



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

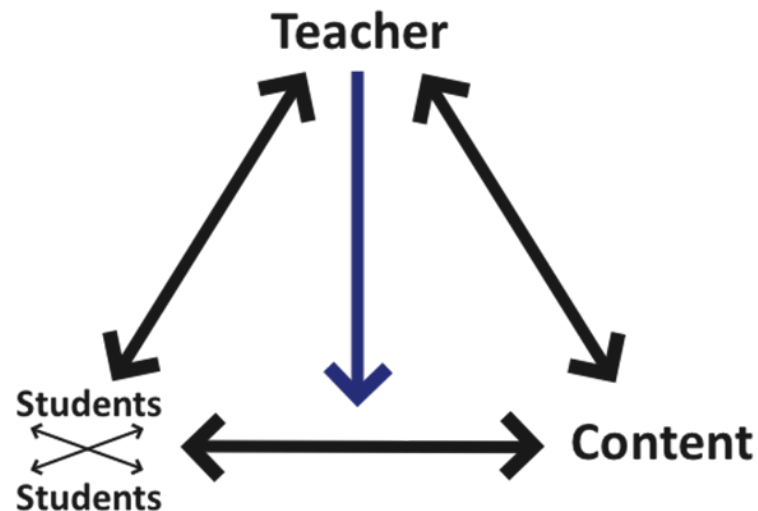
- “Take off your glasses, put on ours”
- Respect for teachers in these videos
- Respect for teachers generally
 - Assume the best –
 - Benefit of the doubt, e.g., Do not record a teacher error unless you are certain it has been made
 - Recognize that even the best teachers make occasional missteps or 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 “Core” 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





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)





MQI Plus

Segment-level codes

- Format of the Segment
- Mode of Instruction
 - Direct Instruction
 - Whole-Class Discussion
 - Working on Applied (Real-World) Problems

Lesson-level codes

- Orienting
- Summarization
- Checking Broadly for Understanding
- Differentiated Instruction





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' link. The Articulate logo is in the top left. Below it, a navigation pane lists the presentation's outline, with '1. Errors and Imprecision' selected. The main area shows a dark blue slide with the title 'Errors and Imprecision' in white. At the bottom of the slide, the logos for the National Center for Teacher Effectiveness (NCTE) and the Center for Education Policy Research at Harvard University are visible. The player's control bar at the bottom includes the Articulate logo, a play button, a progress bar showing 'SLIDE 1 OF 30', a 'PAUSED' status, a timer at '00:02 / 00:22', and a full-screen button.

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

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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

NCTE National Center for Teacher Effectiveness

Center for Education Policy Research HARVARD UNIVERSITY

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 vertical list of four slide thumbnails. The first thumbnail is the title slide, and the others show content related to 'Errors and Imprecision'. The main presentation area on the right displays the title slide content, which includes the title 'Errors and Imprecision' and logos for the 'National Center for Teacher Effectiveness' and the 'Center for Education Policy Research' at 'HARVARD UNIVERSITY'. At the bottom, the 'articulate 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'.



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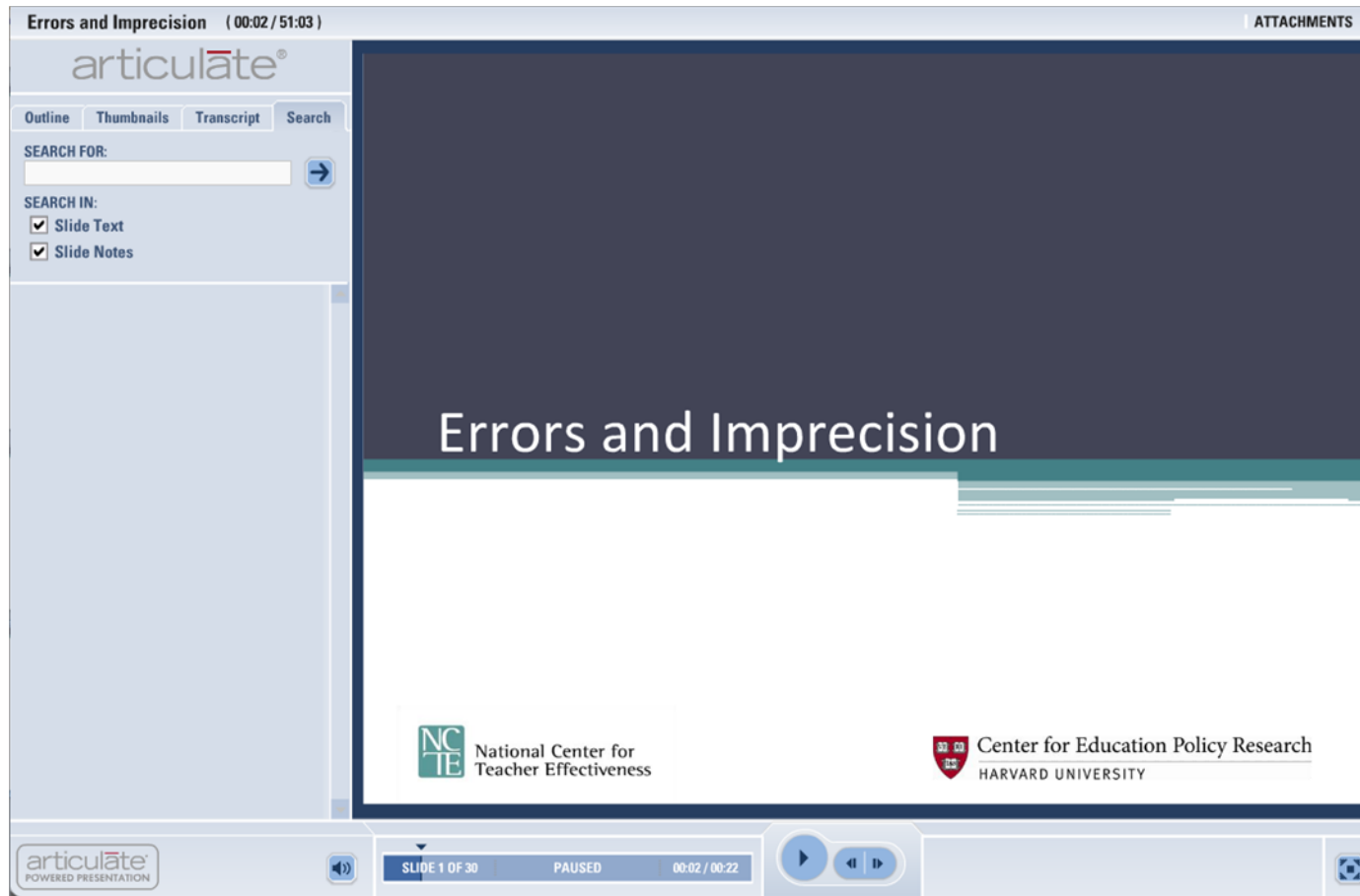


