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# Building a Better Mousetrap

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**A**s an instructional designer and training consultant I have one objective, create the most effective training possible with the limited time and resources available. This has been my goal since I started working in training 18 years ago.

Training is what Simon Sinek calls an infinite game, which means there is no winning or losing just the constant pursuit of improvement. In this pursuit I spent years in university studying adult learning and instructional design and continue to read books and research on cognitive psychology.

Research studies are showing several techniques that improve memory recall. In this [blog](#) post on the science of learning by Zach Groshell, he reviews 11 research reviews and identifies the common themes. Some of these techniques are also highlighted in books on learning, such as *Make it Stick: The Science of Successful Learning* by Peter C. Brown, Henry L. Roediger III, and Mark A. McDaniel, and *How We Learn and Why it Happens* by Benedict Carey.

There is now a solid body of research and evidence to support the use of these techniques to improve long term memory recall.

## Spaced Practice

Studying a topic for four hours in one day is not as effective as studying one hour a week over four weeks. The amount of studying time is the same but long-term memory recall is better when the study sessions are spaced out.

## Interleaving

Focusing on one topic or skill at a time, mastering it and then moving on to another topic is the common teaching method but research shows mixing topics and practicing out of order leads to better comprehension and recall.

## Retrieval Practice

This is a fancy term for testing, but it does not just apply to graded quizzes and scenarios. Answering questions requires more brain processing than reading or listening.

Engaging the brain results in improved memory recall, even if the learner gave the wrong answer.

## Dual Coding

Two senses are better than one. Dual coding is utilizing images in addition to text or verbal explanations. Using more than one form of media engages different areas of the brain which increases memory recall.

## Memory Recall

The caveat to these theories is they improve long term memory recall; therefore, the learning may not be immediately apparent. Studies compared cramming and spaced practice studying found the grades to be similar and, in some cases, cramming resulted in higher grades on the test taken right after the study session, but when tested weeks or months later the spaced practice group scored considerably higher. This challenge is also present when interleaving topics or skills. The learning is slower and may be more frustrating in the short term but the information will be available for a longer period of time.

## Theory to Practice

Being an instructor or an instructional designer requires us to figure out how to convert these theories into practice. Police training is still primarily organized in blocks and silos. Ideally, we would be able to redesign recruit and other training to interleave topics and space practice but that is a major undertaking and most likely way above our pay grade. As an instructor you can look for opportunities to add more review exercises with varied topics in order to space and interleave practice.

In presentations on gamification, I recommend a review trivia game. The class is divided into small groups that write training related questions, then challenge each other. Teams get a point for a correct answer or the team asking the question gets a point if the other teams cannot answer. There is no preparation needed for this exercise and the instructors only facilitate the game. Challenging the groups to develop questions on previously covered topics is a simple way to incorporate retrieval practice, spaced practice, and interleaving.

Using informal questions, exercises and tests while presenting normalizes the concept of testing for learning purposes. In the 2020 ILEETA Journal Fall Edition volume 10, edition 3, I wrote an article on testing and retrieval practice which explains the types of testing and contains an exercise to try it for yourself.

This is a brief introduction to the evidence-based theories being recommended by experts in the field. If you want to learn more about these theories, I encourage you to look at the resources as they all provide more information on the research studies and applications.

## Resources

Avery, K., 2020. Testing 1,2,3. *ILEETA Journal*, 10(3).

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## ILEETA

### About the Author

Kerry Avery is the owner of [Odin Training Solutions Inc.](#) Kerry has a Master's degree in Education and over 17 years' experience designing training programs, with the last 12 years spent working with law enforcement to develop classroom, online and blended learning courses. In addition to course development, Kerry coaches and teaches law enforcement instructors on course design and facilitation. Kerry is the editor for the *ILEETA Journal*, and has presented at the ILEETA, IADLEST, and IACP conferences. She can be reached at [Kerry.Avery@shaw.ca](mailto:Kerry.Avery@shaw.ca).

