

# Developing Sense of Belonging in Isolation: Insights From Two Projects Supporting STEM Undergraduates

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# Presentation Outline

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1. NSF S-STEM Program Objectives
2. Overview of S-STEM Projects
3. Theoretical Underpinnings
4. Study Rationale
5. Methods & Data Sources
6. Findings – Developing Sense of Belonging in Isolation
7. Conclusions & Implications
8. What's Next?
9. Acknowledgments
10. Questions?



# NSF Scholarships in STEM (S-STEM) Program Objectives



**Increase the number**  
of low-income,  
academically talented  
students in STEM.

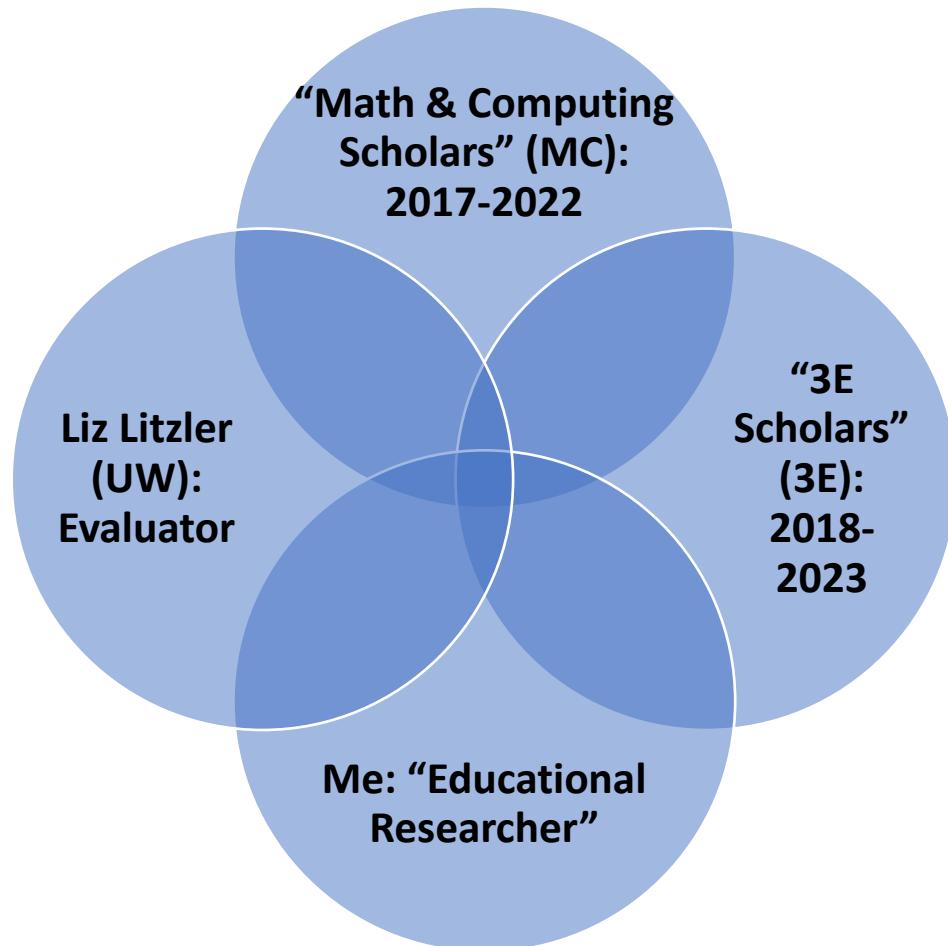
**Improve the**  
**education**  
of future scientists,  
engineers, and  
technicians.

**Generate knowledge**  
to advance understanding  
of how factors or  
activities affect student  
success, retention, and  
persistence.



