In the Classroom 81
Using Information Recall Strategies in Your Classroom

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Stan Skrabut: Thanks for taking the time to listen to this podcast. I really do appreciate it. I know you could be doing other things, maybe you are doing other things, but you're still hanging out with me and I really really appreciate it. Recently, I just finished a book called *Microlearning: Short and Sweet* by Karl Kapp and Robyn Defelice. In the book, they focus on information recall and microlearning strategies for helping learners retain and recall key concepts. I thought I would take a closer look at the topic of information recall.

My experiences with a lot of information recall and how it related to my success was actually while I was in the Air Force. On a number of occasions, information recall was key specifically for each of the duty positions we were qualified in. We were studying constantly, we had to take written, oral, and practical evaluations. At any time our supervisors would come and grill us and so that information, being able to recall information, we had to have it at top of mind all the time.

The other time where information recall was critical was actually for our promotion examinations, that we had to study on information that was key to the concepts of the airforce, dealing with leadership, and professional development, but also dealing with our specialty. In my case, I happen to be in security forces. Those two we were constantly working on information recall techniques, although I didn't really realize it at the time, had I known how the brain worked and how to put really these strategies into use, I think I would have been even more successful than I was.

For our qualification exams, what we needed to do to maintain current in our duty positions. We were taking exams, we had to re-qualify every year. For each of the positions that we were qualified in, and I've talked about this before in previous episodes, and in that was a written exam, an oral exam, a practical evaluation, and our training section and the last part of my career, I was in charge of a training section, we actually built these study test banks. I talked about these in episodes where I talked about test pools and mastery testing.

These were test banks have hundreds and hundreds to thousands of questions that we would use kind of like flashcards in preparation for our exams. Because these exams would actually pull from those sets of cards. Now, for my promotion exams that was entirely different. Some entrepreneurs out there created booklets of test questions that mirrored what we would see in the actual exam. The actual exam was 100 questions for each of the different tests. It was two tests but we would have these booklets that focused on the content that we were supposed to learn. We

would read and study this book but then we would use these test booklets, these practice exams in order to prepare.

I know one of the booklets that I had had 2400 questions. Every night I would sit down and take a couple of hundred questions and I would do this repeatedly going back and forth. I would study take the questions. Once I got wrong, I would go back to my book, find it, highlight it, focus on it, and I would do this, go through these test banks repeatedly for 30 to 45 days prior to my exam. Every time I did that, I got promoted but it was going through thousands of questions in order to prepare.

Like I said if I knew how the brain worked, and I knew different ways of actually preparing, I would have done this a lot better. There's other individuals I worked with that we're quite skilled in this. This all comes down to how the brain works. This is where this information recall is really important both as a student and as an educator because I think as educators, we can weave these strategies into our classes and help students retain these important concepts even more so than we're doing now. They don't have to be arduous, they don't have to take a lot of time and difficulty in doing this because I think you can use students to help prepare this material.

Let's talk about how the mind works first, information that we are sharing as educators, a student pulls that in through their sensory memory and then that information which is worth remembering is sent to short term memory and finally, it's sent to long term memory to be filed for future use. Ideal conditions, everything that you're sending them, you want to eventually get into long term memory but that's not how it works, the mind will do a lot of filtering, it filters first that sensory memory because sensory memory is all the stimuli that you receive through your five senses, your hearing, your sight, smell, taste, feeling, all that. Everything's coming in right there, and the brain starts filtering it. It determines whether it's worth remembering or not and fortunately, we're not remembering everything.

It does a great job of doing that filtering. There's things that you can do to help the brain filter that information better. It actually focuses on the things you want them to remember. In a lot of cases, we're not doing that well, but we can improve upon that. Once the sensory memory, everything that's coming through the senses figures out what you want to focus on, it sends it to short term memory. Short term memory has two parts, it has immediate memory and working memory. The immediate memory is very short-lived, it's 20/30 seconds, that's it. You can extend this time by rehearsing.

Think of it as learning a new telephone number, you see the number and you want to remember it, and you want to write it down, and you got to go to the other room to get a piece of paper so you can write it down, you're going to repeat that number to yourself over and over and over until you can write it down. The odds are, then it's poop out of your mind as soon as you've offloaded it, it's gone.

Working memory is the process of moving this new information into long term memory. This is where active study techniques come in and some of the strategies that I'm going to share with you later in this episode. Passive study methods don't necessarily help with transfers. Just giving a straight lecture for an hour, very little of it is actually going to make its way past working memory into long term memory. I'm

sorry, it's just not going to happen. The same thing to sit down and read passively is not going to help get the information into long term memory, we have to do it a little different.

This is where this chunking of information and having students do something with that information is important. We chunk the information-- Like in presentations, very often I've seen folks put eight bullet points on it and start talking about these bullet points. That is not helping students put this through working memory into long term memory, instead each slide should focus only on one thing, one item and let that sink in and you can spend a minute focusing on that one item. That will help it move its way into long term memory but to have a slide with wight bullets, it's providing too much information, it is not helping students learn. We can improve upon that.

