A SURE Thing

Engaging Students in Research Toward Retention

Nick E. Weimer, Associate Dean of University College Compliance, Assessment, and Sponsored Programs, Director of Texas Success Initiative

Sylvia T. Gonzales, Director, HSI STEM Impact

Dr. Jeremy White, SURE Program Coordinator

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8 PROGRAM EVALUATION

Holistic STEM Undergraduate Research Experience (SURE)

4 STUDENT P.D. SEMINARS

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5 TECHNICAL SKILLS DEVELOPMENT

Today's Discussion

Introduction & Overview of the SURE Program

Significance of Title III & V Programs

Importance of Mentoring Latinx & First-Gen Students

Developing culturally responsive mentors

Skill building with undergraduate mentees

Impact on student outcomes

Successes and challenges

Questions and answers

Title III & V Programs at TXST

Summer Undergraduate Research Experience (SURE)

Student/Mentor Profile

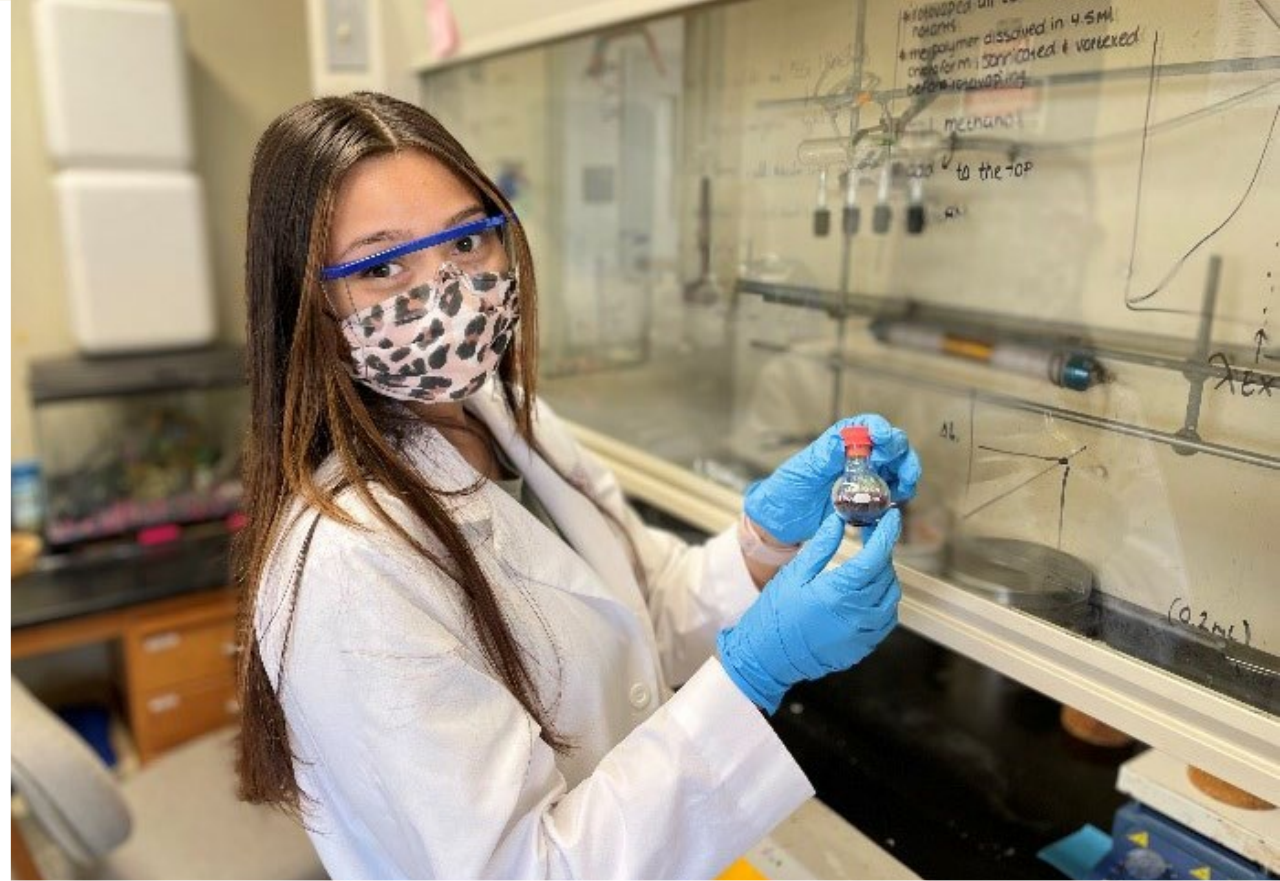**Population: 2017-2019 Cohorts**

64 Undergraduate Students
- 48% Female
- 73% minority (58% Latinx)
- 89% Pell-Eligible
- 78% First-Generation

35 STEM Faculty Mentors
- 46% Female

Faculty Mentoring Critical to Success

Skill Building

Research Skills

- Professional Development
- Oral presentations
- Poster symposium
- Literature reviews

SURE Student Outcomes

- 97% of students persisted after the program.

