



Collaborative Research: Co-designing for State-wide Alignment of a Vision of High-Quality Mathematics Instruction



Katie Schwartz (1), Holt Wilson (2), Allison McCulloch (3), Michelle Stephan (3), Katie Mawhinney (4), Olufunke Adefope (1), Christine Fisher (2)
(1) East Carolina University, (2) UNC Greensboro, (3) UNC Charlotte, (4) Appalachian State University

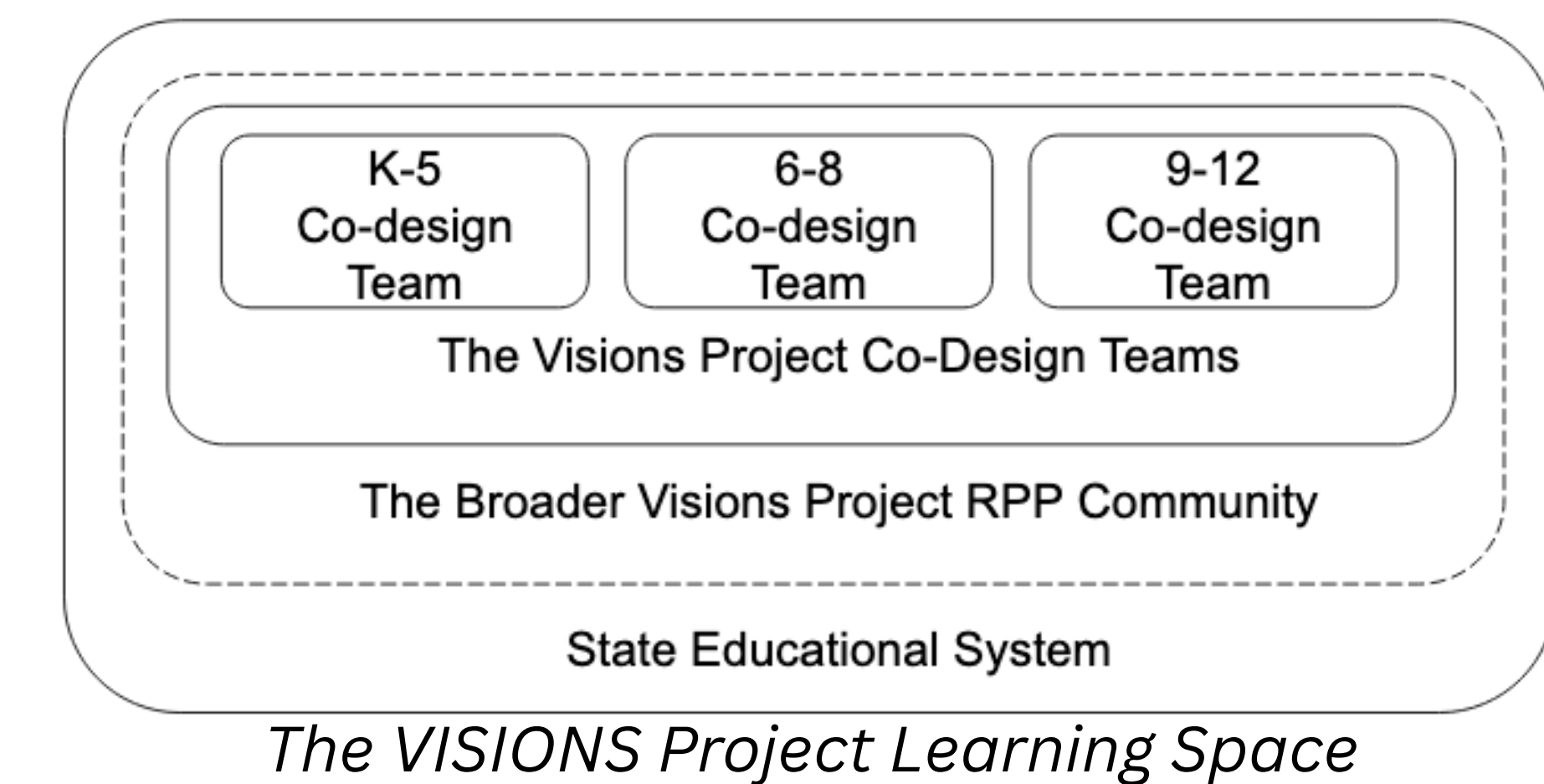
The VISIONS Project Overview

The North Carolina Collaborative for Mathematics Learning (NC2ML) research-practice partnership (RPP) VISIONS project aims to develop an