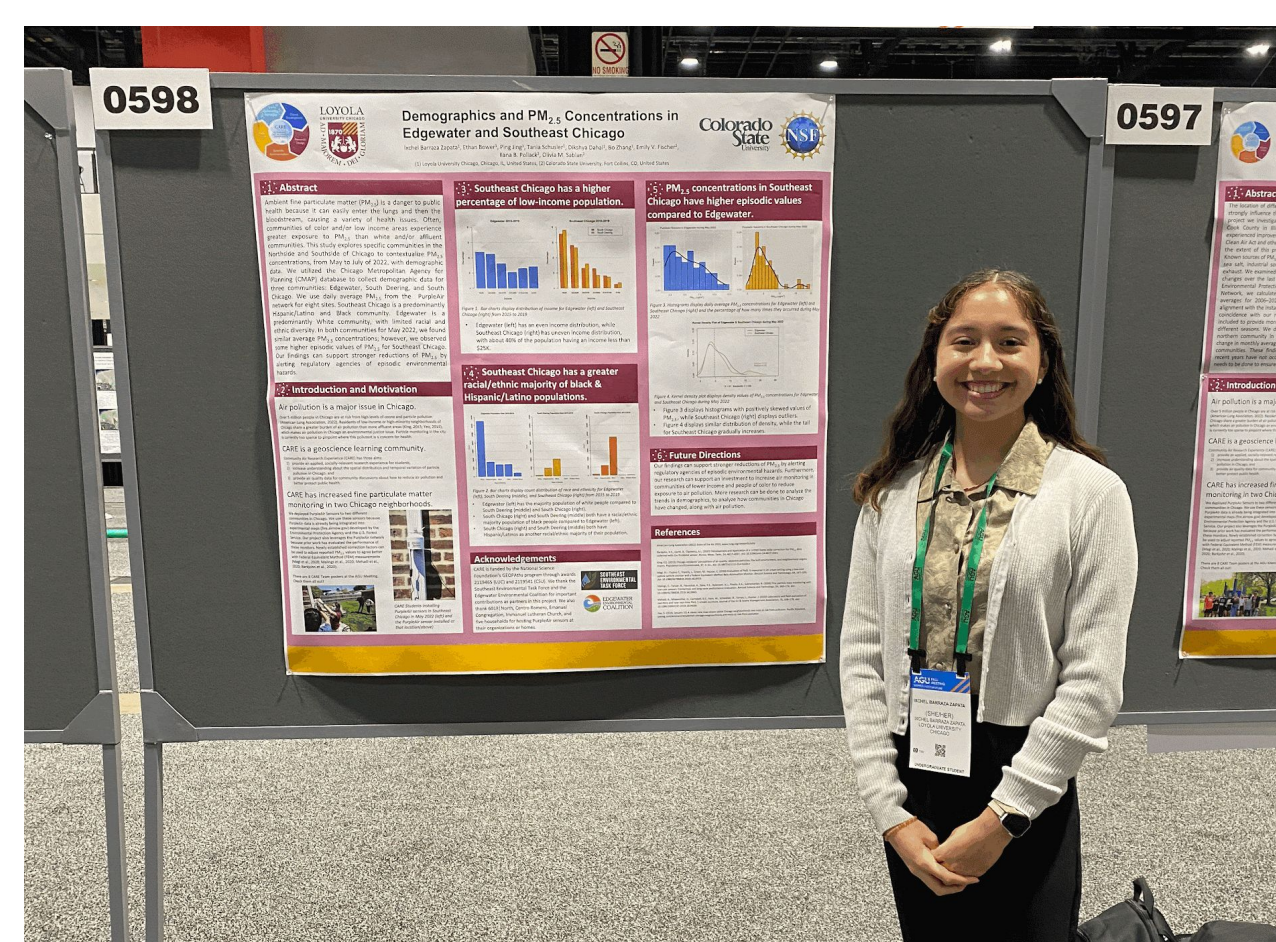


1 Background

I analyzed the geosciences learning ecosystem established through the NSF GEOPaths funded Community Air Research Experience (CARE) to identify programmatic elements that contribute to STEM identity among underrepresented minority (URM) undergraduate students. The CARE project created a learning community with the intent of building students' STEM identity through authentic research, mentoring, introduction to geoscience careers, and community collaboration. CARE created direct connections between students from Loyola University Chicago (LUC), scientists at LUC and Colorado State University (CSU), and community-based organizations. CARE recruited a cohort of eight students to join a research-intensive learning community each year in 2022 and 2023. These 16 students carried out research to measure and attribute air pollution in Chicago.



The CARE team installing a purple air sensor to monitor air quality in Hegewisch

The CARE team presenting at the American Geophysical Union in December 2023



A key premise of the CARE educational model is that faculty can increase students' interests and competencies in geosciences by engaging them in research activities on issues that directly affect their community. My research identifies evidence that supports or refutes this hypothesis. I conducted interviews with CARE project leaders and qualitative data analysis of those interviews plus data generated during CARE's implementation, including student research products. I am assessing the CARE educational model concerning its premise around prosocial research and identifying its challenges and successes.

2 Research Questions

- 1) How, if at all, did engaging with community partners in prosocial research contribute to students' development of a sense of belonging, STEM identity, and self-efficacy?
- 2) What were the successes and challenges that arose from these interactions with community partners?
- 3) How, if at all, did project personnel overcome these challenges?
- 4) What would CARE's community partners recommend for the project's future?

3 Methods

- Conducted a systematic analysis (Patton, 2014) of the educational data compiled from the CARE Project's Cohort 1.
