Optimizing Synchronous Online Teaching Sessions: A Guide to the "New Normal" in Medical Education

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ABSTRACT

In response to the COVID-19 pandemic, the medical education community was forced to transition to the virtual space seemingly overnight, with little time to prepare. As such, many medical educators are actively seeking ways to improve delivery of online content and utilize features of different technologies. This *View from the APPD*, informed by existing literature and author experience, was created to guide medical teachers in their transition to hosting synchronous learning sessions in the virtual space. We hope to empower medical educators with the confidence and skills needed to teach effectively from a distance.

KEYWORDS: COVID-19; medical education; online learning; pediatric residency; student engagement; synchronous learning

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WHAT'S NEW

As the COVID-19 pandemic alters the landscape of medicine and education, residency programs and medical educators are seeking ways to maximize trainee education in the online space. We provide evidence-based methods and practical tips to leverage technology for effective pedagogy.

THE PUBLIC HEALTH response to the COVID-19 pandemic required the medical community to shift education efforts to virtual learning platforms nearly overnight.[1] Medical students found themselves learning anatomy from videos[2] instead of hands-on dissection with cadavers. The cherished practice of morning report, traditionally a conference room filled with eager learners and clinical pearls, was moved to the virtual space, with participants viewing from socially distant team rooms or their breakfast tables. Even seasoned clinicians turned to online resources, including lectures[3] and podcasts[4] to prepare for possible "redeployment" to care for patients with COVID-19.

While the rapid shift of the medical learning environment online has been disorienting in many ways, some benefits have emerged. Junior and experienced faculty—even those in advanced stages of technophobia—are sharing advice and learning from one another. Medical educators who would never have chosen to teach virtually are hosting Zoom meetings. Professional development events and research seminars are experiencing record-high attendance as people find they can participate from distant sites.[5,6] Hosting academic conferences online has improved diversity and inclusion by eliminating the financial burden of travel while simultaneously reducing our collective carbon footprint.[7] Educators have discovered the efficiency, ease of access, and diverse collaborations afforded by the virtual world, and many aspects of online teaching will continue even after relaxation of pandemic-related societal restrictions.

As remote learning carries unique challenges, many medical educators are actively seeking ways to improve delivery of online content and utilize features of different modalities. Hosting effective synchronous online learning sessions poses a particular challenge in trainee education. This V*iew from the APPD* how-to guide provides practical tips (Table 1) to help educators adjust to online learning and leverage its advantages to create optimal experiences for educators and learners alike.

PART 1: GETTING STARTED

GET CONNECTED

One of the first steps to transitioning into virtual teaching involves making sure you have a good connection with a reliable WIFI network, fast internet, a microphone, and a built-in or external webcam. Depending on your institution, common online platform options include Zoom (Zoom Video Communications Inc., San Jose, Calif), Microsoft

Table 1. Twelve Quick Tips for Optimizing Synchronous Online Teaching Sessions

1. **Get connected** by ensuring you have all the technical equipment and support you need.
2. **Arrange your physical space** to optimize audio-visual presentation.
3. **Practice using the platform** to familiarize yourself with the technology and make smooth transitions.
4. **Present your best self** by having a professional appearance, background, and comportment.
5. **Embrace your online teaching persona** which may be slightly different from your in-person teaching style.
6. **Set ground rules with your learners** so expectations are clear from the start.
7. **Take advantage of features that promote learner engagement** such as the chat, polls, and use of the cold-calling technique.
8. Be mindful of logistics unique to the virtual space, such as setting clear expectations for learners prior to starting breakout rooms.
9. **Foster a culture of accountability** as it can be easier for individual learners to get lost in the virtual space.
10. **Use asynchronous learning tools** to support your teaching.
11. **Develop a communication plan** so learners know how to contact you and other students.
12. **Be forgiving of yourself** because all transitions into new areas can be challenging and you will end up having more successes than shortcomings!

