

# Examining the Development of Adaptive Expertise of Mathematics Language Routines

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## Introduction

**We share a framework around mathematics language routines (MLRs), core practices, and adaptive expertise.** This framework will be used to collect and analyze data in the coming four years of this CAREER project. The overall research question guiding this project is: *How do professional learning communities (PLCs), teachers, and students develop the adaptive expertise to make MLRs part of their regular practice?*

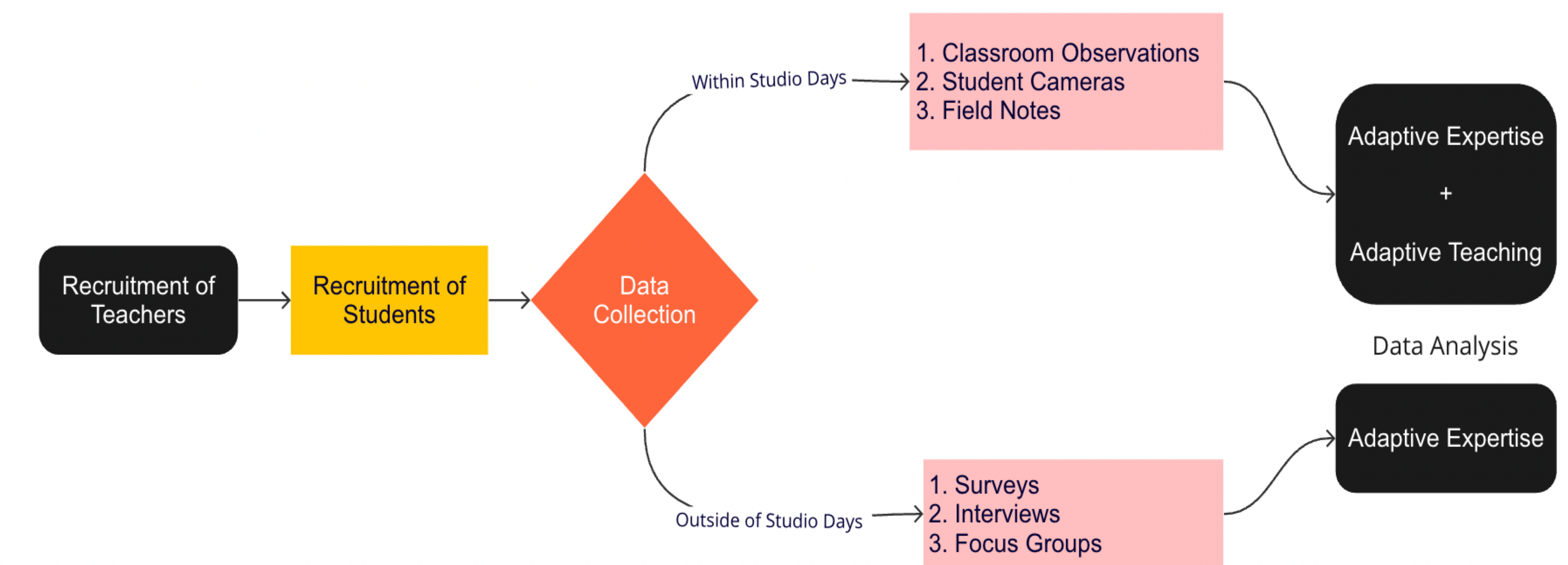
## Framework – Adaptive Expertise, Adaptive Teaching, Core Practices, Mathematics Language Routines

- **Adaptive expertise** is defined as “both the ways people approach a domain and the kind of reasoning they engage in within it” (Baldinger & Munson, 2020, p 2).
- Teachers with adaptive expertise use their knowledge of their students as they adapt their practices and curriculum to promote student learning (Beltramo, 2017).
- Teachers who possess adaptive expertise are able to scaffold students’ mathematical development through the use of effective instruction and appropriate assessment tools, based on the content they are learning and the context of the students and school environment (Heinze et al., 2009).
- We draw on Yoon et al.’s (2019) categories of:
  - **Flexibility:** exhibits an awareness of students, particularly multilingual learners and context, as related to MLRs;
  - **Deeper level of understanding:** brings in variations related to the MLRs and consider affordances and constraints of the MLRs; and
  - **Deliberate practice:** demonstrates motivation, focus, and repeated effort to monitor their practice and devises and subsequently attempts improved implementation.
- We draw on adaptive teaching (Ankrum et al., 2020) to better understand teachers’ in-the-moment adaptations.
  - We consider adaptive teaching with MLRs to be an observable practice – and evidence – of teachers who have developed adaptive expertise with MLRs.