Pouring information into students like they were containers does not help them learn it. They need time to move information from short term memory to long term memory, they need time. All right long term memory. Long term memory is where the information actually gets filed, where you can pull information from a long time ago if you have strong connections to those pieces of memory. To strengthen connections as educators, we need to continually refer to key concepts and do it in varying ways and that will help strengthen those connections. Students also need to do this in their study habit.

This one guy back in the 1880s I want to say Hermann Ebbinghaus, he developed this concept called the forgetting curve. The forgetting curve hypothesizes the decline in memory retention in time, it goes very quick. Information is lost over time when there's no attempt to retain it. You can see something in a classroom and the next day it can be totally gone. Have you ever eaten breakfast and then later that day or the next day, you don't remember what you ate, right? This is part of that forgetting curve. However, information will stay in long term memory when retention strategies are used. We're going to talk about some of those strategies.

When I was stationed in Turkey, I worked as a security controller and there was probably 20 different telephone numbers that I had memorized that I could tell you what that number is, you tell me how to get to POL petroleum folks and I could crank out the number. Tell me the number to law enforcement, I could give you the number. I could not tell you any of that because I haven't had a need to reinforce that information, therefore, it's moved on. The same thing that we need to do in our classrooms.

Some of these memory strategies there's four of that I want to highlight real quick. One is spaced practice. The other is breaking down tasks. Number three is over-learning and number four is repetition. Spaced practice, basically, we have come to learn that cramming is not good, it just does not work as well as spaced practice. Spaced practice is having shorter study sessions, but doing more of them spread over a number of days. If you're preparing for a test, to study for five days for an hour, is a lot better than studying one day for five hours. Ways that you can do this is say you had flashcards you can run through your flashcards a couple of times a day.

We did this when I was in the Air Force preparing for our duty positions at every day, we would take an hour and basically go through hundreds of questions, just pull a stack of questions and just go through those questions and call it a day and then the next day we would do this again, this helps to strengthen the connections in long term memory. Now, what's really interesting is if you provide a little more time between the retrievals, then the greater the long term memory connections will be. What this means is if you study an hour, take a couple of hours off, study, take a couple of hours off, study, is not as effective as if you study, say take 24 hours off then study again, take 24 hours. That actually helps to strengthen this more.

The other concept is breaking down tasks. Break down steady content into blocks, and focus at one block at a time, focusing on one chapter. Maybe you've built a practice questions on one chapter and or flashcards and you just running through those that you break it down into blocks. You can even subdivide it that if you have specific topics that you can have those questions related to a specific topic and focus on that topic. If you've mastered it, you can set it aside If not, you keep it as part of your mix. Educators, we can do the same thing, we can chunk study materials into discrete blocks. If a student masters one block, they can focus on another block where they have weaker skills. Just chunking that information into groups will help be able to prioritize what you want to do.

Over learning, this means that even though you mastered something you need to, over time, come back to that topic and go through it again. You don't have to go through it as often because you've mastered the content, but you have to eventually get back to it on some kind of sequence so that it will stay fresh in your mind. Repetition. Repetition is ensuring that you repeatedly review content at regular intervals. Like in the classroom, there are probably key concepts that are important. You need to regularly refer to them throughout your class and continue to build upon them and because you're doing it in varying ways that helps to strengthen those connections of those key concepts.

If you have ever played a musical instrument or played a sport, you know that you cannot go out and practice the day before where that's your only practice before a major performance. We go to practice every single day to improve our skills so when we finally hit the field or the recital, that we can go and have an exceptional performance. Same thing with repetition that you have to continually practice.

How do we weave these into the classroom? There are countless different ways to weave retention strategies into your classrooms. The cool thing is, to see improved performance on your test is not tied to a specific type of retrieval practice but the fact that retrieval practices are used in general. That is key for your students or how you're preparing your students is just to use different retrieval practices is more important than a specific one. I have my preferences but all of them have benefits.

I would encourage you to try different strategies, weave in different strategies, and continue as you improve your course, build these in as ways that students can prepare. Here are some that I want to mention. The first one is beginning class with polls. Prior to starting the day's lesson, you can activate prior knowledge by asking students questions about previous content. Maybe it's something that you covered in

a previous class, that's what you want to start your class with this particular class. You can ask them questions about this, you can use polls, clickers, simple raise of hands, have them, answer have a series of questions that you want them to do before you jump into the day's lesson. Yes, it takes time from your day's lesson, but it helps reinforce that information.

Another strategy is where you have students asking questions. If you have your students read content prior to the lectures, have students share questions before coming to class, this can be part of your Zoom chats, have a Google form, collect the questions, you can have a slide where you used as Google Slides Q&A to collect the questions, discussion boards, a lot of different ways that you can do this. You can also have students create exam questions, maybe on a shared Google Doc and this could be the basis of a study guide for your students. If you're participating in there, you can vet what's good questions and what are not good questions, but they can build the study guide and ideally that they're using them.

