

Improving Learning With Classroom Quizzes



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BACKGROUND

Tests are usually thought to serve assessment purposes, but they can also benefit long-term learning better than repeated studying.¹

Multiple tests are better than single tests in enhancing learning.¹

Feedback provided after testing also enhances learning.²

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.

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: Half of the target facts were quizzed during lessons, half were not tested (but non-tested items were covered during the class lecture by the teacher)

Procedure

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

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

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

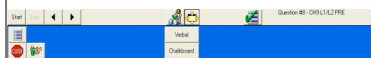
Immediately after the lesson, students took a multiple-choice post-test over tested items.

Approx. 2 days later, students took a review test over tested items.

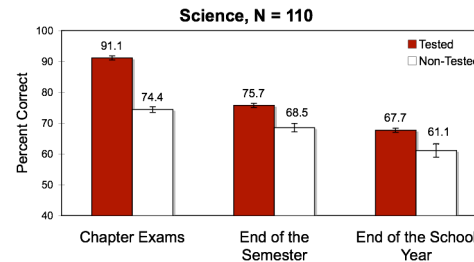
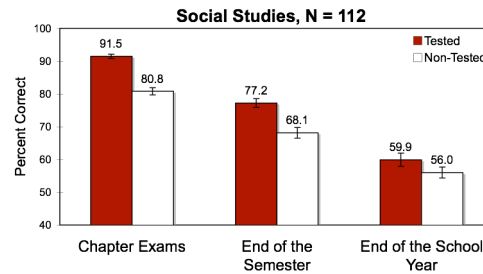
Retention was measured 2-14 days later with multiple-choice exams comprised of all (tested and non-tested) target facts.

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

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



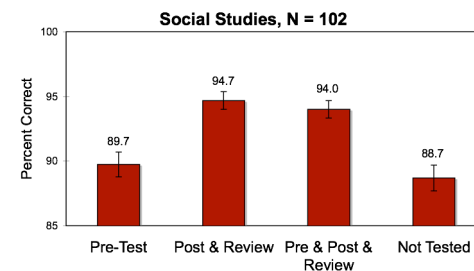
EXPERIMENT 1



Testing information led to significant benefits in retention, even over the long term. Further analyses revealed that students with lower standardized test and pre-test scores showed greater benefits of testing ($r = -.38$ and $r = -.39$, respectively).

EXPERIMENT 2

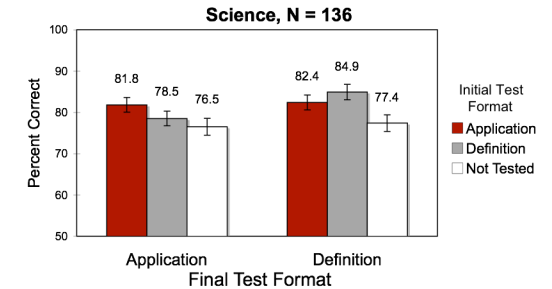
In Social Studies, we evaluated the effect of pre-tests on retention.



A significant effect of testing was obtained, but pre-tests did not enhance retention.

EXPERIMENT 3

In Science, we evaluated the effect of testing on transfer between application and definition questions.



Significant testing effects were obtained and a pattern of transfer appropriate processing³ was revealed.

CONCLUSIONS

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

Results are consistent with the notion of desirable difficulty: more effortful learning conditions (e.g., post-test) produce larger long-term benefits than less effortful learning conditions (e.g., pre-test).⁴

Educational implications: Quizzes can be used as a method to enhance long-term learning.⁵

References

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