

Spaced Practice vs. Massed Practice: Why cramming doesn't work

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What is spaced practice?

Spaced practice is a highly effective study technique based on psychological research in which learners distribute class materials across time periods or study sessions (Dunlosky, 2013; Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). This study technique requires the learner to plan and implement a study schedule across time, thus demanding greater metacognitive effort.

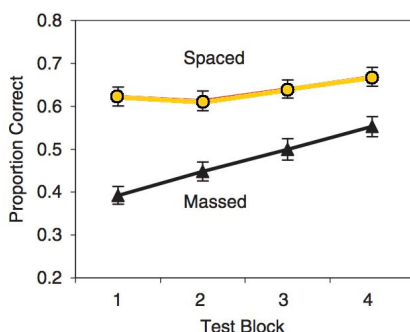
Alternatively, massed practice is a common study technique in which students study all of the class materials or complete an entire assignment in one single study session, typically immediately before a deadline. Massed practice, also known as cramming, is not an effective study technique for long-term retention, though students maintain the false belief that it requires less of their time and effort.

Why is spaced practice important?

Utilizing spaced practice improves memory and performance. Even if students spend the exact same amount of time studying, their performance is enhanced when they spread material across days or study sessions, instead of in a single session, (Dunlosky, 2013). Interestingly, most students tend to prefer cramming, and even consider massed practice a superior study method (McCabe, 2011). This research suggests that students are not always aware of the best strategies to improve their memory and performance.

Is there evidence to support this?

Studies have shown the robust benefit of spaced practice across domains. In one study, spaced practice resulted in more accurate discrimination and identification of artists and their paintings than massed practice, yet, participants surprisingly rated massed practice as a more effective study technique (Kornell & Bjork, 2008).



How can you implement spaced practice in your course?

Spaced practice is essential for learning and long term maintenance, regardless of discipline. From foreign language learning to mathematics, spacing out the material at least a day apart benefits learning. How can you utilize spaced practice to help your students?

1. **Administer frequent low-stakes quizzes.** Regular assessments on previous materials enhance students' memory and recall for that information, and can elicit changes in your students' study habits. If students expect regular low-stakes assessments, they can't wait until the night before a big exam to cram. Low-stakes assessments allow students to make mistakes without greatly affecting their grade.
2. **Discuss and make connections to past material during each class.** Spend a few minutes each class period highlighting important material from previous lessons to help students maintain the material and make connections between old and new information.
3. **Implement cumulative assignments or exams.** Whether it is an essay, a creative project, or an exam, cumulative assessments require students to retrieve information from earlier lessons and connect them to current topics. With non-cumulative assessments, earlier information is easily forgotten.

A consideration for effective implementation:

While spaced practice is shown to enhance learning and long term retention across domains, it also takes time, discipline, and effort to be effective. Be transparent with your students about how your teaching methods utilize this memory technique to keep them motivated and to reduce potential frustration. You could briefly discuss the figure included in this handout during class to highlight the benefits of spaced practice.

References

- Dunlosky, J. (2013). Strengthening the student toolbox: Study strategies to boost learning. *American Educator*, 37(3), 12-21.
- Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, 14(1), 4-58. <https://doi-org.proxy.lib.uiowa.edu/10.1177/1529100612453266>
- Kornell, N., & Bjork, R. A. (2008). Learning concepts and categories: Is spacing the "enemy of induction"? *Psychological science*, 19(6), 585-592.
- McCabe, J. (2011). Metacognitive awareness of learning strategies in undergraduates. *Memory & cognition*, 39(3), 462-476.