

Distributed practice, or spaced repetition, is the process of mixing up questions from different subject groups and then studying them over an extended period of time in several short study blocks. This might sound difficult, but, surprisingly, you can expect to see positive sustained results from this study method.

Teachers and other education professionals are always searching for methodologies which will help their students learn better and retain more of the knowledge they have been taught. This distributed practice method is a common and effective way to strengthen the amount of retained knowledge. The entire process consists of four essential steps, as follows:

Step One - students are introduced to an educational topic and then instructed on its details in a traditional way. The goal here is for students to gain a basic understanding of what they have been taught.

Step Two - Time passes. The students are encouraged to continue learning other topics, and move away from the previous topic which they have learned.

Step Three - Now you, as a student, attempt to recall the information in a new session of instruction.

Step Four - The original topic is now retaught to you. You are essentially going to relearn this topic over the course of a series of lessons.

The point of this multi-step process is to ensure that you take the time to relearn and recall the topic - after a break - in several followup sessions. This type of methodology is akin to training to run a long race. Over the course of several training runs you will indulge in sessions of various length, interspaced with rest breaks. By the time you are ready to run the final longer distance, you have created the proper stamina and muscle memory to run efficiently and for a long period of time.

Why is this method so effective?

The success of this method is attributed to several cognitive theories. Let's take a look at two of them.

One reason for the success of distributed practice is contextual variability. What this means is that when information is stored in our memory we retain far more than just the facts - it is not just the information but also the context in which it is learned and other variables such as our feelings or state of mind that stay with us. When we relive those moments or repeat the way in which we originally learned it, our ability to retrieve the information will be improved.

The other theory is called the "study-retrieval" theory. What this means is that by exposing yourself to information, you are actually creating a retrieval process within our memory. The more you review, the more you receive. The consequence of this is that your memory grows stronger and you become less and less likely to forget things. By incorporating the gap as stipulated in Step Two of the process outlined above, your memory is forced to work harder and our memories of the information are strengthened.

Distributed Practice according to psychologists

Psychologists have proven in study after study that material reviews that take place over a longer period of time, are better than those at shorter periods.

A review of Distributed Practice by Kuepper&Tetzel, 2014 has gone one step further, examining the process of distributed process to evaluate its suitability for educational use. The efficacy of this method has been shown in cases where rote learning is employed in verbal facts, and to a lesser degree in areas such as science and mathematics. There was no proven differentiation between age groups, working with the same degree of success in each group. One interesting aspect of this method is that it has been found to improve retention of facts over the long term as well.

Spacing effect has such unexpected because when you have an initial exposure to information this excites you, it reinforces and contributes to your understanding of it later. This is essentially like building a wedding cake by reinforcing and supporting the structure which is then followed by placing one layer of cake atop another layer - each layer supporting the following one.

There are two types of intervals that should be noted in this type of methodology. The first is the interval with the teaching moment which will be repeated within the lesson itself. The other type of interval takes place between lessons and offers a larger space between re-learning and exposure to the material. This can offer the opportunity for interlinking materials between lessons or coming back to concepts in different ways across a learning journey.

The other reason why distributed practice works when you are trying to retain information is its use of complex thinking. It requires a more complex thinking process because when you pace your retention efforts, you are reducing the chances of simply repeating without understanding. This asks more of you than just a simple act of remembering, instead you are creating a process of retrieval and storage, again and again.

The fine details of distributed practice

The mechanisms behind distributed practice have been examined by many research studies. The efficacy of the process was not the only subject of studies either. In several studies, researchers undertook to examine variable aspects of this process, including the efficiency of different gap lengths. For example, one study of 1,350 persons were asked to review information after 3.5 months, and were then given a test one year later. When examining the results, the optimal spacing was determined to be 20-40% of a 1-week lag and 5-10% of a 1 year delay.

What this means is that if you are faced with taking a test one week from now, then the best methodology to do well would be to go over the information within one day of learning it. In addition, if the retention interval is longer then the optimal break length will also grow - for example a 70 day interval will grow to 21 days.

How many sessions are best?

When the time comes to determine how many times you will need to review information before a test, you must consider how much information you need to learn, when the test will be and what grade you are hoping to receive. There is a helpful methodology you can bring into play when utilizing Distributive Practice:

- When the semester begins, make yourself a schedule incorporating small and regular (preferably daily) sessions for reviewing and retaining each topic.
- Then, determine how long each of these relearning sessions will need to be. If the subject needs more focus and time, then make the study session longer. If the subject is easier, the decrease it. What this means practically is that if you have chosen 50 minutes for your study session, divide this time up between the subjects that you need to cover.

- Make sure you include a sufficient space of time for a break from studying - incorporate a day of here and there as necessary. (Of course you may also use this time off for studying other things, if needed.)

Practicing for efficient retrieval

Retrieval Practice is another method that has been found to be efficacious. With this strategy you must focus on remembering information in your mind. This focus on remembering is why this is another form of Distributed Practice. With this tactic you must recall specific information from the topic you are trying to memorize. Doing this as a conscious act is associated with the process from Distributed Practice in which you recall information after a deliberate break. In this specific method, recalling the information to be learned without any additional study materials strengthens its place in your memory.

