Innovative Applications of Educational Technology in Surgical Training During the COVID-19 Pandemic

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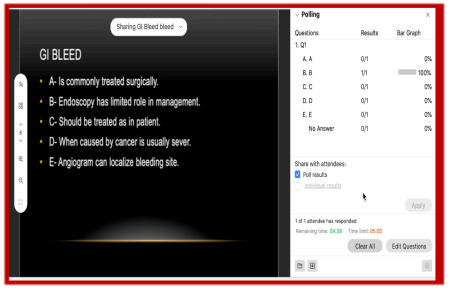
Background

- Training on advanced surgical skills continues to be challenging to trainees, instructors, and their training programs.
- The challenges involve multiple levels of difficulties including mentor availability and training opportunities.
- Surgical trainees go through a long unstructured learning curve to learn such advanced skills. Therefore, the resultant competency is variable and unpredictable.
- Educational technology (ET) offers alternative training opportunities to compensate. Using ET, digital learning objects (DLO) and modules tailored to the educational needs can be created and applied in various surgical educational activities.

Applications

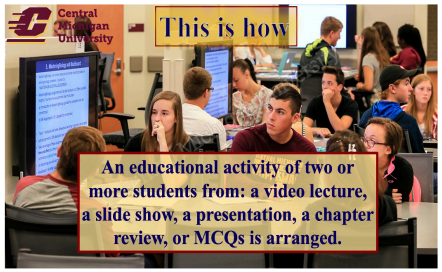
Participants-guided M&M rounds

- Discussing surgical M&M cases is transformed to an engaging education using audience responses/polling.
- The cases are presented in sequential manner from the initial assessment by the surgical team.
- The ultimate presentation will be a cognitive simulation module of real scenarios.
- All the pertinent patient information including imaging, pathology, endoscopy, and interventional findings are shared.
- At the decision-making steps, the audience are asked how to proceed in management. Polling can be conveniently used on the virtual meeting platforms for input.
- Answers are displayed instantly on the screen and the options are discussed with input from the expert surgeons.
- This is an application of knowledge and decision-making learning exercise.
- Making decisions in this prospective manner will encourage active involvement and practicing managing difficult different surgical situation.
- This is compared to the passive way of reviewing the entire case then starting discussions after the end results were known



Learning from the learner

- Sharing learning experiences in a structured and goal-directed educational activity provides rich learning environment.
- Small group studying a topic through slideshow/ video-recording is recorded to include students' comments/ideas/interpretations/analyses/ discussions.



- The recorded activity /learning object (LO) is prepared to be used by other learners via vodcast/ podcast/ other platforms. Learners use this LO as an adjunct or a frame to learn the topic and share their input.
- This LO provides stimulation, enhances attention, facilitates understanding, encourages critical thinking, and allows comparison to other learners in a social, interactive, and self-directed way.

Anticipation-facilitated learning

- The main concept is to facilitate the process of learners' anticipating in the educational materials or topic content that is being taught or discussed to enhance engagement in thinking and proactive learning in a relaxed environment.
- The following points are considered in the designing and testing the anticipation facilitating tool:
- 1- Learners are reminded or requested at variable times during the lecture to anticipate the topic materials or points.
- 2- Anticipation is made by the input of very short phrases or similar.
- 3- Learners' input is shared anonymously and instantly with the rest of the class.
- After building the digital platform for this anticipation sharing, the experience is tested in a structured study on various learning including students and residents. Few to several sessions using this anticipation facilitation are conducted. Further studies of engagement and interaction levels, learning outcomes, and users' perception will facilitate adjusting the approach to the local needs and particular learning objectives.

Conclusion

- Innovative use of ET provides tremendous potentials for surgical education.