- Overall and STEM GPAs were higher in the SURE cohorts as compared to a control group.

- SURE students presented 56 posters at national conferences

- Second authors in 18 peer-reviewed publications.

- 52% have graduated with their bachelor's degree

- 39% are attending graduate or professional programs

- 55% of the graduates that are working are in STEM-related fields.

Program Outcomes and Effectiveness

Methodology

- Science Identity Survey (*Mentees*)

- Research Skill Survey (*Mentors and Mentees*)

- Poster Presentation Scoring (*Mentees*)

- Control Group GPA Comparison (*Mentees*)

- Focus Groups (*Mentors and Mentees*)

- Individual Interviews (*Mentors and Mentees*)
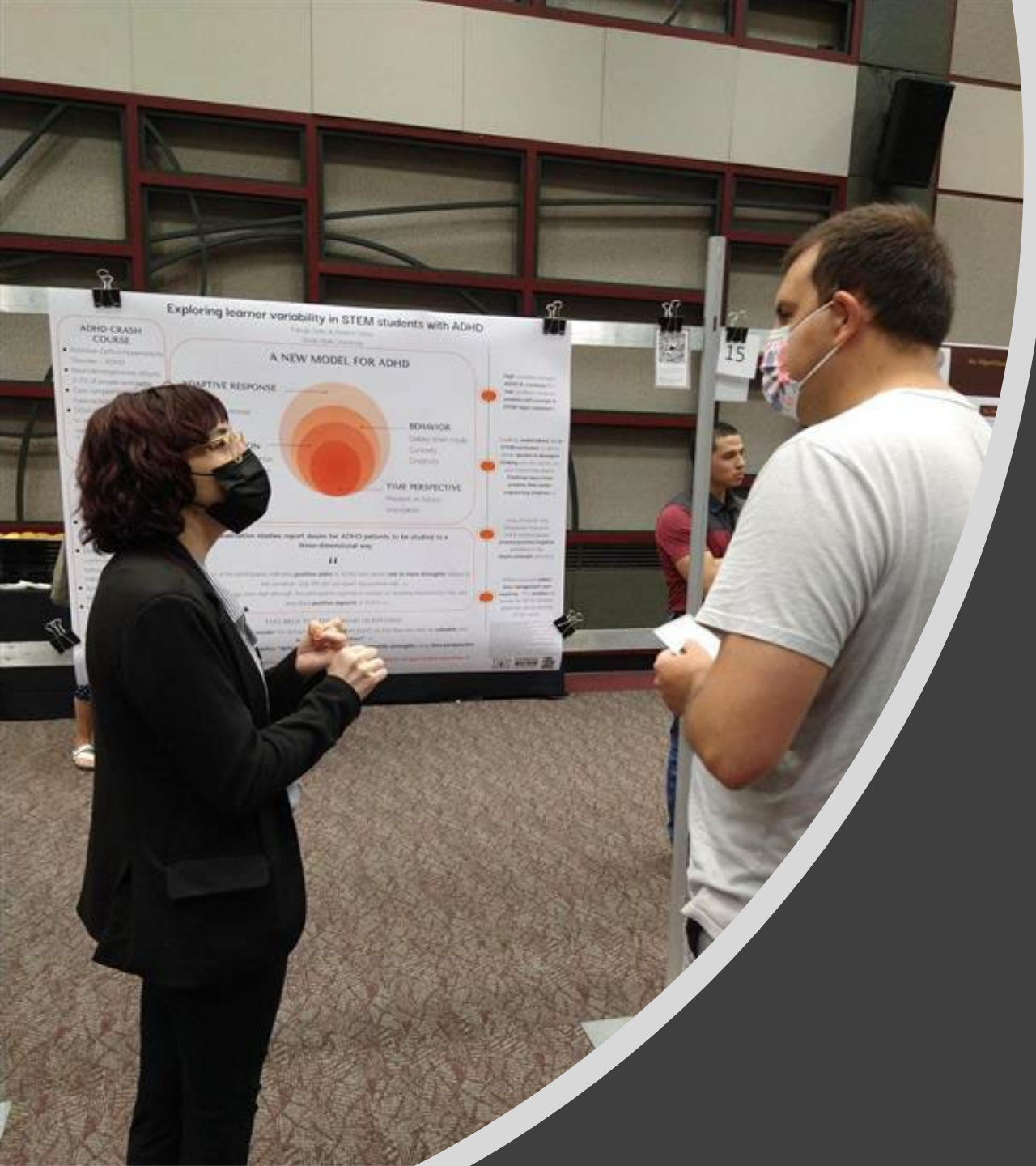
Science Identity / Research Skills Survey

