


Designing Rubrics to Assess Critical Thinking



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

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?

- The intellectually disciplined process



What is critical thinking?

There has been considerable research and thoughtful inference as to how this intellectual process can be defined. Lets 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



What is critical thinking?

- Critical thinking is the intellectually disciplined process **of actively and skillfully**

What is Critical Thinking?

- 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



What is critical thinking?

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What is Critical Thinking?

- 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, as a guide to belief and action.



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What is Critical Thinking?



- 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, as a guide to belief and action. (Foundation for Critical Thinking)

What is critical thinking?

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What is Critical Thinking?

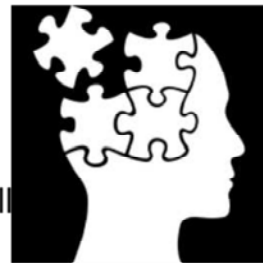


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What is expected of your students?

- 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



3:10

[check list of components that represent expectations in your own discipline/class]

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.

How do student demonstrate these qualities?

- arguing
 - analyzing
 - synthesizing
 - drawing conclusions
- solving problems
 - making decisions
 - evaluating

Once you have clearly defined what is expected of students related to how critical thinking is embodied 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.

The Measure of Assessment (*scoring tool*)

Rubrics *what are they ?*

- **Multidimensional guidelines for scoring with defined scoring criteria**
- **Scoring tool designed so that multiple teachers will arrive at the same score**
- **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**

3:15

Now for the purpose of this session, creating a scoring tool/measurement device for the Critical Thinking assessment task.

Rubrics: what are they? (lets 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**
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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 VALUE RUBRIC

for more information, please contact value@aacu.org



Definition


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.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (all one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Explanation of issues	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated without clarification or description.
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints, related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion), some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed, related outcomes (consequences and implications) are oversimplified.

3:20

Critical Thinking being one of those areas of learning.

Critical thinking is a habit of mind characteriz		<u>Civic knowledge and engagement</u> <u>Creative thinking</u> <u>Critical thinking</u> <u>Ethical reasoning</u> <u>Foundations and skills for lifelong learning</u> <u>Global Learning</u> <u>Information literacy</u> <u>Integrative and applied learning</u> <u>Intercultural knowledge and competence</u> <u>Inquiry and analysis</u> <u>Oral communication</u> <u>Problem solving</u> <u>Quantitative literacy</u> <u>Reading</u> <u>Teamwork</u> <u>Written Communication</u>			
Explanation of issues	Issue/pr stated cl compred informat understa			I. Basics II. Student Learning Outcomes III. Assessment Planning IV. Measurement V. Improvement VI. Assessment Library VII. Additional Resources	
Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	Informa enough (a compo Viewpoi thorough				
Influence of context and assumptions	Thorough methods assumpt relevance position.				
Student's position (perspective, thesis/hypothesis)	Specific thesis/ by account Limits of thesis/ by Others' within p thesis/ by				
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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.



CRITICAL THINKING VALUE RUBRIC

Explanation of issues

Evidence - *Selecting and using information to investigate a point of view / conclusion*

Influence of context and assumptions

Student's position (*perspective, thesis/ hypothesis*)

Conclusions and related outcomes (*implications and consequences*)

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.



CRITICAL THINKING VALUE RUBRIC

Explanation of issues	✓ Context is essential in assessment of student learning	
Evidence - <i>Selecting and</i>		<i>vision</i>
Influence of context	✓ Critical Thinking does not, and should not look the same in every situation.	
Student's position (<i>pe</i>		
Conclusions and relat	✓ The context of the assessment task determines the criteria to be assessed.	

An important construct, or shall I say constructs to have in mind are:

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

CRITICAL THINKING VALUE RUBRIC

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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.

Lets look at one of the criteria areas of their Critical Thinking Rubric

AA VALUE RUBRICS		CRITICAL THINKING VALUE RUBRIC			
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3:25

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 key is to clearly identify :

➤ what is expected to be assessed

and

➤ the levels that differentiate achievement.

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.

Analytic Rubric

Critical Thinking Scoring Rubric

Used by Kansas State University – 2012 Critical Thinking Project
Adapted from Center for Teaching, Learning, & Technology, Washington State University ©2006

Rating Criteria	NA	Rating Scale					
		Emerging		Developing		Mastering	
Summarized problem, question, or issue	Does not attempt to or fails to identify and summarize accurately.	1	2	3	4	5	6
Considers context and assumptions	Approach to the issue is egocentric and socio-centric terms. Does not relate to other contexts. Analysis is grounded in absolutes, with little acknowledgment of own biases. Does not recognize context and underlying ethical implications.	1	2	3	4	5	6
Communicates own perspective, hypothesis, or position	Position is clearly adopted with little consideration. Addresses a single view of the argument, failing to clarify the position relative to one's own. Fails to justify own opinion or hypothesis is unclear or simplistic.	1	2	3	4	5	6
Analyzes supporting data and evidence	No evidence of selection or source evaluation skills. Repeats information without question or dismisses evidence without justification. Does not distinguish between fact and opinion. Evidence is simplistic, inappropriate or not related to topic.	1	2	3	4	5	6
Uses other perspectives and positions	Deals with a single perspective and fails to discuss others' perspective. Adopts a single idea with little question. Alternatives are not integrated. Ideas are obvious. Avoids disconcerting ideas. Treats other positions superficially. No evidence of self-assessment.	1	2	3	4	5	6
Assesses conclusions, implications, and consequences	Fails to identify conclusions, implications, and consequences, or conclusion is a simplistic summary. Conclusions are absolute, and may attribute conclusion to external authority.	1	2	3	4	5	6

Each category gets a score for each criterion.

