



# Introduction to MQI Training



National Center for  
Teacher Effectiveness



Center for Education Policy Research  
HARVARD UNIVERSITY

# How do we measure mathematics instruction?

- Complicated question within educational community
- For instance, responses to the Mauricio segment that was part of the pre-training questionnaire
  - “This was really strong mathematics instruction....”
  - “He nicely involved students in the discussion...”
  - “He never let students talk for themselves....”
  - “He covered some really important ideas in a short period of time....”
  - “This instruction is detrimental to student’s progress....”
  - “The teacher’s use of the mathematics was all wrong...”

Many lenses, little agreement





# The MQI

- A standardized instrument for assessing the mathematical quality of instruction
  - Focus is on mathematics and teaching of mathematics, rather than general pedagogy or climate
  - Because MQI is standardized, we ask raters to learn and adopt our way of thinking about mathematics instruction
- Useful analogy:

Take off your glasses, put on ours



# The MQI

- A standardized instrument for assessing **dimensions that comprise the** mathematical quality of instruction
  - Our instrument rates different dimensions separately
  - For example, the MQI would note that in the Mauricio clip:
    - No errors or imprecision in the mathematics
    - Strong meaning orientation of the mathematics
    - Some student participation in development of the mathematics
    - Strong teacher ability to work with student's mathematical ideas





# The MQI

- A standardized instrument for assessing dimensions that comprise the mathematical quality of instruction in the U.S.
  - Developed the instrument by watching a wide array of U.S. elementary and middle school mathematics classrooms
  - Also by reading the literature on U.S. mathematics instruction
  - Keyed to important differences among U.S. teachers
    - Benefit: “Fits” U.S. classrooms well
      - Captures variation in critical dimensions
    - Drawback: Important practices from other countries are not necessarily represented





# Training: General Principles

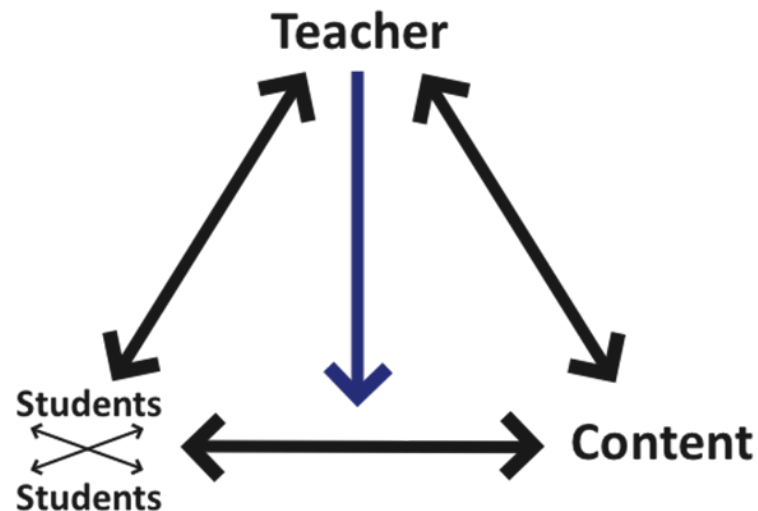
- “Take off your glasses, put on ours”
- Respect for teachers in these videos
- Respect for teachers generally
  - Assume the best –
    - Benefit of the doubt, e.g., Do not record a teacher error unless you are certain it has been made
    - Recognize that even the best teachers make occasional missteps or have less than perfect instruction
    - Recognize that each teacher has strengths and weaknesses
- Criterion is not perfect instruction
  - Impossible to enact
  - Instead, faithfully capture what happened in the lesson





# MQI Framework

- The MQI instrument captures the nature of the mathematical content available to students during instruction, as expressed in teacher-student, teacher-content, and student-content interactions





# The MQI: Segment Codes

- Classroom Work is Connected to Mathematics
- Richness of the Mathematics
  - Linking and Connections
  - Explanations
  - Multiple Procedures or Solution Methods
  - Developing Mathematical Generalizations
  - Mathematical Language
  - Overall Richness of the Mathematics
- Working with Students and Mathematics
  - Remediation of Student Errors and Difficulties
  - Responding to Student Mathematical Productions in Instruction
  - Overall Working with Students and Mathematics
- Errors and Imprecision
  - Major Mathematical Errors
  - Imprecision in Language or Notation (Mathematical Symbols)
  - Lack of Clarity
  - Overall Errors and Imprecision
- Student Participation in Meaning-Making and Reasoning
  - Students Provide Explanations
  - Student Mathematical Questioning and Reasoning
  - Enacted Task Cognitive Activation
  - Overall Student Participation in Meaning-Making and Reasoning

A segment or “chapter” is a 7.5 minute section of classroom instruction. These codes are scored for each segment of a lesson.