Teams (Microsoft Corporation, Redmond, Wash), Cisco Webex (Cisco Systems, Milpitas, Calif), and GoToMeeting (LogMeIn Inc., Boston, Mass). Each platform is different, so explore your options in advance.

Be aware of your institution's policies and restrictions regarding online communication. If using Zoom, create meeting passwords to prevent "Zoom-bombing"[8] and to keep your meeting secure.[9] Additionally, ensuring compliance with the Health Insurance Portability and Accountability Act (HIPPA) is paramount if there is the possibility of discussing patient information. Check with your institution to ensure the proper protections are in place.

ARRANGE YOUR PHYSICAL SPACE TO OPTIMIZE AUDIO-VISUAL PRESENTATION

Most medical educators have little influence over the appearance of lecture halls or hospital conference rooms. However, in this new world of virtual teaching, educators have control of their surroundings, and learners will notice the details. Sit in a private space for your teaching session. Before logging in, check how your surroundings and video background appear on camera. Make sure there is ample lighting, particularly on your face. Tidy up the room you are in or use a neutral "virtual background" to avoid distractions. Position your camera at eye level and look into the camera instead of the image of yourself on video when speaking. If you find it too distracting, minimize or hide the image of yourself on your screen.

PRACTICE USING THE PLATFORM

Developing a degree of fluency with the technology will reduce the cognitive load of managing the software and allow you to focus your mental effort on teaching.[10] Explore the platform by viewing official tutorials[11] and "playing" with features in advance. Learn how to set up and schedule events, disseminate links and passwords to participants, and login to the synchronous session to get started.

You will be able to share your screen and transition between PowerPoint, websites, videos, or other educational content relevant to your session. Organize all content you plan to share ahead of time and keep those windows open and easily accessible. Close everything else to avoid having your learners see your personal emails or other open tabs while switching between screens.

PRESENT YOUR BEST SELF

Wear appropriate clothing, being mindful of what learners will see if you had to stand up suddenly or move while on video (no pajama bottoms!). Log in early to test your microphone and adjust your camera or background. Before class starts, chat with early participants. You can use this time to get to know them, elicit informal feedback, or gauge their level of understanding. Set a professional but friendly tone to bring warmth and humanity to the virtual space. Informal conversation and small talk provide social interaction and promote a sense of normalcy,[1,12] which increases cognitive presence.[13]

PART 2: MASTERING THE ONLINE ENVIRONMENT

EMBRACE YOUR ONLINE TEACHING PERSONA

You may need to make adjustments to your traditional teaching style to ensure your personality and passion for teaching translates effectively online. For example, if you like to pace while teaching or use gesticulations to emphasize certain points, you may need to find other ways to maintain your focus and convey energy. If you rely on humor, consider how it translates virtually—even stand-up comedians struggle with the silent nature of comedy delivered via online platforms.[14] Jokes rely on timing, audience engagement, and nonverbal cues, which are lacking in the virtual space. Thus, use humor selectively and be cautious of sarcasm.[15]

Other ways to let your personality shine in 2 dimensions include opening with a personal anecdote, laughing when technology glitches arise, and making references to unique moments from a previous class. As always, remain present and engaged. Elicit feedback frequently. Encourage learner inquiry. Follow-up on unanswered questions. Strive to make your online classroom a community.

SET GROUND RULES WITH YOUR LEARNERS

Just as the online learning space is different for educators, it is also different for learners. Clarify expectations, delineate the formality of the space, and define basic "netiquette." As more initiative may be required on the part of the online learner, it is important to specify when and how you want to receive questions or comments. Do you want learners to use the virtual "raise hand" feature, to unmute themselves, or to type in the chat? Chat builds accountability by holding every learner responsible for answering,[16] while having learners unmute and participate introduces "media richness" that can enhance meaning with visual and audio cues.[17] Asking learners to raise hands (whether virtually or physically) facilitates classroom management and can help distribute student participation.[16] Defining your policies in advance set clear expectations of your learners and of yourself.