empirically supported design framework and methodology that promotes systemic coherence of large scale implementation initiatives by:

1. investigating the visions of high quality and equitable mathematics instruction (HQEMI) held by educators at different levels of a state educational system,
2. the extent to which those visions are shared, and
3. how the visions mediate and are mediated by the co-design and uptake of implementation resources.

The Collaborative

- Formed in 2016 to support the implementation of new math standards
- Includes researchers from 10 universities, math educators from the state education agency, and over 300 district and school based leaders and teachers
- Over 70 co-designers - split into grade band teams - have come together each summer since 2022 to collaboratiely design resources to promote a state-wide shared instructional vision
- The project used design research as a methodology for the design of individual resources as well as for the overarching professional learning infrastructure



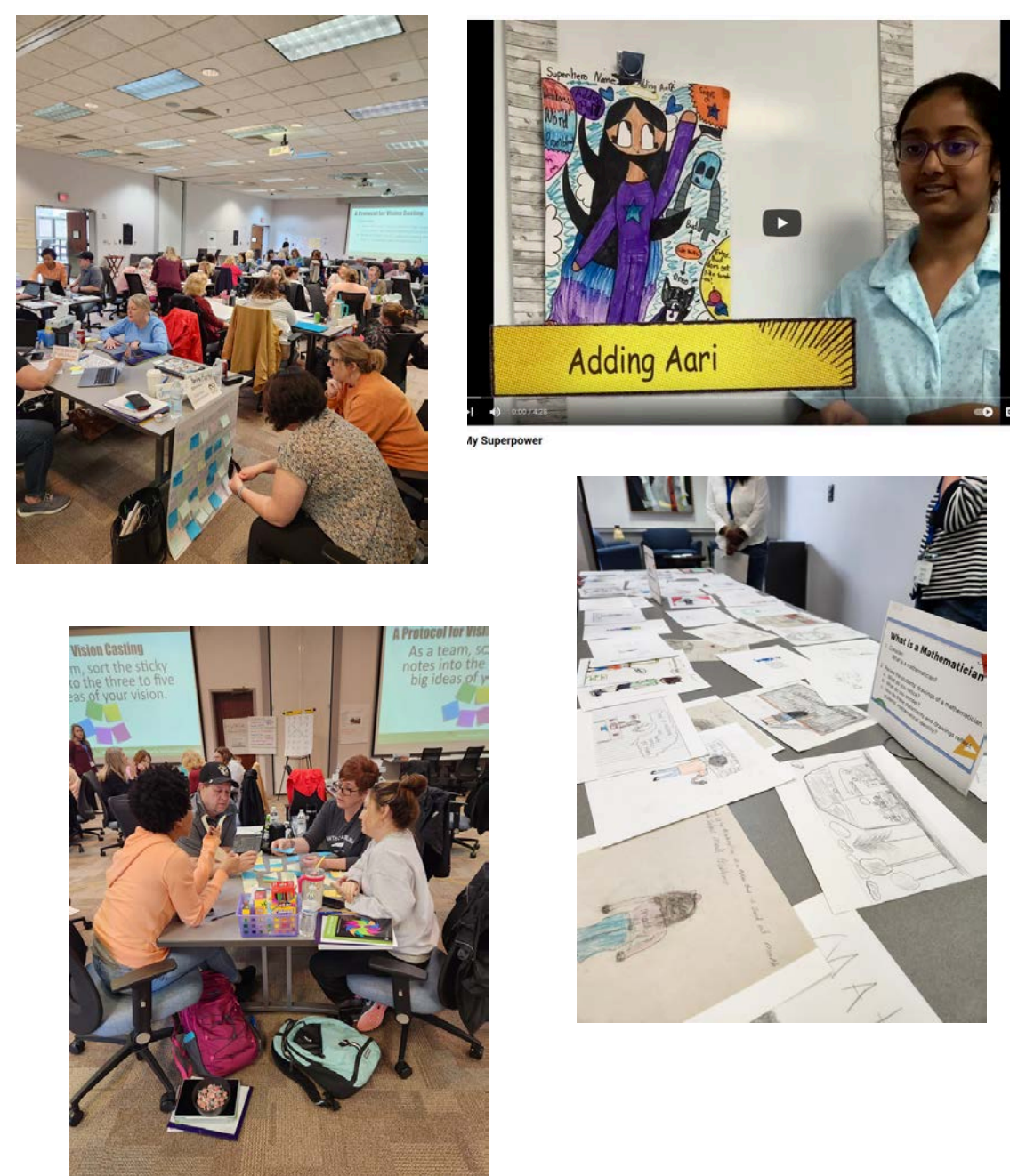
Co-Designing Toward a State-wide Coherent Vision of High Quality Math Instruction