# Overview of S-STEM Projects

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# MC & 3E: Key Curricular & Co-Curricular Project Activities

Summer bridge program (3E only)

First-year seminar courses

Near-peer mentoring

Targeted events

Dedicated advising



# Guiding Theoretical Framework – SCCT

## Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994)

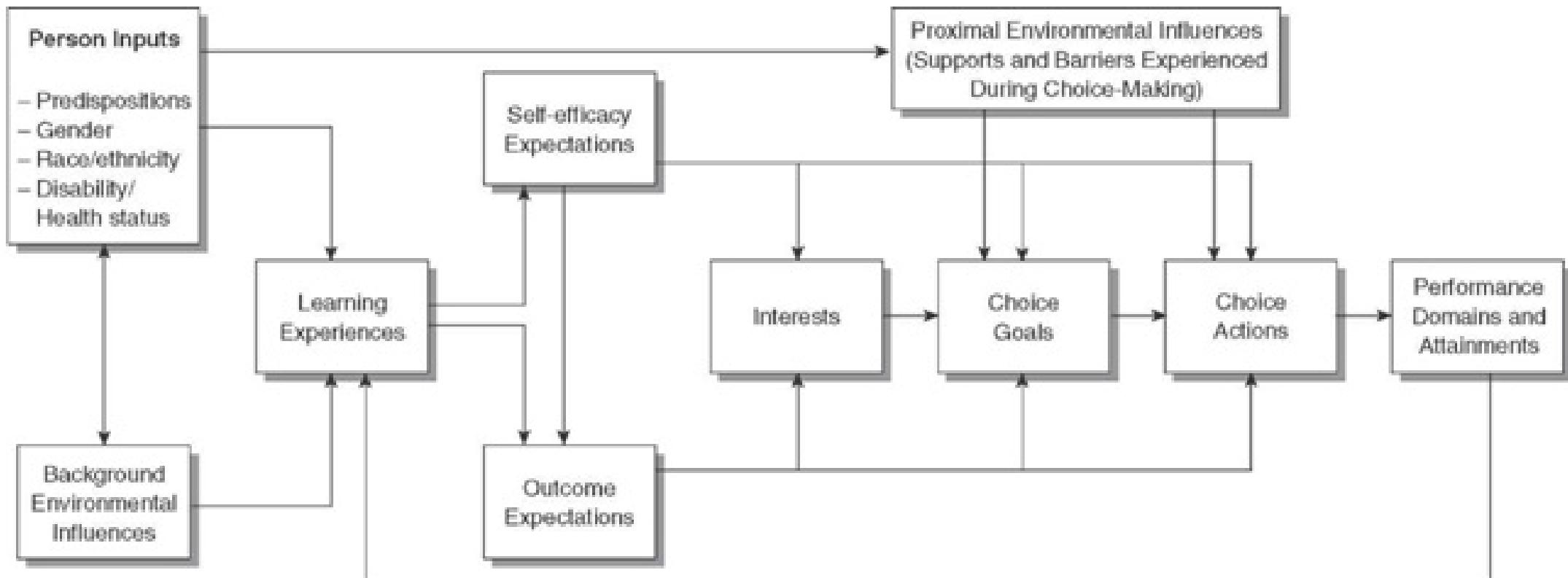
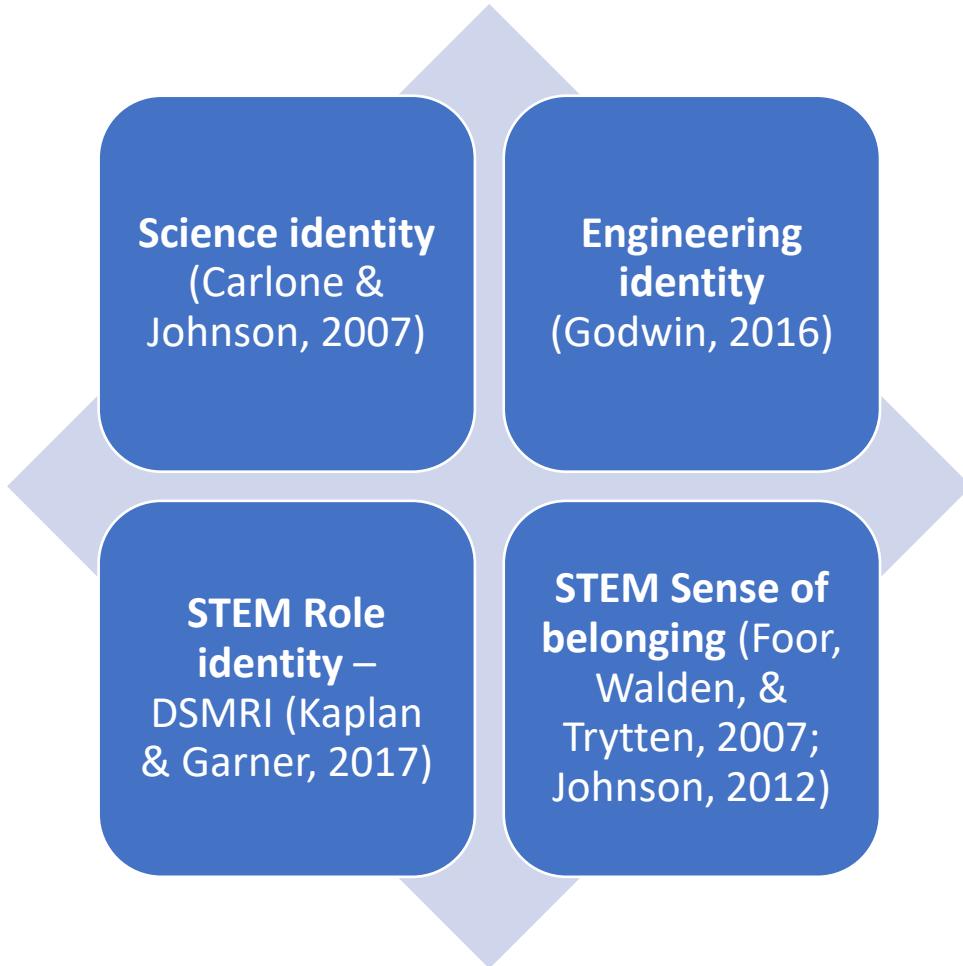


