

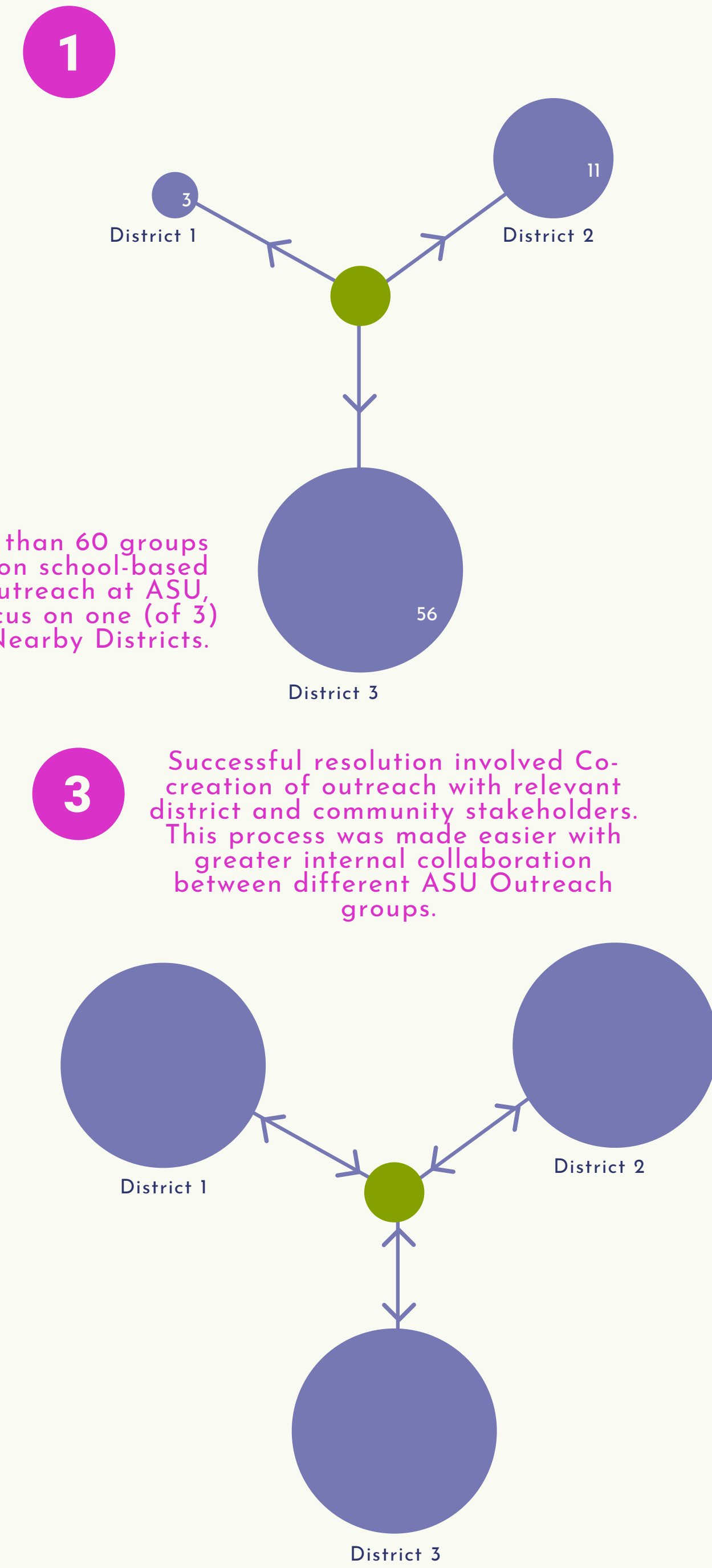
# It Takes a Village: Finding Common Ground Among Stakeholders

