

Expanding What We Notice When Observing Mathematics Instruction: Operationalizing the 5Rs Framework for Use in Undergraduate Mathematics Instruction

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Our Lesson Study (Cerbin, 2011; Lewis et al, 2019) group of mathematicians and mathematics educators adapted and operationalized the 5Rs framework for promoting equitable norms and culture in mathematics (Sears, 2021) in the context of studying undergraduate geometry courses (Boyce et al, accepted). The 5Rs —Responsibility, Relationships, Relevance, Responsiveness, and Rigor (Sears, 2021)—refer to critical aspects of equitable mathematics teaching that instructors of prospective teachers should model to inform their future practice. This research aims to understand how instructors can adapt and use a 5Rs observation instrument to promote equitable norms and culture. In this poster, we describe our process of operationalizing the framework for observations of courses that serve a variety of audiences (e.g., PSTs and STEM majors) and instructor backgrounds.

The observation instrument includes two components for each R: a description of the construct and protocol questions to guide observations. The process of creating and revising these components consisted of three cycles, each consisting of (1) coming to shared understandings of individual Rs' meanings and relationships amongst Rs, and (2) posing and testing construct descriptions and observation protocol questions to determine the extent to which they align with our shared understandings of the 5 Rs. In the first cycle, we maintained the original descriptions of the Rs' meanings from Sears (2021) and developed a set of 20 questions, some of which attempted to simultaneously address multiple Rs. Upon testing that protocol with a lesson observation, we experienced multiple tensions, such as the degree to which we maintained fidelity with the original descriptions; we felt that it was necessary to allow for clarifications and ways to embrace common understandings associated with the terminology. For example, for "Rigor," we noted that the Dana Center (2019) has written about different interpretations of that word, and scholars have identified connections between Rigor and Relevance (Daggett, 2014). In the second cycle, we revised the descriptions of the Rs and created new questions to address only a single R at a time, attempting to resolve the tensions we experienced after the first round. In the third (ongoing) cycle, we have been more deliberate about group members' roles and responsibilities in the testing of the protocol and analysis. Pairs of group members asynchronously analyzed a single lesson, focused on a single R. Subsequently, other group members met synchronously to identify commonalities, themes, and learning opportunities from their peers' observations. The poster will present the current form of the protocol as well as highlights of our learning from creating it.

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