Edtech

Improving PowerPoint presentations

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What's the idea?

Our working memory, which we use to temporarily store and manage information, has a small capacity and is really put to the test when we are taught new information. It's worth bearing this in mind when using PowerPoint presentations in your teaching.

What does it mean?

Some researchers suggest that there are three kinds of cognitive load on our working memory; the descriptions of these below are based on teacher Andy Tharby's articulation of them (2019):

- Intrinsic cognitive load is related to the inherent difficulty of the subject being learnt.
- Extraneous load refers to any extra thinking that does not contribute to learning.
- Germane load is the nourishing and productive thinking that causes students to form and consolidate long-term memories.

For PowerPoint presentations to be effective, teachers need to have: a good grasp of the difficulty your students will encounter when learning a new topic; strategies for reducing extraneous load; and an appropriate amount of challenge (germane load). Research suggests that combining verbal association — spoken or written — and visual imagery eases the strain on our working memory and contributes to better learning.

What are the implications for teachers?

Teachers should focus on pairing text with carefully chosen graphics that support learning. We should avoid illustrations that merely 'liven up', 'add colour' or 'add fun' to a resource, and instead use diagrams, tables, photographs or drawings that present examples or depict overarching ideas or concepts.

Carefully thought-through sequencing, clear labelling, helpful colour-coding, well-designed graphic illustrations and deliberately chosen video clips all contribute to better presentations. They depict models clearly, represent abstract concepts and reveal underlying knowledge structures that help students make the connections needed to enable learning.

TOP TIPS

- Use images or videos only when they support complex concepts and ideas.
- If you need to have a large amount of text on a slide, don't read it out to students.
- Limit extraneous load by avoiding text when an image, graphic or diagram will suffice.

Want to know more?

- De Jong T (2010) Cognitive Load Theory, educational research, and instructional design: Some food for thought. Instructional Science 38: 105–134.
- Sweller J, Ayres P and Kalyuga S (2011) Cognitive Load Theory. New York: Springer.
- Tharby A (2019) Using Cognitive Load Theory to improve slideshow presentations. Impact Special Issue: 10–11.
- Weinstein Y, Sumeracki M and Caviglioli O (2018) Understanding How We Learn: A Visual Guide. Abingdon, Oxon: Routledge.