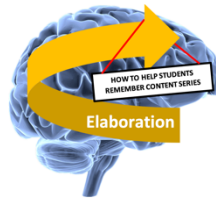


How to Help Students Remember Content Series:



Elaboration

I think it goes without saying that every teacher wants their students to remember the material that they teach...otherwise, why teach it. Of course, we all want our students to leave our classes being able to recall, apply and grow from what we've taught. This series is dedicated to helping classroom teachers know what the science of learning has discovered that really helps students retain the valuable information that you've taught them.

Today's topic: Elaboration

I'll start with a definition I'm lifting from *Make it Stick* (2014):

"Elaboration is the process of giving new material meaning by expressing it in your own words and connecting it with what you already know. The more you can explain about the way your new learning relates to your prior knowledge, the stronger your grasp of the new learning will be, and the more connections you create that will help you remember it later" (p.5 and p.208)

"Elaboration is the process of finding additional layers of meaning in new material" (p.207)

Research has shown that when students link new material to what they currently understand in their prior knowledge, comprehension and knowledge acquisition expands and grows. This is especially important when teaching students abstract concepts. Memory is enhanced when students are able to link or associate new ideas with ones they already are familiar with.

How Does that Work?

You want to relate new material to prior knowledge first, so that students have an initial place to start, then you can build on it to expand their understanding and create new meaning. You can do this in several ways.

1. **Choose a metaphor that students understand.** Relating new content to a concept that students already understand is an excellent starting point. Once student grasp the concept, you are then ready to expand their knowledge by adding new ideas. For

example, if you're teaching students about heat conduction, you could ask your students if they've ever warmed their hands around a cup of hot chocolate before. How did the heat of the hot chocolate warm their hands?



In my own classes in Educational Psychology, I often refer to our brain's Executive Functions (a set of cognitive processes that controls behaviour) as the air traffic control centre of the brain. It's fair to say that everyone understands how air traffic control centres work to control multiple aircraft and busy airspace around an airport. This concept seems to capture the way certain parts of the brain functions to control impulses and attention and decision-making.

- 2. Choose a visual image, demonstration, simulation or video that accurately conveys your meaning.** In *Brain Rules* (2008) by John Medina, he states that "Vision trumps all other senses". He's right. A well-used image can powerfully represent foundational knowledge that you can build upon and elaborate to give new material meaning.



Recently I heard some pretty amazing statements from scientists that initially caused some disbelief, but were later explained through a visual demonstration. Let me explain. What if I made this statement: "Reduce the earth down to the size of a pool table cue ball and it would be the smoothest ball ever, smoother than any machine crafted ball ever." No way, what about the mountains and the deep ocean trenches? This statement was made by American astrophysicist Neil deGrasse Tyson on a Joe Rogan podcast. When he explained the size of the earth, the depth of the ocean and heights of the mountains by ratio, it began to make sense that the surface of the planet is extremely smooth.

- 3. Ask students to state things in their own words.** Having students put things into their own words shows you quickly whether or not they've grasped the concept and can accurately relate it to what you're teaching them. Initially students do not provide a complete or total representation of what they actually know or are able to explain, so be patient. This process of restating and explaining and 'getting it right' is important

and time should be given to allow students to edit their first explanations. You can have students give their responses verbally or through creation of a metaphor/image/graphic or through written responses.

4. **Ask students to explain how the new information relates to their life outside of class.** There are many ways in which this can be done and across multiple school subject areas. For example, asking students to explain the importance of understanding surface area, or friction, or heat transfer, or inference, or fairness outside of the classroom is important, and multiple examples will be given.
5. **Teach students how to study using elaborative interrogation.** Elaborative interrogation is a process of getting students to ask deep questions about the material that they are learning while drawing upon their own prior knowledge to help answer the question. Remember, this is an elaboration strategy and elaboration seeks to connect new material to what they already clearly understand. Students can ask questions like; Why would I explain this concept to someone who has never heard this before? How can I explain this in another way? What does this mean for me? How can I use what I already know to explain the new information? How can I graphically/visually show this another way?

Teachers do need to be careful promoting elaborative interrogation and should consider this a scaffolded activity. In other words, teachers should model this approach and take time to teach students how to do this by first providing questions that students should ask, providing feedback on the questions students develop and eventually releasing the responsibility to students for the types of questions they generate to understand content. Again, it's important to explicitly teach students to link the new material to what they already know through questioning.