K-5 Co-Design Efforts

Problem of Practice: All education stakeholders need access to networking and rich learning experiences to develop and enact shared vision of teaching through problem-solving for each and every student to have conceptual understanding and procedural fluency in mathematics.

Resources

- State-wide leadership retreats focused on developing a shared VHQEMI
- Webinar series with NCDPI
- RP Briefs focused on identity development, classroom community, and building procedural fluency from conceptual understanding

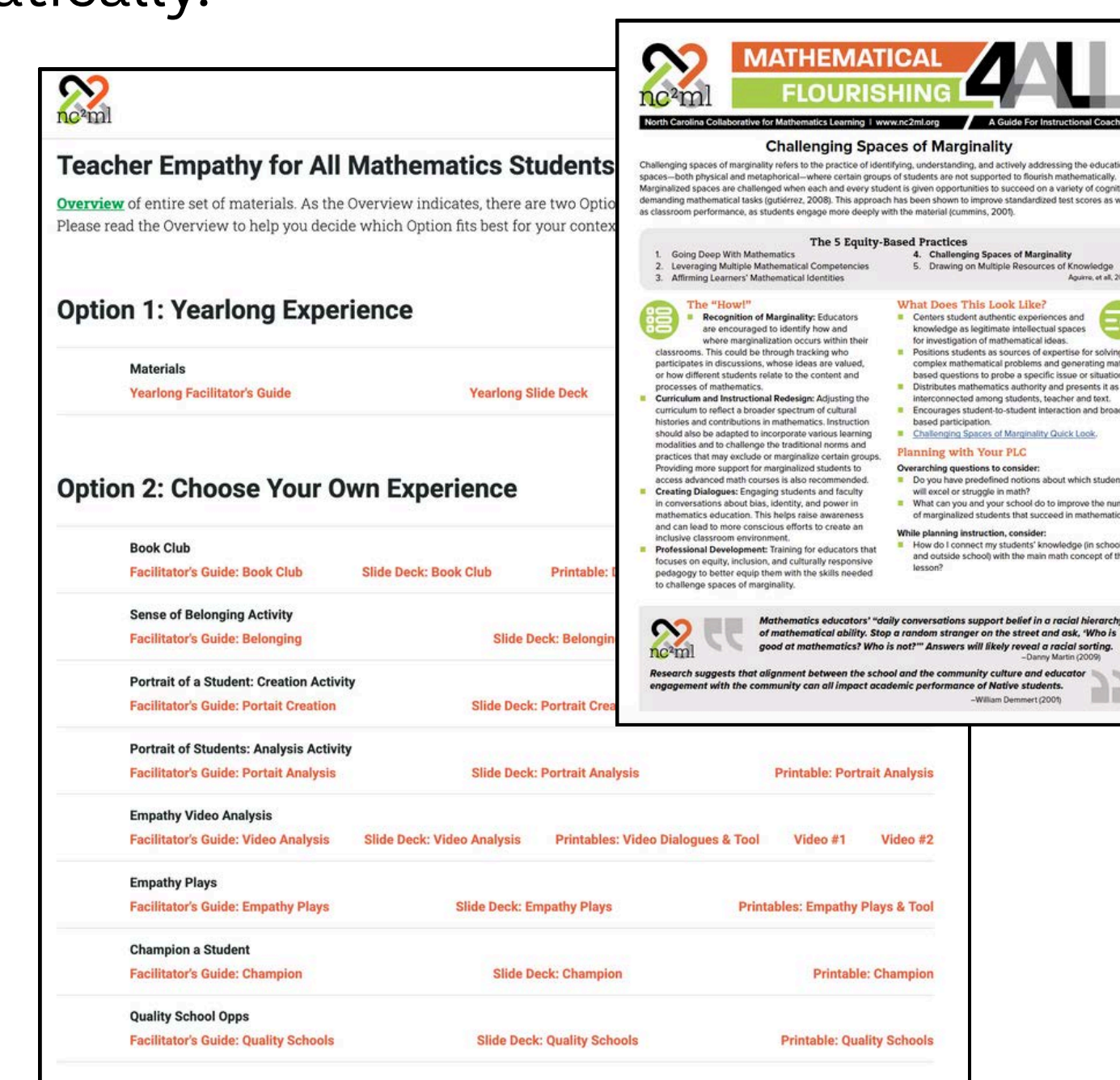


6-8 Co-Design Efforts

Problem of Practice: Due to a variety of individual, local, and systemic policies, practices and visions, NC Instructional leaders have not been adequately equipped to support each and every teacher and student to flourish mathematically.

Resources

- Professional learning materials focused on empathy for all mathematics students
- Professional learning materials focused on growing mathematical mindsets for all
- Professional learning materials focused on characteristics of HQEMI

