Exploring how surgeon teachers motivate residents in the operating room

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Abstract

\textbf{BACKGROUND:} Motivation in teaching, mainly studied in disciplines outside of surgery, may also be an important part of intraoperative teaching. We explored techniques surgeons use to motivate learners in the operating room (OR).

\textbf{METHODS:} Forty-four experienced surgeon teachers from multiple specialties participated in 9 focus groups about teaching in the OR. Focus groups were transcribed and subjected to qualitative thematic analysis by 3 reviewers through an iterative, rigorous process.

\textbf{RESULTS:} Analysis revealed 8 motivational techniques. Surgeons used motivation techniques tacitly, describing multiple ways that they facilitate resident motivation while teaching. Two major categories of motivational techniques emerged: (1) the facilitation of intrinsic motivation; and (2) the provision of factors to stimulate extrinsic motivation.

\textbf{CONCLUSIONS:} Surgeons unknowingly but tacitly and commonly use motivation in intraoperative teaching and use a variety of techniques to foster learners’ intrinsic and extrinsic motivation. Motivating learners is 1 vital role that surgeon teachers play in nontechnical intraoperative teaching.

Surgical residents adapt to complex learning environments when they walk into the operating room (OR). They navigate various structural and social frameworks; confront a myriad of stimuli; and mesh their operative learning into a complex, interwoven process of didactics, reading, and other experiential learning opportunities while guided by broad, imprecise program objectives. They must arrive motivated to learn their technical skills and surgical lore in the OR and despite distractions maintain that motivation.

Helping residents to remain motivated to learn in these complex environments is just 1 facet of resident teaching that surgeon teachers must accomplish in the OR.

Motivation is the reason behind action and for practical purposes is often relegated to an unconscious process. Being ubiquitous and “self-evident,” it attracts attention only when it is perceived to be lacking in some important component. Motivation is strongly linked to learning in both conditioned responses\textsuperscript{1} and complex professional learning.\textsuperscript{2} It is also correlated with satisfying biological needs, performance, and the attainment of values. There are even philosophical debates on whether one person can motivate another or just provide opportunities for the other’s self-motivation. In this article, we eschew the debate and describe actions by surgeon teachers as being able to affect residents’ motivation.
The study of motivation has a long history in the social sciences, and the scientific literature describes several theories of motivation. The self-determination theory (SDT) purports that learners are generally self-motivated (intrinsically), explaining medical students considerable efforts to enter medical school and to embark on further specialty training as residents and fellows. The SDT also explains how motivation can be externally manipulated (extrinsically) to some extent. The major focus on motivation in education has been to understand its role in learning from the viewpoint of the learner. Kusurkar et al’s recent review of motivation in the medical literature showed that motivation can be viewed as a dependent variable that cannot be manipulated by medical educators, whereas motivation as an independent variable appears to affect learning and academic performance in medicine. However, the role motivation may play in teaching remains poorly described in medical education, especially when it comes to the teaching of surgical residents.

Our literature review suggests that teachers in domains outside of medicine or surgery consider themselves integral to the process of motivating learners. A paucity of motivation literature in surgical education and a complete lack of literature on how surgeons help motivate residents in the OR prompted us to explore this potentially important role of surgeon teachers. Surgical residents learning in a complex environment may require their surgeon teachers to augment or help maintain their motivation to learn. It is unknown whether surgeon teachers are cognizant of such a need, and, if they are, it is unclear how they address it. As a first step in understanding how surgeon teachers teach residents in the OR, we explored the perceptions of surgeon teachers in terms of their intentions when they teach residents in the OR. Motivation was included a priori as a topic for investigation as part of a larger qualitative study.

Methods

Design

Research Ethics Board approval was granted by McMaster University, Hamilton, Ontario, Canada. A focus group–based, qualitative description approach was used to explore how surgeon teachers motivate residents in the OR. Nine, 1-hour surgeon investigator-facilitated (DD, EDM, and DAS) focus groups were conducted with 2 research assistants attending to take field notes in addition to the audio recording. An identical, piloted 8-item facilitator guide was used for each focus group. Facilitators and observers debriefed after each focus group.

Setting and participants

We invited surgeon teachers from all divisions in the McMaster University Department of Surgery via e-mail using purposive sampling. Participants who volunteered consented to the study, and all focus group content was held confidential. Focus groups were held on the McMaster campus, and all participants were informed of the procedure.

Sample size

The aim was to conduct focus groups with participants who were representative of each surgical subspecialty. We continued running the focus groups until we were able to reach conceptual saturation, which is the point at which no new themes or concepts arise from the data. This provided a solid basis for analysis.

