions. Throughout the course, an average of 2 and 2.6 excused and unexcused absences per session were observed, respectively. At the participant level, 10 of 13 fellows attended more than 60% of the modules (Table 3). Several fellows demonstrated a desire to attend course modules but could not because of legitimate excuses. When considering actual attendance and desire to attend, nearly 85% of fellows had significant interest in 75% or more of the course modules. Among all, 1 fellow was completely disengaged with 0% attendance throughout the course.

In all, 7 course modules included specified action plans (Table 5). Overall, 42.4% of participants completed the action plan. In those who performed an action plan, 88% reported the plan increased awareness of teaching skills and enhanced overall teaching skills in 80%. Further, 88% of fellows who completed the action plan felt it was a valuable exercise. Based on 21 fellow responses, an action plan was not performed because of lack of time (38%), resources (24%), understanding (19%), or interest (5%); 14% simply forgot to do the exercise.

Postworkshop surveys were reviewed and compared with the preworkshop surveys. Notable observations included the following: (1) an increase in the number of fellows who would consider a career as a clinician educator (31%-62%); (2) an improved knowledge of educational theory, highlighted by a greater understanding of Competency Based Education (54% vs. 82%); (3) a greater awareness of the best practices for teaching (7.7% vs. 81.8%); and (4) an improved understanding about the Briefing, Intraoperative teaching, Debriefing model.⁸

In particular, we observed improvements in those who suggested optimal areas to efficiently review the operative plan with trainees immediately before the procedure (38.5% vs. 81.8%).

Aspects of OR leadership improved. For example, participants were much more likely to know everyone's name in the OR at the conclusion of the course (69.3% vs. 90.9%), suggesting an increased command in the OR.

The quality of participant responses on the posttest was more thoughtful, focused and used education vernacular demonstrating a greater understanding of educational issues and a more substantial knowledge base. Participants were asked whether they planned on pursuing future educational initiatives. Before the workshop, there was interest; however it was vague and without detail. Examples include "I would like to be part of the residency educational committee," or "I would like to get a Masters in Education." There was also 8 of 13 (61.5%) who had no specific plans for any educational projects. On the postworkshop survey, most of the participants highlighted detailed plans to delve into educational initiatives. Some discussed projects they had begun during the workshop ("created an ultrasound training module for residents"), whereas others discussed clear plans they were actively implementing ("develop computer based modular learning for OR learning"). Participants were also asked to reflect on their own teaching skills in the OR. Before the workshop, participants had a variety of different ways to teach the trainee, most citing what methods that they had been exposed to as a resident. After the workshop, many participants cited use of the Briefing, Intraoperative Teaching, Debriefing model, or use of "teaching scripts to keep me on task and organized." Lastly, participants were asked about constructive feedback they had received from faculty in the past. Many complained about the lack of constructive feedback, often citing they were simply told "good job." After the workshop, many participants were able to more clearly cite examples of constructive feedback, and were able to dissect the feedback into what made it constructive (e.g., "Attending sat me down in a quiet area and, without interruption, gave me specific examples of areas I could improve on, and how to improve on them").

4. Discussion

Surgeons must be intentional about surgical education, particularly in the OR where a number of pressures can create barriers to teaching. Increasing demands on surgical faculty as well as shorter workweeks for residents necessitate efficient training that continues to enhance learning in the OR.³ and 4 Multiple studies provide rationale to reevaluate existing methods of surgical training,^{11, 12, 13} and 14 however, implementation of new techniques is challenging when surgical faculty have not been equipped with the tools to critically evaluate and adapt these methods. Litvack et al.¹⁵ reported their experience with implementing a formal educational training program for neurosurgical residents. They found that a structured teacher training program objectively improved residents' ability to impart knowledge to a learner and, as a result, they recommended adaptation of the curriculum into residency training programs. We commend this group in the development of this course, as residents have a great deal of responsibility in educating junior residents and medical students. Still, the broader feasibility of this is uncertain, as demands on surgical residents are already extraordinary.

In the current study, we determined the feasibility of an education workshop for surgical fellows, rather than residents. The fellow participants were highly engaged in the program, likely because of their academic aspirations. Despite our initial concerns that busy surgical fellows would have limited time or topic attention, fellow participants attended most sessions that occurred at a potentially inopportune time often reserved for clinical activity. Competing interests and a lack of time are clearly barriers to the success of any education initiative. Nonetheless, attendance, which was not mandated, was reasonably favorable given the number of professional and personal commitments fellows regularly experience.

Fellow participants embraced the course concept and worked to establish a framework for themselves for their operative teaching. Overall, interest and satisfaction in the workshop sessions were high. Those who participated grew increasingly more aware of key knowledge gaps in their teaching skills, and sought to improve their integration of education tools into their operative practice

and adjust their previous attitudes about teaching in the OR. This became clear through oral participant reflections on their action plan experiences described at the beginning of each module. Moreover, as captured by the postcourse participant self-assessment survey, fellows demonstrated increased knowledge about education methods, as well as potential applications for these methods within the context of their clinical work. We valued these observations, as self-assessment of one's teaching skills is a useful tool to stimulate enhancement in clinical teaching.¹⁶

Our experience with the action plan activity was mixed. We integrated an action plan into course modules to provide a method of practice and implementation of the module goal. Time was a major barrier for those who did not complete their assigned plan. Others noted a lack of understanding or resources as reasons for lack of participation, suggesting that greater instruction and reinforcement was needed for the applied aspects of the program. Still, for those who opted to complete the action plan assignment, there was increased self-awareness of teaching practice and a sense that the activity directly improved their instructional performance. We have since made adjustments to our survey process, permitting "in class" time to complete it, devoted greater time to group discussion of the plan at the beginning of each course module, and incorporated more regular email reminders to complete the action plan. As the program develops, a more rigorous system of action planning grounded in peer observation is anticipated.

Although this work is interesting, we recognize its limitations. The generalizability of our findings is certainly limited by our small number of participants and the academic focus of our fellows. As all participants had an interest in future academic practice, it is likely that our population was enriched with learners with an interest in education. Although we experienced high satisfaction scores in our course modules, response was dependent on attendance and therefore it was not necessarily representative of all participants. Finally, although this pilot study informs the feasibility and satisfaction of the workshop, the observed data does not clearly demonstrate actual improvements in the teaching skills of fellows, rather it provides supportive evidence of self-perceived improvements in participant teaching. Given the variety of surgical services involved and the nonstandard assessment practices within and among each service, we did not find it possible to standardize fellow assessments using resident and student evaluation tools. Instead, during this early pilot, we relied on self-assessments from the participants. Since this pilot we have continued to modify our evaluation process and currently have begun using intraoperative video-based assessment of teaching skills related to specific workshop training. We feel this would be the best method to objectively assess teaching skills and provide a format for participant self-reflection.

5. Conclusions

The current pilot demonstrates the feasibility of the Surgery Fellow's Education Workshop, which uses a "train the trainer" approach to enhance fellow's educational skills in the area of intraoperative teaching. Participant engagement and satisfaction were high and the course sessions were highly rated. After the workshop, fellows had greater insight into gaps in their teaching skills and improved knowledge of education methods and a greater interest in integrating education into their academic career. This work justifies a larger study to determine the effect and value of focused instruction in teaching on the careers of surgical fellows.

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