

An Adaptive Approach to Improving Outreach Centered Around Group-Based Learning

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TEXAS TECH UNIVERSITY
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Introduction

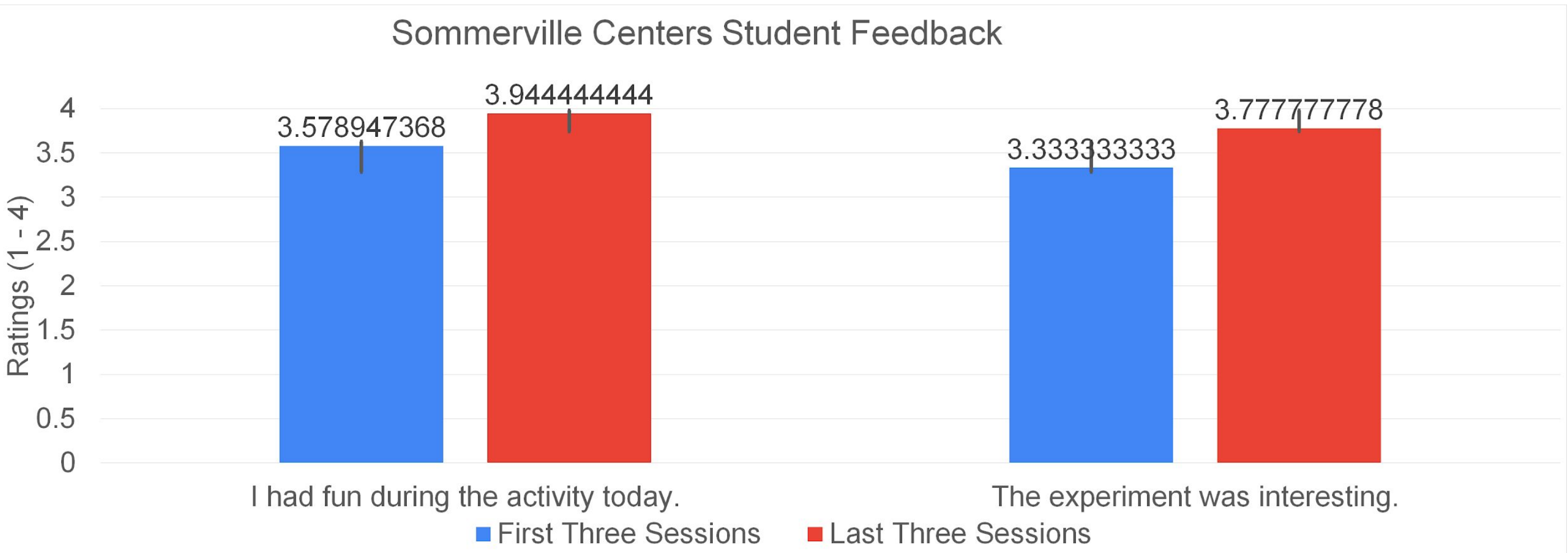
The STEM & Leaf Corps is a education-based service organization in Lubbock that strives to empower students of all grade levels through multiple free programs operated by undergraduate students from Texas Tech University. Through the analysis of student data, we have been able to constantly evolve our approach to service, *creating specialized initiatives to maximize growth and impact*. Our endeavors at various schools allow us to strive toward our goal of enriching the personal and educational experience of all students regardless of background and socioeconomic status. Reflecting on the past three semesters, we have observed that *our approach has had a major impact on students through increases in intellectual performance, interest, and excitement*. Moving forward, we plan to broaden our outreach by expanding our existing programs into more campuses within the Lubbock Independent School District and we hope that our work can be used to inform changes to the existing educational structure on a regional and national level.

Methods

Guadalupe - Parkway Sommerville Centers

Here, students from the Guadalupe and Parkway-Cherry neighborhoods, served by the East Lubbock Promise Neighborhood initiative, participate in creative and fun projects while engaging in interactive discussions to learn the principles and theories behind those activities.