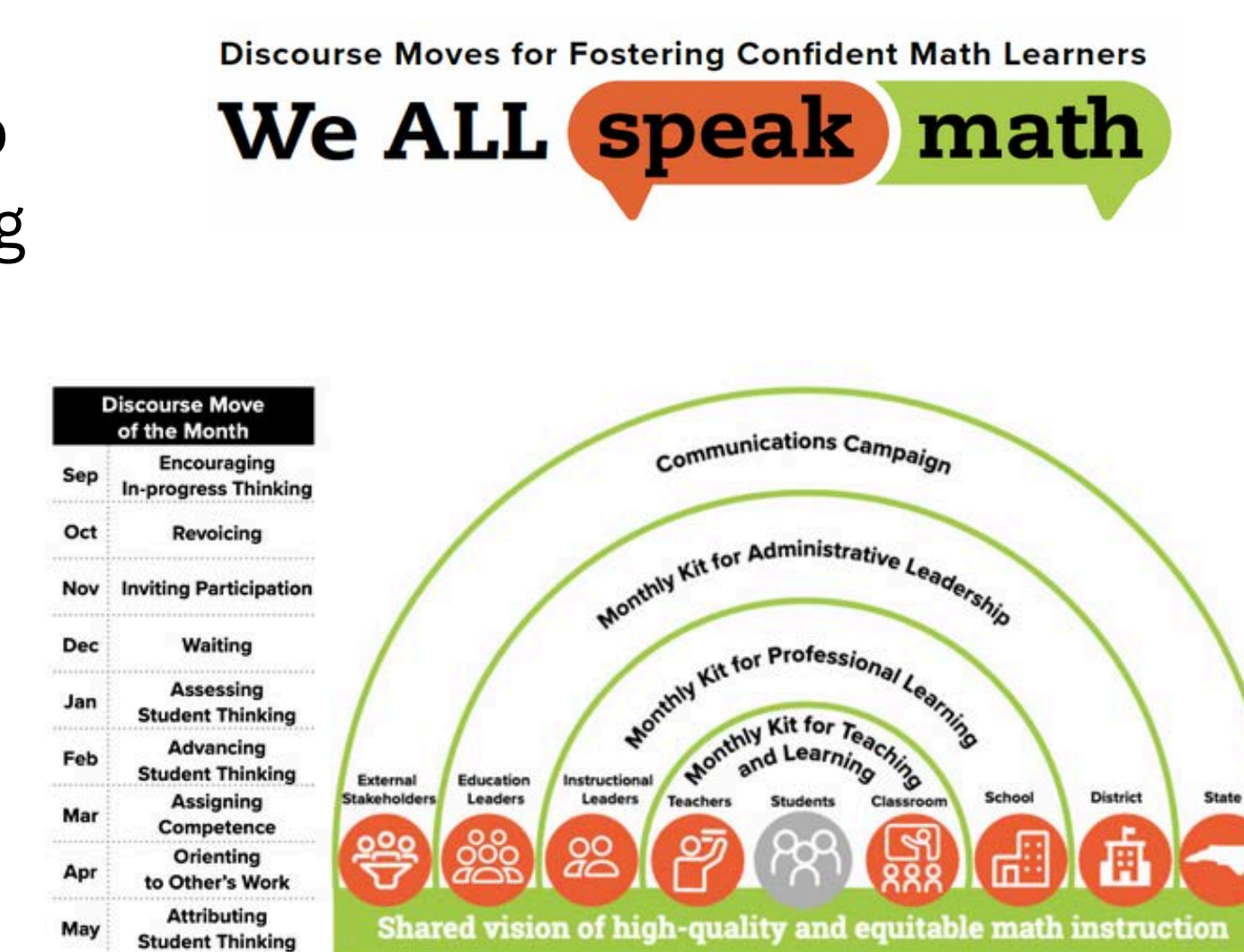


9-12 Co-Design Efforts

Problem of Practice: Each and every NC student deserves to experience engaging and high-quality math instruction fostering confident mathematicians that flourish in and through mathematics.

Resources

- A state-wide campaign that aims to create enthusiasm for collaborating as a state math education community to improve mathematical discourse in HS classrooms and develop a shared vision and enactment of HQEMI.
 - 3 sets of tool kits for each of 9 discourse moves
 - a monthly blog / newsletter
 - the Amplifying Voices podcast series



