Comparing the Cognitive Demand of Traditional and Reform Algebra 1 Textbooks

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Graduation Year
2011

Document Type
Open Access Senior Thesis

Degree Name
Bachelor of Science

Department
Mathematics

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Abstract
Research has shown that students achieved higher standardized test scores in mathematics and gained more positive attitudes towards mathematics after learning from reform curricula. Because these studies involve actual students and teachers, there are classroom variables that are involved in these findings (Silver and Stein, 1996; Stein et al., 1996). To understand how much these curricula by themselves contribute to higher test scores, I have studied the cognitive demand of tasks in two traditional and two reform curricula. This work required the creation of a scale to categorize tasks based on their level of cognitive demand. Based on this task analysis, I have found that more tasks in the reform curricula require higher cognitive demand than tasks in the traditional curricula. These findings confirm other results that posing tasks with higher cognitive demand to students can lead to higher student achievement.

Recommended Citation
Park, Allison M., "Comparing the Cognitive Demand of Traditional and Reform Algebra 1 Textbooks" (2011). HMC Senior Theses. 9.

https://scholarship.claremont.edu/hmc_theses/9

The Cognitive Tutor Algebra I program is currently used in hundreds of schools nationwide. The program was shown to improve student achievement on standardized test items (especially on constructed-response or performance items), enhance levels of student understanding of mathematics, and increase student engagement in the learning process. Within the Miami-Dade County Public Schools, the program was used in nine senior high schools during the 2000-2001 school year. The Division of Mathematics and Science requested this evaluation of the 2000-2001 Cognitive Tutor Algebra I program. To investigate and compare the effectiveness of the Cognitive Tutor Algebra I program with other traditional and reform texts, researchers examined whether the textbook and workbook were accomplished the purpose with "cognitive expectation", "level of cognitive demand", and "response types". Researchers revised framework of Son, J. W. & Senk S. (2010). How reform curricula in the USA and Korea present multiplication and division of fraction. Educ. Stud. In my Algebra class, I explicitly remembering my teacher explaining out a textbook method to the class for factoring, and then explaining her method she was taught and that she learned, asking everyone to choose which one they preferred. Everyone chose hers, the textbook one was complicated, and didn't work well for higher skill problems. TL;DR. Textbooks aren't my go-to for learning, rather a teacher with experience.