When needing to bring this strategy into play, consider the following method. After a period of study, take a moment to reflect on the material that has been studied. After this time of reflection, consider trying to write down your recollections of the material just learned and try to explain it out loud, or try jotting it down on a piece of paper. Then consider your conclusions or your notes and see how they compare with the original materials.

Information Chunking

Much like Distributed Practice asks you to break down your learning into small sessions, information chunking asks you to separate the information you need to memorize into smaller pieces to make recall more easy. For example, if you are learning a new language, perhaps you might approach your new vocabulary by separating the words into related groups. If you need to remember mathematical concepts, break them down into associated groups. If you find that the information does not have an associative trends, you can also break thee information down into small and easily digestible groups.

Learning with Mnemonic Devices

Mnemonic devices are tools and strategies for improving memory recall. They can offer a methodology that will allow you to memorize and retain information that you can then recall quicker. These methods take advantage of the way our memory tends to group information together.

Imagery

Our visual memory has been proven to work more effectively than that associated with auditory intake. When you are able to recall a specific image, you will find that information associated with this image is also easier to recall. If you consider creating a mnemonic for information recall, try and create an image that incorporates movement as this will increase the strength of the impression. For example if you need to recall a formula, then consider some imagery associated with the concepts at hand (perhaps imagine an apple falling in association with the concept of gravity) this will also you to identify the needed information.

Word Recall Strategies

In some cases you will need to recall specific facts on a regular basis. In these instances you can consider employing associated words, such as Every Good Boy Deserves Fudge to memorize the lines of the treble cleft.

Narrative

Consider associating facts with a story. Perhaps you can even tie some event - or personal association to make the recall more meaningful and easier. If you need to recall a historical event from a location you have visited, maybe you can recall visiting this location yourself.

Information Linking

Consider ways in which you can link two or more items together. Associate these items with visual images that can be associated in conjunction. As you add items to the group of needed information, you will create further links between them as well. This type of linking when used properly can work in any direction.

Oral Association

Rhyming is quite a good strategy for memorization. Rhyming relies on acoustic encoding which makes them automatically more memorable. Consider how much easier it is to remember a poem, than it is a block of text. Speaking information out loud is another great way to memorize information. When you need to recall spelling words, repeating words in a pattern is an excellent way to strengthen recall. Consider how many remember how to spell "Wed-nes-day" by stressing the way the word sounds.

Make a List

When you need to memorize a list of information, try writing them down. Then try and recall the words without looking at the list. Separate the words into different categories and experiment trying to recall them in different order.

Mind Mapping

This type of mnemonic strategy relies on creating a schematic in your mind and tying it to pieces of information. These ideas are then all linked to each other, and tied to a separate central idea.

The mind map can be created on a sheet of paper, with the central idea in the center of the paper. Then from this central point, the other ideas branch out, much like the branches or stems of a plant.

This type of information processing relies heavily on the brain's ability to remember related information easier. This type of strategy enables you to also recall information faster, and make you more creative. It enables what can be actually labeled a effortless thought structure.

The idea behind mind mapping relies on your brain's innate thought creation processes. Every thought begins with a single idea or concept, and goes on to draw upon each side of our brain's hemispheres - drawing on skills that force these two sides to work together. When this happens our brain functions at a higher level.

Building a Mind Map

If you are considering building a mind map follow these few key steps:

Main Idea - this is the central idea from which your mind map starts. You can use a visual image if you like, or simply utilize a concept. For example if your concept is the beginning of World War II, you would write this in the center.

Themes - these are the ideas that branch off of the main idea and are still higher in the concept hierarchy. For example, if you are studying the start of World War II, you might choose, the invasion of Poland and France or the Molotov-Ribbentrop Pacts as main ideas that stem from the main concept.

Secondary Themes - these are follow-up ideas and supporting data. So if we continue the World War II idea, you would use such things as, the Allied response, or the Lend-Lease program.

There are many ways you can design a mind map, the trick is to find a formula that works for you. The great things about them is that you can continue to divide the information according to type or similarity.

Learning in a Group

One final way to consider strategizing your learning is through group learning. This type of study model is highly dependable on the group dynamic. When students are urged to get together for study, it can follow several methods. First ,you can come together to discuss their conclusions about work that they have already done. You might also analyze the information and draw conclusions together with a partner. Finally, you might also simply ask your immediate neighbor to compare and discuss your conclusions together.

The benefits of this type of work do depend on individual social, organization and learning variables. However, it can work well when these variables align.

Conclusions

Overall, these mnemonic strategies can have a longterm and improved effect on recall and performance. It is wise to bear in mind, however, that there are innumerable variables that can affect performance. Your own feelings about your academic performance can also affect your learning, and your memory recall, for example. (Bahrick & Hall, 2005; Kornell, 2009)

Also, it is wise to consider investigating further aspects of how the Distributed Practice effect works. There is no firm understanding of how the practice works, and this lack of understanding can make implementing the practice in the classroom difficult. The necessity of an interval seems key in this process, but its application and an understanding of its exact effect is missing. Lesson planning could be changed if academic units were designed to be applied according to a schedule that needed to take into account the forgetting process. But this lack of defined mechanisms has hampered implementation and is the reason for continued research. Psychologists continue to investigate this phenomenon, and seek further opportunities to validate this method of learning.