Low stake or no stake testing, throughout your unit, you should have students complete low or no stake quizzes, have them take quizzes. Ideally, you're having them aim for mastery, that's a strategy that you can use that they can complete the quizzes as many times as they want and only get credit for the score when they have gotten 100%. If they get anything less you don't give them credit for it only when they get the credit. You want to keep this low stakes no stakes in doing this but powerful strategy.

I talked about master quizzing and test pools in Episode 18 and 40, go check those out. When I was at the Air Force Academy prep school, we received an exam every other day. We had four topics that-- We had four classes, basically a day every other day in every single class, we had a quiz. It was a timed quiz. It did amazing things. I look back at that and that was perhaps where I understood the power of testing in order to learn a topic and that's how I went through the rest of my Air Force career is benefiting from testing.

In the article, Test-enhanced learning: Using retrieval practice to help students learn by Cynthia Brame, and Rachel Biel discovered that in 2002, Lemming used an exam a day approach to teach an introductory to psychology course. He found that students who completed an exam every day rather than exams that covered large blocks of material scored significantly higher on a retention test administered at the end of the semester. These tests are powerful. It's tied to active learning, you have to come up with the answer. I'm a huge fan of these regular quizzes.

Reflection. Reflection is another tool at your disposal. Having students reflect on their assignments that they've completed, their preparation for exams and quizzes, other study methods is a powerful way for them to strengthen this learning aspect. Ask them how they prepared, ask them for key lessons that they picked up in that particular unit. Have them reflect on how the content they're learning tied back to the learning objectives. Very powerful, very strong stuff.

Reviewing exams. One of the things that you should do is provide opportunities for students to review missed quiz items. Now, when you do this, it's actually interesting,

because you could do this automated. You can do this have an online test, as long as you have a way for them to review what they got wrong. What's interesting is that delayed feedback is more powerful than immediate feedback. If you're doing say online testing, make sure that at the end of the test, you review the questions gotten wrong, rather than after each question right. The research has found out that this is a more powerful way to do it.

Flashcards, yes. That low-cost strategy of simply getting some index cards and writing something on one side and the answer on the other side, a very powerful tool. You can use it to teach concepts vocabulary procedures, all kinds of stuff. Flashcards can be, you can have a category for flashcards so they can be grouped as part of that breaking down tasks using it to group things, they're very quick. You can stick them into your pocket, you can use them everywhere.

You can also use them for other strategies that you can build practice quizzes or you can use them with concept maps that you can use these different flashcards, build-out concept maps. Flashcards can be used by yourself solo or as part of a group activity where you're having a contest, maybe you pull out 25 cards, and see who gets the most right. Have a little game. Educators can have students build flashcards as part of the class, the same with quizzes. I've talked about in building test pools that student can help with the building of the test pools, they can do the same thing and building flashcard decks. That they can just keep improving upon it. Flashcards can be paper-based or they can be digital. There's great applications like Quizlet or StudyBlue that will allow you to create flashcards.

Concept maps. Concept maps are another strategy. I talked about them in Episode 43. This is really great for showing the relationship between items. Different ways that you can use it is in the class, you can start a concept map from scratch, you can have students do concept maps, you can create empty worksheets that students need to fill in. Lots of different ways that you can use concept map.

One of the strategies that I picked up while I was at the Air Force Academy prep school is SQ3R. SQ3R is a powerful way for students to prepare to study. It's an acronym. It stands for Scan Question Read Recite Review. Once I learned this strategy, I used this to build my own study materials for my whole academic career that I've used this strategy. I've advocated it for a lot of other people.

The first thing is to scan your book. Say you got a textbook, is to scan it, see how it's laid out, get a feel for it. Are things bolded? How are they identifying vocabulary? What kind of images do you have? Graphs. Just all kinds of stuff, then you create questions. You use the headings. Headings through the book and you turn them into questions. For example, SQ3R, that could be a heading. I could turn that into a question, what is SQ3R? What are the elements of SQ3R? Now I build a series of questions, I can turn them into flashcards if I wanted to, and I would continue on that.

The next piece is to read. I read with the goal of answering the questions. Reading shouldn't just be passive, you should turn it into an active activity where you're trying to answer a specific question. After you get done reading, pull out your cards and you're doing recite. Recite is you look at the question, try to answer it. The questions

you get right is set off to the side, the questions you get wrong, you put into another pile. The ones you got wrong, you go back to your book and review. Do it again, recite and review and then go through each chapter, but your review sessions become a little more intense because you can not only focus on that chapter, but you can focus on previous chapters. A really powerful tool.

The final thing that I want to share about these practices is teach students about these retrieval strategies and the effects that they have on learning. Talk about how the brain processes information and why these particular strategies are powerful. There's a lot more but these are the ones that I wanted to highlight. You need to coach your students on how to use these strategies because they really don't know how. That is a little bit on information recall. I think they are strategies that both instructors and learners can use, understanding how their brain works. I think we can improve our classes, how we create our presentations, being able to create the support materials, like quizzes and concept maps, that's just going to make your classes stronger. That is it on information recall and retrieval. Before I let you go, here is a plug for my book.