Figure 1.

A Simplified View of How Career-related Interests and Choices Develop



# Mediating variables in SCCT



## Study Rationale

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Previous findings: Both projects were successful in fostering students' sense of belonging via targeted curricular & co-curricular activities

BUT...All activities went fully virtual due to pandemic

**RQs: To what extent do curricular and co-curricular activities aimed at building community and sense of belonging among STEM undergraduates from underrepresented groups maintain their effectiveness when transitioned to a fully virtual context? Which activities appear to have the most / least influence on students' sense of belonging in the virtual context?**



# Data Sources & Analyses

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## Spring 2021 First Year Student Focus Groups

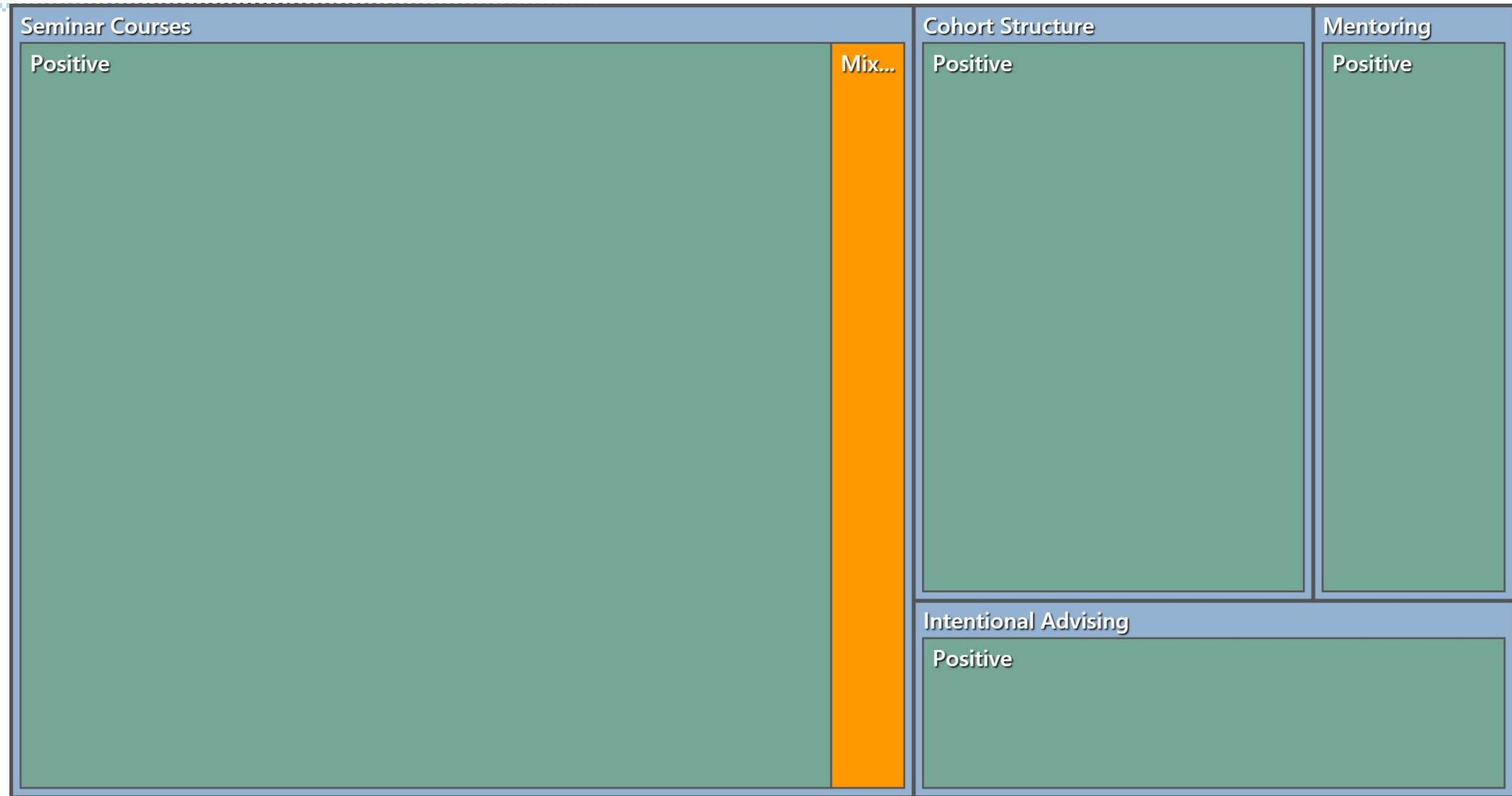
- Co-facilitated on Zoom by me + project evaluator (alternated lead role)
  - MC: 10/14 participated (9 female, 1 male)
  - 3E: 8/13 participated (3 female, 5 male)
- For 3E, students were split based on Math Placement Assessment status
- Audio recording transcribed verbatim