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Transcript tab

The screenshot displays the Articulate presentation software interface. At the top, the title bar reads "Errors and Imprecision (00:02 / 51:03)" and "ATTACHMENTS". The main menu on the left includes "Outline", "Thumbnails", "Transcript", and "Search". The "Transcript" tab is active, showing the title "1. Errors and Imprecision" and a timestamp of "00:22". Below this, a text box contains the following message: "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 main content area features a large dark blue header with the title "Errors and Imprecision" in white. Below the header, the slide content is mostly blank. At the bottom of the slide, there are two logos: the "NC TE" logo for the National Center for Teacher Effectiveness and the Harvard University logo for the Center for Education Policy Research. The presentation controls at the bottom show "SLIDE 1 OF 30", "PAUSED", and a timer at "00:02 / 00:22".

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". On the left, there is a sidebar with tabs for "Outline", "Thumbnails", "Transcript", and "Search". Below these tabs, there is a "SEARCH FOR:" field and a "SEARCH IN:" section with checkboxes for "Slide Text" and "Slide Notes". An "Attachments" window is open in the top right corner, titled "ATTACHMENTS". It contains a list of items to view: "Errors and imprecision pdf", "Mimi: Greater than, Lesser than transcript", "Karen: Cows and Calves transcript", "Georgia: Equations and Estimation transcript", and "Georgia: Equivalent Fractions transcript". The bottom of the presentation window shows the Articulate logo, the text "POWERED PRESENTATION", and a status bar indicating "SLIDE 1 OF 30", "PAUSED", and a timer "00:02 / 00:22".

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

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Outline Thumbnails Transcript Search

SEARCH FOR:

SEARCH IN:

☒ Slide Text

☒ Slide Notes

ATTACHMENTS

Click the items below to view the attached content:

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

OK

Errors and Imprecision

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



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Video

Errors and Imprecision (27:04 / 51:03) ATTACHMENTS

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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
 - 9. 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. Mimi: Greater than, Less than
 - 15. Video
 - 16. How would you score this clip?
 - 17. Answers
 - ▶ 18. Karen: Cows and Calves
 - ▶ 22. Georgia: Equations and Estimation
 - ▶ 26. Georgia: Equivalent Fractions
 - 30. Errors and Imprecision

Mimi: Greater than, Less than: Video

Teacher: Mimi
Greater Than, Lesser Than

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SLIDE 15 OF 30 PAUSED 00:02 / 02:19

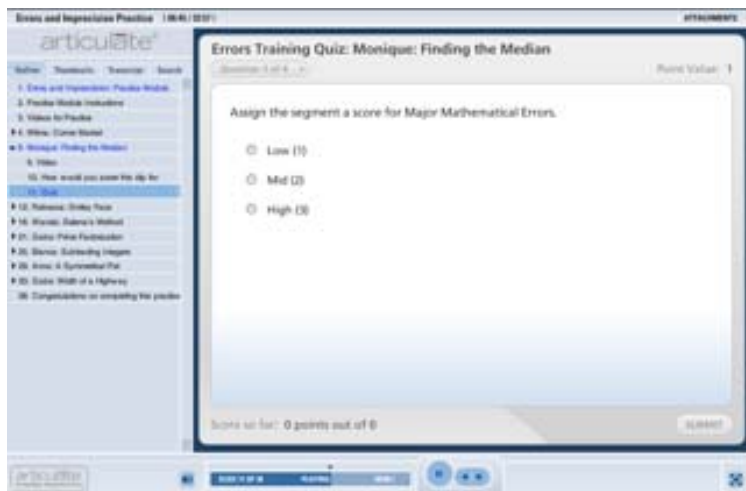


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Quizzes





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, your additional practice on the MET player is linked to on the practice pages

