

What Works Clearinghouse



June 2011

WWC Quick Review of “Retrieval Practice Produces More Learning Than Elaborative Studying With Concept Mapping”¹

What is this study about?

The study examined whether using the retrieval-practice studying technique—in which students alternate between reading a passage and writing memorable information from that passage—improved student learning of a science passage more than the study-once, repeated-study, or concept-mapping techniques.

Eighty undergraduates at Purdue University participated in the study in exchange for course credit.

One week after the experiment, participants were given a test that contained both factual and conceptual questions about the passage they had read.

The study measured the effect of retrieval practice by comparing the test scores of students randomly assigned to use retrieval practice with the test scores of students randomly assigned to use one of the three other studying techniques.

What did the study find?

The study found that students using the retrieval-practice technique scored significantly higher than students using the study-once, repeated-study, and concept-mapping techniques. The average percent of correct test questions for each group was 67% for retrieval practice, 27% for study once, 49% for repeated study, and 45% for concept mapping.

What methods of studying were contrasted?

All study participants began by reading a 276-word passage on sea otters for five minutes.

They were then assigned to one of the following groups, each of which employed a different method of studying:

Study-once group: Students did nothing beyond the initial five-minute reading period.

Repeated-study group: Students read the same text during three additional five-minute sessions, with one-minute breaks between sessions.

Concept-mapping group: Students were instructed to spend 25 minutes after the initial reading period mapping out the text’s main concepts on a sheet of paper.

Retrieval-practice group: Students were instructed to spend 10 minutes after the initial reading period listing any information they remembered from the text in a response box on a computer screen. The students then reread the text for another five minutes and were again asked to list the information they remembered.

WWC Rating

The research described in this report meets WWC evidence standards

Strengths: The study was a well-implemented randomized controlled trial.

Cautions: Students in the retrieval-practice and concept-mapping groups received equal amounts of study time, but both groups had more time to learn the text than students in the study-once and repeated-study groups. This unequal amount of study time, rather than the study approach, could have caused the differences in outcomes.

¹ Karpicke, J. D., & Blunt, J. R. (2011). Retrieval practice produces more learning than elaborative studying with concept mapping. *Science*, 331, 772–775.

Quick reviews examine evidence published in a study (supplemented, if necessary, by information from author queries) to assess whether that study’s design meets WWC evidence standards. Quick reviews rely on the effect sizes and significance levels reported by study authors.

The WWC rating applies only to the summarized results, and not necessarily to all results presented in the study.