Learners should mute their microphones by default, and un-mute when speaking. As the instructor, most formats allow you to mute others if background noise (eg, texting, typing, kids) becomes distracting. Ask participants to turn on their video. Audio plus video is always better than audio alone, as it allows for elements of nonverbal expression and provides an element of accountability[18]—learners are less likely to scroll through social media when they know you can see them. Remind participants to introduce themselves before they talk, especially if they are interacting without the video component. It can be hard to place voices without faces, and you do not want to spend so much effort identifying the voice that you forget to listen to the content in the learner's comment!

TAKE ADVANTAGE OF FEATURES THAT PROMOTE LEARNER ENGAGEMENT

Leverage the tools of your technology platform to maximize learning with features such as the chat function, breakout rooms, and real-time polling.[18] Make a plan for the chat function. It can be difficult to focus on your presentation and the chat simultaneously, so consider having a teaching partner monitor the chat to allow you to focus on pedagogy. This partner can also moderate chat content to ensure the professional learning environment is maintained.[9]

Capitalize on the benefits of small group work using breakout rooms (Zoom) or running concurrent meetings (Teams). Virtual small groups allow learners to interact and learn from each other. Additionally, polling can assess learner engagement and knowledge acquisition. Polls can be created ahead of time in most formats but can also be used spontaneously if needed.

BE MINDFUL OF LOGISTICS UNIQUE TO THE VIRTUAL SPACE

Online teaching creates new practicalities. Leave more time after questions for learners to generate responses, as it takes a moment for learners to unmute or type in the chat. At least 3 seconds of response time is advised when in-person,[19] so consider waiting at least 5 to 7 seconds in the virtual setting.

If using breakout rooms, consider group size, composition, and timing in advance. Zoom allows for creation of up to 50 different breakout rooms per session, and participants can be assigned to breakout rooms in advance.[20] Before students are sent to their breakout rooms, suggest that they designate one team member as the "recorder." Alternatively, you can create a Google Slide deck with one or more slides designated for each breakout room, either blank or formatted to structure the exercise (eg, an empty table to be filled in). Learners can develop "their" slides as the deck is edited collaboratively in real time.

Since real-time moderation of small group discussions can be challenging in the virtual space, ensure that task assignments and report-back expectations are clearly delineated before sending learners to breakout rooms. Using collaboratively editable documents (eg, Google Slides and Google Docs) that are specifically formatted to provide guidance − with instructions and a template provided − can be very helpful in this capacity. Explicit instructions support autonomous learning by reducing ambiguity and allowing learners to focus on content.

As the meeting host, you can circulate among breakout rooms to check-in with the different groups. After returning to the main room, learners can show their work while reporting back to the full group. Free tools such as Padlet (Wallwisher, Inc., San Francisco, Calif) can also be used in this capacity. To ensure learners remain on task, you can send messages to all breakout rooms alerting them of time remaining or sending reminders of the question prompt.

Because long hours on a computer can be tiring, well-timed breaks can increase attention and focus.[21] While there is individual variation among students,[22] studies indicate that learner attention declines after just 20 minutes of a lecture.[23] Changes in activity, such as asking students to type a response using the chat function, can help recapture attention. Alternatively, short, well-timed breaks can refresh learners and combat "Zoom fatigue."[24,25] You can tell participants to turn off their videos and take a break, or you can run through stretches, breathing exercises, or calisthenics as a group.[26] Finally, remember to notify participants in advance if you plan to record the session. Learner privacy is protected under the Family Educational Rights and Privacy Act[27] so learners should be allowed to opt out of active video/audio participation if desired.

