



**TEAM Members: Can Saygin (PI), Jose Gutierrez, Stephanie Alvarez, Mayra Ortiz Galarza, Nicolas Pereyra, Juan Salinas, Olga Ramirez, Elizabeth Salinas, Griselda Salinas, Virginia Santana, Dagoberto Ramirez**

## Abstract/Objective

In this project we implement a novel Family-Centered Theory of Change Model for Latinx Students in undergraduate STEM disciplines. By placing students and families from the community at the center of this model, the project aims to dismantle deficit thinking systems, policy, and practices that continue to marginalize Latinx students from STEM fields. The transformative change process begins with a 3-day professional development workshop where the Family-Centered model creates learning opportunities for students, families from the community, and selected UTRGV faculty to engage in *pláticas* (dialogue) as equal producers of knowledge. This leads to a collaboration between students, families, and faculty in Family Integrated Education: Serving & Transforming Academia (FIESTA) courses, research project and research symposium. Figure 1 shows students, families, and faculty who collaborated in FIESTA activities and symposium.



Figure 1: FIESTA (Family Integrated Education: Serving & Transforming Academia)

Utilizing family-centered curricula, pedagogies and learning frameworks typically used in Mexican American Studies, the Community Engaged Scholarship & Learning course (CESL) and STEM courses address diversity, equity, and inclusion (DEI) through an intersectional framework that accounts for multiple social identities, domains of power, and historicity. Existing STEM courses (n=34) in mathematics, chemistry and physics that are required for the general education core were revised to include a family-centered class project that is culturally relevant to address DEI in STEM disciplines. In addition, STEM students take a Mexican American Studies course (CESL) in order to gain a better understanding of the self, the family, and community in order to develop their culturally competency and understanding of social responsibility. These initiatives pave the way towards higher student learning, persistence and degree attainment.

## Objectives/Hypothesis

The objective is to evaluate the transformational impact the novel Family-Centered Theory of Change Model for Latinx Students in undergraduate STEM disciplines has on an HSI's "servingness" (Garcia et al., 2019).

## Activities & Conceptual Framework



Figure 2: FIESTA Activities: AVE Frontera family leaders presenting family-centered lessons to students enrolled in STEM courses (top left); students share to the class their academic goals and family history in the language they feel most comfortable (middle); students present their course-based, research projects at a symposium (right).