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## The Problem

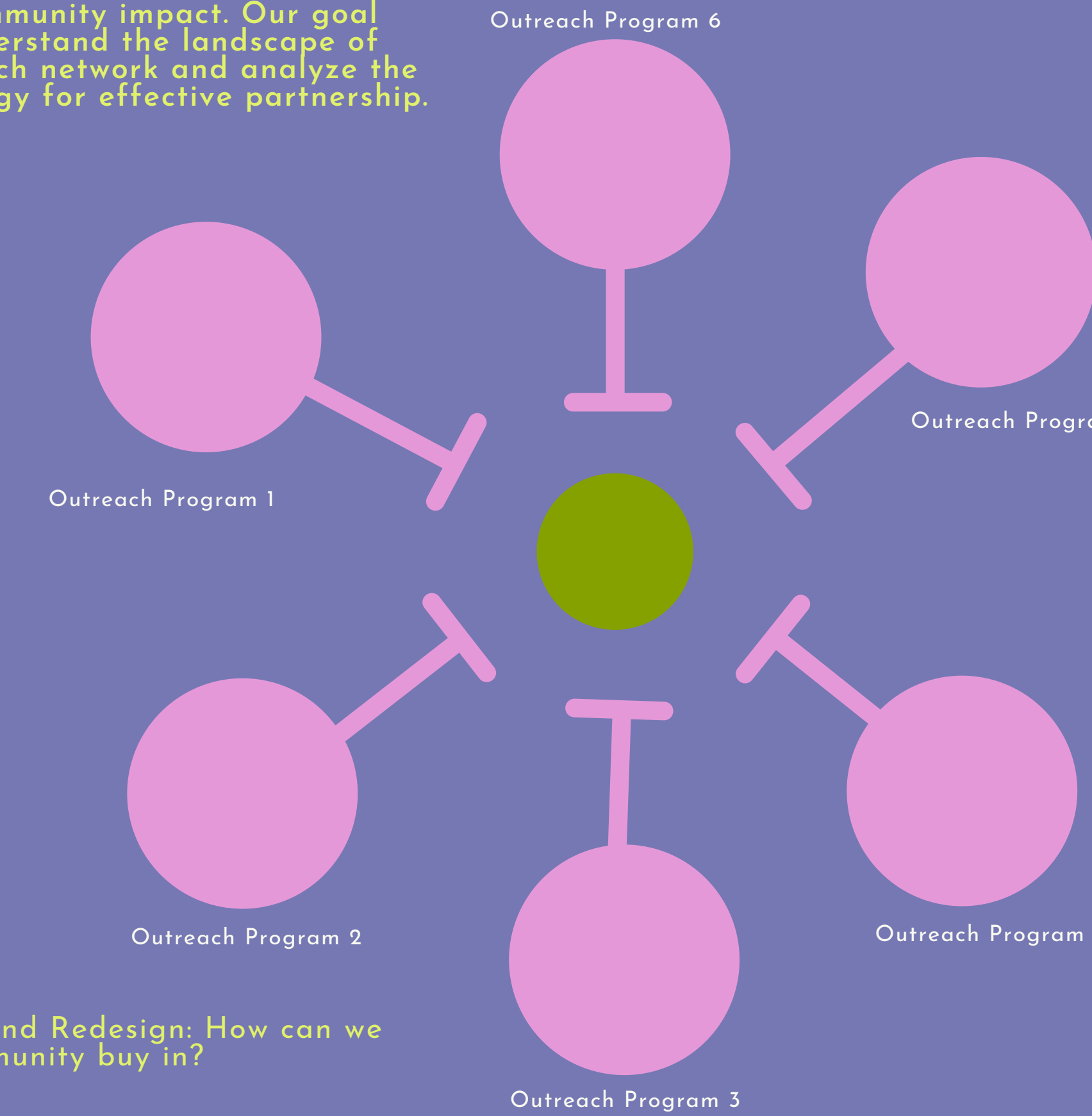
The proliferation of science outreach in the past decade has led to increased participation in STEM fields and strengthened community-university ties (1-3). While this growth is encouraging, it must occur in a way that is sustainable and equitable. While this growth is encouraging, it must occur in a way that is sustainable and equitable. In our work with graduate students at universities across the country through NCSE's Graduate Student Outreach Fellowship, we have noticed three consistent issues: Many outreach efforts 1) attempt to reinvent the wheel, 2) rarely persist for longer than five years, and 3) are often not rooted in understanding community needs. In particular, as illustrated by Figure 1, the most effective way to broaden participation in STEM may not be by solely increasing the number of outreach efforts, but instead, through a participatory research approach that focuses on local systems of science outreach and incorporates community stakeholders early in the process.



Can these lessons be applied effectively at broader scale?