FOSTER A CULTURE OF ACCOUNTABILITY

Because self-initiation and follow-through are key components of adult learning,[28] accountability is crucial to success. Encourage contributions from all, and let your learners know how you will interact with them to ensure their engagement and monitor their understanding. At the onset of the teaching encounter, consider asking students to reflect on their experiences in meetings where participants were engaged versus disengaged, then asking them to develop ground rules to promote engagement. Asking learners how Zoom meetings differ when webcams are on versus off can reinforce the point that the learning environment is richer with cameras on; this can help make

strong encouragement to activate webcams feel constructive rather than coercive.

Use the list of participants to view which learners are attending the session. One example of maximizing this feature to build accountability is the practice of think-and-write exercises followed by cold-calling. Pose a question and encourage all learners to write down an answer, then choose one learner to unmute and answer out loud. Cold-calling is most effective when used consistently, as it helps to establish a culture of preparation and accountability.[16] In his book Teach Like a Champion, Lemov describes the benefits of cold-calling which, when used regularly, keeps learners alert and ready. We recommend this book for educators looking for more evidence-based recommendations and to highlight Lemov's method of observing highly acclaimed teachers in order to assemble best teaching practices.[16]

PART 3: STAYING CONNECTED

DEVELOP A COMMUNICATION PLAN

Distance learning can be isolating and confusing. The educator and the learner are not occupying the same physical space, easily creating a sense of separation. Furthermore, the messaging in online courses (emails, instructions, assignments, etc.) can be overwhelming. A communication plan can both clarify expectations and reduce noise. Define your availability to assure your accessibility to all learners, and use clear and succinct communications to keep learners connected. Alert learners of your contact preferences (ie, email, phone call, discussion board post) and let them know expected response time.

Likewise, all outgoing communication should be consistent. Using different methods of sharing instructions, such as posting instructions on a chat 1 week and emailing assignments the next, creates confusion. Clearly state how you will communicate different types of information to your learners and maintain this practice throughout.

USE ASYNCHRONOUS LEARNING TOOLS TO SUPPORT YOUR TEACHING

Asynchronous learning does not require learners to be copresent at a particular time, thus offering convenience and opportunity for self-pacing. One way to foster asynchronous learning is by pre-recording lectures for students to watch before class, thus freeing class time for group discussions.[29] Moving didactic content outside class time for self-paced, asynchronous learning and dedicating synchronous class time for problem-solving and discussion can promote deeper learning.[30−32] To ensure students complete prework, assign high quality, relevant material, set realistic expectations, and hold students accountable by asking questions and requiring synthesis in synchronous class sessions.

Another way to encourage asynchronous learning is to provide structured ways for learners to interact outside of class sessions. Microsoft Teams and Google Drive allow users to work together and edit documents collaboratively,

and a host of other digital tools can be incorporated into online courses to promote asynchronous engagement. Discussion forums and chat functions in learning management systems and education platforms allow learners to engage in asynchronous discussion. Curricular content can be hosted and managed in these platforms as well, thus ensuring that all resources are well-organized and easily accessible.

BE FORGIVING OF YOURSELF

As with any venture into new experiences, you are bound to make mistakes—even after reading this guide. Embrace those errors. Model for your learners that mistakes present wonderful opportunities for growth.[33] Turn to local technology experts, peers, and online discussion boards for tips and tricks to perfect your online teaching. Incremental innovations are often more successful than sudden or large changes in teaching,[34] so we encourage educators − particularly novices − to make small changes, assess them, and refine accordingly. Most importantly, do not be embarrassed to ask learners for help with technical issues − reaching out for assistance can prove beneficial to both parties. Reflect upon your successes and shortcomings to refine your "online style," just as you would any other teaching experience. Remember—you are not expected to be a technology expert, you are a medical educator!

CONCLUSIONS

The dramatic shift in the landscape of medical education is undeniable, and there will be a period of adjustment for everyone, both learner and educator alike. While the transition from live to virtual learning incited by the COVID-19 pandemic was rapid, many aspects of the transition are likely to be long-lasting. Thus, we believe this guide to teaching online will support medical educators as they adapt to this "new normal" and continue to inspire the future of medicine.

ACKNOWLEDGMENTS

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