



Presentation design and delivery to improve knowledge translation in a remote world

Grace Sze Yin Leo,^{1,2} Ross Fisher,³ Tessa Davis,^{4,5} Ben Lawton,^{6,7} Henry Goldstein,^{8,9} Andrew Tagg,^{10,11} Damian Roland ,^{12,13} on behalf of Don't Forget the Bubbles

For numbered affiliations see end of article.

Correspondence to

Professor Damian Roland, Health Sciences, University of Leicester, Leicester, UK; dr98@leicester.ac.uk

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ABSTRACT

The practical dissemination of new knowledge is not given adequate attention despite large investment in undertaking high-quality research and the desire for evidence-based practice. It is important that those involved in knowledge translation and continuing medical education understand the fundamental principles of effective presentations, whether at scientific conferences, workshops or group teaching sessions. The switch to remote presentations has made this a more challenging endeavour. We describe established presentation techniques that improve knowledge translation and how to use them in both face-to-face and remote settings.

BACKGROUND

There is a large amount of educational literature that highlights effective presentation techniques. This theory is seldom applied, and a deeper understanding of these principles would lead to more effective presentations.¹ We aim to highlight some of these principles and offer effective techniques to help clinicians and academics improve the impact of their presentations and decrease the knowledge translation gap. Due to the COVID-19 pandemic, many conferences are being held remotely and, while core concepts have not changed, we highlight specific adjustments for these situations.

PREPARATION

It is a privilege to speak. Equally, as a speaker, it is a privilege to be gifted the audience's time. The time given over to preparation should reflect this. You should research the needs of the audience and their context. Speak with organisers, colleagues and potential audience members. Consider your topic and its intersection with the audience's

experience. How can you add value: by providing a unique perspective? building on existing knowledge? challenging preconceptions? Picking up a pencil and notepad to brainstorm key ideas avoids the constraints of technology.²

Bloom's taxonomy of learning³ suggested that students must move beyond acquiring knowledge to develop higher-order thinking about that knowledge. Fisher's p cubed approach⁴ to presentations transforms the 'what' of the topic into a 'so what?' for the audience. He frames a presentation as the product of three components; the message (p1), the supportive media (p2) and its delivery (p3). The value of a presentation, then, is the product of these three⁵:

$$p_1 (\text{message}) \times p_2 (\text{media}) \times p_3 (\text{delivery}) = p^3$$

EFFECTIVELY DESCRIBE THE MESSAGE (P1)

The purpose of the presentation is to deliver a clear and memorable message not to transfer large volumes of data. The latter can only be done effectively in a document or handout. Building the presentation through a series of questions, challenges or models leads to construction and delivery of the core message. The carefully crafted script should be timed to fit within 80% of the time allocated. Stripping a message down to essentials enforces precision and succinctness rather than filling time. It is not possible to sustain an audience's attention, regardless of the skill of the speaker for greater than 17 min. Break hour-long sessions into smaller segments.⁶

Expert presenters use stories to engage an audience and demonstrate abstract ideas; analogy and metaphor help them



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Mayers Multimedia Learning Theory

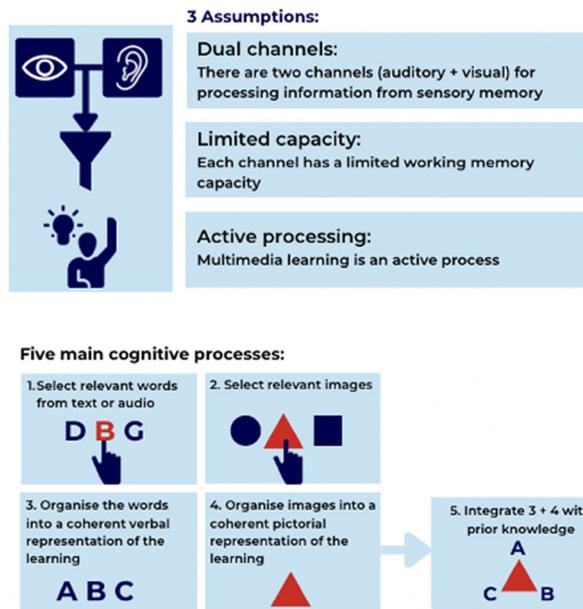


Figure 1 Summary of Mayer's multimedia learning theory.

access and question pre-existing schemas aiding knowledge retention.

USE SUPPORTIVE MEDIA WISELY (P2)

Good design aids good understanding. Supportive media should add to the message and, only as part of the delivery, improve knowledge translation. It should not be the script or handout, nor is it compulsory.