## Case Study 1: Proof of concept

The Carnegie Libraries partner with multiple organizations providing community-focused science outreach. However, the problem is that, despite the high number of outreach efforts, no single outreach effort has created lasting community impact. Our goal was to understand the landscape of this outreach network and analyze the best strategy for effective partnership.



Reflect and Redesign: How can we get community buy in?

## Super STEM Program at the Carnegie Library of Pittsburgh



### How can we make community-university partnerships more impactful and sustainable?

The Super STEM program is a collaboration between NCSE, Duquesne University, and the Carnegie Library of Pittsburgh that offers monthly STEM programming that provides hands-on, inquiry based activities to elementary school children in the Hill District (Pittsburgh, PA). The program started in May 2019 and had low participation (<20 participants). In February 2020 it was determined that there was a need to shift to a participatory model that identified community need and refined programming accordingly.

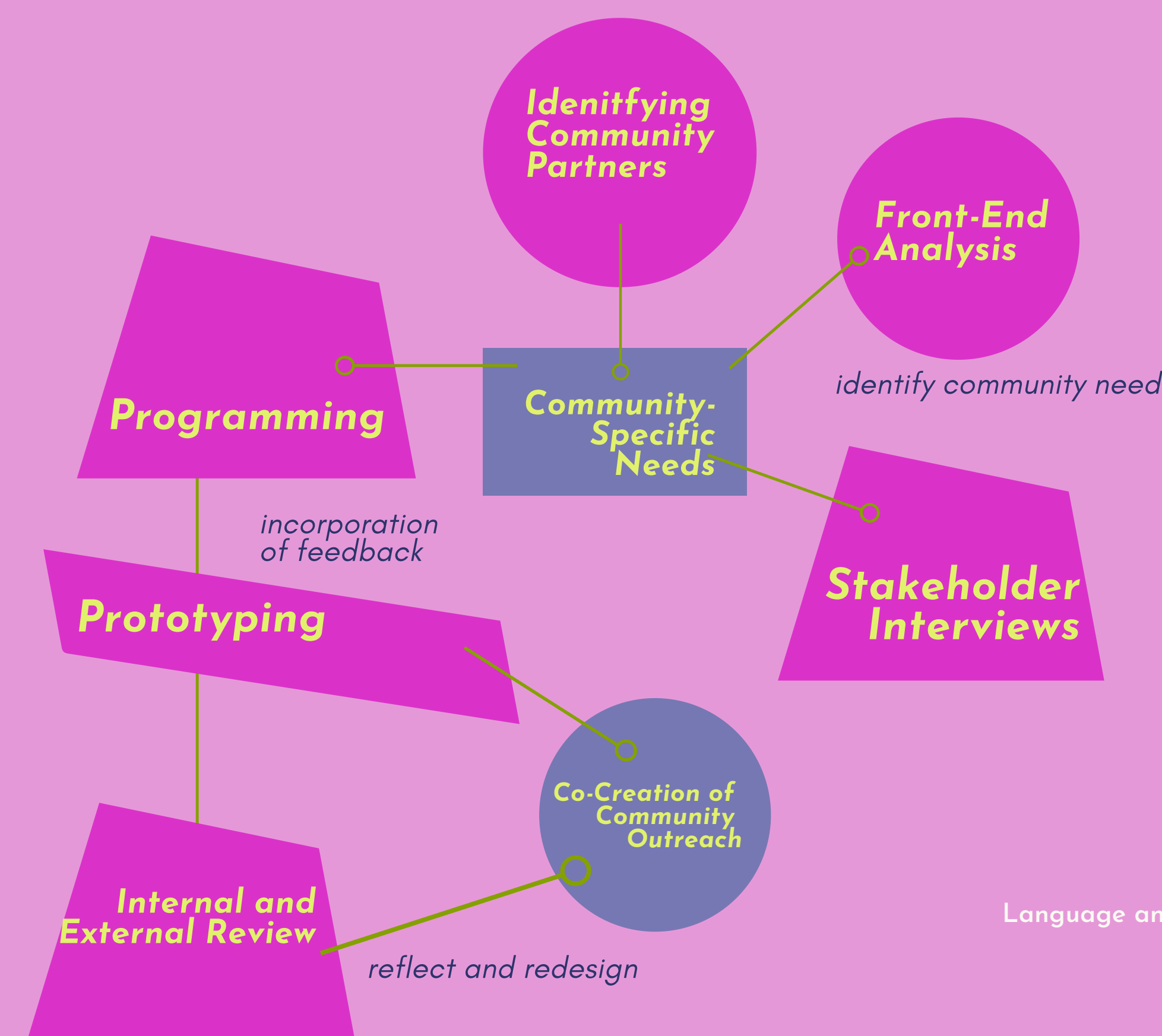


## Effective community outreach requires:

1. Early incorporation of diverse community stakeholders
2. Partnerships with pre-existing networks
3. Evaluation at all stages of planning and implementation

