3:00
Traditional assessment measures such as multiple choice questions are a form of selected response measures designed for knowledge recall and sometimes for decision-making from a selection of options. In such measures, students are asked to think critically in the process of selecting their response.

Although traditional forms of assessment can identify learning that results from critical thinking, there are other effective assessments that can provide indicators of critical thinking in the process of students completing tasks relevant to your discipline.

We will discuss designing rubrics for task that require students to think critically in the context of your discipline.
Essential for assessing Critical Thinking

• A definition as to what critical thinking looks like when applied in your discipline.

• A task through which student can demonstrate critical thinking in an applied setting.

• A tool to measure the components of critical thinking expected in your discipline.

3:05
What is the key to assessing critical thinking?
• A definition as to what critical thinking looks like in your discipline.
• A task through which student can demonstrate the ways your discipline exemplified critical thinking.
• A tool to measure the components of critical thinking expected in your discipline.
What is critical thinking?
There has been considerable research and thoughtful inference as to how this intellectual process can be defined. Let's begin with current conceptions of Critical Thinking:

• Critical thinking is the intellectually disciplined process
What is Critical Thinking?

- The intellectually disciplined process of actively and skillfully...
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- The intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication.

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• Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion. (American Association for Colleges and University, AAC&U)

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What is expected of your students?

- Conceptualizing (reviewing) a Situation
- Explanation of Issues Surrounding and Influencing Context
- Investigation of Evidence (ideas, artifacts, events)
- Systematic and Methodological Analysis (observation, experience)
- Evaluating Evidence (making decisions based on evidence)
- Synthesizing an Hypothesis
- Drawing Conclusions (making decisions, applying to context)
- Reflecting on Implications

Does your discipline (or your course) require any of the behaviors in the process of applying learning?

- Conceptualizing (reviewing) a Situation
- Thinking about and explaining Issues Surrounding and Influencing that situation/context
- Getting to know that situation, event, or thing more as fully as possible
  Investigation of Evidence (ideas, artifacts, events)
- Analyzing each of the constituent parts Systematic and Methodological Analysis (observation, experience)
- Evaluating Evidence (making decisions based on evidence)
- Formulating options Synthesizing an Hypothesis
- Drawing Conclusions (making decisions, applying to context)
- Reflecting on Implications of the conclusions

Take two minutes to think about and mark the components of critical thinking that is inherent and expected of your students. Feel free to discuss this with
whomever is near.
Once you have clearly defined what is expected of students related to how critical thinking is embodies in your discipline, an task relevant to your discipline/course must be designed through which student can demonstrate these qualities of critical thinking. A task through which students demonstrate critical thinking skills and through which you can observe and assess things like

* arguing, analyzing, synthesizing, drawing conclusions, solving problems, making decisions, and evaluating at several different levels of student performance

[Brainstorm in pairs/share varieties of assessment tasks – note on the handout]
3 minutes, then a few will share the type of task they have selected or use in their course/discipline that requires critical thinking.
Now for the purpose of this session, creating a scoring tool/measurement device for the Critical Thinking assessment task.

**Rubrics: what are they?** (let's make certain we are all under the same understanding of what a rubric is)

- Include Multidimensional guidelines for scoring with defined scoring criteria
- A Scoring tool designed so that multiple teachers will arrive at the same score
- A Consistency framework for evaluating student work
- Justification for scoring an assignment
- Mechanism for students to evaluate his/her own work before submitting
- Mechanism for feedback to students

We have already seen the definitions of critical thinking. AAC&U has worked to develop, test, and disseminate rubrics for some of the common university-level learning expectations.
Critical Thinking being one of those areas of learning.
For your information, in addition to Critical Thinking, the AAC&U Value Rubrics also include:

Civic knowledge and engagement-local and global  
Creative thinking  
Critical thinking  
Ethical reasoning  
Foundations and skills for lifelong learning  
Global Learning  
Information literacy  
Integrative and applied learning  
Intercultural knowledge and competence  
Inquiry and analysis  
Oral communication  
Problem solving  
Quantitative literacy  
Reading  
Teamwork  
Written Communication

All of which can be found on the Office of Assessment website in an editable format and many can be found already uploaded into CANVAS for your use.
The Criteria areas for Critical Thinking are seen here and defined in more detail on the rubric.