# Codes of the MQI: Lesson-Level Codes

## Overall MQI and MKT

- Whole-Lesson Mathematical Quality of Instruction (MQI)
- Lesson-Based Guess at Mathematical Knowledge for Teaching (MKT)

Lesson-level codes are scored once for the whole lesson.





# MQI Plus

## Segment-level codes

- Format of the Segment
- Mode of Instruction
  - Direct Instruction
  - Whole-Class Discussion
  - Working on Applied Problems

## Lesson-level codes

- Whole Lesson Codes
  - Orienting
  - Summarization
  - Checking Broadly for Understanding
  - Differentiated Instruction

Training for the MQI Plus is available for NCTE raters or upon request.



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# Scoring the MQI codes

- Almost all the codes are scored based on a three point scale:
  - Low (1)
  - Mid (2)
  - High (3)
- Depending on the code, these ratings are based on quantity or quality of behaviors in the lesson
  - These differentiations are discussed in each of the training modules



# How to use the module player

The screenshot displays the Articulate module player interface. At the top, the title 'Errors and Imprecision' is shown with a timer at '00:02 / 51:03' and an 'ATTACHMENTS' button. The Articulate logo is in the top left. Below it, a navigation pane lists an 'Outline' with items 1 through 30, where item 1 is selected. The main area shows a presentation slide with the title 'Errors and Imprecision' and logos for the National Center for Teacher Effectiveness and the Center for Education Policy Research at Harvard University. The bottom control bar includes the Articulate logo, a play button, 'SLIDE 1 OF 30', 'PAUSED', a timer at '00:02 / 00:22', and a full-screen button.

Errors and Imprecision (00:02 / 51:03) ATTACHMENTS

articulate®

Outline Thumbnails Transcript Search

- 1. Errors and Imprecision
- ▶ 2. Errors and Imprecision
- 5. Major Mathematical Errors
- ▶ 6. Imprecision in Language or Notation
- ▶ 8. Lack of Clarity
- 10. Generally for Imprecision and Lack of Clarity
- 11. Overall Errors and Imprecision
- 12. Examples (Score all 4 codes)
- 13. Errors and Imprecision
- ▶ 14. Mini: Greater than, Less than
- ▶ 18. Karen: Cows and Calves
- ▶ 22. Georgia: Equations and Estimation
- ▶ 26. Georgia: Equivalent Fractions
- 30. Errors and Imprecision

Errors and Imprecision

NC TE National Center for Teacher Effectiveness

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articulate® POWERED PRESENTATION