1. Leaders create engaging projects for students by utilizing aspects of STEAM
2. Volunteers lead groups of 6-15 students in carrying out the experiments and discussing fundamental scientific principles
3. Students participate in pre- and post-experiment discussions about key terms and learning objectives to better understand the projects and the concepts behind them
4. Accumulate qualitative and quantitative data via feedback forms to determine what we are doing well, what we can improve, and how we can better adapt our program to meet our students' needs
5. Collect tutor feedback from leaders within the program via a Google form
6. Actively evolve programs by analyzing data and adapting to student needs



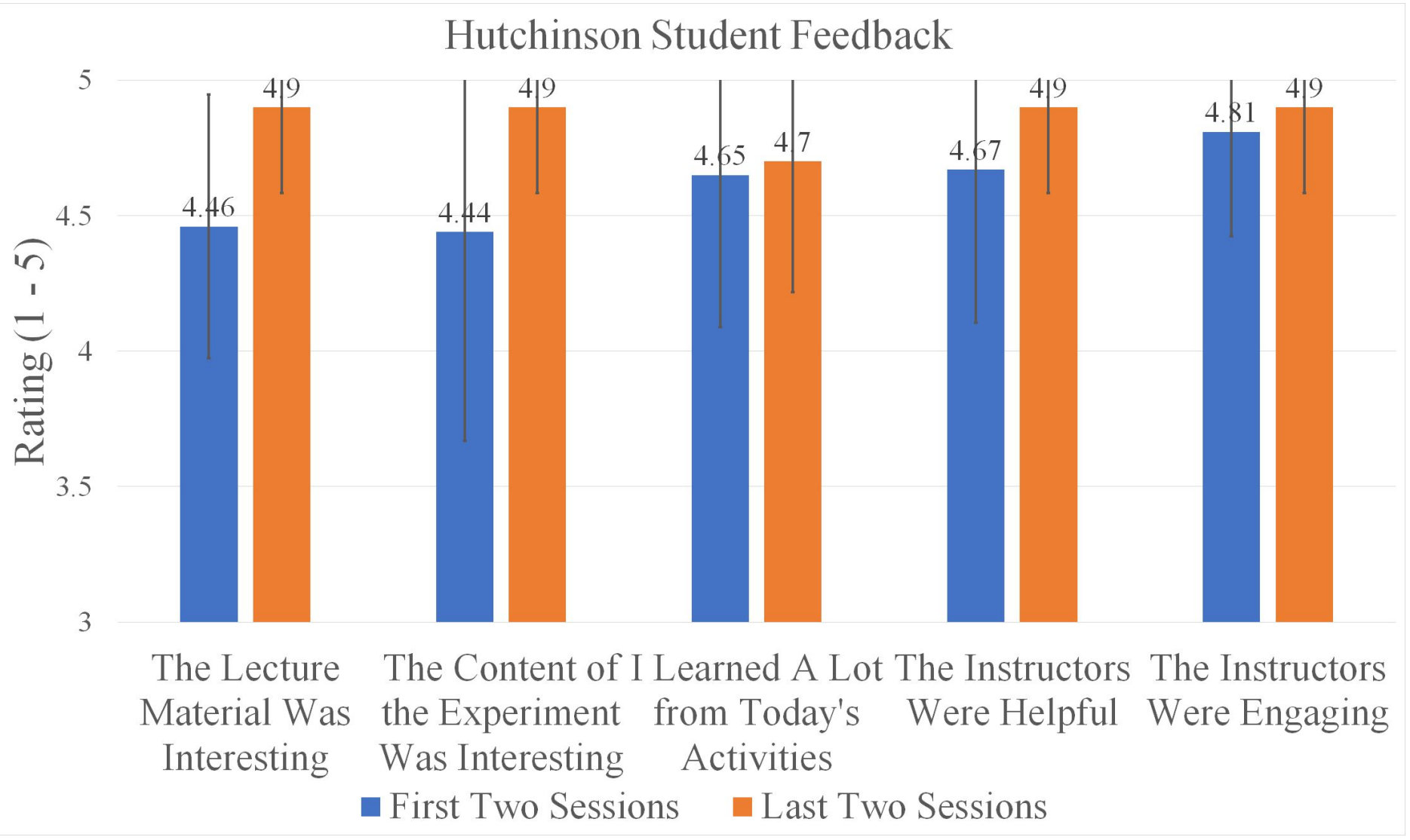
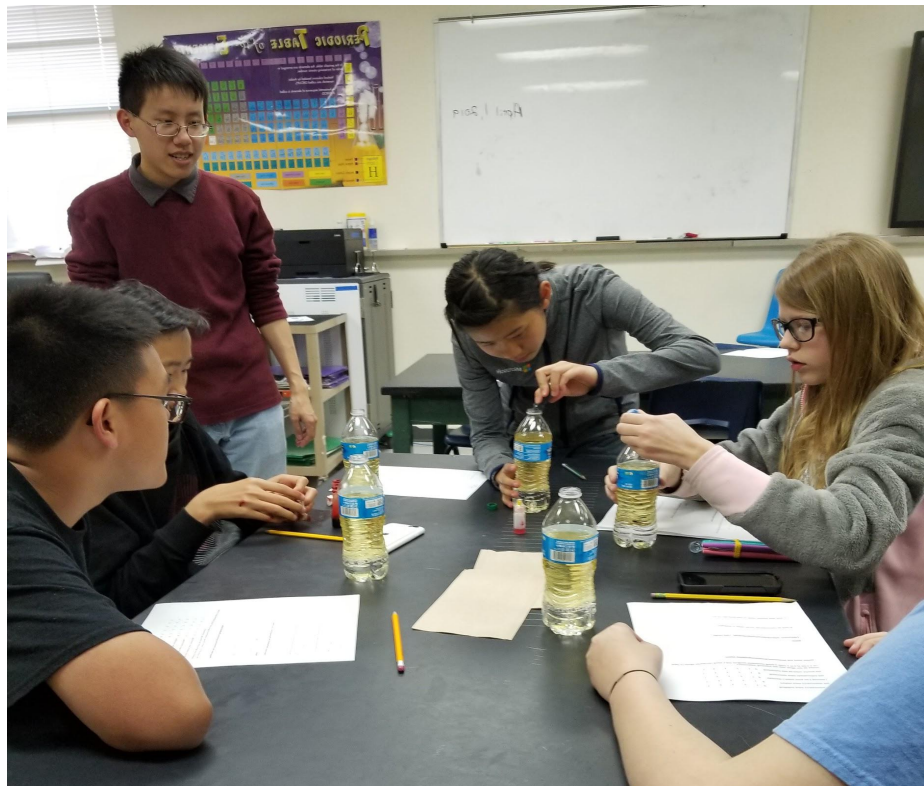
Guadalupe-Parkway Sommerville Centers	
Tutors Participating	9
Volunteer Hours	46
Unique Student Contacts	64
Total Student-Contacts	130