Data analysis

The focus group data were transcribed and entered into NVivo 8 (QSR International; Burlington, MA). Data were analyzed using qualitative content analysis to classify large amounts of text into themes that emerged. Three surgeon investigators independently coded each transcript and then collaboratively developed a codebook. Further iterative analysis with the codebook using open, axial, and selective coding generated concepts and themes related to motivation techniques used in the OR. Methodological rigor was ensured throughout the study by use of an audit trail, investigator and data triangulation, and member checking with participants from the focus groups.

Results

Forty-four surgeons, 38 men and 6 women, from orthopedics (19), general surgery (10), urology (6), otolaryngology (5), and plastic surgery (4) participated in 1 of 9 focus groups (mixed specialties were in each group). The average number of participants per focus group was 5, with a range of 3 to 9.

Surgeon teachers in some focus groups began by describing motivation as a determination or drive that the residents had to exhibit of their own accord. They did not consider it something that a teacher could affect. One surgeon teacher stated, “If we have to motivate someone, they should not, I repeat, they should not be there.” Other groups began with the realization that residents were self-motivated, as evidenced by their choices to become surgeons—“...these kids, I think, on the whole, are motivated. Otherwise they wouldn’t be here.” Statements like these caused pause, re-evaluation, and vigorous discussions. In focus group debriefings, the facilitators and observers noted how the initial hesitation to speak about motivation switched to passionate, interactive discussions of motivational teaching techniques. The surgeon teachers seemed to become aware that a significant part of their teaching was aimed at increasing the residents’ motivation to learn.

One surgeon teacher best stated why she thought that she needed to facilitate the residents’ motivation. “When they’re juniors, they’re very excited to do anything. When
they’re chiefs, they’re afraid of having to practice on their own in 6 months, which is a great motivator. And the people in between are very hard to motivate. They’re sort of in the doldrums where things aren’t really exciting anymore.” Rich discussions ensued about how each of the surgeons actively facilitated their residents’ motivation to learn. Our analysis identified 34 concepts related to motivation, which we further clustered into 8 different teaching techniques (Table 1). Some of the techniques were designed to appeal to, facilitate, or augment the residents’ intrinsic motivation described earlier, and others were designed to provide the environmental or extrinsic motivation to nudge the resident along. Some concepts and techniques straddled intrinsic and extrinsic themes and were placed where they seem most applicable. Although the process of discovery in qualitative research begins with details and leads to themes, we have organized the results of this study in a top-down approach for clarity.

**Intrinsic motivational teaching techniques**

Surgeon teachers affected residents’ intrinsic motivation to learn by facilitating autonomy. Some surgeons provided less direction, “I’m going to sit here on the stool ... so that they don’t even feel like there’s somebody looking over them,” to create a sense of independence and responsibility, whereas others treated the resident as a junior colleague, “I also encourage them to take on my practice … Hopefully, they’ll buy into the whole notion of ownership and that will help to motivate them,” thus flattening the hierarchy and encouraging a sense of professional belonging. Narratives about this teaching technique were quite common, and this was described as being used more frequently as the resident becomes more senior.

Surgeon teachers treated residents with the expectation of being intrinsically motivated. By encouraging the residents to show themselves motivated to learn, it puts the onus of initiative on the resident and allows them to show their desire to become surgeons—“...I’ve got some responsibility here and I want to see a good outcome.” However, surgeons understood that they would sometimes have to put aside these expectations of self-motivation and reignite the residents’ desire to learn surgery. One surgeon explained “...but you excite them by saying, ‘Look at this guy. [He] couldn’t do this. And look at what we did for him. And look at him now! He’s happy. He’s playing soccer, or he can button up his shirt … or other functional activities.” However, surgeon teachers expected residents to be motivated to learn in the OR because “they want to do operations. No motivation [from me] is required.”

A sense of responsibility is an intrinsic quality that manifests in a resident’s attitude toward learning. Surgeon teachers sometimes improved resident motivation by fostering a responsible attitude. They identified responsible behavior as a learned trait developed through graded assignment, “give them responsibilities … those that are appropriate, graded for their level of expertise … and then showing them the rewards of surgery.” Surgeon teachers modeled responsible behaviors, thereby helping the resident to become more responsible and thus more productive and motivated. One surgeon stated, “When you’ve got responsibility, no one to fall back on, you’d better make sure that you’ve done all of the foundation things.”

Surgeon teachers also motivated residents by modeling relational behavior. They believed residents were more inclined to learn when they felt a sense of belonging to the profession (“Just by telling them our own interest, why it motivated us and what we find interesting in surgery … I think we can really motivate them.”); when they related well to the people doing surgical work; and when they felt that their surgical teachers took an interest in their learning, showing empathy and interest in their welfare. “To still maintain that teacher thing, but yet still have some sort of a personal relationship with them … can help [positively] influence their performance in the OR and on the ward.”