Note that your criteria from the checklist of Critical Thinking Attributes might or might not reflect these criteria.

<table>
<thead>
<tr>
<th>CRITICAL THINKING VALUE RUBRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation of issues</td>
</tr>
<tr>
<td>Evidence - <em>Selecting and using information to investigate a point of view / conclusion</em></td>
</tr>
<tr>
<td>Influence of context and assumptions</td>
</tr>
<tr>
<td>Student's position (<em>perspective, thesis/hypothesis</em>)</td>
</tr>
<tr>
<td>Conclusions and related outcomes (<em>implications and consequences</em>)</td>
</tr>
</tbody>
</table>
An important construct, or shall I say constructs to have in mind are:

✓ Critical Thinking Context is essential in assessment of student learning
✓ Critical Thinking does not, and should not look the same in every situation.
✓ The context of the assessment task determines the criteria to be assessed.

To allow a variety of criteria is not only permissible, it is essential in order for the assessment to validity assess what is intended to be measured.
If the criteria in a measure remains static across multiple disciplines, then it may not be authentically representing the way critical thinking occurs in the context of an assessment task.

Critical Thinking is not one thing, but is demonstrated uniquely in each context. That is why AAC&U states that the rubric(s) are not to be administered without adjusting the criteria and language to the context of the task. They have spent the past 20 years testing these rubrics and have found that reliability of scoring requires making adjustments for context.

Let's look at one of the criteria areas of their Critical Thinking Rubric.
When adapting the AAC&U rubric(s), it is important to recognize that are designed with the following four scoring levels.  
* 1-Benchmark identifies that the students are prepared for university level expectations;  
* the 4-Capstone is the level expected for program completion or graduation credentialing;  
* Milestones 2 & 3 are levels in-between.

You might consider these Freshman through senior, but not necessarily. Another way to think about this is that a student at a sophomore level might be expected to reach level 2 and then the rubric for this assessment would create categories of achievement between 1 & 2, with 3 considered exceptional beyond expectations of the particular assignment.

Another consideration is to adapt the scoring device to be used across an entire program through-out a series of courses. It could assess sequential development of progress across the program leading to the capstone level. It would not necessarily be tied to a grade, unless at a lower level course a score of 2 meets the course expectations, etc.

* When adapting a rubric, you might use different terminology for the caption of the criteria (explanation of issues),  
* or adjust the descriptors of expectation to match the assessment task more specifically.
The most important consideration of developing or adapting a rubric is to clearly identify:

- what is expected to be assessed
- and
- the levels that differentiate achievement.

These adaptations of criteria and achievement descriptions are to clarify expectations of the task and/or discipline for the student as they prepare their work and for the professor in scoring student work.

The goal is to address how critical thinking is appropriately demonstrated in the task.
There are a variety of formats for rubric development. Analytic Rubrics provide the opportunity to score each criteria area individually.

- This allows for you to identify deficiency needs of students in specific aspects of learning
- If used over time, this form of rubric can expose trends of learning needs that can guide instructional decisions.

This particular rubric was used by the Critical Thinking project implemented here at K-State several years back, adapted from rubric from Washington State University.

An important issue of rubrics is to recognize is that these scores are categorical. Averaging into a mean score has very little meaning for program assessment. It is only useful if scoring for a grade. What is most informative is to identify counts or percentages of scores in each category. On this rubric, you can also identify a number/percentage that are high/low in each level to identify tendencies.
Free-scoring with feedback

<table>
<thead>
<tr>
<th>Emerging</th>
<th>Free-Scoring Rubric</th>
<th>Mastering</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Does not identify and summarizes the problem/question at issue (and/or the source's position).</td>
<td>Identifies the main problem and subproblem, if embedded, or implicit aspects of the position, and identifies them clearly, addressing their relationships to each other. Identifies not only the basics of the issue, but recognizes nuances of the issue.</td>
<td></td>
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<tr>
<td>2) Identifies and presents the STUDENT’S OWN hypothesis, perspective and position as is important to the analysis of the issue.</td>
<td>Identifies, appropriately, one’s own position on the issue, drawing support from evidence, and information not available from assigned sources.</td>
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<tr>
<td>3) Identifies and considers OTHER salient perspectives and positions that are important to the analysis.</td>
<td>Identifies perspectives noted previously, and additional diverse perspectives drawn from outside information.</td>
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<tr>
<td>4) Identifies and assesses the key assumptions.</td>
<td>Identifies and questions the validity of the assumptions and addresses the ethical dimensions that underlie the issue.</td>
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<tr>
<td>5) Identifies and assesses the quality of supporting data/evidence and provides additional data/evidence related to the issue.</td>
<td>Examines the evidence and source of evidence: questions its accuracy, precision, relevance, completeness. Observes cause and effect and addresses existing or potential consequences. Clearly distinguishes between fact, opinion, and value judgments.</td>
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</table>