SLIDE 1 OF 30 PAUSED 00:02 / 00:22



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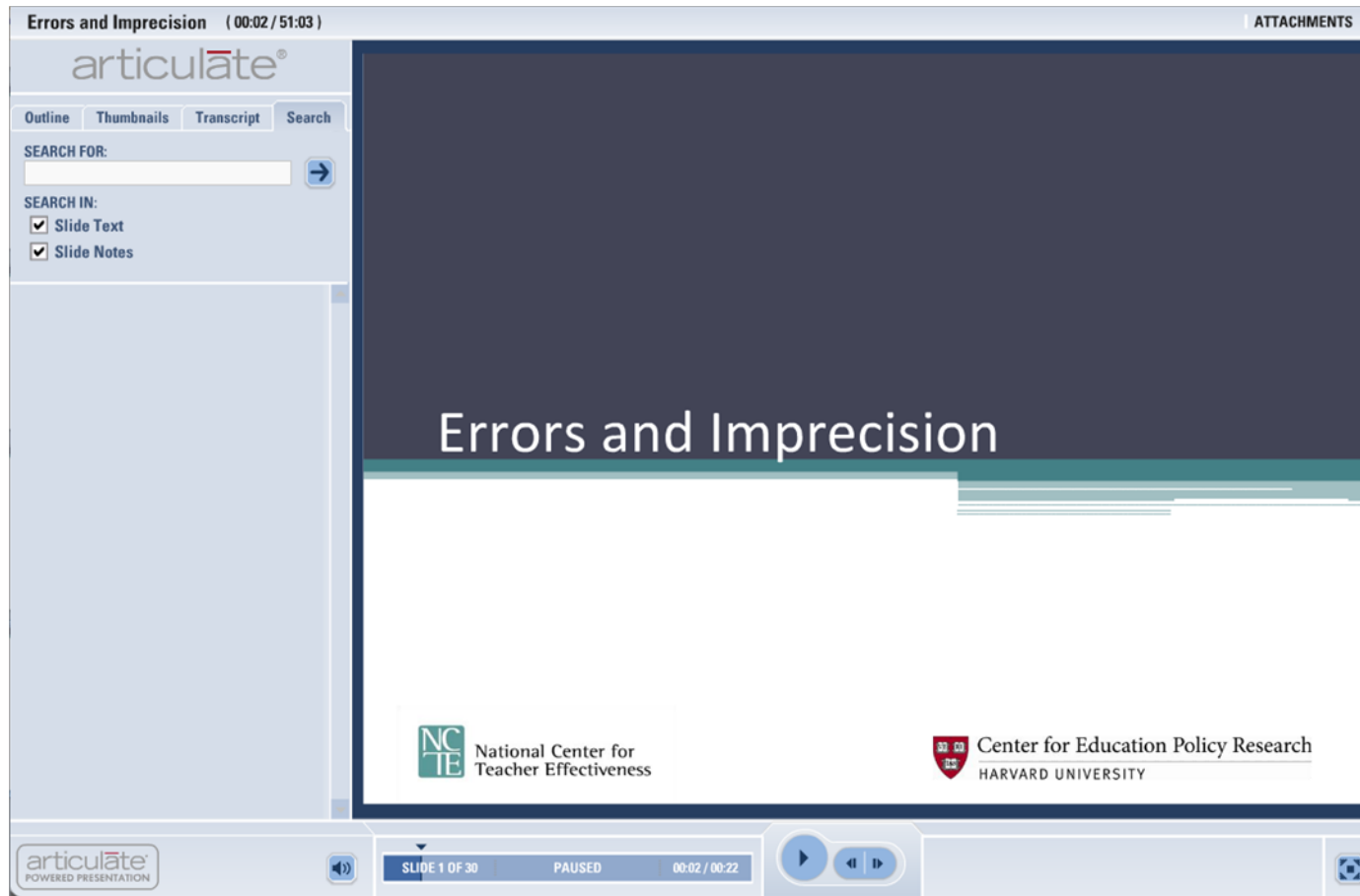
# Thumbnails tab

The screenshot displays the Articulate presentation software interface. At the top, the title 'Errors and Imprecision' is shown with a timer at '00:02 / 51:03' and an 'ATTACHMENTS' button. Below the title bar, the 'artikulate' logo is visible, followed by navigation tabs: 'Outline', 'Thumbnails', 'Transcript', and 'Search'. The 'Thumbnails' tab is active, showing a list of four slide thumbnails on the left. The first thumbnail is labeled '1. Errors and Imprecision' and shows a dark slide with the title. The second thumbnail is labeled '2. Errors and Imprecision' and shows a slide with a diagram of a triangle and text. The third thumbnail is labeled '3. Errors and Imprecision' and shows a slide with text. The fourth thumbnail is partially visible and labeled 'Errors and Imprecision'. The main presentation area on the right shows the first slide, which has a dark blue header with the title 'Errors and Imprecision' and a white body with the NCTE logo and the text 'National Center for Teacher Effectiveness' and 'Center for Education Policy Research HARVARD UNIVERSITY'. At the bottom, the 'artikulate POWERED PRESENTATION' logo is on the left, and a control bar on the right shows 'SLIDE 1 OF 30', 'PAUSED', and a timer at '00:02 / 00:22'.

