

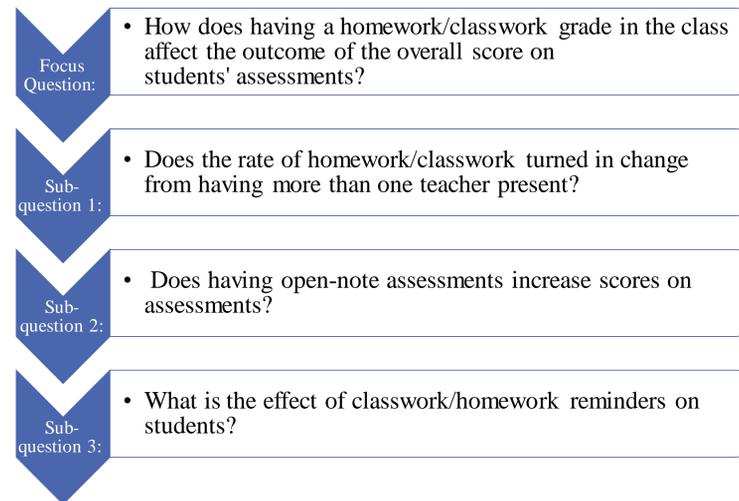
# THE EFFECTS OF HOMEWORK AND CLASSROOM GRADES AND THE OUTCOMES OF STUDENT ASSESSMENTS SCORES IN HIGH SCHOOL PHYSICAL SCIENCE



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## Introduction and Background

During the 2019/2020 academic year, I conducted my action research project at Hilliard Davidson High School, where I have taught freshman science for the past three years. During that time, I saw a drastic decrease in student homework turn in as well as motivation to learn. Students have the technology to explore but are not using it. Grades are falling, which results in students are not passing. Therefore, the primary purpose of this study was to see what correlations between grading classwork/homework and student summative assessments.



## Claim, Evidence, Reasoning

### Claim

- Students improved the most over the treatment periods.
- More students turned in homework after seeing the difference in their test scores between the graded and non-graded homework units

### Evidence

- Students understand homework improves test scores; the average normalized gain of the treatment units was 55%.
- When comparing the Conservation of Matter and Universe Units, both treatments where homework was graded, however, the Universe unit was a closed note post assessment.
- With a W value of 379.5 in the Wilcoxon Signed Rank test, when comparing the post assessment data, the distribution is approximately normal.

### Reasoning

- Students that study, will continue to study no matter if it is an open note assessment or not.
- Students who are not academically driven do not use the resources given to them.

**Acknowledgments** Montana State University MSSE program; Walt Woolbaugh; Mike Plautz; Hilliard Davidson students and staff

## Sample Data Set

- Two sections of 9th grade Physical Science Classes, sample size (N) = 49 students
- 2nd period - 20 females and 6 males, 3 students have IEP's, 1 student is gifted in mathematics, and 19 students have early warning signs.
- 7th period (co-taught) - 10 females and 13 males, 6 students are on IEP's and 10 students have early warning signs.

## Data Analysis

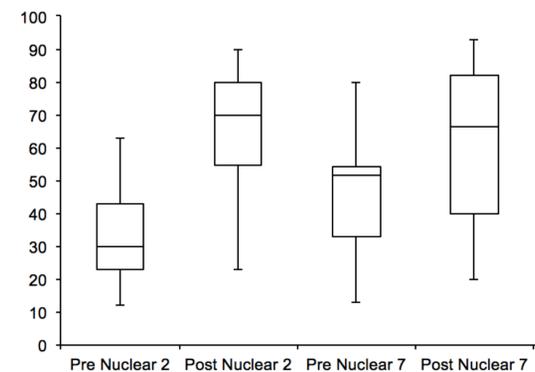


Figure 1. Score distributions of the pre and post assessment of the Nuclear Assessment. Homework was not graded. (N=49).

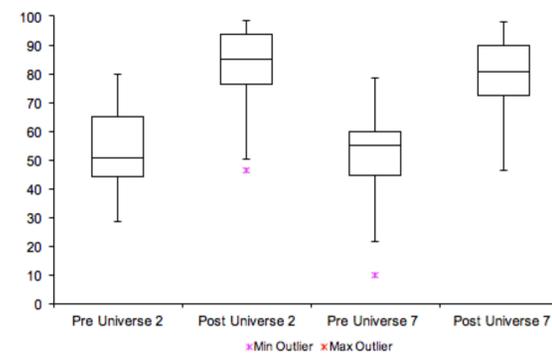


Figure 2. Score distributions of the pre and post assessment of the Universe Assessment. Homework was graded (N=49).

