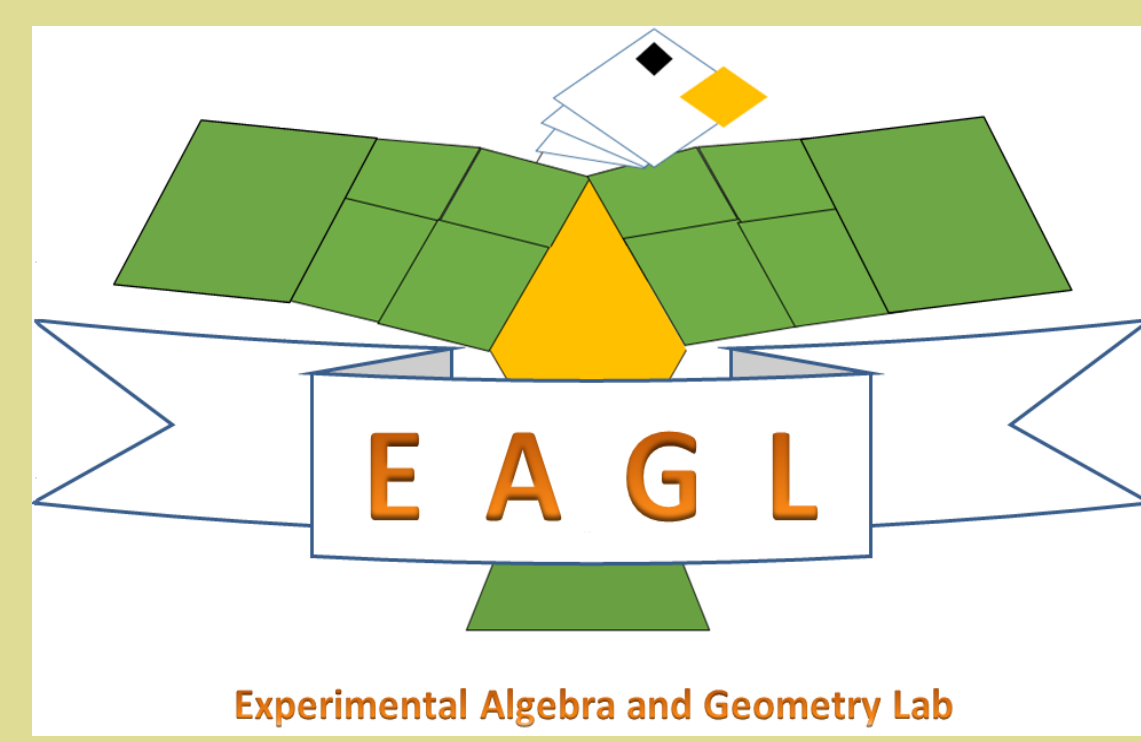


EAGL Presentations Changing High School Students' Attitudes towards Mathematics



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Abstract

In 2017, students and professors in the Experimental Algebra and Geometry Lab (EAGL) gave presentations to regional high school math students and also collected pre- and post-surveys. A modified version of the Attitudes Towards Mathematics Inventory (ATMI) was used as the research instrument. The results of these surveys were transferred to spreadsheets for the analysis which sought to find out if these presentations changed students' attitudes towards mathematics. The survey responses were based on a Likert Scale, with the answers ranging from 1 to 5, where 1 represents Strongly Disagree and 5 represents Strongly Agree. The factors making up the math attitudes inventory for this instrument included Self-Confidence, Value, Enjoyment, and Motivation. The missing data we've encountered were inputted using the person-mean substitution method. The overall results of the analysis, which included a sample of $N = 306$ respondents, were satisfactory. There was evidence that the one-day presentations did have a slight but statistically significant positive effect on students' attitudes towards Mathematics. These findings may have broader implications in terms of influencing students to enter degree plans in Mathematics at the college level.

Methods

- Participants:
 - 396 regional high school students
 - Sample population: $N = 306$ regional high school students with complete survey responses
- Equations:
 - Person-mean substitution method:

$$PMS_i = \frac{\sum_1^k X_{ik}}{(k - m_i)}$$
 - T-Statistic:

