If They Don't Remember, Can They Really Know?

Tips for using effective revision strategies that strengthen students' retrieval capacity

With external exams returning this summer, the next few months will be a testing time for many young people (and for teachers) who have faced ongoing disruptions to their learning since the pandemic's start.

This makes teaching them effective learning techniques they can use in the classroom and during independent study more important than ever, which is why I've updated my 2018 paper on evidence-based strategies in the light of Covid. I hope you find it useful.

As Dr. John Dunlosky points out in his article 'Strengthening the student toolbox- study strategies to boost learning', teaching students how to study is just as important as teaching them the content. Exploring and demonstrating effective learning strategies with students is crucial if we are going to train them to move away from unhelpful practices like last minute 'cramming' sessions, caffeine-fueled all-nighters and the highlighting of everything on a worksheet or textbook meaning the re-reading of it almost in its entirety.

Unfortunately, there are no magic tricks I can teach pupils for retaining information for an exam (as much as I would love there to be). Learning is achieved through hard work and continuous effortful practice. However, there are some very useful techniques and tips I would encourage. Strengthening the retrieval capacity of our students is essential and if we manage to store information into long-term memory, we are able to retrieve it again and again and again.

Working with my own pupils as well as planning and delivering the student Brain Booster masterclass workshops I deliver for Veema Education has meant I have developed a deep interest in neuroscience and the science of learning. However, what I feel is sometimes missing from the research papers are simple, practical revision strategies we as teachers can adopt to enable our learners to maximise the impact of their revision. So what follows is a list of the ones that I have found to really effective:

Retrieval practice is one of the most effective ways of learning that leads to fluency. Trying to recall something from memory requires mental strain and effort, which is why low stake-testing rather than simply reading, highlighting and re-reading information is more effective. When reading text from a textbook or worksheet have pupils answer a series of questions to test their knowledge and understanding from memory. These can be questions that have been prepared earlier or questions that you get students to prepare themselves. Knowing that students are about to test each other can be a wonderful engagement tool! To take this a step further, include some more challenging and higher order thinking questions that encourage them to think about how this new learning relates to previous information they have learnt in the past–whether this being yesterday's lesson or something from last term.

Graphic Organisers such as mind maps, spider maps, sequential thinking and Venn diagrams should be used as much as possible for students to show their thinking and understanding of key ideas and topics from memory. When learning, students need to be active and graphic organisers are a fantastic way of reconstructing information they have been exposed to whilst making useful links and connections to what they already know.

Flashcards

These are highly effective revision tools, but nearly a third of students don't use them for self-testing (Hartwig

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and Dunlosky, 2012). This is a real shame as they are great for improving knowledge, understanding and memory.

I've adapted these tips from "Powerful Teaching— Unleash the Science of Learning" to encourage their use among your students.

Three ways to use flashcards

1. Write a concept or key term on one side of a flashcard and ask students to write what it means on the other. Check their response against the preferred answer to see how well they have done. This kind of self-quizzing helps identify knowledge gaps.

2. Highlight keywords, concepts, and theories when reading and transfer this information onto flashcards, then self-test.

3. Do as above but use illustrations as well as words.

Three ways to get even more out of flashcards

Retrieve: Ensure pupils are actually recalling the answer by making them say it out loud before flipping the card over. This way, they stay accountable and don't become overconfident, thinking they know the answer when they don't. Just because a student recollects an answer doesn't mean they understand what is meant.

Re-order: Pupils should shuffle their pack of flashcards when they have gone through so the sequence of answers is different each time. This way, they aren't just remembering the order of answers.

Repeat: Our own research shows students tend to remove cards too early. So, students should keep cards in their deck until they've correctly retrieved them three times. They should also revisit each flashcard as often as possible, especially in the build-up to exams.

Bonus Tip

· Many students now use tech flashcards, like Kahoot, Quizlet, and Socrative.

Cornell Note taking. I love the Cornell note taking system and many of my GCSE and A-level students did too. This is an excellent way of getting students to think metacognitively (McCabe 2001), asking questions, noting key terms, and summarising the content being revised at the end of a lesson or during independent study. This method enables students to self-test what they have covered in the lesson as well as piece together previously learnt information. You can download a guide I produced last year of how to use this here and it's a definitely worth exploring with students.

Spacing out your learning and revisiting material as often as possible is so important for embedding. This is one reason why I feel we constantly need to expose students to information they have previously learnt either in the lesson or through homework, mixing up material from different units in class tests or assessments if they are going to hang onto the knowledge they gain.

The key here to effective revision is not the hours of cramming you do in the final few weeks or days before the exam but regular, focused, shorter sessions with regular brain breaks. Cedepa et al (2008) in their research on spacing effects in learning show that the optimal intervals for retaining information between study sessions for say one week should be between one or two days, six months three weeks and 1 year every four weeks. I often put it to my students as 'the little and often' approach. Daily low-stakes testing, weekly reviews and cumulative testing is so important for helping students store information into long-term memory.

Past questions. Students need to practice different examination questions, over and over, well-spaced over time, rather than massed practice of the same problem type (and without looking at any notes). Also, the effect of exploring worked examples or exam answers, as well as writing their own, helps students process, practice and refine their revision to meet the parameters of exam success.

The reason many of the following techniques work so well is that they encourage learners to be active agents in their learning, They need to think hard about the information they are faced with. Learning that feels difficult embeds knowledge into memory better compared to learning that feels easy, which soon disappears–hence why we need to train students to avoid passive, superficial and time consuming techniques

Preparing students for exams is never easy, and if we are going to teach students to be independent learners than we really do need to give some further thought into guiding students on how to revise, rather than simply telling them they should do this or focusing merely on subject content.

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Finally, here are my 20 top revision and exam tips for your students. Feel free to adapt and make changes to these so that they are 100% relevant to your students!

20 top revision and exam tips for your students

Effective revision:

1. Divide study time into timetabled chunks, so your revision has structure.
2. Make notes in a way that fosters self-testing.
3. Allow extra time for more difficult subjects, so you don't end up cramming.
4. Learn actively by making notes and testing your understanding as you revise.
5. Practice past exam papers, so you know what to expect.
6. Become familiar with mark allocations. That way you can focus your efforts on what matters most.
7. Regularly review what you've learned so it sticks. Every two or three days in the week before an exam is good.
8. Take regular short breaks. This will keep you fresh so you can revise longer without getting tired.
9. When revising, periodically get up and move about. A little exercise will help you to concentrate.
10. Get enough sleep, as this re-energises the brain.

During the exam:

1. Read the whole paper thoroughly right at the start.
2. Begin with easier questions. Answering these will give you confidence.
3. Be strategic. Concentrating on questions that give the most marks makes sense.
4. Don't answer questions automatically. Make sure you understand what is really being asked. Identifying key words helps you do this.
5. 'Brainstorm' the question by making notes about it.
6. Leave time for proofreading, checking SPAG and final additions or changes.
7. Take water into the exam room and drink frequently as this helps brain function.
8. If you go blank, dropping your shoulders and breathing out slowly will help you stay calm and refocus.
9. After the exam, reward yourself. You deserve it.
10. Learn from each exam and apply this new knowledge to the next.

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