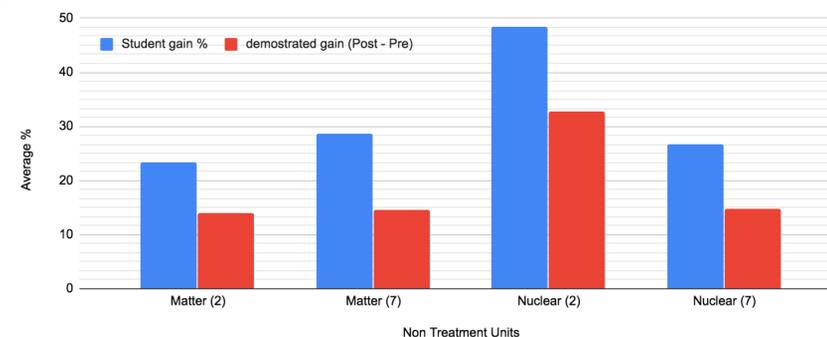


Figure 3. Students did not reach their full learning potential. The demonstrated gain was less than the potential gain over both treatments.

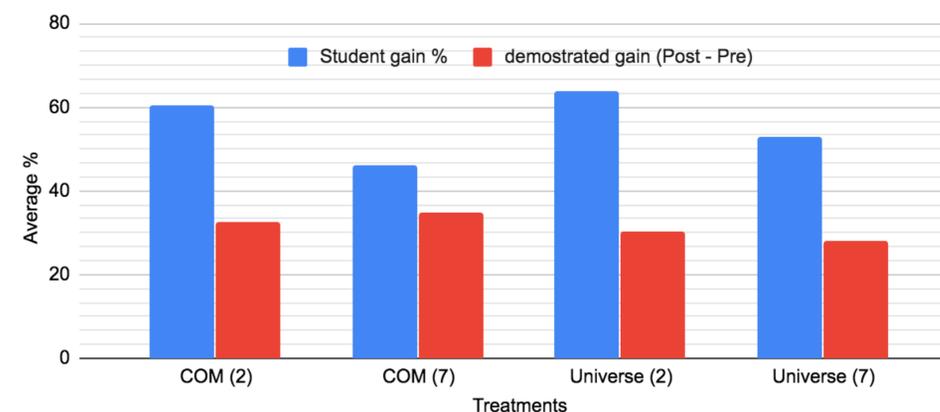


Figure 4. Comparison the COM and Universe units: both treatments where homework was graded; however, the Universe unit was a closed note post assessment. With a W-value of 379.5 in the Wilcoxon Signed Rank test, the distribution is approximately normal.

## Treatment Methodology

### Treatment:

The treatment section of this project occurred during the unit Conservation of Matter (COM) and the Universe Unit where homework was graded.

- Compared with open-notes, reminders, and co-teachers

### Non-Treatment:

The non-treatment unit consisted of Matter and Nuclear Reactions because homework grades did not count towards their grades.

- Compared with open-notes, reminders, and co-teachers

## Data Collection Methodology:

Pre and Post assessments – box and whisker plots and bar graphs  
 Homework Survey – Analyzed using Wilcoxon Signed Rank Test, t-test, and p-test  
 In class interviews – used as supporting evidence  
 Observations – recorded in journal for supporting evidence

## Student Survey Results

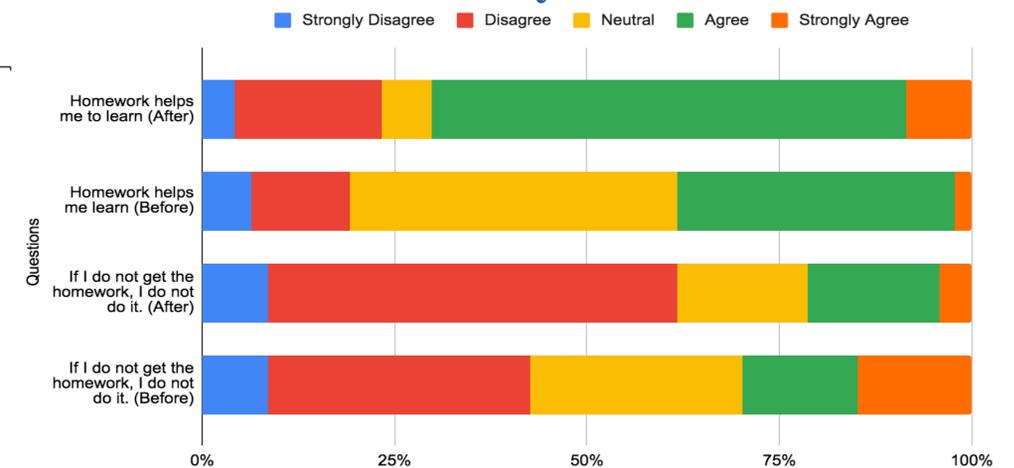


Figure 5. There was a significant change in the interest of using a type of organizer to remind students to do their homework from the beginning of the study to the end of the study. While homework was not being graded, more students did not use any aides to assist them in reminding themselves to do their work.

## Value and Future Studies

### Value of Study

- Homework needs to have value - practice, changing misconceptions, or review
- Feedback on homework is more important than the grade

### Future Studies

- I would like to see in the future is focusing on the internal motivation of high school students.
- I would like to see the effects of a co-teacher in all classes: which of the five methods is the best?

### Impact on Researcher

- Data collection is a powerful tool to understand your students better as well as being an educator.
- This study has taught me to value the opinions of my students in the classroom when it comes to teaching styles.