- Interviewed CARE project leaders, LUC faculty members Ping Jing and Tania Schusler.
- Created an interview guide, analyzed data, and reported results.
- Wrote a researcher identity memo (Maxwell, 2012) before data collection and analysis began that documented my experience in CARE and responded to the research questions.

4 Preliminary Results

Parent Node: Project Implementation	
Code	Definition
Authentic Research Experience	Providing students with an immersive experience of posing research questions, designing a study, collecting, and analyzing data, and drawing conclusions based on evidence.
Community Partnership	Collaboration with organizations external to Loyola University Chicago.
Mentorship	Structured guidance from project personnel and cohort peers.
Recommendations	Recommendations for future expansion of the CARE model and for other universities to implement a similar model.
Recruitment	Project personnel conducting different strategies to recruit URM students.
STEM Education	Providing students with STEM knowledge of air pollution, R Studio, and air sensors.
Underrepresented Minority	Broadening the participation of under-represented groups by focusing on URM undergraduate students and collaborating with organizations that serve minority communities.
University Obstacles	Logistic and bureaucratic issues that project personnel navigated with the CARE program.
Parent Node: Student Outcomes	
Community Building	Students gain a sense of community and build connections with their peers.
Field Trips	Organized field trips to visit environmental organizations Southeast Environmental Task Force and Edgewater Environmental Coalition.
Professional Development	Organized activities such as Career Talks and Career mapping and other opportunities for students to acquire skills needed to excel in one's profession or career.
Program Satisfaction	Student's level of fulfillment on whether the program's objectives were clearly defined and aligned with their expectations.
Research Question	Student's specific inquiry that guided their research project.
Research Skills	A set of abilities that enable students to conduct effective research like critical analysis, data collection, collaboration, etc.

Table 1. Parent and child codes inductively derived from multiple data sources.