**Extrinsic motivational teaching techniques**

The techniques surgeon teachers described to extrinsically motivate residents were more action oriented and tangible than those classified under the intrinsic domain. For instance, surgeon teachers provided residents with expectations, instructions, and directions, “At the beginning of the rotation, just be clear about your expectations … around knowing the patients, in the OR, and outside the OR.” Surgeon teachers felt strongly that setting clear expectations from the outset allowed residents to become motivated to follow through on these requirements. Some examples included setting realistic timelines for operative participation, meeting measurable objectives, agreeing on clear expectations, and discussing the evaluation of progress. “Early on, a lot of it is sitting down ahead of time … talking to them about anatomy, draw diagrams … talk to them about steps they need to take during the procedure...”.

One of the most frequently cited concepts was that of being personally present with the resident. Surgeon teachers identified being present as motivating to the resident to engage, participate, and strive to show good performance.

| **Table 1** Surgeon teachers’ techniques to improve residents’ motivation |
|-----------------------------------------------|--------------------------|
| **Intrinsic motivational techniques**         | **Extrinsic motivational techniques** |
| Facilitating residents’ autonomy             | Providing expectations, instructions, and directions |
| Expecting resident self-motivation           | Being personally present |
| Fostering a responsible attitude             | Providing a safe teaching environment |
| Modeling relational behavior                 | Providing reward and feedback |
and evidence of learning—“...once they [resident] are aware I’m there to help … and no matter what happens, they’re there to learn…you can get them involved.” Being present also allowed the surgeon teacher to teach directly and to provide feedback to encourage the resident. “Some of the motivation aside from the self-motivation just comes from the positive and negative feedback they get through the case and through the day and through the week and through the month.” One surgeon commented, “I think they hear enough bad comments on the wrong things they’ve done. It’s useful for them to be positively motivated along the way and congratulated after each case has been well done,” to make the learning situation interesting and to quiz the resident during the case. “Good educators usually stay in the OR … I try to keep a running quiz going during the OR … so there is a continual academic discussion … with all levels of learners.”

Surgeon teachers provided a safe teaching environment to encourage learning in the OR. A safe teaching environment takes away disincentives to learning, provides appropriate and useful feedback, and sets the stage for the residents to learn. Surgeon teachers discussed challenging residents in a constructive way ("We have to be careful not to walk on tiptoes around here. If a guy does something wrong, he has to be made aware what he’s done wrong, ask him why he did it, and how we can change that in the future."). taking over if residents get frustrated (“As soon as I see them get frustrated, that’s when I take it out of their hand … and when you go through the resolution of it, you give it back to them.”), debriefing after each case, and advocating for learning opportunities for the junior (“I step in and occasionally tell the chief, do you really want to scrub in here? Maybe you should give someone else a chance … like the junior who has progressed quite well?”).

Surgeon teachers agreed that residents should be rewarded for work well done, for solid preparation, and for showing motivation. This included providing autonomy (“...they’ve got it, don’t get in their way, and just let them go”), acquiescing (giving the resident what they want, such as a particular type of case or patient), allowing for more participation in cases (“Bring them in and say, ‘Come on, doc, you’re a colleague now’. Let’s go talk about things and let’s...make them feel involved. Like they’re not just sitting on a stool, watching.”), providing feedback and encouragement (“Encourage them. Say, ‘Hey, that was a good job!’”), and letting seniors teach the juniors.

Feedback was one of the most common motivational teaching techniques identified by surgeon teachers because several discussions were about providing both negative and positive feedback. However, it was not noted to be one of the strongest motivators of intraoperative learning. Surgeon teachers agreed that in the OR feedback is generally an extrinsic motivator that provides the tangible evidence (especially in learning technical skills) and clear stimuli that residents use to know that they are on track in their learning. However, surgeon teachers often used the term feedback when contextually they were clearly discussing praise or reward—“they have to have continual and sustained positive feedback or they stop.”

Surgeon teachers admitted to not having had any formal training in motivating learners; yet, on the whole, they described using intrinsic and extrinsic motivation techniques automatically by reading their residents’ needs. Surgeon teachers referred to their own training as instructive, both because they were able to understand the challenges that their residents faced while training and because they appreciated benefiting from similar efforts from their own teachers during their training.