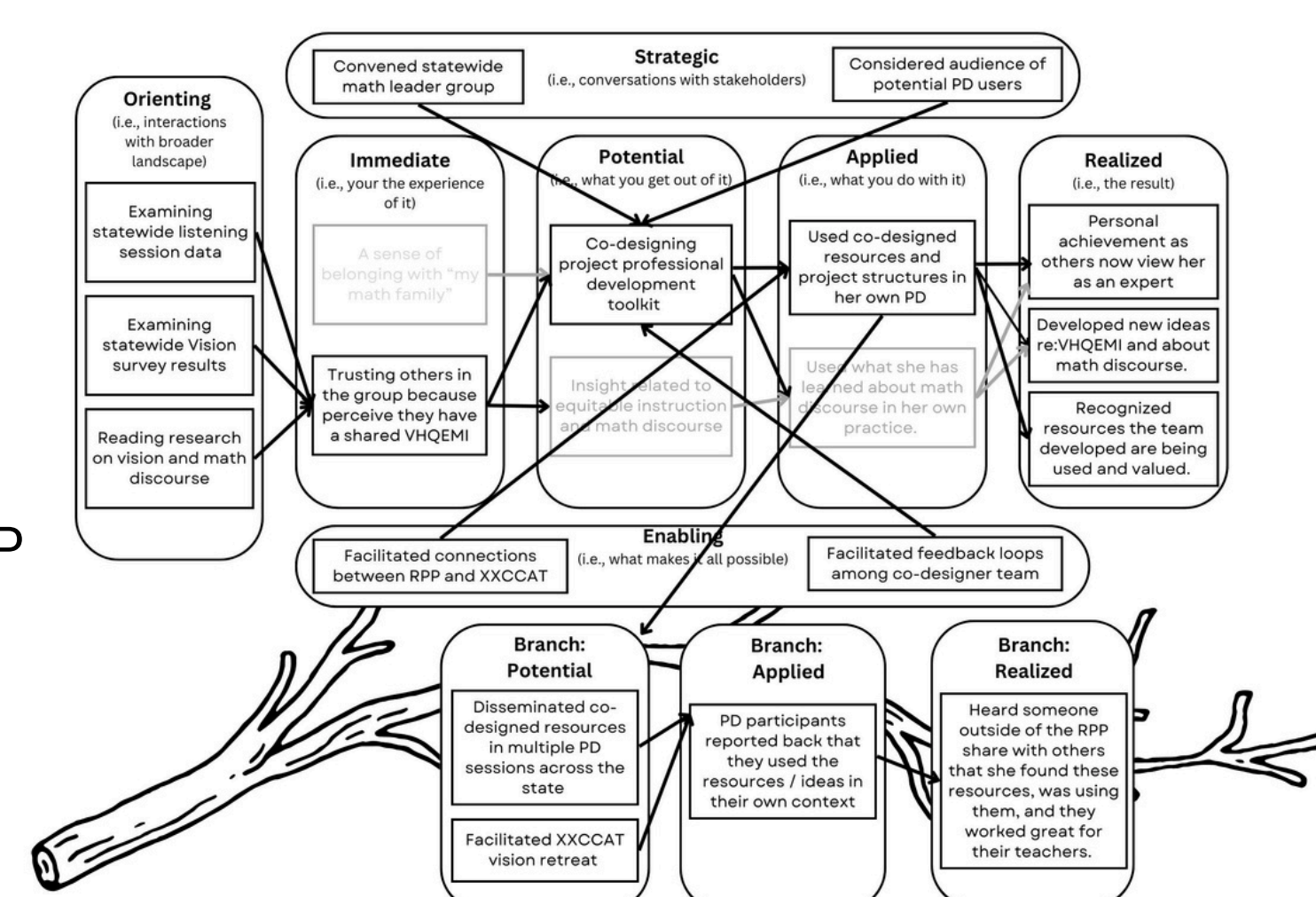
To date, these resources have been accessed more than 198,000 times by educators from all 115 school districts in the state. Learn more and access all of the co-designed resources at nc2ml.org.

Goal: To understand how the project co-design efforts generated and translated value for a coherent statewide VHQMI

We have adopted Wenger - Trayner & Wenger - Trayner's (2020) Value Creation in Social Learning Spaces framework to study individual, collective, and organizational learning in our context. Specifically, we conceptualize learning as the creation of value for a shared, research-based VHQEMI within the social learning space.

Methods Overview:

- We collected value creation stories from co-design team members (interviews), broader RPP community members (written stories through a questionnaire), and the "branches" (i.e., where value flows into a new learning space) they created (written stories through a questionnaire).
- Data is being analyzed using Trayner & Wenger - Trayner's (2020) value types as a coding scheme, then stories are mapped (see example), and maps will be compared to identify themes.
- In addition, we are currently analyzing a data from a state-wide survey that included questions to identify value generation and translation.