Survey Design:

- Pre and post surveys were given to faculty mentors and student participants.

  - Science Identity Survey
  - Research Skills Survey

- Data were analyzed to determine statistical significance using unpaired T-Tests.

Brown, D.A., Wright, N.B., Gonzales, S.T., Weimer, N.E., & Soto, J.G. (2020). An undergraduate research approach that increased student success at a Hispanic Serving Institution (HSI): The SURE Program at Texas State University. Scholarship and Practice of Undergraduate Research, 4(1), 52-62. https://doi.org/10.18833/spur/4/1/18
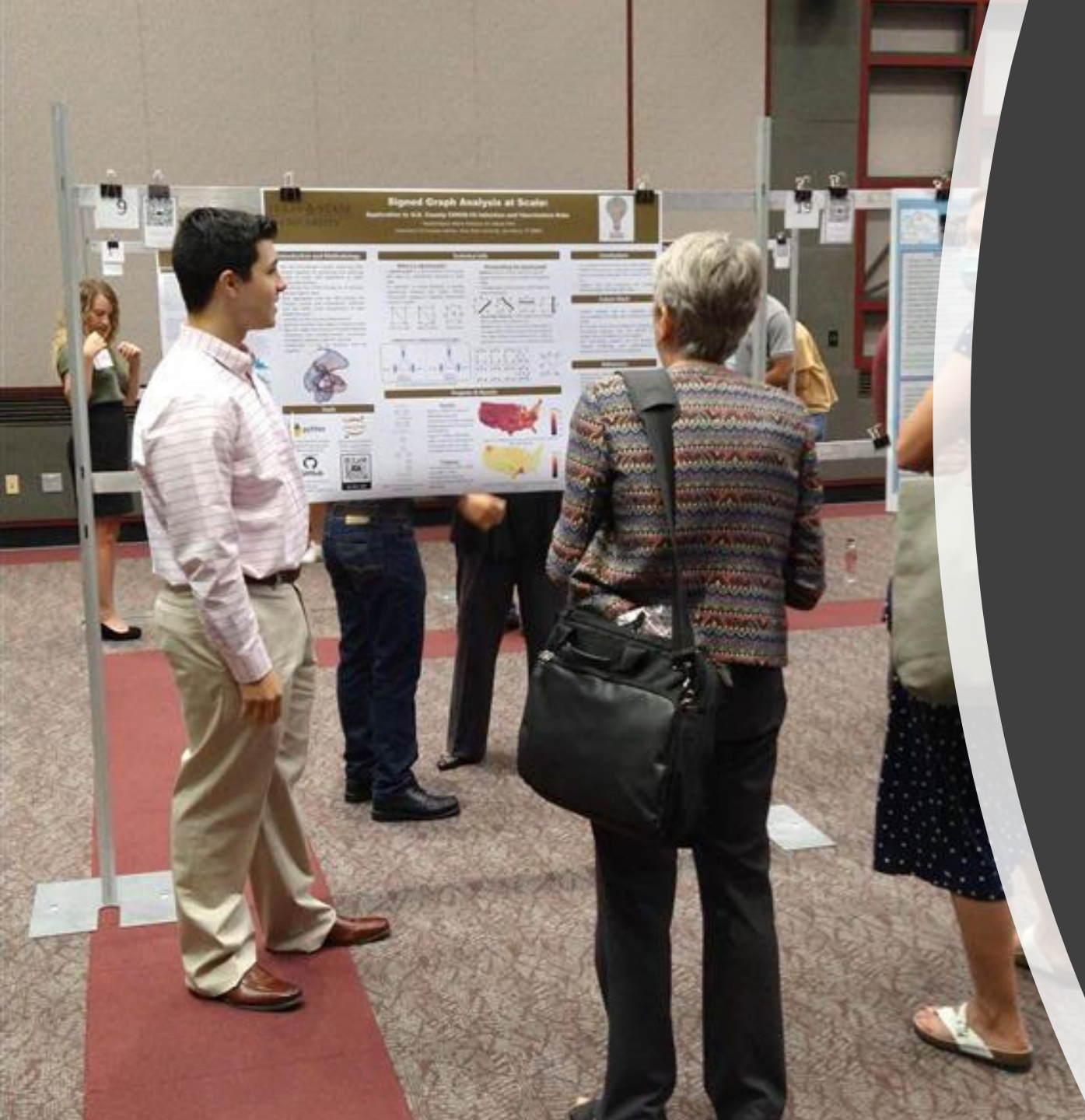
# Poster Presentation Scoring

