Improving student learning with classroom quizzes: Three years of evidence from Columbia Middle School

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BACKGROUND

Tests and quizzes are usually thought to serve assessment purposes, but they can also benefit long-term learning better than repeated studying. Prior laboratory research supports these principles, yet none have been thoroughly tested in a classroom setting using a true experimental design. We examined whether a test-enhanced learning program, integrated with daily classroom practices, is an effective method of enhancing retention in a middle school setting. We also examined whether quizzing enhances learning more than restudying, if quizzes can improve transfer of information, and if the timing of the quiz affects long-term learning.

METHOD

This research was conducted at a public middle school in Illinois.

Materials

Textbook material from Social Studies and Science classrooms

Multiple-choice quizzes followed by immediate feedback

Within-subjects design: Some target facts were quizzed during lessons, some were not (depending on the design of the study), but all items were covered during the class lecture by the teacher.

Procedure

Students took a multiple-choice pre-quiz over tested items.

The teacher was not present for the pre-quiz and did not know which target facts were quizzed.

Following the pre-quiz, the teacher taught the lesson for the day.

Immediately after the lesson, students took a multiple-choice post-quiz over tested items.

One day before the chapter exam, students took a review quiz over tested items.

Retention was measured with multiple-choice exams comprised of all (tested and non-tested) target facts.

According to the legend, Romulus and Remus were rescued by what animal?

A. a deer
B. a horse
C. a tiger
D. a wolf

QUIZZING ENHANCES LEARNING MORE THAN RESTUDYING

6th Grade Social Studies, N = 63

Quiz correct

Chapter Exams

End of the Semester

Tested

Read

Not Tested

.90

.83

.81

.60

.53

.55

A significant testing effect was found at the end of the semester, particularly for material initially quizzed in application format but tested in definition format, demonstrating the long-term effects of quizzing on transfer of information.

REFERENCES


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CONCLUSIONS

A test-enhanced learning program can be successfully implemented in a classroom setting.

Over the long-term, quizzing benefits retention and transfer of information for Social Studies and Science content.

Review quizzes administered the day before a chapter exam benefit long-term retention at the end of the semester.

All results are consistent with the notion of desirable difficulty: More effortful learning conditions (e.g., review quizzes) produce larger long-term benefits than less effortful learning conditions (e.g., pre-tests).

Educational implications: Quizzes can be used as a method to enhance long-term learning and transfer of information.