## Graduate Student Outreach Fellowship

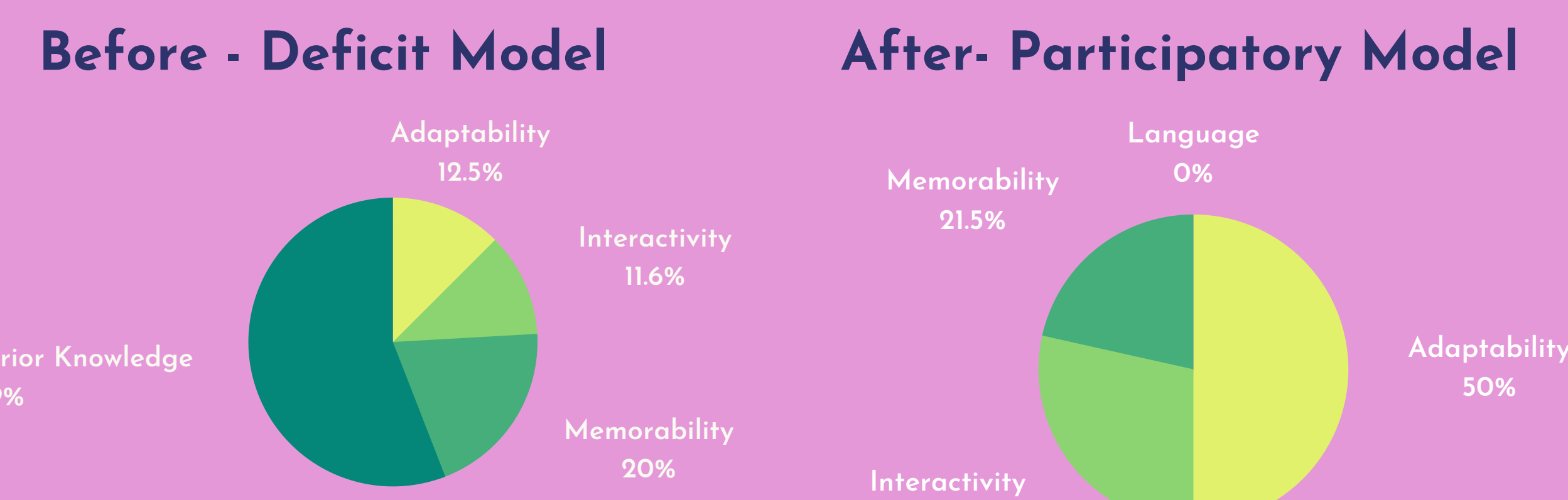
**Participatory Research:** framework where knowledge is not shared with the community through vertical transmission (e.g., deficit model) but co-created, first by understanding community needs and then by developing relevant programming with community stakeholders (4).



This logic model describes the process that Fellows take to co-create community research in their communities

### How can we help graduate students across the country connect with pre-existing infrastructure instead of creating outreach de novo?