# Transcript tab

The screenshot displays the Articulate presentation interface. At the top, the title bar reads "Errors and Imprecision (00:02 / 51:03)" and "ATTACHMENTS". The main interface is divided into a left sidebar and a large central video area. The sidebar contains the Articulate logo, navigation tabs for "Outline", "Thumbnails", "Transcript", and "Search", and a section titled "1. Errors and Imprecision" with a timestamp of "00:22". Below this, a text block reads: "Welcome to another module of the Mathematical Quality of Instruction (MQI) Instrument. This module will walk you through the dimension Errors and Imprecision. As in other modules, you'll first get to know the codes of this dimension; and then you will be asked to assign ratings to some video clips and compare your ratings to those of our research group." The central video area shows a dark blue background with the title "Errors and Imprecision" in white. At the bottom of the video area, the logos for the "National Center for Teacher Effectiveness" and the "Center for Education Policy Research HARVARD UNIVERSITY" are displayed. The bottom of the interface features a control bar with the Articulate logo, a "SLIDE 1 OF 30" indicator, a "PAUSED" status, a "00:02 / 00:22" timer, and navigation buttons.

# Search function



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# Attachments

The screenshot shows the Articulate presentation software interface. The main window displays a slide titled "Errors and Imprecision". An "Attachments" window is open in the top right corner, listing several files for viewing:

- [Errors and imprecision pdf](#)
- [Mimi: Greater than, Lesser than transcript](#)
- [Karen: Cows and Calves transcript](#)
- [Georgia: Equations and Estimation transcript](#)
- [Georgia: Equivalent Fractions transcript](#)

The left sidebar contains navigation options: Outline, Thumbnails, Transcript, and Search. The bottom status bar indicates "SLIDE 1 OF 30" and "PAUSED".



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# Video

The screenshot shows an Articulate presentation interface. The title bar at the top reads 'Errors and Imprecision (27:04 / 51:03)' and 'ATTACHMENTS'. The Articulate logo is in the top left. Below it are tabs for 'Outline', 'Thumbnails', 'Transcript', and 'Search'. The 'Outline' tab is active, showing a list of 30 items. Item 15, 'Video', is highlighted. The main content area displays a video player with the title 'Mimi: Greater than, Less than: Video'. The video frame is black with white text that reads 'Teacher: Mimi' and 'Greater Than, Lesser Than'. At the bottom of the video frame are logos for the 'National Center for Teacher Effectiveness' (NCTE) and the 'Center for Education Policy Research' at 'HARVARD UNIVERSITY'. The bottom of the presentation window features a control bar with the Articulate logo, a speaker icon, a progress bar showing 'SLIDE 15 OF 30', a 'PAUSED' status, a time display '00:02 / 02:19', and navigation buttons.

Video clips are included in the training as examples . Please note that most clips are shorter than a standard segment.

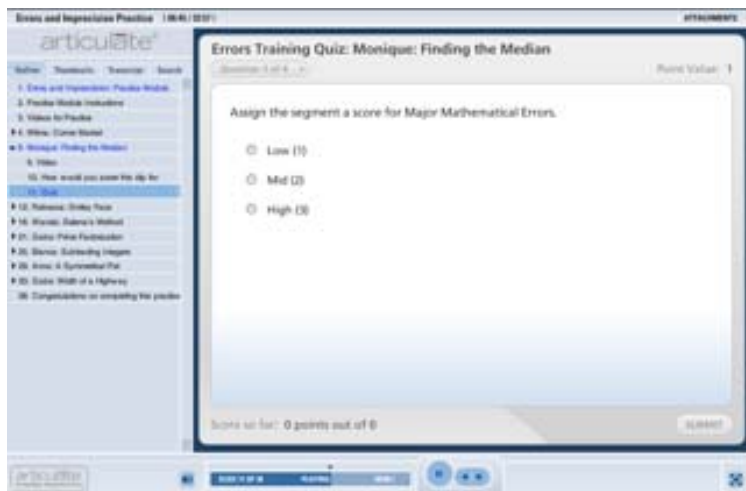


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# Quizzes





# Structure of training

- Pre-training questionnaire
- Training modules for each dimension
- Practice modules
  - Video clips
  - Quizzes with feedback on your scoring
- Post-training questionnaire
- Certification
- **ETS/MET raters** should also complete the training module for the Explicitness and Thoroughness in the Presentation of Content code from the MQI Lite. Also note, there is additional practice and training through the MET (Teachscape) website.
- **NCTE raters** should be sure to complete the training for the MQI Plus codes.