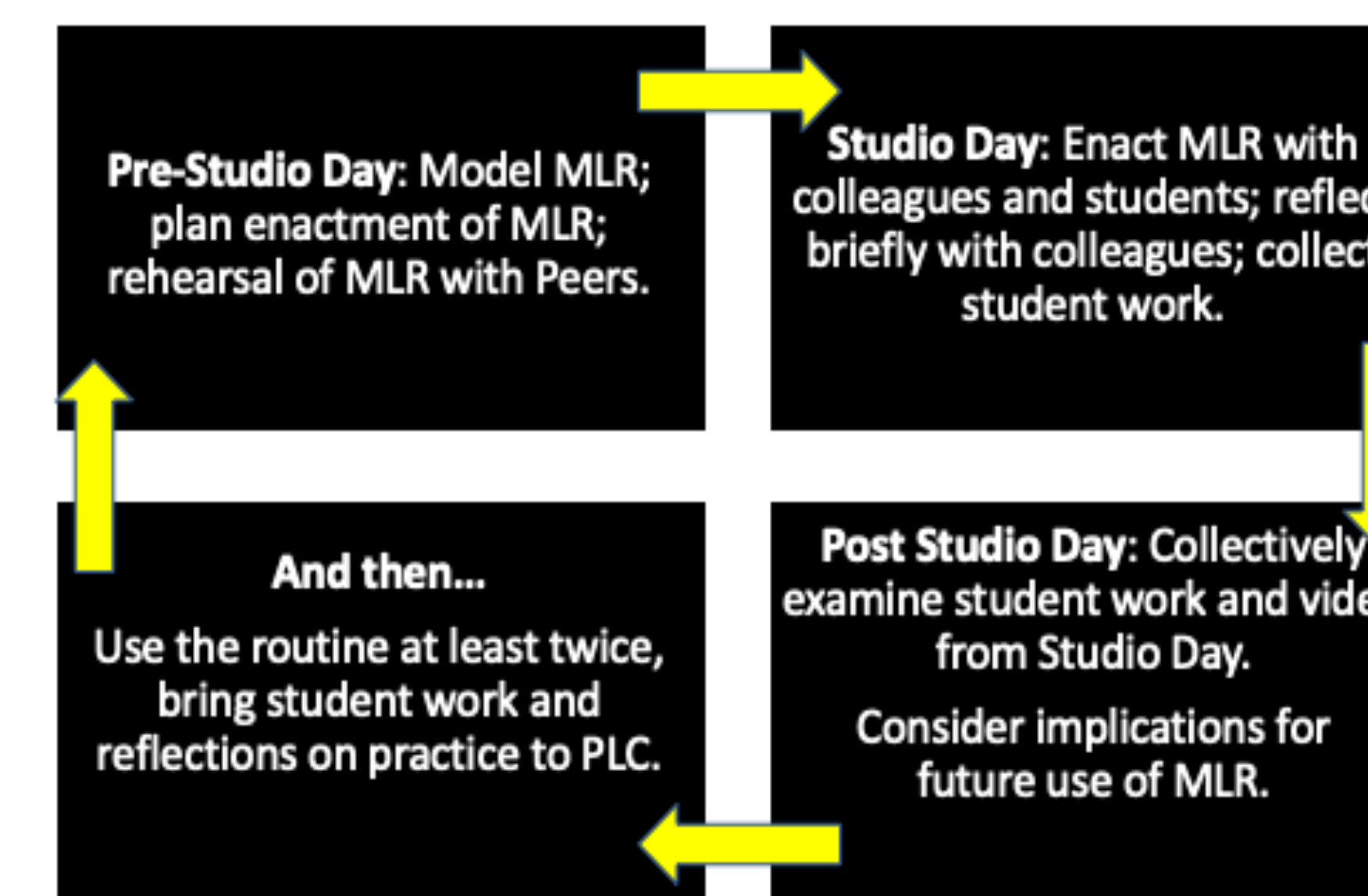
## Methodological Next Steps

Future data collection involves: (1) observing teachers and students during the enactments of Mathematics Language Routines (MLRs) within the Studio Days, and (2) prompting students and teachers to reflect on the enactment of the MLRs through surveys, focus groups, and one-on-one semi-structured interviews.

**Figure 1**  
Overview of Data Collection & Analysis



**Figure 2**  
Structure of a Studio Day Cycle



**Figure 3**  
Mathematics Language Routines



## References