- All SURE students presented posters at the culminating symposium.

- Poster presentations were used to examine the effectiveness of two of the Student Professional Development Seminars (oral and poster presentations).

- Evaluated in six categories (appeal, editing, content, methods, data analysis, and accuracy).

- As an aggregate, students scored highly in most categories.

Control Group GPA Comparison

- Students were compared with a control group that had matching ethnicity, income status, first-generation status, and student class standing (Freshman, Sophomore, etc.)

- No statistically significant differences STEM GPAs of SURE cohorts and the control group before the program began

- A year after SURE, cohorts STEM GPAs were significantly higher than the control group.

- The number of students who increased their STEM GPAs by a letter grade was higher than the control group; while the number of students who decreased their GPA was higher in the control group.

Control Group GPA Comparison

B. Increased or Lowered Overall GPA
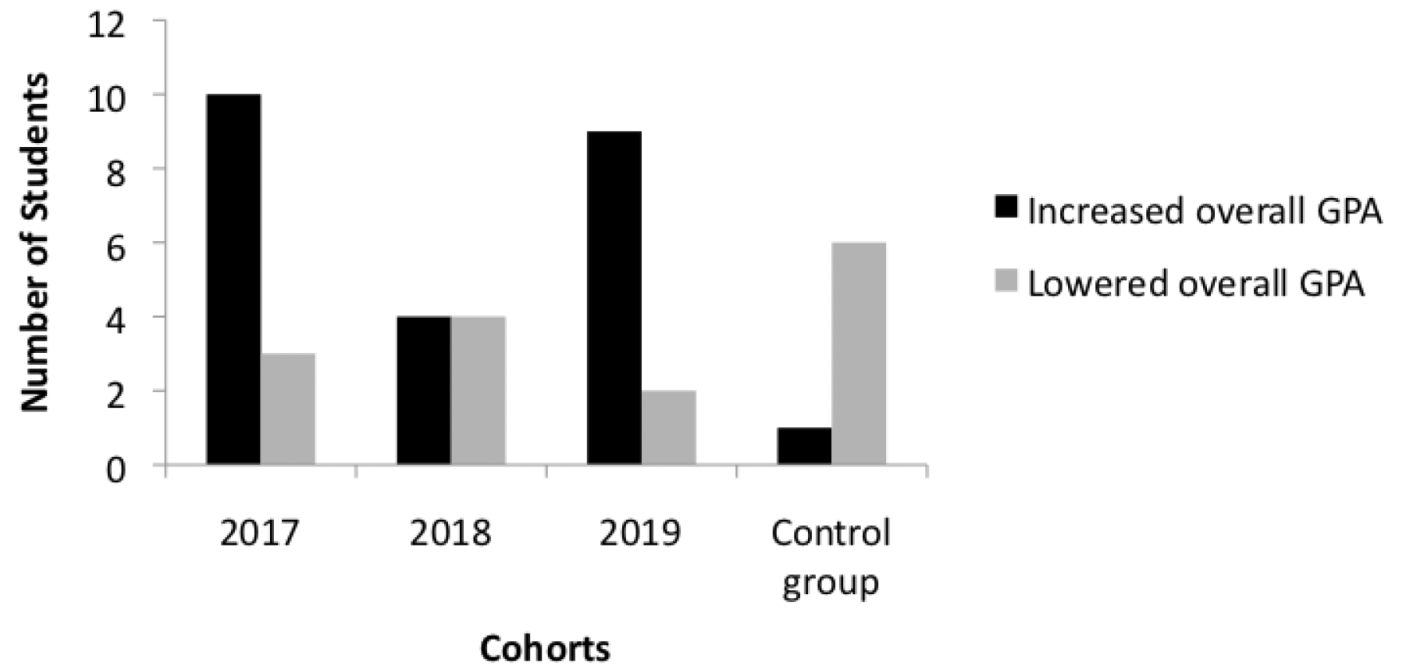
Student Focus Groups

- 19 students interviewed after the program in the first year
    - 100% responded that they gained confidence and skills by the end of their experience
    - 95% responded an increasing sense of science self-efficacy