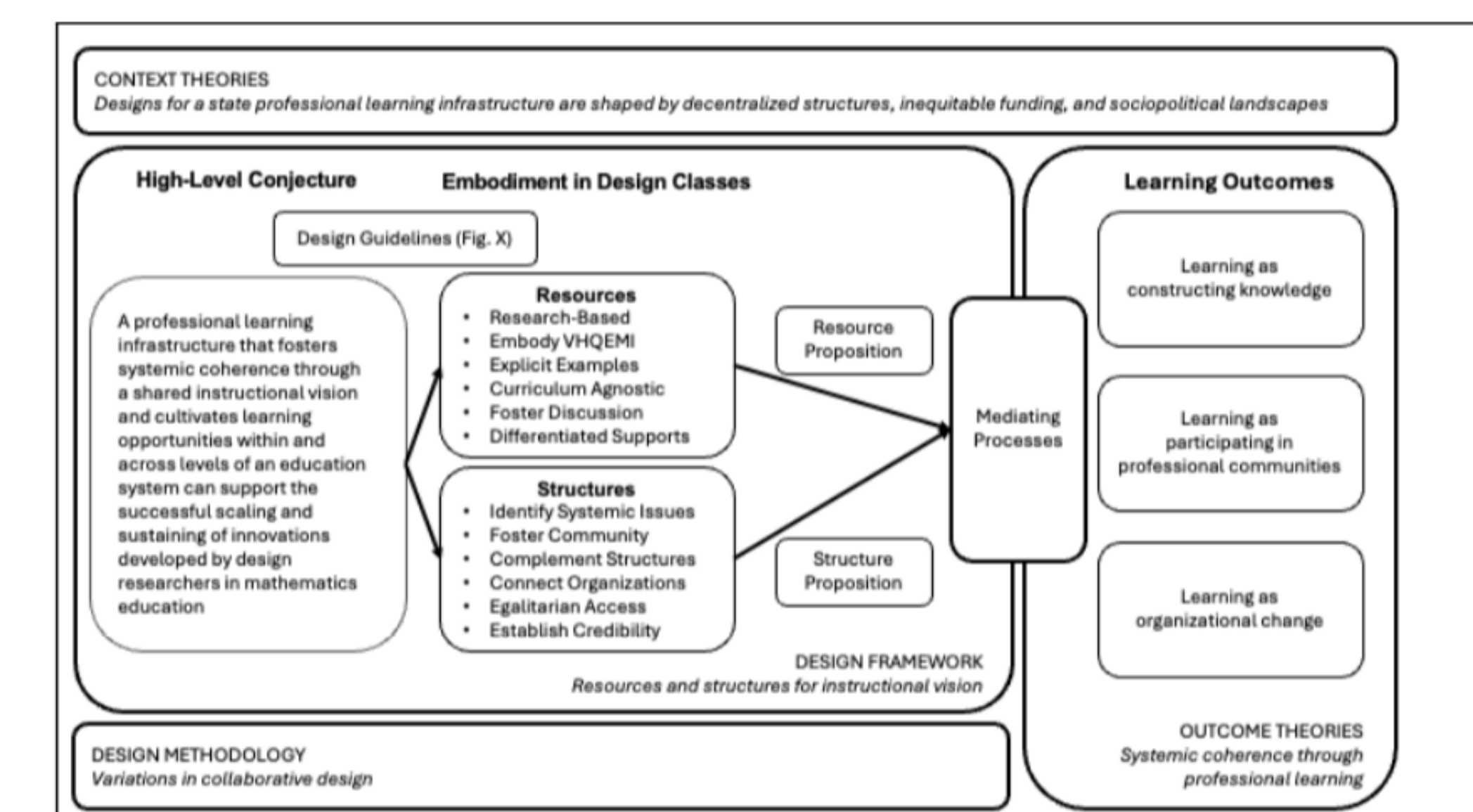
Example of a Value Mapping
McCulloch et al., (under review)

Goal: To develop an empirically supported design framework for developing professional learning infrastructures

We are working toward developing and iteratively refining a design framework for developing a learning infrastructure within an education system that serves as a guide for enabling, supporting, and coordinating learning across an education system.

We are using adapted conjecture maps (Sandoval, 2004) to articulate and investigate our context theory, outcome theory, design methodology, and design framework.

Ultimately, we aim to refine our theories and disseminate the framework along with a toolkit of recommendations / activities to support other RPPs who wish to engage in large scale STEM implementation initiatives.



Our Framework for Designing a Learning Infratructure
Wilson et al. (accpeted)