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5 Preliminary Results Continued

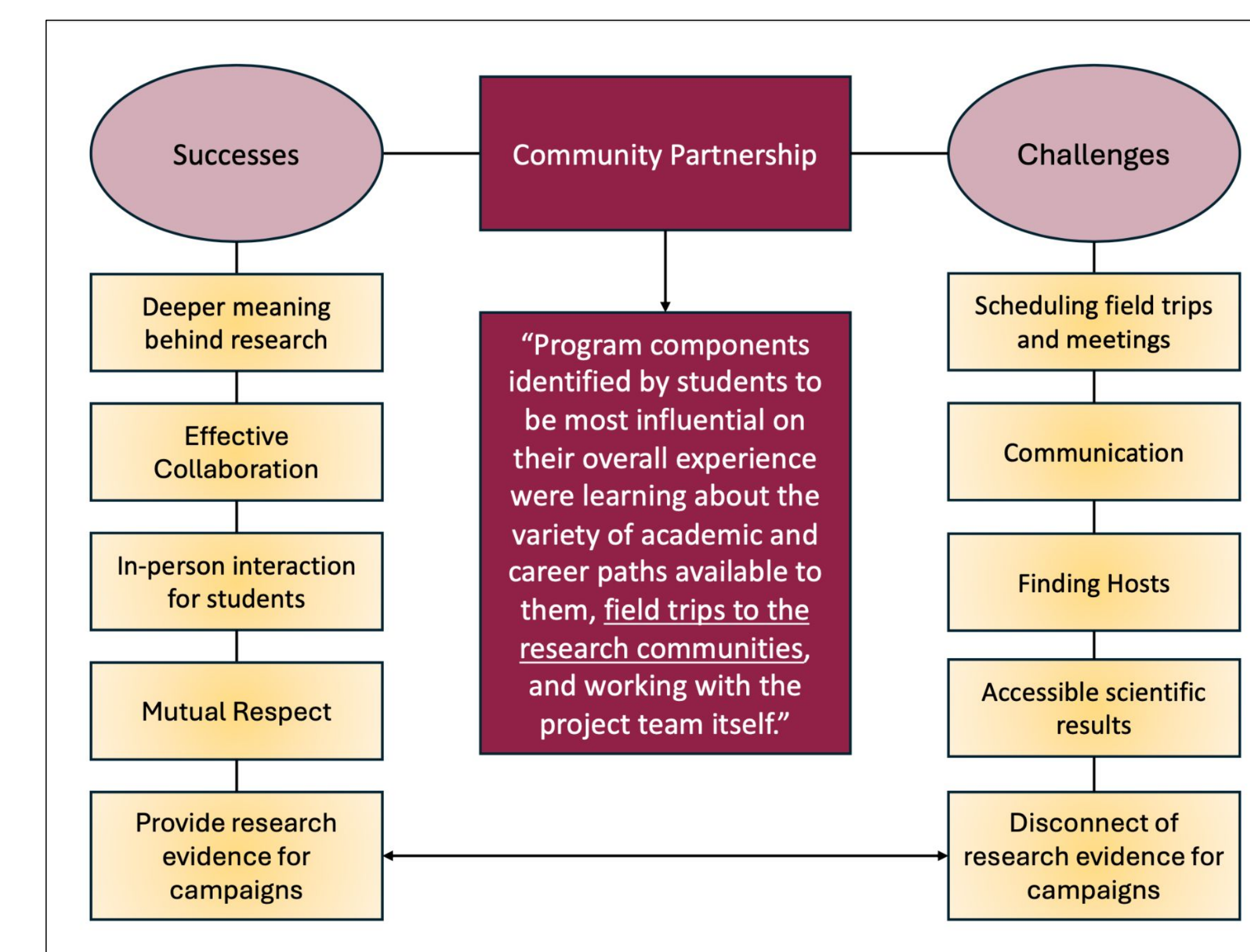


Figure 1. Success and challenges inductively derived from interview with project leaders.

6 Discussion

Preliminary results provide evidence that students engaging with community partners in prosocial research was an important element of the CARE experience. Despite some challenges, students and project leaders find this facet of the program to be influential and meaningful.

Next Steps

- Inductively code student reflections from Cohort 2.
- Conduct interviews with staff members and volunteers from CARE's community partners, Edgewater Environmental Coalition and Southeast Environmental Task Force.
- Inductively code data from interviews with CARE's community partners.
- Transition from descriptive coding to analysis of relationships evident between student outcomes and facets of the CARE's program implementation.

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