## Coding scheme

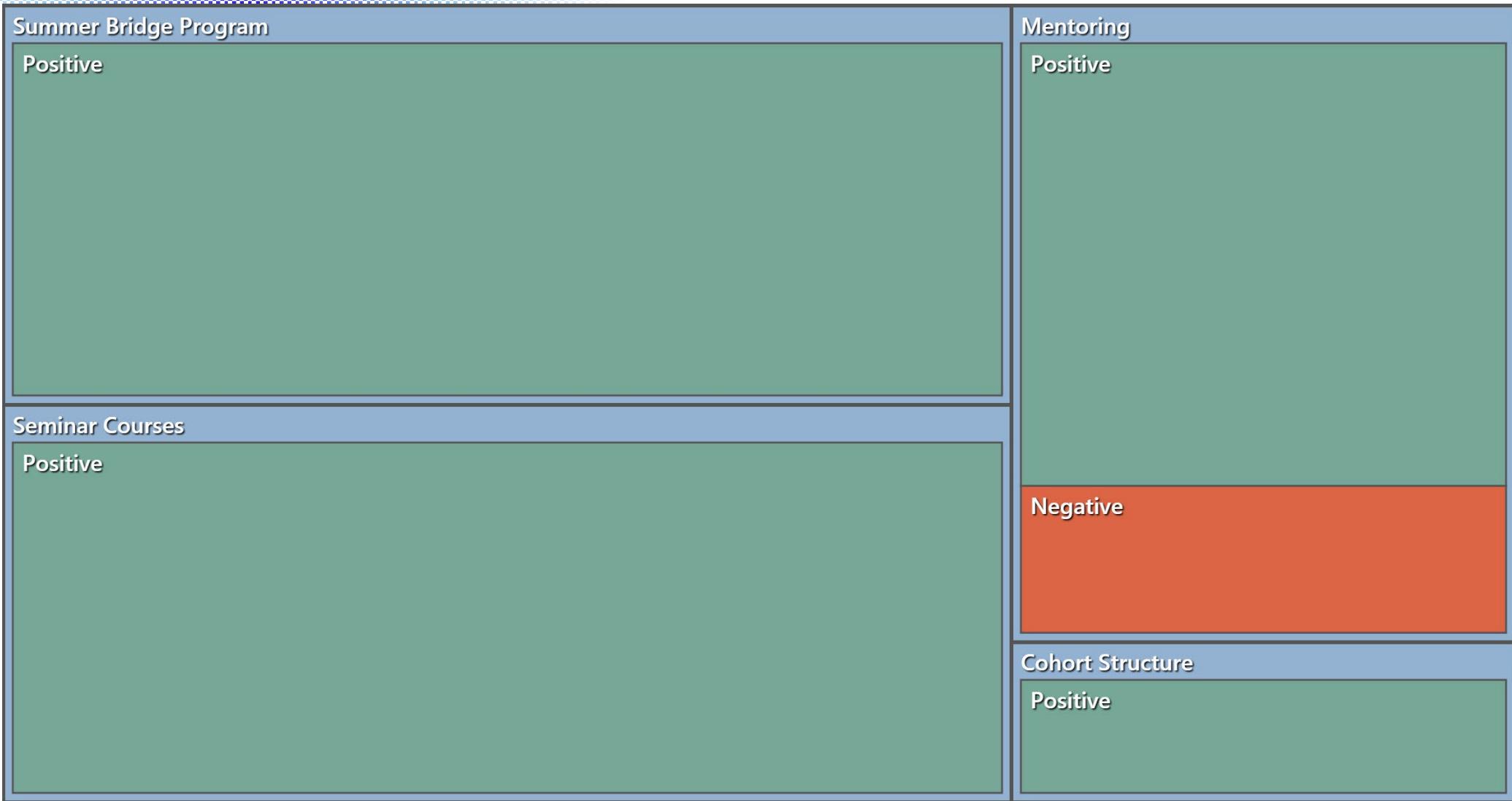
- Student mentions of specific project components / activities
- Student references to feelings of community / sense of belonging
- Sentiment analysis – Positive / Negative
- Nvivo hierarchy charts



# Student sentiment re: belonging by activity - MC



# Student sentiment re: belonging by activity – 3E



## Student Quotes – Positive Sentiment

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**MC student comment about seminar:** *“I would have felt lost without it fall quarter, the community was amazing and helped me make the transition to college so much easier and fun. And staying at home, it was great being able to form bonds with each other.”*

**MC student comment about mentoring\*:** *“I don’t know if this would be the answer in a normal year but, for me, this year, one of the best things about the program is another human being. I’ve been very grateful for another human being that I’m obligated to interact with in my life.”*

**\*NOTE that student was able to meet mentor in-person.**



## Student Quotes – Positive Sentiment

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### 3E student comment about bridge program + seminars:

*“I think it really helped me like get my foot in the door, like socially because I was like well it’s all online and I’ve met no one, but by the first day of like actual classes, I was like I already know these people, and we have little jokes and stuff on. And it was not like a forced group, but like I was paired up with people who were more like me than just random people like we had, at least, you know, a couple things in common, which I really needed.”*



## Student Quotes – Negative Sentiment

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**3E student comment about mentoring:** *“I think at the end of the day it boils down to how similar you are or how much they want to help you and, like the effort that goes into the relationship. Obviously, I think those factors are, I think they derail the relationship now during COVID, especially since you’re meeting with them through a screen. And I feel like, if it were in person, maybe it would be easier to talk to them and sort of build a mentor-mentee relationship like that.”*



## Conclusions & Implications

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Targeted curricular & co-curricular activities helped boost 1<sup>st</sup>-year students' sense of belonging even in a fully virtual context

In some cases, these activities offered person-to-person interactions available to otherwise highly isolated students

Findings suggest these types of activities could play important role in supporting student success within fully virtual or hybrid degree programs



What's next?

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MC: Mentoring & STEM  
identity paper – IJSTEM?

3E: Bridge program & math  
identity study – ASEE



## Acknowledgements

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# Questions?

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