

IMPROVEMENT OF METACOGNITION SKILLS WITHIN HIGH SCHOOL GENERAL CHEMISTRY



Results

- Students' grades improved when compared to previous year
- Treatment group showed less of a link between their grade and their attitude in chemistry class when compared to control group
- Students showed improvement in metacognition possibly linked to ownership of grades

Data Collection and Analysis

Treatment

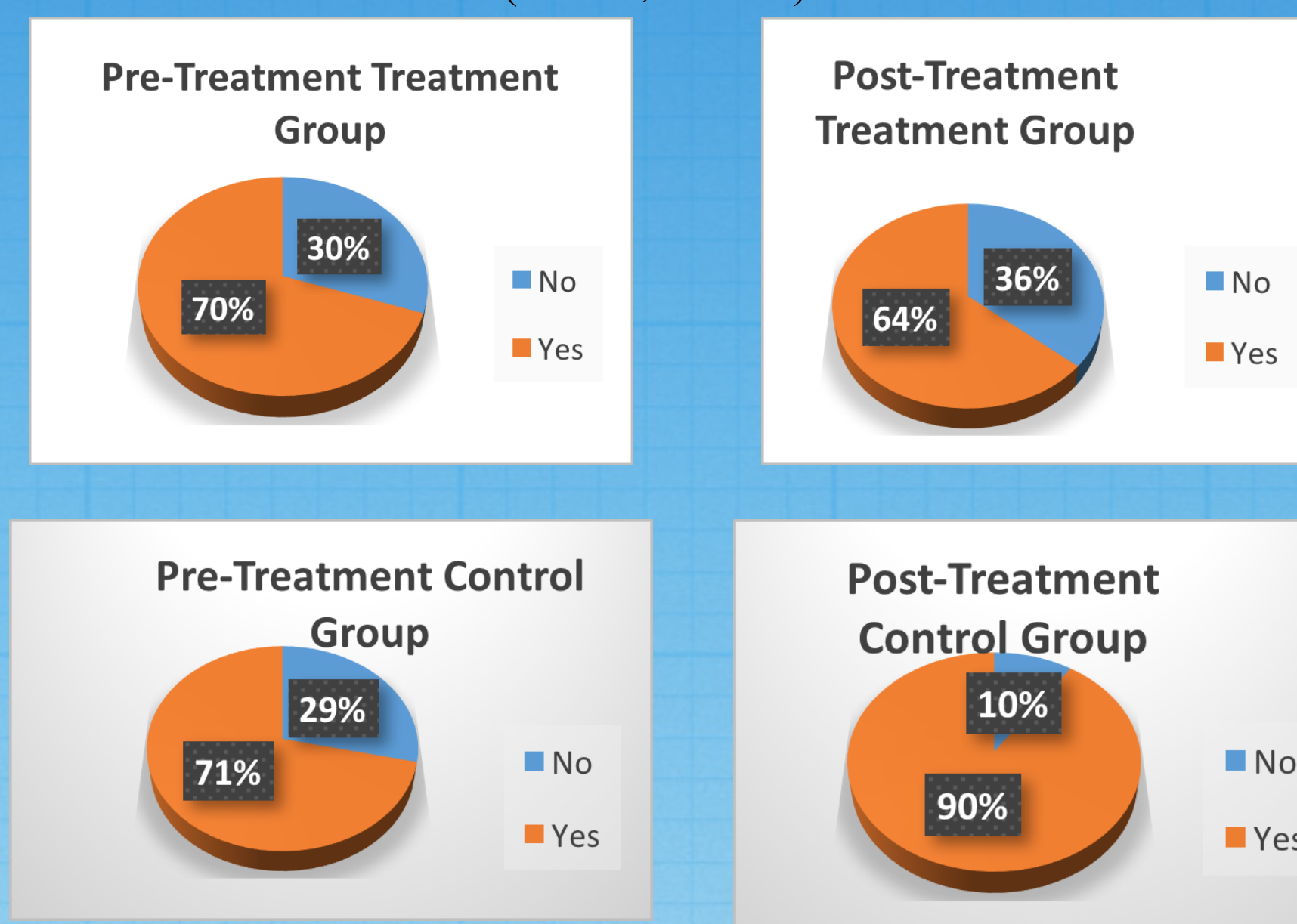
Mixed Method Research

- Pretreatment survey to establish baseline metacognitive skills
- Metacognitive techniques taught:
 - Pre-unit foreshadowing
 - two column, processing notes
 - concept maps
 - planning problems out
- Opportunities to practice these skills were given in class and were assigned as homework.
- Students completed weekly self assessment of their participation in the activities
- End of unit survey allowed students to compare their weekly survey answers and their grade on the unit test

Questions	Data Source 1	Data Source 2	Data Source 3
Focus question: How does the improvement of my student's metacognition skills and techniques impact their learning?	Pre- & Post-treatment survey	Classroom Observations	Student interviews
Sub question 1: What are the current metacognition levels and techniques used by my students?	Pre- & Post-treatment survey	Classroom Observations	Student interviews
Sub question 2: How are my students' grades impacted by instruction of and the use of metacognition techniques?	Mid Unit Survey	Grades of current students on Unit test and quizzes compared to other classes	Grades of current students on Unit test and quizzes compared to grades of past students
Sub question 3: How do the attitudes of my students' towards their chemistry learning change after the use of metacognition techniques?	Pre- & Post-treatment survey	Student Weekly Study Habit Survey	Student interviews

Data

Student answers to:
 "Does your grade in this class affect your attitude towards it?"
 (N= 58, N= 21)



Test Averages of Unit 7 (N=21, 58, 104)			
	Control	Treatment	2016
Average	84.84	85.32	78.84

When asked about studying for chemistry, a student stated they are,

“no longer simply looking over...I am actually mentally participating and thinking about it”

Background

Germantown High School has 1,420 students that come from suburban to rural backgrounds. Within my science classroom at GHS, students lack the ability, or desire, to evaluate their own understanding of material. This inability negatively affects both their grades and their overall attitude towards science. Research has shown the importance of metacognition to students and especially chemistry students. Many students lack the knowledge and experience to conduct this type of thinking. Through specific lessons that focus on modeling, as well as, opportunities to practice what was modeled, students can dramatically improve not only their understanding but also their grades.