COGNITIVE COMPLEXITY IS NOT THE SAME THING AS DIFFICULTY

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Revised Bloom’s Taxonomy
(Anderson & Krathwohl, 2001)

• Knowledge Dimension
  • Factual knowledge
  • Conceptual knowledge
  • Procedural knowledge
  • Metacognitive knowledge

• Cognitive Process Dimension
  • Remember
  • Understand
  • Apply
  • Analyze
  • Evaluate
  • Create
Revised Bloom’s Taxonomy
(Anderson & Krathwohl, 2001)

Contrary to what you might see on YouTube!

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<table>
<thead>
<tr>
<th></th>
<th>Easy</th>
<th>Difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recall</strong></td>
<td>Who is the main character in <em>The Cat in the Hat</em>?</td>
<td>Name all the characters in <em>Hamlet</em>.</td>
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<tr>
<td><strong>Higher-order thinking</strong></td>
<td>Why do you think the Cat cleaned up the house on his way out, before the mother got home?</td>
<td>Hamlet tackles a major question in his soliloquy, “O, that this too, too solid flesh would melt” in Act 1, scene 2, lines 131-161. What is the question in his mind, and how do you think he resolves it by the end of his soliloquy? State your interpretation of his major question and his resolution, and use evidence from the speech to support it.</td>
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Harmful Consequences

- Young students
- Students who struggle
- Students with learning disabilities
- Students without strong background in a topic
Typical Remedies for Classroom Assessment

• Teach teachers how to write questions and tasks that assess higher-order thinking
  • Open-ended questions
  • Performance tasks
  • Novel information
  • Avoid “retelling” tasks
• Teach teachers to use a two-dimensional test blueprint
  • Context-dependent items and other HOT items
• Ask teachers to have students explain their reasoning
Remaining Issues

- Only minimal control over the relationship between cognitive complexity and the level of difficulty of an item or task
- Effective use of the typical classroom assessment remedies requires deep content knowledge on the part of the teacher (as well as assessment literacy)
- Deals better with some aspects of construct-irrelevant variance than other aspects
  - Purely surface features
  - Somewhat content-related
  - At some points on some learning progressions, there is an interaction between cognitive complexity and difficulty
Interesting Possibility from Large-Scale Assessment

• Assessment Engineering (AE); Luecht (2012, 2013)
• Construct map
  • “Content is NOT and SHOULD not be considered to be the same across a score scale. Content is and must be more complex as we progress along a scale…Traditional item content blueprints and coding schemes tend to ignore task complexity and instead rely on the statistical item difficulty to act as a surrogate indicator of increasing or decreasing complexity.” (Luecht, 2013, p. 5-6).
  • Construct map should be supplemented with evidence models.
• Task model – for a family of items – and task model maps
• Item templates
  • “Changes in difficulty should not be random outcomes that occur because creative item writers decide to add uncontrolled and sometimes unknown sources of complexity to the items” (Luecht, 2013, p. 24).
Classroom Teachers are not Assessment Engineers, but they are Assessment Designers

RECOMMENDATIONS

• Design begins with the intended outcome in mind.

• Use all the assessment literacy and deep content knowledge at your disposal, and apply the typical remedies to build the desired cognitive level into assessment items and tasks.

• Use the assessments as instantiations of the intended learning outcomes. Ask: Is this something the student should know/be able to do? Show students examples of these types of questions and tasks, and have “learning how to do that” become part of their conception of what they are supposed to be learning.