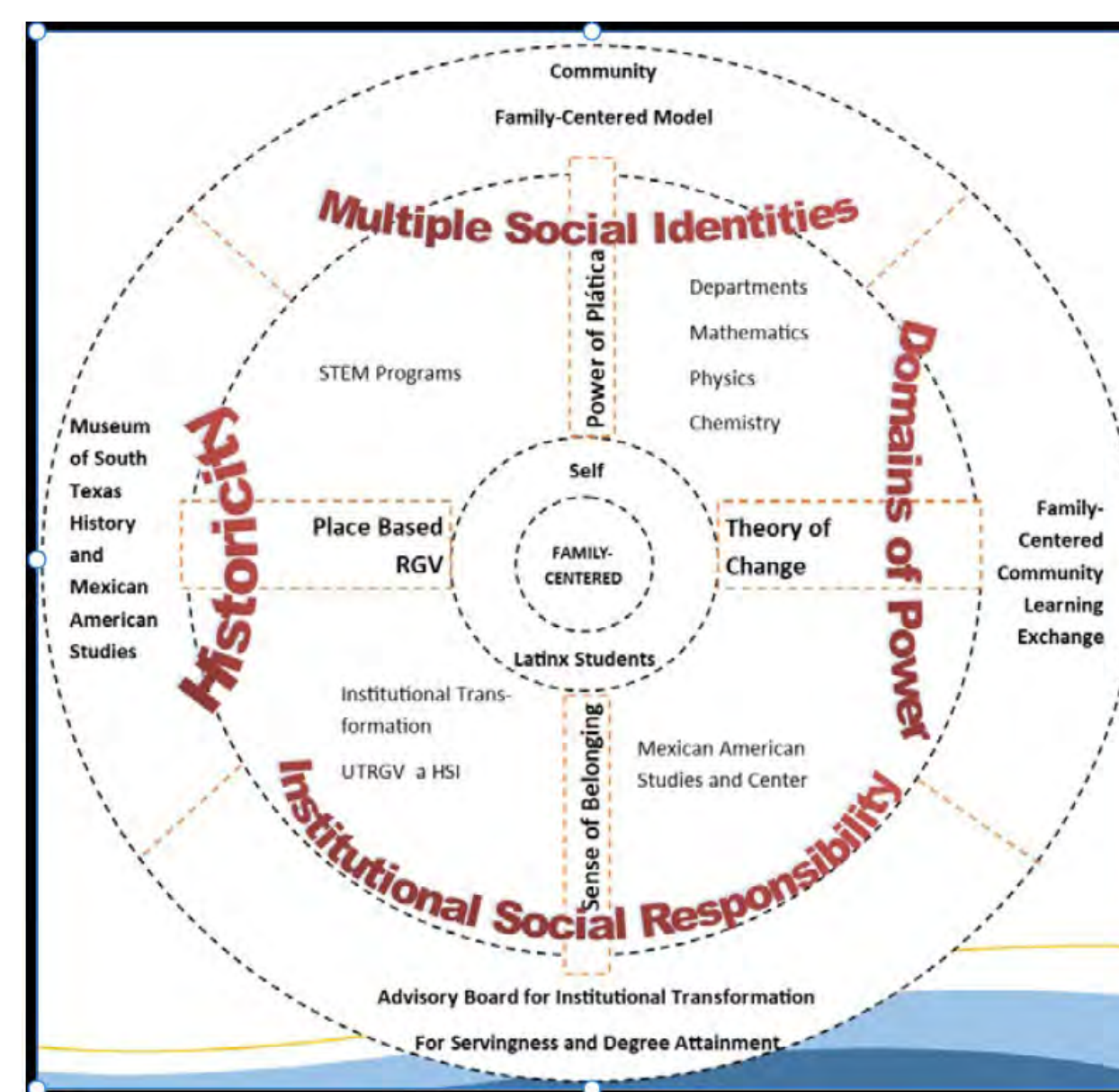


Figure 3: Conceptual Framework addressing intersectionality and sense of belonging through Family-Centered Pedagogy and Theory of Change.

## Results/Outcomes

- Improved student engagement, retention, and passing rates.
- Strong sense of belonging among students, families, and faculty.
- Expansion of research.
- Real life applications in lower- and upper-level undergraduate STEM courses.
- Three End of Semester Symposia with over 1000 participants overall.
- Over 350 course-related student research project presentations at FIESTA Symposia.
- Increased participation among underrepresented individuals or groups in STEM.

