CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)

Sterling Ripley-Phipps; Jameson Schwab

Project Number

S0322

Project Title

Cognitive Scaffolding as Measured by Varying Question Difficulty Order on Math Test Performance

Abstract

Objectives/Goals

This is an experiment designed to investigate the effects of cognitive scaffolding, demonstrated through the item order of standardized test questions, on the score received on a math test.

Methods/Materials

The experimental (n=33) and control groups (n=30) consisted of 16-18 year old, predominately Caucasian male and female students, from a rural high school in central California. All were acquired through an opportunity sample. The experiment was carried out during two class periods with two separate math tests composed of the same ten problems. In the first test on cognitive scaffolding, the questions presented were ordered from high difficulty to low difficulty. In the second test, the question order was exactly reversed to present cognitive scaffolding to the participant; the questions were ordered from low difficulty to high difficulty. The independent variable was the order of the questions based upon difficulty, and the dependent variable was the score received on the math test.

Results

A one tailed t-test demonstrated that there was significance at the $p < .005$ level, showing that test scores were positively influenced by the presence of cognitive scaffolding.

Conclusions/Discussion

In conclusion, the research hypothesis was supported. A test with cognitive scaffolding is more likely to receive a higher score than a test without it.The implications of the experiment#s results are that exams with item order from easy to difficult receive higher scores than those progressing from difficult to easy.

Summary Statement

The Effect of Cognitive Scaffolding on Math Test Performance.

Help Received

No more than instruction in classroom