Hutchinson Middle School

Here, we conducted chemistry and biochemistry related experiments with 7th and 8th grade students from the International Baccalaureate program.

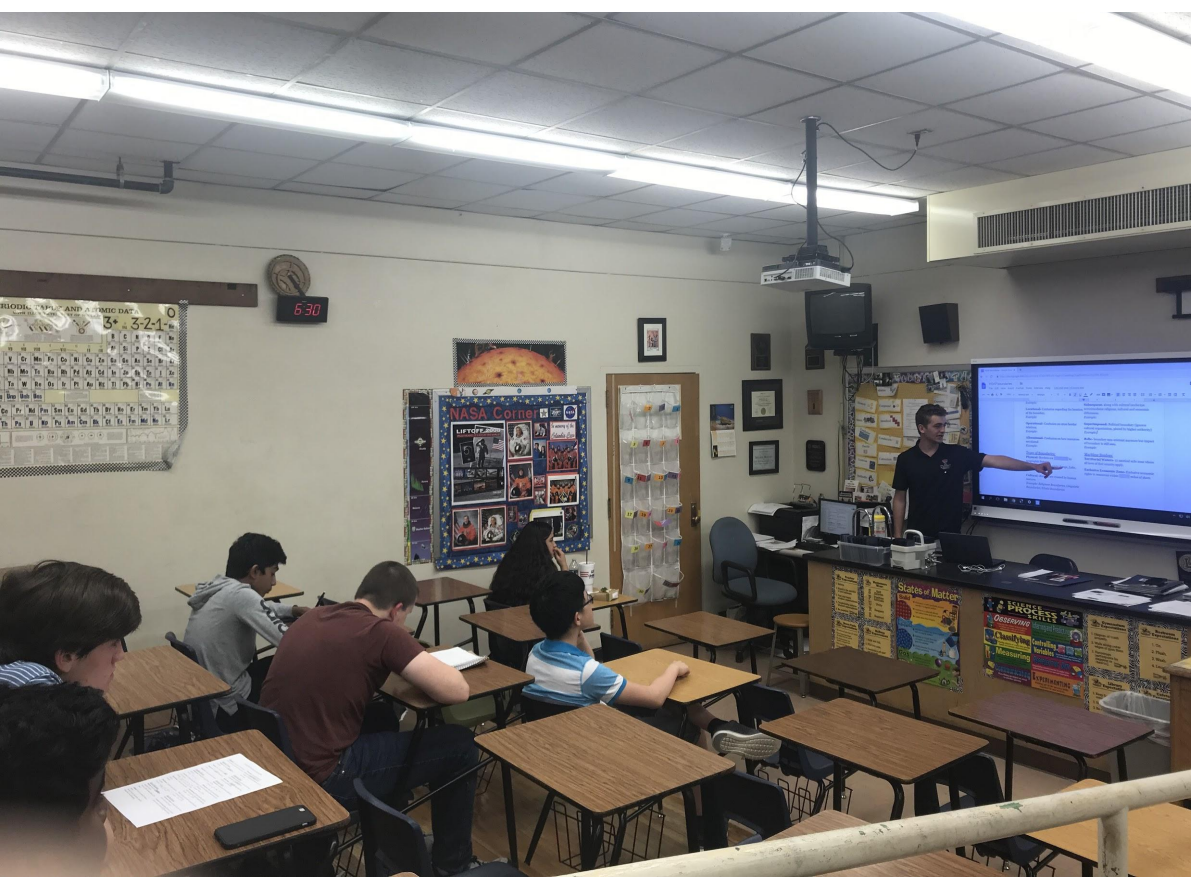
1. Logical series of experiments are planned out weekly across a semester to explain the fundamentals of chemistry and examine applications in biological systems
2. ~15 students are split into table groups of 2-5 each with a tutor to help explain core concepts and assist with experimental procedures
3. Students are given short worksheets to facilitate their involvement in the lesson while enhancing their knowledge of topics covered
4. Student feedback forms are collected to inform changes to better meet individual student needs and allow for a longitudinal study to be performed to measure impact of overall program on students at HMS
5. Tutor feedback data is accumulated via a Google form from individuals who were involved in leading sessions

Hutchinson Middle School	
Tutors Participating	12
Volunteer Hours	79
Unique Student Contacts	22
Total Student-Contacts	79

