

Successive Relearning: Combining Retrieval Practice and Spaced Practice

Retrieval practice is any activity in which a person tries to recall previously studied information.

Examples include:

- Practice quizzes in which students answer questions: 1) embedded in a reading assignment, 2) at the start of class, 3) at the end of class or, 4) online after class
- Reading a few pages from a text and then trying to recall the information without looking back at the book
- Taking a few minutes at the end of class to write down the major ideas from lecture without looking at notes
- Covering up class notes and then trying to recall the information
- Study group members ask and answer one another's questions
- Answering clicker or poll questions in class

When students initiate retrieval practice, it is usually called self-testing. When teachers initiate it, retrieval practice is usually called practice quizzing. In both cases the key cognitive activity is trying to recall previously learned ideas, concepts, definitions, and so forth.

Abundant research has demonstrated that retrieval practice is a powerful learning strategy, and works for two reasons:

1. Whenever we recall information from memory, we alter it by making new associations and connections with it. This expands and strengthens our memory for the material.
2. Retrieval helps us identify information that we know (can recall) and information that we don't yet know very well (can't recall or have difficulty recalling). Based on this feedback, we can allocate more study to the information we do not yet know.

Spaced practice involves studying the material multiple times spread out over time, e.g., studying for one hour every other day leading up to the exam. Spaced practice contrasts with "cramming" in which students condense their study into one long session, e.g., studying 5 hours the night before a test.

Research has established that spaced practice is especially effective for long-term learning. When you allow time to elapse between study sessions, you start to forget the material. When you study it again, you "relearn" the information and increase the likelihood that it will be retained in long term memory. Students who cram the day before a test may be able to pass their exam but will quickly forget the information.

Retrieval and spaced practice are potent learning strategies on their own. They are even more effective when you combine them and practice retrieval spread out over time, a strategy known as *successive relearning*. In several studies, students using successive relearning outperformed other students on exams by 10%, which is an entire letter grade!

Four features are essential for successive relearning:

1. Retrieval practice. You self-test as the primary mode of learning.
2. Spaced practice. You schedule several practice sessions separated by one or more days.

3. Practice until you answer each question correctly. At every practice session you answer each question correctly at least one time.
4. You practice answering all the questions multiple times.

For example, suppose you need to learn 20 key concepts for a test. To use successive relearning effectively you would need to schedule several practice sessions separated by 1-2 days each. You would practice answering all 20 concept questions multiple times and answer each question correctly at least one time at each practice session.

Step-by-Step Guideline to Implement Successive Relearning

I. Select content and questions. Identify the content, concepts, skills you need to learn.

II. Make or select questions and prompts that cover all the material you need to learn. Create a “correct” answer for each question so that you can evaluate your answers accurately.

III. Schedule several practice sessions.

- The goal is to practice retrieval with all the content several times. Start practicing well before the exam date and schedule 2-3 more practice sessions before the exam.
- Spread out practice so there is one or more days between sessions. For example, if an exam is in two weeks you could practice five times with two days between each session.

IV. Practice Session 1.

- Start with the set of questions/prompts.
- Answer a question and use the “correct” answer to evaluate the accuracy of your answer.
- If you answer a question correctly, put it aside for the remainder of the session.
- Continue with unanswered and incorrectly answered questions until you have answered all the questions correctly one time. Use the correct answers as feedback to evaluate and re-study items that you answer incorrectly.
- The session is completed when you have answered all the questions correctly.

Note: As a result of session one you have started to learn the concepts and probably know some better than others. At the next practice session, you will have the opportunity to relearn the concepts and strengthen your memory for all of them.

V. Practice Session 2.

- Repeat the same sequence as Practice Session 1.
- Add questions and answers for any new content covered in class since the first practice session.
- Answer each question and evaluate its answer.
- Put aside correctly answered questions and re-study questions you are not able to answer.
- Continue until you answer every question correctly one time.

Note: Be sure to add questions and answers for new content covered in class for each practice session. This means that the overall number of questions will increase from session to session. If it

takes too much time to practice all the questions in one session, divide them up and cover half in one session and the other half in a later session. However, be sure that you practice each question multiple times before the exam!

VI. Additional Practice Sessions.

- Repeat the sequence – answer a question → evaluate its answer → if correct put it aside → if incorrect use the correct answer to restudy → continue working through the set until you have answered all the questions correctly.

VII. No cramming necessary. By studying on a successive learning schedule, you will not need to cram the day before the exam. Instead, you can plan one more practice “booster” session before the exam.

Final notes:

- Think of practice quiz sessions as similar to practicing your favorite out-of-school activity. If you want to improve at any kind of skill you practice it repeatedly over a long period of time. Learning new knowledge and skills requires exactly the same kind of focused long-term practice and relearning until you know it well.
- Be sure you practice the “right” content, concepts, skills, etc. This means identifying the key concepts most likely to be on the exam. Follow your instructor’s advice about what to study, look at what is emphasized in class, follow any course study guides, etc.
- The essential ingredients that make successive learning effective are: 1. retrieval practice in which you try to recall the information you learned previously, 2. spaced practice in which you spread out practice over time, 3. Practicing all the information multiple times, and each time you practice answering each question correctly at least one time.