One should be able to interpret an effective slide within 3 s.⁷ Text must be large enough to be legible to the audience at the back of the room. In a remote setting, consider how large the video feed will be, as well as the size of your slides relative to the window/platform. Bullet points with detailed text, complex diagrams and animations increase the extraneous cognitive load and impair processing and learning.⁶ Complex data, references and additional material can be provided separately as a handout using a quick response code or shortened uniform resource locator (otherwise known as a web address) to a referenced blog post or online file.

Mayer's multimedia learning theory and principles provide an evidence-based framework for shaping and designing slides (figure 1). These principles of reduction of text, removing redundant content and clarity of diagrams make it easier for students to achieve meaningful learning including those with neurodivergency. Examples of applications are shown in figures 2–4. It is also important to be cognisant that supportive media may be helpful for one group or participants but not for other (eg, be aware of the colour blind or deaf participant).

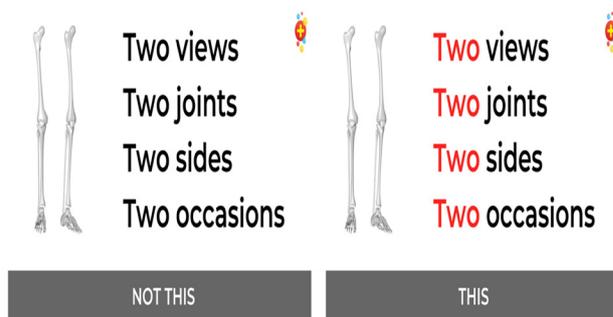


Figure 2 Slide comparison on the 'rule of twos' for joint imaging. The signalling principle states that we learn best when we are shown exactly what we need to pay attention to.

ENGAGEMENT AND ENHANCING DELIVERY (P3)

Effective delivery of the talk is as much a skill as suturing and can be learnt. The perfect combination of speech and body language is developed by practice, honest feedback and effective coaching.

When an audience is presented with multiple different stimuli, then they are more likely to remember the one thing that is different. This is the von Restorff effect.⁸ This principle can be applied to all teaching.

Polling and live discussions increase interactivity and drive engagement. By changing the flow of information, the audience become more focused.⁹ There is, however, a fine line between usefulness and uselessness. These tools can be superfluous and a source of technical error. Questions delivered via electronic polls can be used to gain a deeper understanding of the learners (figure 5) and to check their learning and understanding.

Pausing for reflection remains a valuable tool for both speaker and audience.⁹ Humour may be powerful if used appropriately and sparingly.

VIRTUAL SET-UP IN A REMOTE WORLD

Delivery in the virtual milieu is significantly impaired by pixelated video and images, poor audio and simple technical issues such as challenges of screen sharing;

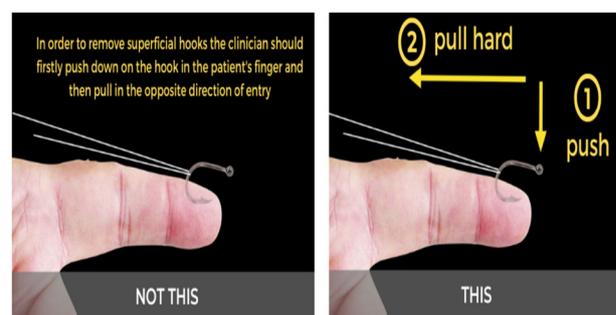


Figure 3 Slide comparison on removal of a foreign body showing the spatial contiguity principle. Corresponding words and pictures should be presented close to each other. The right slide uses clear simple language which follows Mayer's personalisation principle: we learn better when words are conversational rather than formal.



Figure 4 Slide comparison of presenting data on outcomes for children with bronchiolitis on high-flow nasal cannulae. The slide on the right removes excess text and uses graphics to highlight the key outcomes in keeping with Mayer's multimedia learning theory.

attire causing a moiré effect due to patterns and stripes; poor lighting; and custom backdrops.

Technology can be improved in five key areas: camera, audio, lighting, internet connection and online platform.

Camera

Many smartphones have higher-quality cameras than those built into computers, and there are a number of free applications that will allow their use as a webcam. An alternative is to purchase a specific webcam for your computer. With these, you simply plug in a USB cable and position the webcam on top of your computer. A digital single-lens reflex (DSLR), or a mirrorless camera, comes in at the higher end of the price range but shoots the highest-quality image. This is essentially a professional camera that you can connect to your computer to record and stream in 4 k quality.

Audio

An external USB microphone will capture better audio than a built-in computer microphone. These are simple to plug in and use.