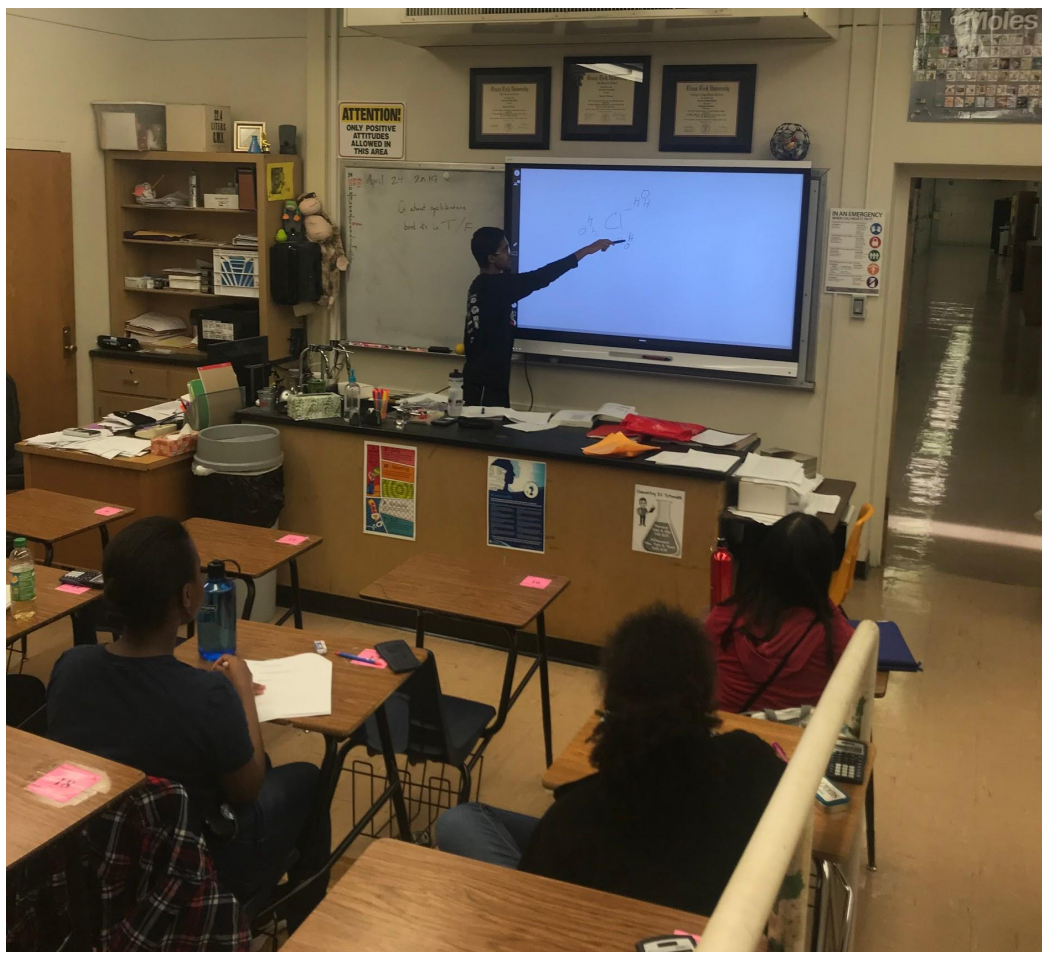
