

## Purpose and Significance

The purpose of the VEAR-MI project is to extend previous validation work on the Equity and Access Rubrics for Mathematics Instruction (EAR-MI) to construct an interpretation/use argument (IUA; Kane, 2016) for this classroom observational instrument. Our systematic investigation includes the evaluation of: training materials and procedures, data collection protocols, scoring decisions, and appropriate interpretations of the scores generated by the EAR-MI.

Significance: The EAR-MI identifies, decomposes, and provides images of practices that support students who have been historically marginalized. Before the instrument is used widely, the work of this study will determine the criteria for its use by systematically evaluating the validity of the inferences and claims that can be drawn from the data. The project will also contribute empirical findings that directly connect practices theorized to be important for students with concrete outcomes.

## The Equity and Access Rubrics for Mathematics Instruction (EAR-MI)

The EAR-MI:

- Measures practices aimed to support historically marginalized students to substantially participate and achieve in mathematics classrooms.
- Has 11 rubrics, 1 per practice.
- Is designed to complement the Instructional Quality Assessment (IQA).

Example Rubric: Math Coaching		
	Teacher Suggestions & Math	Teacher Suggestions & Students' Needs
Level 4	Clear and conceptual	Targeted based on students' needs
Level 3		Not targeted
Level 2	Clear and procedural	Targeted or not targeted
Level 1	Vague	
Level 0	No suggestions related to the math task	

Practices (Rubrics):

- |                                      |                               |  |
|--------------------------------------|-------------------------------|--|
| 1. Positioning Students as Competent | 5. Social Coaching            | 9. Context                                   |
| 2. Social Expectations               | 6. Attributing Responsibility | 10. Proactive (Classroom Culture)            |
| 3. Math Expectations                 | 7. Math Language              | 11. Reactive (Response to Off-task Behavior) |
| 4. Math Coaching                     | 8. Cultural Dialects          |  |

## Study Design

### Prior to this Study

**MIST**  
(Middle School Mathematics and the Institutional Setting of Teaching)  
Utilized Instructional Quality Assessment (IQA)  
6<sup>th</sup>-8<sup>th</sup> Grade

**RCES**  
(Responsive Classroom Efficacy Study)  
Utilized Mathematics Scan (M-Scan)  
3<sup>rd</sup>-5<sup>th</sup> Grade

Wilson et al. Identified Practices  
Wilson created rubrics

### Phase 1: Initial Coder Training

Training Material Development **S2**  
Coder Training **S1**  
Cognitive Interviews

### Phase 2: Generalizability & Decision Studies

EAR-MI Coding of 60 videos\*\*  
**G2 G1**  
Generalizability and Decision Studies  
**S1 S3**

### Phase 3: Coding Full Sample

EAR-MI Coding of Full Sample\*  
IQA Coding of RCES Data  
M-Scan Coding of MIST Data

### Phase 4: Full Sample Analyses

Exploratory and Confirmatory Factor Analysis  
Score Distributions **S2**  
HLM Analyses of Relations between Measures **E1**

Inference	Assumption to be Evaluated
Scoring	S1 Scoring with the EAR-MI is applied accurately and consistently.
	S2 Scores on the EAR-MI represent equitable teaching practices.
	S3 Scoring with the EAR-MI is bias-free.
Generalization	G1 The EAR-MI can be reliably used to measure equitable teaching practices based on video-recordings of 3 <sup>rd</sup> -8 <sup>th</sup> grade classrooms.
	G2 Unexplained error is minimized.
Extrapolation	E1 EAR-MI scores adequately represent equitable teaching practice.

#### Full Sample\*

- 72 elementary school (ES) teachers (Gr 3-5), 3 lessons per teacher, total of 216 lessons
- 59 middle school (MS) teachers (Gr 6-8), 2 lessons per teacher, total of 118 lessons

#### Sub-Sample\*\*

- 24 teachers, 4 teachers per grade
- 36 ES lessons, 24 MS lessons