**Comments**

Do surgeon teachers really think that they need to help motivate residents to learn in the OR? It is clear from this study that they do. However, despite surgeon teachers intending to motivate residents to learn in the OR, they are, on the whole, unconscious about how they use these teaching techniques. Schön describes this process of tacit skillfulness as “knowledge in action,” and it is a hallmark of professional education. The surgeon teachers participated in prolific discourse about how they use teaching techniques to motivate residents although they were initially surprised when they were asked about this topic in the focus groups. They only realized their active teaching techniques by engaging in a form of “reflection after action” that occurred during the focus group discussions. Through the discussions, it became obvious that the rich mix of concepts that emerged sparked a realization in the surgeon teachers that they had been, even if not intentionally so, paying attention to how motivated residents were to learn in the OR, and, if needed, they further tried to increase residents’ motivation as a specific teaching technique.

Tannenbaum et al recognized that motivation to learn in professional work begins before the professional training and is augmented and validated with the training itself. That the surgeon teachers expend effort to improve the residents’ motivation to learn suggests that they consider themselves active agents in this process of maintaining motivation. They provide not just opportunities for residents to become motivated but also outside influences on residents’ behavior. This is congruent with the way that SDT explains the internalization of extrinsic motivation.

Surgeon teachers also seem to agree that residents begin their training intrinsically motivated to learn. In fact, the initial reaction of the surgeons showed a reliance on residents’ intrinsic motivation. Surgeon teachers also seem to know that intrinsic motivation provides the strongest drive to learning. Intrinsically derived from a sense of purpose, value, or meaning, providing residents with a genuine interest in learning. However, even the residents’ intrinsic motivation to learn may wane during a long, difficult training program.

An important concept about the use of teaching techniques to motivate residents involves the concept of mid-level residents slipping into the “doldrums” but yearning to
perform more complex surgical procedures while they stand and observe or assist their senior colleagues. When not on home-specialty rotations, they may participate in operations to a lesser degree or not get to participate at all. Their decaying intrinsic motivation may not spur them to take an active role in their OR learning. Surgeon teachers recognize that this is the time during training when there is the greatest need to boost residents’ intrinsic motivation and facilitate learning experiences that increase residents’ external motivation.

The surgeon teachers use 8 techniques to help motivate their residents to learn (see Table 1). Some of these techniques such as “expecting resident self-motivation” are rather subtle and are categorized as “intrinsic.” The surgeon teachers explain that the residents would be more deeply motivated to learn if they knew that self-motivation was the expectation of their surgeon teachers. Other techniques categorized as “extrinsic” (like “providing instructions”) are more direct techniques to help the residents to learn, see their progress, and become more motivated to learn.

The grouping of the teaching techniques into “intrinsic” and “extrinsic” categories is useful for discussion, aligns the findings with SDT, and helps surgeon teachers who want to apply motivation to surgical teaching. The subtle teaching techniques appeal to and help guide the residents’ intrinsic motivation, whereas the more direct techniques provide more explicit evidence to modify the residents’ extrinsic motivation. Surgeon teachers generally use direct techniques to enhance the extrinsic motivation of the junior residents and subtle techniques to augment the intrinsic motivation of the senior residents who are preparing to enter practice. This practice aligns with SDT.

More recent articles have investigated OR teaching and specifically feedback as a teaching technique. None have discussed feedback as a way to motivate residents to learn. However, we recognize that feedback is a vital part of the process of teaching that is constantly used in the OR and responsible for much of the direct teaching. Therefore, we designed our larger study to look specifically at the process of feedback as a teaching technique. Although surgeon teachers identify feedback as an extrinsic motivator, their discussions generally center on the delivery of feedback and its reception by residents. Not surprisingly, the colloquial and common meaning of the term (using feedback to mean praise) was most strongly linked to motivating the residents. This praise was felt to give the residents the impression that they were succeeding through the long residency and was used when surgeon teachers identified a resident or a situation that required giving the resident a boost.

Limitations

Although our study was conducted at a single teaching center and not all surgical specialties were represented, we did acquire a considerable amount of rich, descriptive text from which to analyze and draw conclusions. The focus groups were designed to elicit how surgeon teachers intended to teach, so there is no way to extrapolate the results to know whether the motivational teaching techniques described were useful in helping residents to be more motivated learners.

Conclusions

Surgeon teachers realize that teaching in the OR is a dynamic, bidirectional process. They actively engage residents by using teaching techniques to help motivate the residents to learn. Surgeon teachers understand and accept the strength of residents’ intrinsic motivation and their need for extrinsic motivation. Their discussions show that surgeon teachers are thoughtful individuals who think carefully about how they can motivate their residents to continue learning in the OR. This study has generated an important initial list of teaching techniques that surgeon teachers use in the OR to help motivate their residents to learn. Further work can expound on this list and clarify how these teaching techniques work, whether they are effective, and how they can be made part of a more explicit repertoire of teaching techniques that all surgeon teachers can use.

References