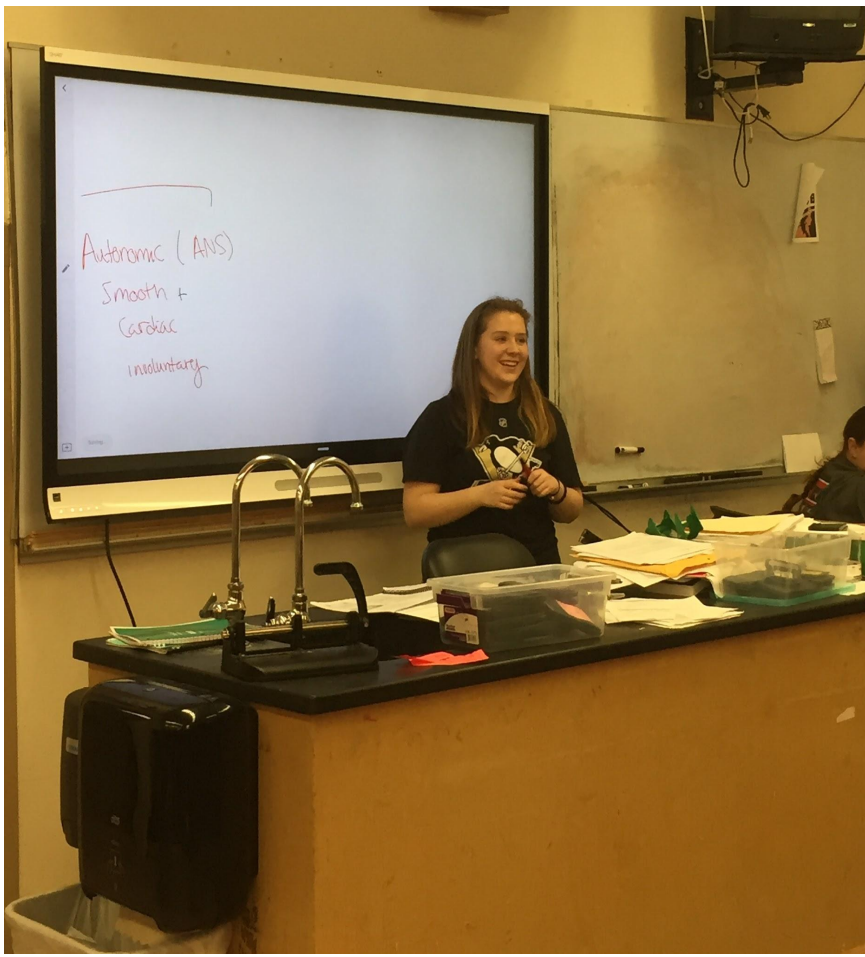