Lighting

Good lighting improves the quality of your video. Start with a ring light behind or around the camera

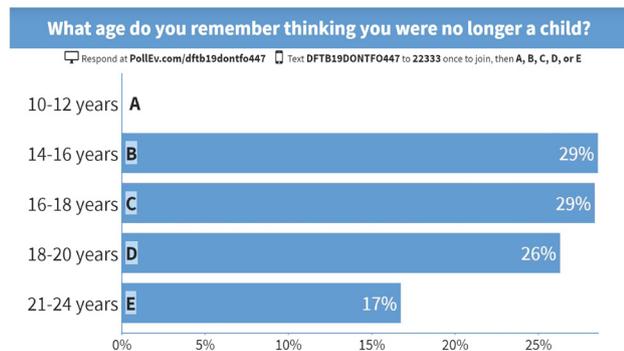


Figure 5 Example of the use of PollEverywhere for audience engagement.

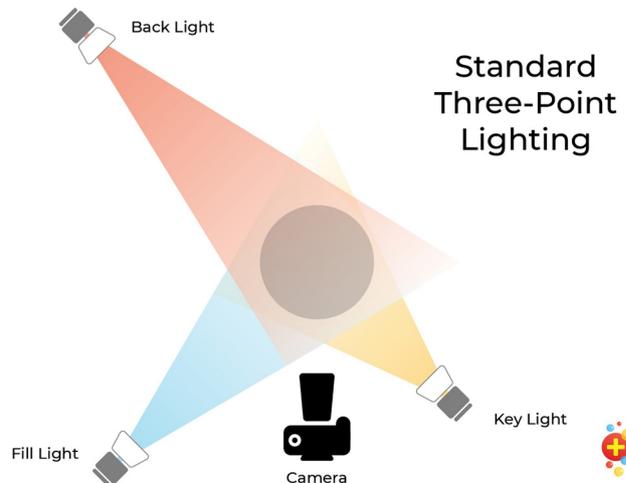


Figure 6 Example of three-point lighting set-up.

lens. Additional sources above and to the side minimise glare on spectacles. Ideally, consider a three-point lighting system (backlight, fill light and key light), shown in [figure 6](#).

Internet

Live streaming needs a reasonable internet upload speed. WiFi connections can vary, depending on network usage, so an ethernet connection ensures you get the most out of your carrier.

Platform

Online presentation platforms all work slightly differently. Learn to use the platform you are using. Before going live to the audience, run a technical rehearsal, checking all options; connecting and muting your microphone; sharing your slides/screen and delivering your presentation online. Ideally, deliver a dress rehearsal live prior to the event. Do not leave this to chance or the last moment.

POST PRESENTATION

The learning conversation should continue after the presentation. Making a visual abstract, blog post or recording of the presentation available online after the event gives further detail to the message.

Provide attendance certificates post completion, for example, by using Google Forms with the Certify 'Em plug-in¹⁰ to incentivise feedback on both the educational and technical aspects of the presentation. This is an essential and challenging part of evaluating online teaching and one's personal development.

CONCLUSION

However good the education or research, the impact is limited if its presentation is poor. We have proposed a sequence of steps that do not force a common format but ensure the message (the story or the research, p1), the format of presentation (the supportive media, p2) and its delivery (p3) are thought through, relevant and

rehearsed. Academics and clinicians should view this critical phase of knowledge translation as importantly as the design and methodology of the study they are presenting.

Further reading

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- ▶ Don't forget the bubbles bubble up community: <https://bubbleup.community/>.
- ▶ P cubed presentations <http://ffolliet.com>.

Author affiliations

- ¹General Paediatric Medicine Division, Sydney Children's Hospital, Randwick, New South Wales, Australia
- ²School of Medicine, The University of Sydney, Sydney, New South Wales, Australia
- ³Department of Paediatric Surgery, Sheffield Children's Hospital, Sheffield, UK
- ⁴Paediatric Emergency Department, Royal London Hospital, London, UK
- ⁵Blizard Institute, Queen Mary University of London, London, UK
- ⁶Paediatric Emergency Department, Lady Cilento Children's Hospital, South Brisbane, Queensland, Australia
- ⁷School of Medicine, Faculty of Medicine and Biomedical Sciences, The University of Queensland, Herston, Queensland, Australia
- ⁸Department of Paediatric Medicine, Lady Cilento Children's Hospital, South Brisbane, Queensland, Australia
- ⁹School of Medicine, The University of Queensland, Saint Lucia, Queensland, Australia
- ¹⁰Emergency Department, The University of Melbourne Western Clinical School at Sunshine Hospital, Saint Albans, Victoria, Australia
- ¹¹School of Medicine, The University of Melbourne, Melbourne, Victoria, Australia
- ¹²SAPPHIRE Group, Health Sciences, University of Leicester, Leicester, UK
- ¹³Paediatric Emergency Medicine Leicester Academic (PEMLA) Group, University Hospitals of Leicester NHS Trust, Leicester, UK

Twitter Tessa Davis @tessardavis, Ben Lawton @paedsem and Damian Roland @damian_roland

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ORCID iD

Damian Roland <http://orcid.org/0000-0001-9334-5144>

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