INTRODUCTION

Like many math textbooks, Connected Mathematics 2 has a wide variety of visuals.

We sought to improve the integration of visual and verbal information in modifying the CMP2 books.

We based these modifications on three cognitive principles: signaling, contiguity, & coherence (Mayer, 2009).

Now we are in the process of empirically testing these modifications to determine their effectiveness.

Contiguity Principle

Learning is improved when multiple representations are aligned along important features (Ginns, 2006; Mayer, 2002).

Coherence Principle

Learning is improved when interesting, but irrelevant words and pictures are removed (Harp & Mayer, 1998; Mayer, 2002).

Signalizing Principle

Learning is improved when there are cues to important information (Kalyuga, Chandler, & Sweller, 1999; Koning, Tabbers, Rikers, & Paas, 2009).

Empirical Tests

Two experiments to examine the effects of the revisions: Problem solving and lesson reading.

Problem solving:
- 50 seventh-grade students
- 8 story problems (4 revised and 4 original; between and within subjects)
- Revisions did not affect problem-solving accuracy
- Revisions also did not affect student’s reports of their level of interest, confusion, or perceived difficulty
- Problem solving may involve different processing than does reading lessons.
- More research needs to be done to reconcile these findings with others on the seductive details effect.

Lesson reading:
- In progress with sixth- and seventh-grade students
- Read lesson (original or revised) while eye movements were recorded, wrote recall, solved problems
- Preliminary eyetracking data indicate revised lessons were easier to read than original lessons.

The findings from these experiments will contribute towards refining cognitive principles for future revisions.

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