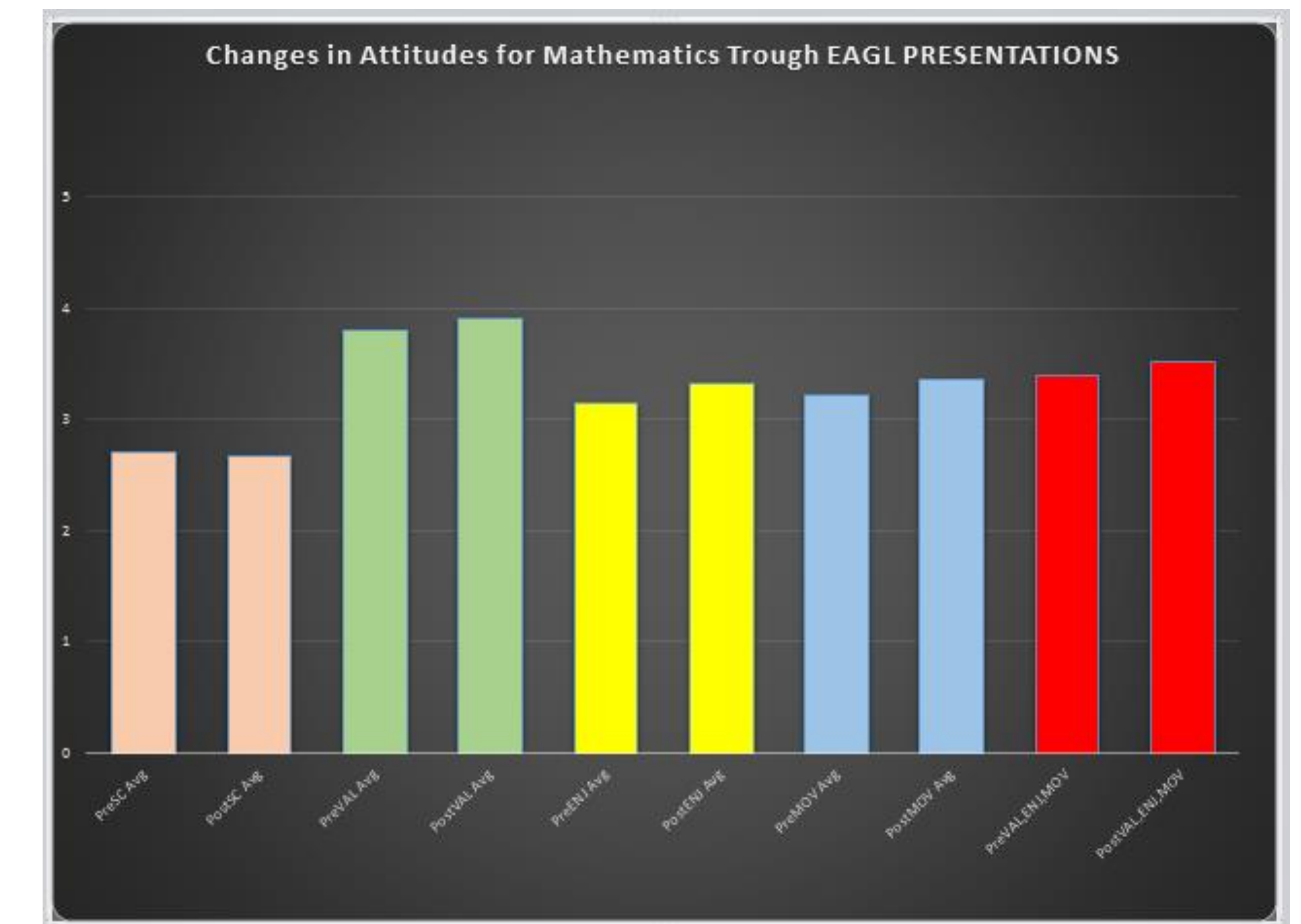
$$\frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$
 - Mean:

$$\bar{x} = \frac{\sum x}{N}$$
 - Standard deviation:

$$\sqrt{\frac{\sum(x - \bar{x})^2}{N - 1}}$$
- Research Question:
 - Did the EAGL presentations change high school students' attitudes towards Mathematics?
- Sample Survey Questions:
 - I am never confused in my math class. (Self-Confidence)
 - A strong math background could help me in my professional life. (Value)
 - I really like math. (Enjoyment)
 - I am willing to take more than the required amount of math. (Motivation)

Findings

- Results:



- We find that there were slight yet statistically significant results from each category.

	Pre-Survey		Post-Survey		T-Stat.	p-value
	M	SD	M	SD		
Self-Confidence	3	0.66	3	0.63	1.15	0.124
Value	4	0.63	4	0.64	3.94	p-value < .001
Enjoyment	3	0.7	3	0.68	6.05	p-value < .001
Motivation	3	0.64	3	0.66	4.58	p-value < .001
Value, Enjoyment, Motivation	3	0.56	4	0.57	6.83	p-value < .001

Conclusion

- From the data analysis results, we can conclude that the EAGL presentations did have a slight yet statistically significant impact of changing high school students' attitudes toward Mathematics. Now, the EAGL presentations are done with a one-day interval, so the question here is: Will these presentations provide better results if they've been extended to a three-day interval?