A rubric does not have to be designed with squares in a matrix.

You can use an analytic rubric allowing the freedom of scoring while providing feedback.

This rubric structure presents the high and low expectations, then your feedback identifies for the student support of the score given.

Note that you still have an individual score for each criteria area.
Some disciplines do not look for consistency of product, but embrace variance. The ARTS often feel constricted with specified expectations.

An analytic rubric in this format will provide the opportunity to express aspects of quality achievement while exposing uniqueness of achievement and areas for improvement.

Note that the criteria on each of the rubrics would include all the criteria of evidence that exemplify Critical Thinking as defined by your program expectations.

These rubrics examples are not meant to suggest that there are not other criteria necessary for assessing an assessment task. You may also include criteria for written communication; oral communication; areas of essential knowledge; inter-cultural competence; etc. Since each criteria has its own score, disaggregating per outcome area become easy using CANVAS or other online technology.

<table>
<thead>
<tr>
<th>Concerns</th>
<th>Criteria</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas that need work</td>
<td>Standards for this task</td>
<td>Evidence of exceeding standards</td>
</tr>
<tr>
<td>Explanation of issues</td>
<td>Issue presented in the assignment</td>
<td>Clearly stated, clearly and described comprehensively, delivering all relevant information necessary for full understanding</td>
</tr>
<tr>
<td>Use of Evidence</td>
<td>Information is relevant, supported with strong explanation; evidence is developed &amp; comprehensive evidence is provided.</td>
<td>Viewpoints of aspects are questioned thoroughly</td>
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<tr>
<td>Inferences, assumptions</td>
<td>Thoroughly (systematically) and systematically analyzed and other assumptions are clearly articulated and defended</td>
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<tr>
<td>Standard's position (thesis/hypothesis)</td>
<td>Specific problem (perspective, thesis, hypothesis), arguments, supporting evidence are organized, supporting the conclusion; conclusion is supported by evidence</td>
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<tr>
<td>Concepts and selected outcomes</td>
<td>Condition and evaluated outcomes (e.g., support assumptions; support positions; extend positions)</td>
<td></td>
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</table>

**Single-Point Rubric**

- Provides mastery expectation
- Allows for multiple levels of feedback
- Results in a score for each criterion
3:35
On the other hand, an **holistic rubric** consists of a single scale with all criteria included in a single score. This is more like giving an overall grade to a task.

An holistic rubric will come up with an overall score for critical thinking, or whatever you are assessing, but:

- You will not be able to disaggregate individual qualities of achievement or expose specific trends.
- Includes more subjectivity, thus less consistency of scoring.
- Less informative for students unless you write a lot of specific feedback.
What does a rubric strive to achieve?

- **Validity (face and construct)**
  - with credibility and transferability to authenticity in practice.

- **Reliability (consistency of the measure)**
  - with dependability of the score
  - confirming conformability of the scoring device

**Validity** (face and construct)
**Face validity** is the extent to which the scoring device is recognized to measure what is intended.
**Construct validity** is the appropriateness to which results from scoring device can be inferred to practice. Much better described as **credibility and transferability to authenticity in practice**.

**Reliability** (consistency of the measure) dependability of the measure resulting in:
- Consistency of scoring with multiple raters
- Consistency of scoring with singular rater
- Consistency of score if a student is assessed multiple times
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Emerging</th>
<th>Developing</th>
<th>Proficient</th>
<th>Accomplished</th>
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3:40
Experience the Rubric
Designing Rubrics to Assess Critical Thinking

Sponsored by the Office of Assessment
and the Teaching and Learning Center

Questions, Issues?