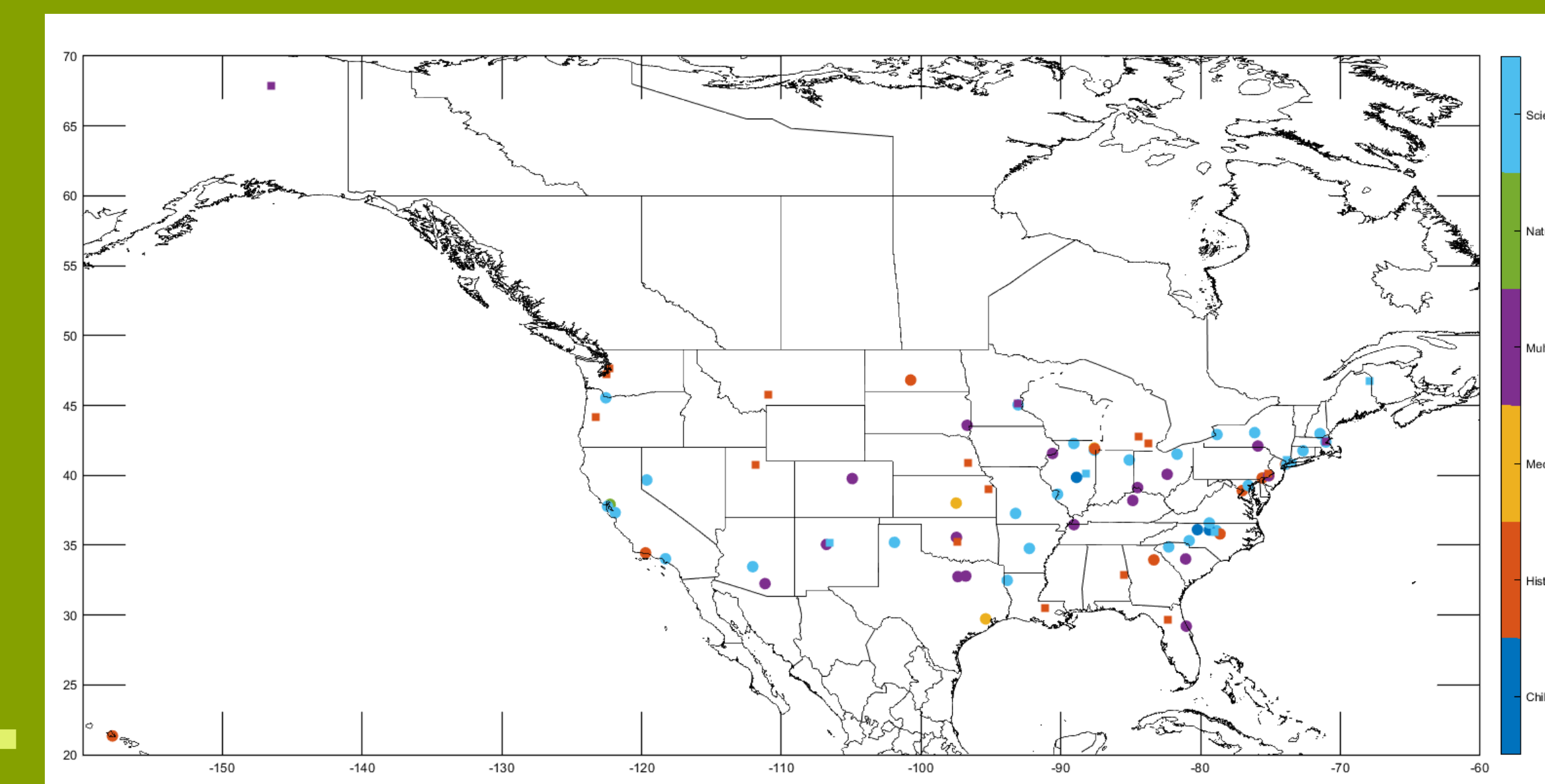
NCSE's Graduate Student Science Outreach Fellowship program (<https://ncse.ngo/breaking-down-barriers>) supports graduate students through formal training in science communication, informal science education, and community outreach. Thus far, fifteen graduate students across eleven universities have participated in the program and highlighted the diverse, often competing programs occurring in their community. This further validated the need for outreach programs that privilege a community-based perspective.



**Figure 1: What is the most important factor that contributes to good outreach?** Graduate students participating in The National Center for Science Education's Science Communication Fellowship shift their community outreach strategy after completion of fellowship from a Deficit Model to Participatory Model.

