



## **How Might We:**

---

**Design evidence-informed media for  
student learning and understanding**



# Contents

---

- 3 Overview
- 4 Student voice
- 5 How might we...
- 6 More information
- 7 References



# Overview

---

An important element of active learning is the use of pre-, during and post-class learning materials to support the acquisition and consolidation of learning objectives. Irrespective of the medium in which this information is presented - PowerPoint, video, animation, workbook, or an immersive medium - it is best practice to follow a number of evidenced-based instructional design principles.

These principles are based on the Cognitive Theory of Multimedia Learning and serves to bridge the domains of cognition, media and instruction. This theory has been developed after decades of empirical research and draws upon the role of the mind in how people learn from words and pictures to promote learning (Cognitive Load). The primary aim of these principles is to manage an individual's cognitive load and optimise the learning environment in which they can learn and understand new information.

As the university moves towards a much more blended and interactive approach to learning and teaching, an evidence-informed approach to the design of media will be essential when providing students resources that promotes learning and supports their understanding of key information and concepts.







# Student voice

**Student feedback on this approach to developing learning resources has always been positive, with some students stating:**

“The way the slides develop over time helps me to understand the content in a slow and organised way”

“As we have to know complex diagrams, having them stripped back to the core essentials then narrated over and added to by the lecturer is really helpful”

“ I was a little confused at the start of the module, as other lecturers used to provide lots of information on the slides which made copying the notes really hard. Having basic slides provided and then added to in the class made us focus on the key points.”



# How might we...

## The 12 design principles

Emerging from the available pedagogical evidence from the literature, all media presentations should attempt to integrate the following 12 design principles:

### 1. Coherence

Exclude extraneous words, pictures and sounds.

- Only include images, text and narration that link to the learning objectives (i.e., don't use unrelated images, logos or supplemental materials)
- Do not use music in the background to add ambience
- Use simple visuals that are specifically related to the content

### 2. Signalling

Provide cues to highlight the organisation of the essential material.

- Draw attention to important and relevant information by using the cursor or highlight arrows and other visual cues

### 3. Redundancy

Use graphics and spoken narration only, rather than graphics, narration and on-screen text; use narration of words, rather than narration and on-screen text.

- When narrating a presentation, use either graphics or text, but not both
- Reduce the amount / use of text during a narrated presentation

### 4. Spatial Contiguity

Place corresponding words and pictures near each other on page and screen, rather than separated.

- Position text in close proximity to the graphics/pictures it refers to
- Provide the text to be read in advance of an animation or graphic being presented

### 5. Temporal Contiguity

Present words and pictures simultaneously rather than successively.

- time the narration so that it plays along with the animation or drawing

### 6. Modality

Present words as narration rather than as on-screen text.

- During a narrated presentation with images and graphics, only use on-screen text where necessary (i.e., listing key steps, providing direction for next steps)

### 7. Multimedia

Present words and pictures rather than words alone.

- Include images and graphics to present key information
- If you use text, use font size 22-24 where possible to increase accessibility
- Only use images and graphics to enhance and clarify
- Use static images where possible or images that build up in complexity (i.e., progressive/generative drawing)

### 8. Segmenting

Present content with the learner able to control delivery, rather than as continuous unit.

- Use speed control and stop functions on videos
- Deliver long sections of information in chunks with suitable breaks

### 9. Pre-training

Present students with media they are familiar and comfortable using.

- Provide and clarify key terms prior to delivering an integrative task (i.e., glossary, FAQ, Fact sheet)
- Provide clarity on usability of the learning tool

### 10. Personalisation

Present narration in a conversational style rather than formal style.

- Use language contractions
- Use extemporaneous speech over heavily scripted

### 11. Voice

Use spoken voice in a friendly human tone for multimedia presentations rather than a machine voice.

- Use the voice of someone familiar to the student group, and avoid machine voice.

### 12. Image

It is not necessary to include an image of the speaker when delivering a presentation.

- Include an image of yourself when you are trying to establish social presence or there are no words or pictures
- Don't include a side box video of the narrator or instructor



# More information

---

Links to more information:

[Six strategies for effective learning](#)

[Principles of multimedia learning](#)





# References

Issa N, Mayer RE, Schuller M, Wang E, Shapiro MB, Darosa DA. 2013. Teaching for understanding in medical classrooms using multimedia design principles. *Med Educ* 47:388–396.

Issa N, Schuller M, Santacaterina S, Shapiro M, Wang E, Mayer RE, Rosa DA. 2011. Applying multimedia design principles enhances learning in medical education. *Med Educ* 45:818–826.

Mayer RE. 2009. *Multi-Media Learning 2nd Ed.* New York, NY: Cambridge University Press. 318 p.

Plas JL, Moreno R, Brünken R (Editors). 2010. *Cognitive Load Theory.* 1st Ed. New York, NY: Cambridge University Press. 275 p.

Pickering JD. 2015. Anatomy drawing screencasts: Enabling flexible learning for medical students. *Anat Sci Educ* 8:249–257

Pickering JD. 2016. Measuring Learning Gain: Comparing Anatomy Drawing Screencasts and Paper-Based Resources. *Anat Sci Educ* 10:307-316.

Sweller J. 1988. Cognitive load during problem solving: Effects on learning. *Cognit Sci* 12:257–285.