

Math Course Redesign Intervention Analysis

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Office of Planning and Institutional Research



Executive Summary

An analysis was conducted to evaluate the effectiveness of the Math Course Redesign Achieving the Dream Intervention, which took place during Spring 2012. A total of 17 course redesign sections of MATH 0013 (Beginning Algebra) were offered with 276 students enrolled (henceforth called “redesign group”) compared to 569 students enrolled in regular sections of the course during the semester.

Outcomes

There were three outcomes of interest in the present study: 1) scores on an algebra skills assessment written by the Math faculty at TCC, 2) scores on the Mathematics Anxiety Rating Scale-Short Version (MARS-S), and 3) successful completion rates for MATH 0013 (defined as percentage of students earning a grade of C or better in the course). Students enrolled in the course redesign sections completed the algebra assessment, as well as the anxiety scale, both at the beginning and end of the semester. Individual student scores were compared to examine the impact of attending the course redesign section on their algebra skills assessment score and math anxiety assessment score. In addition, the successful completion rate of the redesign group was compared to that of all other students enrolled in MATH 0013 during the Spring 2012 semester.

Results

All statistical tests were conducted using a 95% confidence level. The comparative results for the pre and posttest results are based upon those redesign group students taking both tests for each instrument. For the algebra assessment instrument, the results from a paired-samples t -test revealed that posttest scores were significantly higher than pretest, $t(166) = -29.34, p < .001$. Additionally, a second paired-samples t -test was conducted for the math anxiety instrument. Anxiety scores were significantly lower at the end of the course than at the beginning, $t(163) = 2.75, p < .001$ (see Table 1 below for statistics for each measure).

Table 1. Pretest and Posttest Mean Scores

Measure		Matched Sample Size (N)	Mean (Std. Deviation)	p-value
Algebra Skills*	Pretest	167	3.16 (2.57)	< .001
	Posttest	167	12.69 (3.89)	
Math Anxiety*	Pretest	164	74.95 (19.02)	< .001
	Posttest	164	70.32 (22.59)	

*Statistically significant difference with a 95% confidence level.

Lastly, the redesign and control groups were compared on their success rates in MATH 0013 – Beginning Algebra (i.e., percentage of students earning a C or better). Although the success rate for the redesign group (54.7%) was higher than that for the control group (49.0%), a chi-square test showed that the difference between the groups was not statistically significant, $\chi^2 (1, N = 845) = 2.40, p = .12$.

Conclusions

The present findings indicate that students participating in MATH 0013 Course Redesign demonstrated significantly stronger algebra skills at the end of the semester based upon the algebra skills assessment. The redesign group also demonstrated significantly less math anxiety after attending the program. Although the success rates in Beginning Algebra did not vary significantly between the redesign sections and students enrolled in standard course sections, the higher success rate for the redesign group suggests that a larger sample may reveal a statistically significant advantage for those students.