- ! Allows for feedback on specific areas of achievement or need.
- ! Exposes learning needs through longitudinal analysis.

IMPORTANT!!!!

Scores are categorical, not interval
You should **NOT** average scores.
(distance between scores is not uniform).

Use counts/percentage of scores in each category for evaluation.

3:30

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

Emerging	Free-Scoring Rubric	Mastering
1) Identifies and summarizes the problem/question at issue (and/or the source's position).		
Does not identify and summarize the problem, is confused or identifies a different and inappropriate problem. Does not identify or is <u>confused</u> by the issue, or represents the issue inaccurately.		Identifies the main problem and subsidiary, embedded, or implicit aspects of the problem, and identifies them clearly, addressing their relationships to each other. Identifies not only the basics of the issue, but recognizes nuances of the issue.
2) Identifies and presents the STUDENT'S OWN hypothesis, perspective and position as is important to the analysis of the issue.		
Addresses a single source or view of the argument and fails to clarify the established or presented position relative to one's own. Fails to establish other critical distinctions.		Identifies, appropriately, one's own position on the issue, drawing support from experience, and information not available from assigned sources.
3) Identifies and considers OTHER salient perspectives and positions that are important to the analysis.		
Deals only with a single perspective and fails to discuss other possible perspectives, especially those salient to the issue.		Addresses perspectives noted previously, and additional diverse perspectives drawn from outside information.
4) Identifies and assesses the key assumptions.		
Does not surface the assumptions and ethical issues that underlie the issue, or does so superficially.		Identifies and questions the validity of the assumptions and addresses the ethical dimensions that underlie the issue.
5) Identifies and assesses the quality of supporting data/evidence and provides additional data/evidence related to the issue.		
Merely repeats information provided, taking it as truth, or denies evidence without adequate justification. Confuses associations and correlations with cause and effect. Does not distinguish between fact, opinion, and value judgments.		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 <u>fact</u> , opinion, & acknowledges value judgments.

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.

Single Point Rubric		
Concerns <i>Areas that need work</i>	Criteria <i>Standards for this task</i>	Advanced <i>Evidence of exceeding standards</i>
	Explanation of issues Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	
	Use of Evidence Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	
	Influence of content and assumptions Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	
	Student's position (perspective, thesis/hypothesis) Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are addressed within position (perspective, thesis/hypothesis).	
	Conclusions and related outcomes (implications and consequences) Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	

Single-Point Rubric

- Provides mastery expectation
- Allows for multiple levels of feedback.
- Results in a score for each criterion.

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.

Holistic Rubric

The Holistic Critical Thinking Scoring Rubric - HCTSR A Tool for Developing and Evaluating Critical Thinking

The Holistic Critical Thinking Scoring Rubric (HCTSR) is an internationally known rating tool used to assess the quality of thinking displayed in verbal presentations or written reports. The HCTSR can be used in any training program or assessment process. Its greatest value is obtained when used by trainees to assess the quality of their own or another's reasoning. The exercise of applying this holistic evaluation leads trainees to internalize descriptions of strong (and weak) thinking.

Strong 4: Consistently does all or almost all of the following:

Accurately interprets evidence, statements, graphics, questions, etc.
Identifies the most important arguments (reasons and claims) pro and con.
Thoughtfully analyzes and evaluates major alternative points of view.
Draws warranted, judicious, non-fallacious conclusions.
Justifies key results and procedures, explains assumptions and reasons.
Fair-mindedly follows where evidence and reasons lead.

Acceptable 3: Does most or many of the following:

Accurately interprets evidence, statements, graphics, questions, etc.
Identifies relevant arguments (reasons and claims) pro and con.
Offers analyses and evaluations of obvious alternative points of view.
Draws warranted, non-fallacious conclusions.
Justifies some results or procedures, explains reasons.
Fair-mindedly follows where evidence and reasons lead.

Unacceptable 2: Does most or many of the following:

Misinterprets evidence, statements, graphics, questions, etc.
Fails to identify strong, relevant counter-arguments.
Ignores or superficially evaluates obvious alternative points of view.
Draws unwarranted or fallacious conclusions.
Justifies few results or procedures, seldom explains reasons.
Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.

Significantly Weak 1: Consistently does all or almost all of the following:

Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.
Fails to identify or hastily dismisses strong, relevant counter-arguments.
Ignores or superficially evaluates obvious alternative points of view.
Argues using fallacious or irrelevant reasons, and unwarranted claims.
Does not justify results or procedures, nor explain reasons.
Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.

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 comes 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

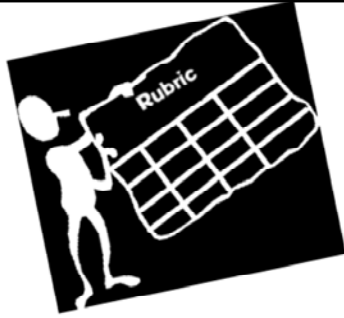
Consistency of scoring with singular rater

Consistency of score if a student is assessed multiple times

Critical Thinking Assessment Task:				
Criteria	Emerging 1	Developing 2	Proficient 3	Accomplished 4

3:40

Experience the Rubric



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Questions, Issues?