Assessment in QR courses

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QR Fundamentals

• Why teach QR?
QR Fundamentals

• Why teach QR?
• How is QR different from other Transfer Module courses?
## Traditional Math or QR?

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

QR Fundamentals

- Why teach QR?
- 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

\[
\frac{2}{3} - \frac{3}{4}
\]
A football player advances $\frac{2}{3}$ yard. A second player in the same team advances $\frac{3}{4}$ yard. How many more yards did the second player advance?
Assessment Considerations

If we do this in class or homework:

- A football player advances $\frac{2}{3}$ yard. A second player in the same team advances $\frac{3}{4}$ yard. How many more yards did the second player advance?

should we ask this on an assessment?

- A football player advances $\frac{4}{3}$ yard. A second player in the same team advances $\frac{5}{4}$ 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
Keeping Grounded

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• What should we expect of the students?
Keeping Grounded

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• What should we expect of the students?
Keeping Grounded

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• What should we expect of the students?

• Important objective: *develop a practical, robust habit of mind*
Keeping Grounded

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