

An Analysis of Different Revision Techniques



Students are constantly required to retain and apply new knowledge in preparation for exams. Many will have considered an abundance of different revision methods such as note taking, highlighting text, reading textbooks, flash cards etc. But just how effective are these methods?

Throughout my school life I have actively researched the best ways to retain information and effectively prepare for my exams. However, I never really found anything different to the usual methods above...until recently!

Whilst conducting some general research I came across a Youtuber called Dr. Ali Abdaal who is a Cambridge University Medicine Graduate and now works as a Junior Doctor in the NHS. He has published several informative and interesting YouTube videos looking at topics like productivity and studying.

One video that I found particularly useful was entitled, 'How to Study for Exams - Evidence-based Revision Tips' and within this video he spoke about popular (but surprisingly inefficient) techniques as well as recommending a technique called 'Active Recall' which I had not come across before.

Dr Ali's video references a scientific paper which was written in 2013 by Professor Dunlosky (Department of Psychological Sciences, Kent State University, USA), where he and his colleagues analysed hundreds of papers looking at all the research behind 10 different revision techniques. Dunlosky included overall assessments for all the techniques that he had thoroughly evaluated, based on available evidence.

Surprisingly some of the most popular revision techniques such as highlighting and underlining, note taking and summarisation, the use of imaginary for learning texts and utilising mnemonics did little to boost performance.

I was quite surprised to learn that despite the popular belief that highlighting, re-reading and summarisation were efficient learning techniques, in reality it's quite the opposite! After reading about the surprisingly low effectiveness of these methods, I was intrigued to see which strategies would benefit my revision for future examinations.

Some other techniques discussed in Dunlosky's paper were assessed as having some benefits. These included self-explanation, elaborative interrogation and interleaved practice (an explanation for all techniques is provided in the table at the end of the article in Table 1).

I then went on to look at the techniques rated as having the most beneficial impact. One of these techniques was 'distributed practice' (i.e. spaced repetition).

'Distributed practice' refers to reviews that take place sometime after the original learning event, as opposed to reviews that occur immediately following the original learning event. When we want to learn something well, studying the information or practicing the task just once is almost always inadequate. Reviewing the information or practicing at the right time is critical for durable learning.

'Practice Testing' (sometimes called 'retrieval practice') was also rated by Dunlosky as being highly beneficial. It involves frequent testing or quizzing over a period of time to encourage students' recall of the material from memory. Practice testing can be easily implemented by students and is less time consuming relative to other popular techniques e.g., summarisation.

Back to 'Active Recall'...

'Active recall' is actually a form of 'practice testing' and is a method which essentially involves retrieving facts from your brain. In his video, Dr. Ali rates this method as the most effective study technique he has used, given that the very act of retrieving information strengthens the connections within your brain.

Now the science bit...

In a 2010 study, conducted by Professor AC Butler (Washington University, USA), students were split up into two groups. One group were going to have a practice test whilst the other group were going to study the material using whatever method they wanted to e.g., re-reading, highlighting and summarising. This study tested the students on both the facts and the concepts. The group who did not complete the practice test achieved results of between 30-40%, which is understandable given that they had only studied the material once. The other group, who studied the material and had a small practice test at the end of it, performed significantly better. For some, the results were increased by approximately 30%.

In another study conducted in 2011 by Karpicke and Blunt (Department of Psychological Sciences, Purdue University, USA), students were split into four different groups in which they were required to learn some material and then were given a test about a week later. The first group studied the text once, the second group studied it four times, the third group read the text once and then made a 'mind map', and the fourth group read the text once and then tried to recall as much of the content of the text as they possibly could (i.e., 'active recall'). On questions about specific information mentioned in the text, the first group performed the worst, whereas the 'active recall' group (group 4) performed significantly better than group 2 (who studied the text four times). This implies that just testing yourself once is probably more effective than just re-reading a text four times! The same group of people were then asked inference questions, which would require them to understand the text in more depth. The first group once again performed the worst, whilst the active recall group once again performed the best (group 4). There was a third phase of this study in which Karpicke & Blunt asked the students beforehand what they thought the results of the study would be. The students rated repeated study (i.e. group 2) as being the most useful technique and they rated active recall (i.e. group 4) as being the least effective strategy. This

illustrates that our own intuitive idea of what makes a good study technique doesn't necessarily match up with the evidence!

I hope that this article has challenged your way of thinking and given you some ideas on how to improve your revision techniques as well as an insight into the effectiveness of various methods.

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Further Information

<https://www.youtube.com/watch?v=ukLnPblffxE> – YouTube Video

<https://www.youtube.com/channel/UCoOae5nYA7VqaXzerajD0lg> - Ali's YouTube channel

<https://shorturl.at/vIU89> – Dunlosky's paper

Table 1 – Study Technique Evaluation

Study Technique	Explanation	Effectiveness
1. Elaborative interrogation	Generating an explanation for why an explicitly stated fact or concept is true	Moderate
2. Self-explanation	Explaining how new information is related to known information, or explaining steps taken during problem solving	Moderate
3. Summarization	Writing summaries (of various lengths) of to-be-learned texts	Low
4. Highlighting/underlining	Marking potentially important portions of to-be-learned materials while reading	Low
5. Keyword mnemonic	Using keywords and mental imagery to associate verbal materials	Low
6. Imagery for text	Attempting to form mental images of text materials while reading or listening	Low
7. Rereading	Restudying text material again after an initial reading	Low
8. Practice testing	Self-testing or taking practice tests over to-be-learned material	High
9. Distributed practice	Implementing a schedule of practice that spreads out study activities over time	High
10. Interleaved practice	Implementing a schedule of practice that mixes different kinds of problems, or a schedule of study that mixes different kinds of material, within a single study session	Moderate