### How can we apply these lessons to national implementation of partnership projects?

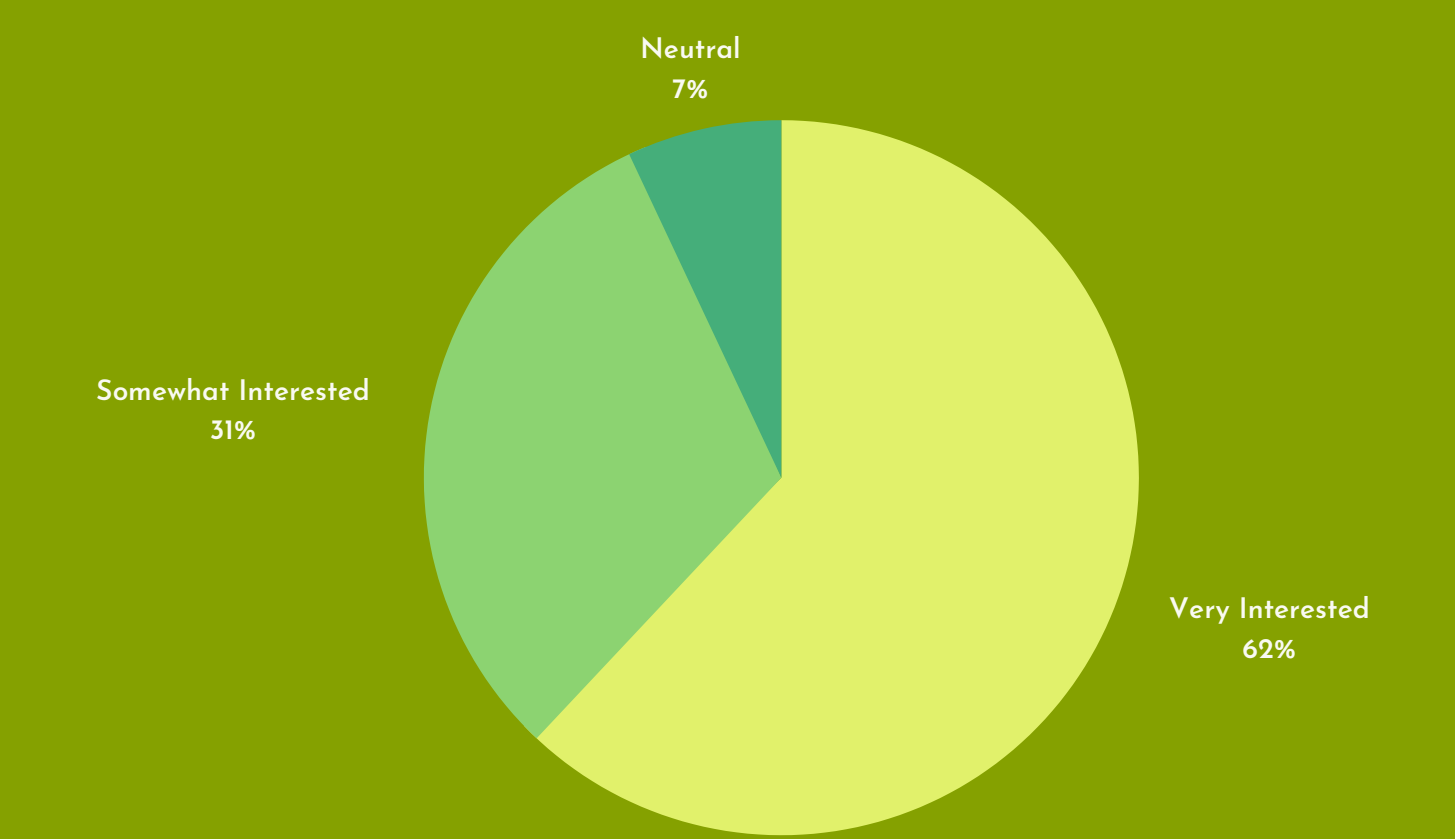
In an effort to increase genetic literacy and to provide accurate and accessible genetics content, a meta-analysis of museums (n = 604) was conducted to identify areas of the country that were lacking genetics content. Large areas of the country were identified where no genetics content was available (genetics deserts). A traveling genetics exhibit is currently being designed to address this need (<https://ncse.ngo/traveling-exhibit-promotes-greater-understanding-real-world-genetics-knowledge>). A front-end assessment was performed to assess community interest. The front-end assessment was sent to library patrons of three libraries in communities identified as genetics deserts and the responses are being used to inform content design.