- One Latino student noted, "At first I was very scared, I was very intimidated about it, but as the days went by and the weeks went by and everybody shared their experiences, their troubles, I realized that it is a learning process and that is not something we're going to be automatically good at but you're shaping molding yourself into an actual scientist."

- Another Latina student described how she came to feel a sense of belonging in the campus, "I definitely felt a sense of community . . . specifically when we all sat around in a circle, and how that was guided, and you know everyone opened up a little about sort of about their personal lives and what made them want to do this, and their passion behind it."

Student Focus Groups (cont.)

- Student data also revealed that SURE program impacts extended beyond facilitating students' sense of belonging on campus, as student participants discussed how it also enhanced skillsets and feeling career ready. For example, one student stated, "The [SURE program] let me know I am not alone, I wasn't the only one afraid going into this. . ." and, "It gave me relevant experience, skills, and expectations . . . encouragement and confidence to pursue a graduate degree."

- Another stated: I enjoyed coming over to the SURE program because you discuss with people from very different fields who are not in computer science or math and that helps me communicate better because I think you learn to discuss your research with someone who does not know what you're talking about.

Faculty Mentor Cultural-responsive Training

- 77% of faculty reported that the SURE program positively impacted their ability to deliver undergraduate research mentoring to students using culturally-responsive methods.

- One faculty mentor described her integration of culturally-responsive mentoring practices as increasing her active listening, flexibility, time in getting to know the mentees' stories and interests, attention to non-academic issues (e.g., mental health), encouraging students to prioritize family commitments, connecting students with additional mentors (e.g., Black women physicists), and valuing of her mentees' expertise and life experiences.

Faculty Mentor Cultural-responsive Training

- A mentor emphasized the positive effect of talking about family with the mentee and supporting their time spent with family during the research experience.

- Another mentor reported indicators of successful development, including the value of supporting a work-life balance, communicating expectations, being very honest with feedback, and sharing stories about each other's cultural backgrounds.
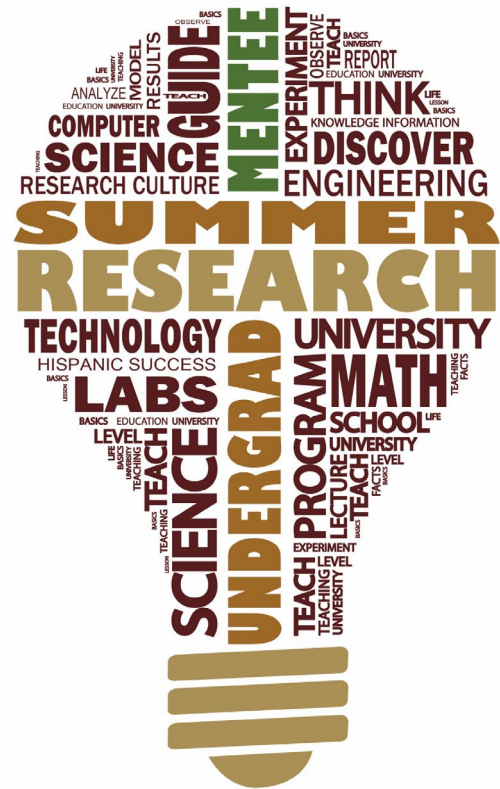
STEM Undergraduate Research Experience
SURE
HSI STEM Impact

Successes & Challenges

- Size of cohort
- Change in time of experience
- Keeping it to summer only
- Faculty mentor training model
- Involving family & social media recognition
- Living on campus
- Travel experience
- Finding students not in the research lab already

- Intentional outreach to first-generation (78%), Latinx (58%), and financially vulnerable (89%) students
- Faculty supportive of program
- Mentor training institutionalized
- IDEA Center

Nick Weimer
new22@txstate.edu

Dr. Jeremy White

jw5455@txstate.edu

Sylvia T. Gonzales

stg39@txstate.edu

Thank you!