Assessment in QR courses

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QR Fundamentals

- Why teach QR?

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- How is QR different from other Transfer Module courses?

Traditional Math or QR?

Traditional Math	Quantitative Reasoning
Abstract, deductive reasoning	Practical, robust habit of mind
Employed in professions such as sciences, technology, and engineering	Employed in every aspect of an alert, informed life
Rises above context	Anchored in context
Objects of study are ideals	Objects of study are data
Serves primarily professional purposes	Is essential for all graduates' personal and civic responsibilities

Source: *"Quantitative Reasoning: The Next "Across the Curriculum Movement."*
By Susan Elrod in Peer Review, Volume 16, Number 3 (2014)

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- How is QR different from other Transfer Module courses?
- What makes the QR course “college level”?

How is QR College Level?

- College level courses ***deepen***, ***broaden***, and/or ***extend*** what students have learned in K-12.
- The procedural "math" content of the QR course cannot be viewed as "college level."
- A QR course deepens understanding of math, broadens knowledge of ways to use math, and extends students' ability to effectively use mathematics beyond the classroom.

QR Fundamentals

- Why teach QR?
- How is QR different from other Transfer Module courses?
- What makes the QR course “college level”?
- What should we consider when assessing QR?

Is this appropriate?

- Compute

$$\frac{2}{3} - \frac{3}{4}$$

Is this enough?

- Compute

$$\frac{2}{3} - \frac{3}{4}$$

Working in Context

- A football player advances 2/3 yard. A second player in the same team advances 3/4 yard. How many more yards did the second player advance?

Assessment Considerations

If we do this in class or homework:

- *A football player advances 2/3 yard. A second player in the same team advances 3/4 yard. How many more yards did the second player advance?*

should we ask this on an assessment?

- *A football player advances 4/3 yard. A second player in the same team advances 5/4 yard. How many more yards did the second player advance?*

Keeping Grounded

- Need to be realistic
  - Working in context is hard
  - Novel contexts are harder
  - Ambiguous contexts are even harder

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- Important objective: ***develop a practical, robust habit of mind***

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- What should we expect of the students?
- Important objective: ***develop a practical, robust habit of mind***
- **Traditional assessments can subvert this objective**

Assessing What?

- The goal for students:
  - to identify the “math” they need to use in novel and possibly ambiguous contexts
  - to develop “productive persistence”
  - to use the “math” correctly
  - communicate coherently about what they are doing or have done

Assessment Challenges

- Grading ambiguous and/or open ended assignments can be tough and time consuming
  - How can you be consistent in assigning points when different students or groups take different approaches?
- Assessing coherent communication isn't most math instructors' cup of tea
  - How do we even start? Give them all an A?

The Case for Qualitative Assessments (Some of the Time)

- Take a look at the VALUE rubric produced by AACU
- This is an attempt to deal consistently with some of the assessment challenges facing QR instructors
- Would something like this work for you?

Consider Measuring and Rewarding Progress

- Consider using tools like Eric Gaze's (egaze@bowdoin.edu) QLRA (Quantitative Literacy Reasoning Assessment) as a pre-post measure of progress
- Consider rewarding progress on such an assessment
- What is more important: where a student arrives, or how a student gets there?

Things to Consider

- One of the reasons to teach QR is to help in the process of transforming attitudes from “no, I can’t” to “yes, I can” and on to “yes, I do”
- As much as is reasonable, consider assessments that reward achievements rather than punish deficiencies

Things to Consider

- Value collaborative work
- Reward progress
  - Consider “cumulative grades” in some circumstances
- Value quality over quantity
  - Structure assessments so there are fewer, but deeper problems
  - Consider grading using rubrics like VALUE in some circumstances