

# Microlearning and Social Media: A Novel Approach to Video-Based Learning and Surgical Education

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**A**s technology and access to information evolve, so must our techniques in surgical education. The traditional surgical learning paradigm—consisting of textbook reading, didactics, simulation, and in-person operative instruction—is due for a modern supplement in line with advancing technology. Current surgical medical students and residents readily use digital platforms, with 2 institutional studies demonstrating that 90% of trainees use videos to prepare for cases.<sup>1,2</sup> Despite the widespread utilization of surgical videos for education, trainees often report that educational videos are poor quality or too long, suggesting that the current available learning content is discordant with the preferences of surgical trainees. Current videos also lack the ability for dynamic interaction and co-learning that can be integral to a meaningful learning experience. Contemporary social media, meanwhile, fosters this dynamic interaction within the medical community, which broadly utilizes social media to interact and impart knowledge.

Microlearning is an educational strategy characterized by self-determined online learning in short time frames (less than 15 minutes).<sup>3</sup> The content is broken down into smaller units and published to online platforms where learners can actively engage with the material.<sup>3,4</sup> This strategy is an emerging technique in medical education.<sup>5-7</sup> We suggest applying microlearning approaches to surgical education in the form of instructional videos focused on operative techniques and distributed via Twitter to a global audience. This implementation of microlearning in surgical education has the potential to improve the accessibility, efficiency, and interactivity of educational content for residents and medical students. This approach may also enhance collaboration and discussion among academic institutions, where a

considerable amount of surgical knowledge is traditionally siloed.

## Advantages of Microlearning and Twitter

Microlearning has been demonstrated to increase confidence in performing procedures and to improve the retention of knowledge in various disciplines within medicine.<sup>3</sup> Employing this strategy to create short (< 3 minutes) videos that intentionally highlight only 3 to 4 key objectives is consistent with the educational theory that reducing an operation into its component parts fosters surgical proficiency.<sup>8</sup> Moreover, trainees can replay the short video clips to gain further understanding of components of the operation without a large time commitment.

Social media, which has been rapidly adopted within the medical community,<sup>9</sup> improves engagement among trainees and provides a space for educational dialogue.<sup>10</sup> In particular, through its limited format, Twitter promotes concise discussions in which trainees may engage actively with faculty as well as learn by observing discussions among faculty.<sup>11</sup> Twitter also offers a solution to the active schedule of surgical trainees and faculty as an unlimited number of trainees and faculty can interact with content independent of time and geographical barriers.<sup>10,12</sup> We believe that Twitter-based microlearning can overcome the limitations imposed by traditional electronic learning (eLearning) methods. While videos of surgical techniques have been made available through several other formats, including website-hosted videos such as the Toronto Video Atlas of Surgery or CollectedMed,<sup>13,14</sup> Bannister and colleagues found a 100-fold increase in participation when sharing a traditional eLearning module in continuing medical education to social media in a microlearning format.<sup>15</sup> Microlearning videos posted

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## Microlearning Videos for Surgical Education

### Identify a key topic

- Videos should focus on a discrete portion of an operation with particular relevance to trainees.
- Our topics include approaches to incision, retraction, dissection, and implantation of organs in abdominal transplant surgery.

### Film in the operating room

- Planning ahead saves time in filming only specific elements of an operation.
- Student and/or resident involvement is a learning opportunity via exposure to advanced topics, interaction with faculty, and operating room experience.

### Edit the video

- A student and/or resident meets with the faculty surgeon to review the video.
- Extraneous footage is removed, key objectives are identified, and the video is narrated by the surgeon.
- Trainee involvement in the editing process presents another learning opportunity.

### Share on social media

- Videos are posted to Twitter, tagging various surgeons across the country to interact with the content and describe their unique approaches.
- Sharing broadens the reach of the content to a global audience.

### Additional considerations

- Patient consent should be carefully attained and institutional experts on communication consulted.
- The total time investment per microlearning video is approximately 4 to 6 hours.
- Necessary equipment consists of a basic smartphone video camera and free video editing software.

#### FIGURE

#### A Stepwise Guide to Making a Microlearning Video

Note: The process follows a framework consisting of identifying a key topic, filming in the operating room, editing and narrating the video, and sharing on social media. It is important to note a microlearning video for surgery can be created in 4 to 6 hours with only a smartphone camera and free video editing software.

to Twitter therefore may fill a new niche by allowing improved access to educational content.

### Microlearning: Our Early Experience

A microlearning video for surgical education can be completed in a short amount of time (approximately 4 to 6 hours), with readily available resources such as a smartphone camera and free video editing software (FIGURE). Our process intentionally involves students and residents to bolster their education via exposure to advanced topics, interaction with faculty, and operating room experience. As this is a relatively novel approach to the existing and widely used tool of educational operative video for trainees,<sup>1,2</sup> the primary outcome we assessed was participation, as Level 1 of the 7-Level Outcomes Model by Moore et al.<sup>16</sup> In 2 months, we have posted 8 videos that have been viewed 1945 times and watched for a total of 43.9 hours. The average view duration was 79 seconds, equivalent to 63% of each video. The video-containing tweets attained 53 800 impressions,

defined as tweet views. Our Twitter account has followers in 27 countries and 36 US states, with a reach of 133 000 defined as the number of users who may view a given tweet of ours. Twitter users engaging with our microlearning content (favorite, retweet, or reply) included faculty (41%), residents (25.6%), fellows (12.8%), medical students (12.8%), and organizations (7.7%). Expert engagement in public discussion of various approaches to operations and technical maneuvers allows trainees to actively participate through questions or to observe the discussion thread.

### Potential Drawbacks and Concerns

A notable concern in the use of social media to broadcast operative videos is the security and privacy of patient health information.<sup>17</sup> To address these concerns, our group consulted with institutional regulatory and communications experts to ensure HIPAA compliance. For these videos, we first clarified the educational aims of the initiative and steps to

ensure privacy and then asked patients for consent to use their operative video on social media–based public channels. Accordingly, we deidentify the videos using only narrow fields of view and post the videos more than 30 days following an operation. Another potential concern with disseminating microlearning solely via Twitter is the lack of a library for learning. Thus, we created a YouTube Channel where all the microlearning videos live in a central repository. Additionally, fostering academic discourse in an open environment such as social media could lead to the spread of inaccurate, potentially hazardous clinical information.<sup>18</sup> It would be difficult to have a formal peer-review process as differences in technique are often a matter of opinion with no gold standard. To mitigate this concern, all videos posted by us have been directed and narrated by a faculty surgeon who only disseminates technical advice generally agreed on by our faculty group.

## Next Steps

It is difficult to evaluate the educational benefits for trainees engaging with microlearning videos. However, we intend to incorporate microlearning videos into the curriculum for our surgical trainees and assess acceptability, frequency of use, and operative confidence in comparison with prior cohorts. We also aim to produce more microlearning videos and collaborate with other institutions. Our goal is to encourage widespread adoption of this technique nationwide in various surgical specialties.

## Conclusions

The combination of microlearning with Twitter yields an educational tool that may be more acceptable and accessible to current surgical medical students and residents. With few barriers for participation, microlearning empowers participants to join discussions or learn from observing expert discourse. Educators can share clinical and technical pearls with a wide audience. Short videos (less than 3 minutes) appear most appropriate for this approach. Through increasing access, microlearning videos distributed on social media platforms contribute to the democratization of surgical education worldwide. We look forward to conversations about this approach with interested individuals or programs and encourage interaction with our Twitter account, @UM\_TREE.

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