Designing Effective and Powerful Educational Videos by Applying Mayer's Principles of Multimedia Learning

Thwin, E.P.A

Introduction

During the COVID-19 pandemic, face-to-face lectures in many medical and health professions schools were converted to asynchronous video lectures. Even in the post-COVID era, these video lectures continue to be essential teaching tools.

Well-designed videos can be powerful educational tools to deliver key concepts and provide students with autonomy for their learning. Therefore, this paper is prepared with reference to Mayer's principles of multimedia learning (Mayer, 2014) and other relevant literature (Davis & Norman, 2016, Guo et al., 2014, Meta-Ed, 2020) to provide 12 practical approaches for educators to create educational videos that are engaging and tailored to the needs of online learning. These approaches are grouped into six thematic areas.

Theme (1)   Setting the stage

Approach (1)   Prepare students ahead

Students can learn more effectively if they understand a lesson's context and content before watching a video. Therefore, educators should plan an introductory guide or a handout to provide students with the necessary information, such as key terms and definitions.

Theme (2)   Managing content

Approach (2)   Chunk the information

Students remember more when the content presented is broken down into a manageable bite-sized chunks of information.

Centre for Medical Education, School of Medicine, University of Dundee, United Kingdom.

Corresponding author: Dr. Eugenie Phyu Aye Thwin Email: ethwin001@dundee.ac.uk

Research indicates maximum student engagement is achieved with videos lasting 6 to 9 minutes. For longer content, videos should be divided into smaller segments, each lasting no more than 9 minutes.

Approach (3)   Focus on essential content

Students' learning is enhanced when extraneous materials unrelated to the learning process are removed. Therefore, educators should eliminate non-essential elements such as unrelated animations or decorative backgrounds and focus on including only text, visuals, and narration that are relevant to the learning outcomes.

Theme (3)   Emphasising the importance

Approach (4)   Reinforce key points through visual cues

Educators should use visual cues such as animated arrows, symbols, highlighting or advanced organisers to emphasise and help students remember key points.

Theme (4)   Utilising the visuals

Approach (5)   Use of relevant multimedia

The human brain processes images more quickly than text, and combining images with text enables faster information processing. Therefore, educators should not rely on text alone and include relevant pictures, images or graphics.

Approach (6)   Place visuals and relevant text together

Keeping visuals and relevant text together makes it easier for students to process the information, reducing cognitive efforts. It is recommended to place graphics and corresponding text close to each other.

Approach (7) Synchronise narrations with corresponding visuals

Student learning is maximised when narration synchronises with corresponding images, pictures, or animations. Educators should carefully time their narration to coincide with multimedia images.

Theme (5) Applying the dual channel of information processing

Approach (8) Balance visuals & spoken words

Humans need two channels for information processing: a visual channel for texts and visuals and an auditory channel for spoken words. Students learn better when educators use both visuals and spoken words rather than visuals and text. Therefore, in narrated presentations, educators should rely more on visuals and minimise the use of text, using it only for defining key terms, listing steps, or providing directions.

Approach (9) Avoid redundant text

In narrated presentations, if educators add text to explain visuals, it becomes redundant and burdens the visual channel processing. Therefore, educators should not include redundant text that can be explained verbally.

Approach (10) Include talking heads sparely

Including a video of educators can overload the visual channel's information processing, and students generally do not learn better from this. However, to establish a social presence with students, educators can include their talking heads in video recordings at appropriate times.

Theme (6) Using natural conversational styles

Approach (11) Use your voice

Students may feel the teacher's presence while watching the video narrated in a human voice. Hence, educators should use their voices in narrated presentations instead of computer-generated voices.

Approach (12) Use conversational language

Student engagement increases when educators use conversational rather than formal language in narrated presentations. First and second-person pronouns, such as 'I', 'you', 'we', or 'our'; contractions, for example, 'let's'; and polite speech, such as 'please', 'you may want to' can be used, while maintaining professionalism.

The author's experience in implementing Mayer's Principles in enhancing video lectures

In applying these principles to my lectures, I adopted several key practices. First, I provided lecture handouts alongside video content, enabling students to follow along and engage more deeply with the material. Second, I focused on using only relevant images and animations and avoiding distractions. Additionally, I used visual cues such as arrows and symbols to highlight critical points and improve retention. I also divided the content into manageable segments, ensuring that topics were effectively broken down for easy understanding. For instance, the topic of peptic ulcer disease was divided into two separate lectures, one focused on the pathophysiology and the other on pharmacotherapy, instead of presenting them in a single lengthy lecture.

I kept images and text close together in my video presentations to reduce cognitive effort for students. For example, in the anatomy of the cerebrum lecture, text and images were positioned in proximity to each other. Moreover, including my still picture on the title slide of the lecture allowed students to connect with the lecturer without distracting them with talking heads on the subsequent slides. Finally, using my own voice enhanced the learning experience by adding a personal touch to the material. These experiences have significantly improved the quality of my teaching and enabled students to thrive in this new era of online learning.

Conclusion

This manuscript provides practical approaches for health professional educators to design asynchronous video lectures. By following these approaches, educators can create engaging and compelling educational videos that empower students and enhance online learning experiences.

Acknowledgment

Conflicts of Interest

The author has no conflicts of interest to declare.

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