Lubbock High School

As demand for educational enrichment increased over the years, STEM & Leaf at LHS shifted to providing group-centered teaching initiatives by offering Science Bowl Special Topics lectures and AP/IB review sessions.



1. Members within the organization are formed into groups based upon subject area expertise
2. These groups create presentations that feature a content-specific lecture followed by discussion and interactive experiences with the students
3. While our members are presenting, students actively participate in the lecture via our in-house lecture packets that guide progress through the topic at hand

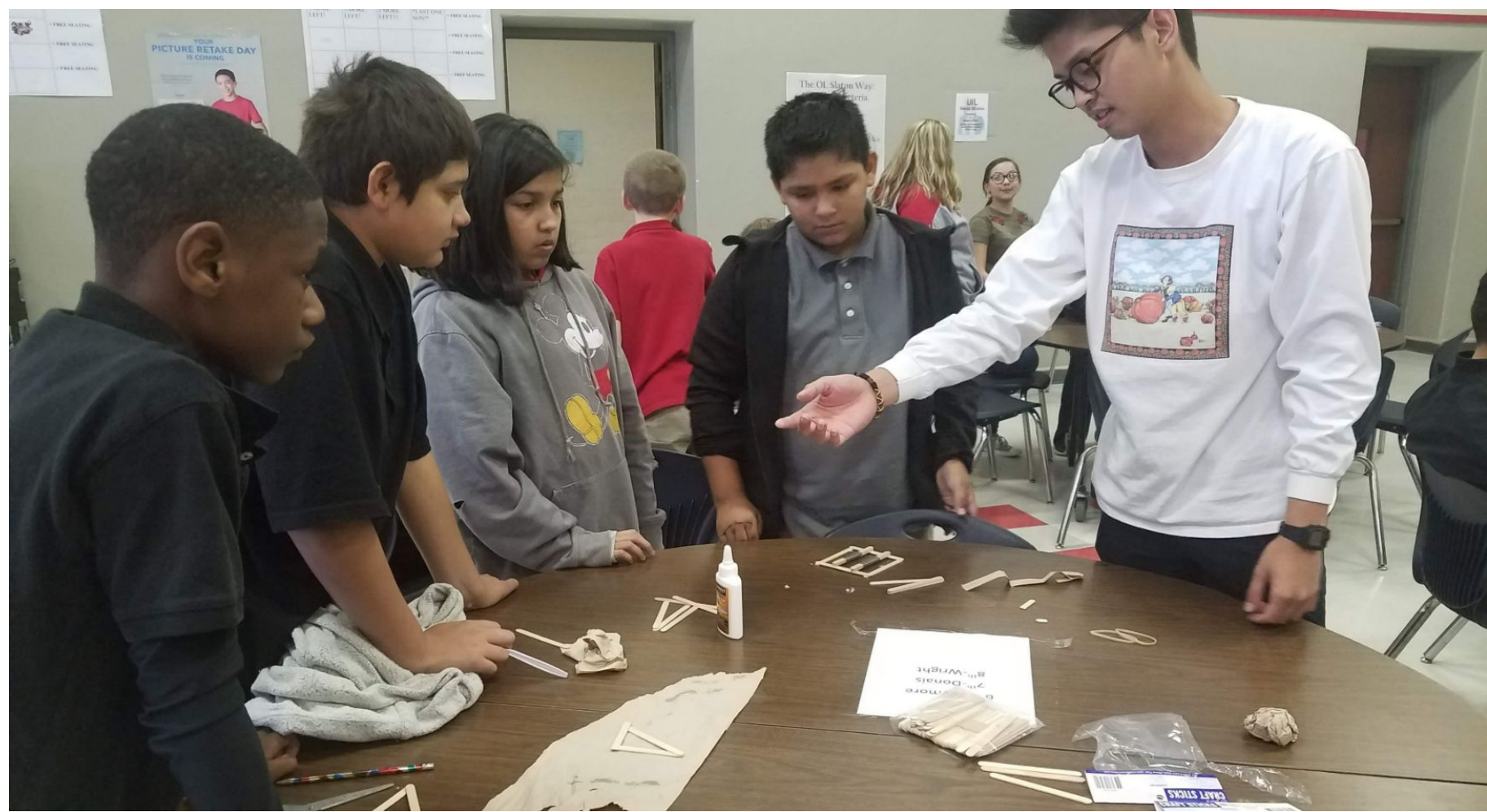


Lubbock High School	
Tutors Participating	26
Volunteer Hours	180
Unique Student Contacts	112
Total Student-Contacts	247

Conclusions

Incorporating group-based learning into our programs at 3 different educational levels has *synthesized a collaborative culture of learning* which reshaped our original framework of educational outreach. Our elementary and middle school level data has shown us that this adaptive model of educational outreach can effectively improve student interest in learning. Qualitatively, we have shown that excitement for learning increases students' willingness to challenge themselves and probe deeper into concepts.

Engaged scholarship is at the center of the learning process for both tutors and students. Through sustained involvement of students and tutors in a communication-heavy setting, we have identified potential synergies between research and service. We hope that this model of educational outreach can be implemented at other universities in the future, creating a wider and more lasting impact on youth regionally, nationally, and globally during their formative years.



Future Goals

Next semester we will:

- Incorporate more demonstrations and activities into our AP/IB, UIL, and Science Bowl lectures to emphasize active group learning at the high school level.
- Examine the impact of programs on knowledge acquisition via pre- and post-tests

In the coming semesters we hope to:

- Create a group-based lecture-discussion hybrid for our high school programs that utilizes kinesthetic, visual, auditory, reading, and writing learning styles.
- Expand our programs to K-12 institutions across Texas through partnerships with local school districts.
- Collaborate with individuals from other universities to assist more college students in beginning their own service projects.

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