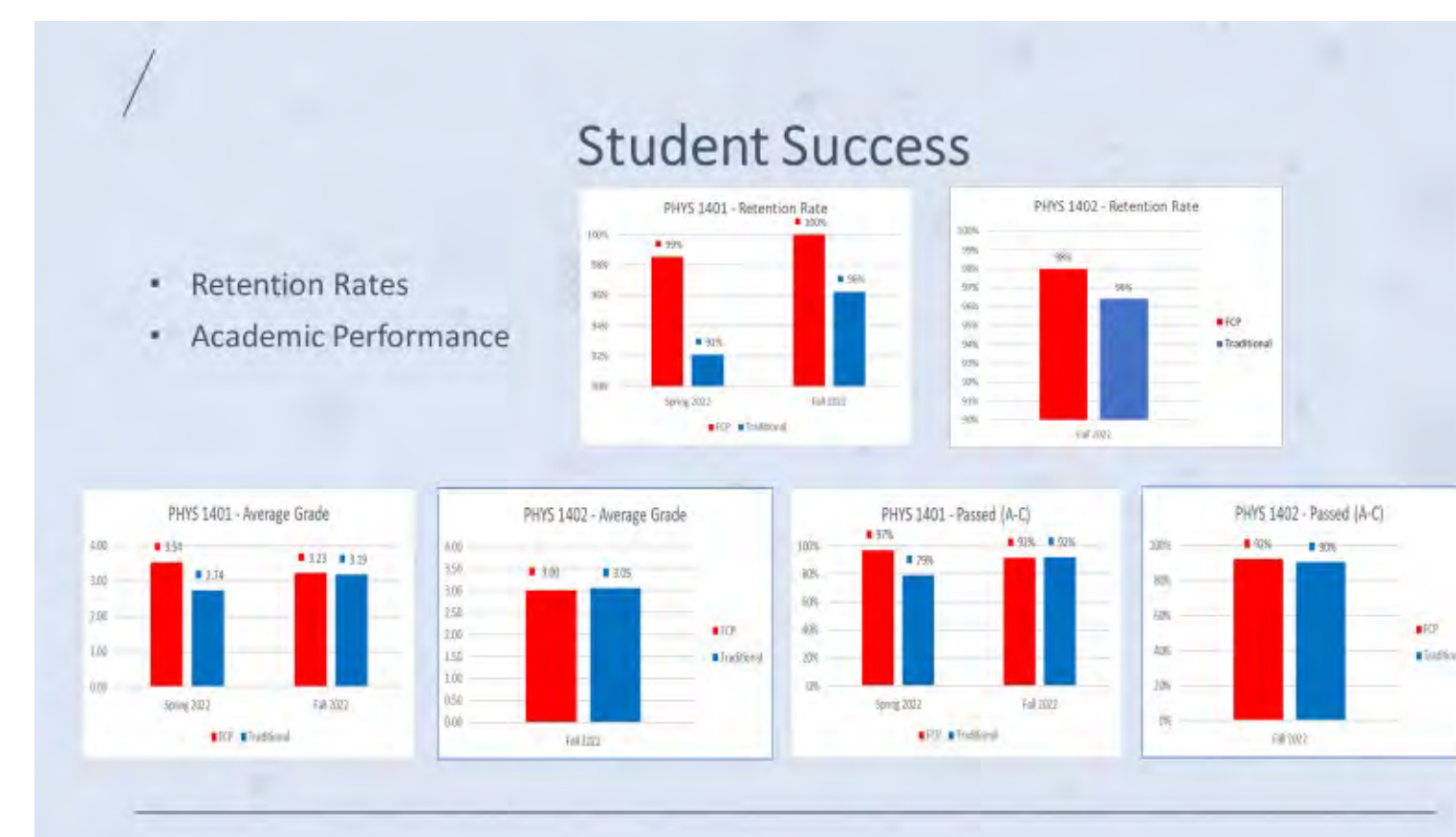


Figure 4: Family-Centered Pedagogy preliminary data demonstrates higher rates of retention when compared to more traditional-lecture-type Physics courses.

## Discussion

Family-Centered Pedagogy was successfully implemented in 34 different sections across three disciplines (chemistry, physics, and mathematics). This suggests that the versatility of the intervention/enrichment is likely suitable to be implemented in a wide range of courses, including lower- and upper-level undergraduate STEM courses. The Family-Centered Theory of Change is having a transformational impact due to its design in engaging students, families, and faculty as equal collaborators in the course-based undergraduate research projects. Preliminary qualitative analysis reveals that the Family-Centered Theory of Change: (1) Provides a Leveling Platform - a common opportunity where families, students, and educators engage in academic and cultural wisdom exchange free of presumed domains of power; (2) Instills a sense of belonging with ownership and pride; (3) has a transformative factor that can be attributed to the cultural connection of the project team, students, family leaders and faculty; (4) engages families as active participants and collaborators in the development of student research projects.

## References

- Garcia, G. A., Nuñez A. M., & Sansone, V. A. (2019). Toward a multidimensional conceptual framework for understanding "servingness" in Hispanic-serving institutions: A synthesis of the research. *Review of Educational Research*, 89(5), 745-784.
- Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate and Latino college students' sense of belonging. *Sociology of Education*, 70(4), 324-345.
- Valencia, R. (2010). *Dismantling contemporary deficit thinking: Educational thought and practice*. New York, NY: Routledge.

## Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant No. 2122875.