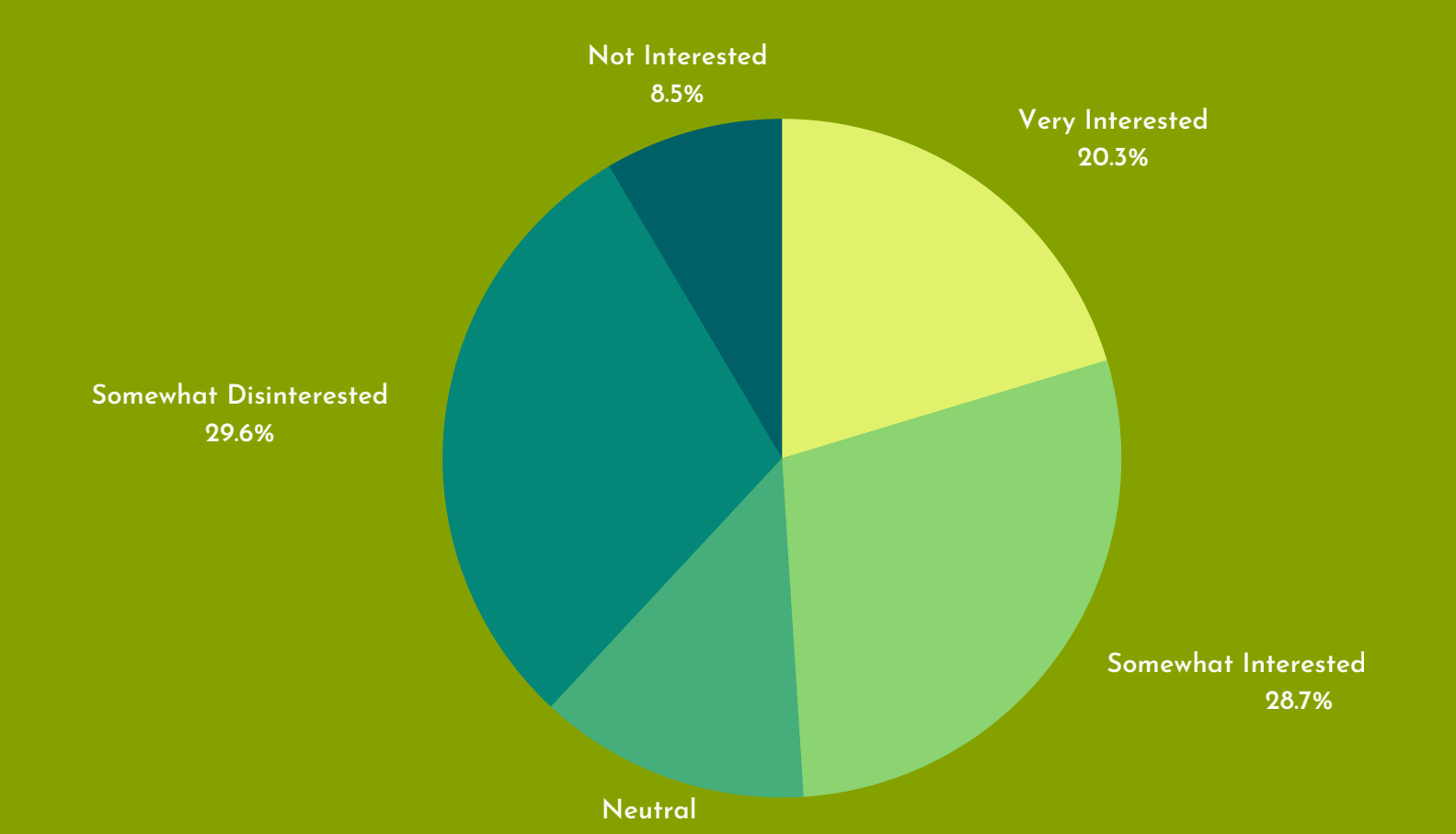
**Figure 2: Identifying genetic-content deserts is necessary to identify community need.** A meta-analysis of 604 museums across the nation revealed that only 88 museums had exhibits containing genetic content. The map above reveals the location of museums carrying genetic content and the type of museum they are (children, history, medical, science, nature, or multiple).

## Identifying Genetic Deserts: Making Genetic Content More Accessible

### Interest in Genetics and Ancestry



### Interest in Genetics Careers



**Figure 3: Front-end assessment informs traveling exhibit design.** A front-end analysis was sent to patrons at three libraries located in genetics-content deserts to identify community interests. The results showed that there was a large interest in genetic testing and ancestry (top), while there was little interest in careers in genetics (bottom).

## Case Study 2: Site-specific implementation