

Module 2: Assessing Analysis, Evaluation, & Creation

1	Title Slide	Welcome to the Assessing Analysis, Evaluation, & Creation module in the Assessing Higher-Order Thinking series. To advance to the next slide, select the “forward” arrow located on the play bar at the bottom of your screen.
2	Introduction	<p>“Teaching for transfer, or teaching for meaning, involves enabling students not only to remember and understand but also to use knowledge in increasingly more complex ways.” (Anderson & Krathwol, 2001)</p> <p>This module will explore ways to assess higher-order thinking that require transfer of ideas from the context in which they were previously taught to new contexts to demonstrate students’ abilities to analyze, evaluate, and create. You will notice that the assessments discussed in this module demonstrate the principles for assessing higher-order thinking described in the first module. For example, most of them rely on presenting introductory material that is new to the student.</p>
3	Learning Objectives	At the completion of this module, the learner will be able to design assessments that measure students’ ability to analyze, evaluate, and create.
4	Bloom’s Taxonomy (Revised)	<p>As we previously discussed, “analyze, evaluate, and create” are cognitive processes represented in Bloom’s taxonomy. Taxonomies such as this one are useful for categorizing learning objectives and assessments according to level of complexity. As recommended by Brookhart, your instruction and assessment should match your intended learning target in both content (what the student learns) and cognitive complexity (what the student is able to do with the learning).</p> <p>Take just a moment to review Bloom’s Revised Taxonomy. As you might recall from the previous module, the order of the chart is significant – the lower on the chart, the lower level of thinking required. You will notice that creating, evaluating, and analyzing are all at the top of the model. This is because they are components of higher-order thinking.</p>
5	Assessing Analysis	<p>Let’s begin our discussion of the top three levels of Bloom’s revised taxonomy with analysis.</p> <p>Analysis is defined in the taxonomy as “taking information apart and exploring relationships.”</p> <p>Analysis-level questions present students with material (or ask them to locate material), then ask questions or present problems with answers that require differentiating or organizing the parts in a reasonable way. Explaining the reasoning used to relate the parts to one another is often part of the analysis task.</p> <p>In the upcoming slides, we will discuss three ways you can assess your students’ ability to analyze: focusing on a question or main idea, analyzing arguments, and comparing and contrasting.</p>
6	Assessing	One central analytical skill is the ability to focus on a question or main idea,

	<p>Analysis: Focus on a Question or Main Idea</p>	<p>or “getting the point” of something. At the analysis level, this means that students can find the main idea in a text that is not stated clearly. If the main idea is stated clearly, students just need to remember and understand it – and if you will recall from Bloom’s taxonomy, remembering and understanding are on the lower end of the six cognitive processes.</p> <p>To assess how students focus on a question, give students novel introductory material. This could be a statement of a problem or policy, a political address or cartoon, an experiment and results, a speech, documentary, scenario, or set of events. After presenting students with this material, ask them to determine what the main point, problem, thesis, or argument is as a whole.</p>
7	<p>[Task Force E-Connectivity pdf]</p>	<p>Let’s look at an example of providing students with material to focus on a main idea. This question set example is derived from USDA’s Agriculture and Rural Prosperity Task Force Report by Secretary Sonny Perdue. Click on the link and take a minute to skim the document. After you finish, close out of the window and return to the module.</p>
8	<p>Assessing Analysis: Focus on a Question or Main Idea</p>	<p>The following example is a multiple-choice question set to identify the main idea.</p> <p>Question 1: According to the passage, the most important purpose of increased electronic connectivity is to improve</p> <p>A. Sustainable farm production *B. Rural American’s quality of life C. Education and health opportunities</p> <p>Question 2: Which statement best summarizes the main point made in the passage?</p> <p>A. Inaccessibility to rural broadband prevents American farmers from being players in the global marketplace and local workforce. B. The main function of accessible rural broadband is to connect rural Americans to education and health services. *C. Rural prosperity can be achieved by connecting rural America to high-speed internet.</p> <p>Question 1 begins the set by assessing understanding from the reading. While the Task Force mentions A and C, the main point is B.</p> <p>Question 2 is an example of asking students to identify the main idea. To arrive at the correct answer, students have to consider the parts of the text, including the economic impact of agriculture and the potential for improved health and educational opportunities. Then students have to reason that, taken together, these parts constitute the main idea that -- C, rural prosperity can be achieved by connecting rural America to high-speed internet. This question example could easily be presented at a lower-level of thinking such as recall, however, having students extract the main point from the reading is a demonstration of analysis.</p>

		<p>An example of an essay question using the USDA’s Task Force Report, is:</p> <p>What is the main point of the Task Force Report? State the main point in your own words, and then give evidence from the passage.</p> <p>When assessing the essay questions, criteria for formative feedback or rubrics of summative evaluation for this question could be:</p> <ul style="list-style-type: none"> • Clear, appropriate statement of the main point. • Appropriateness of evidence. • And soundness of reasoning and clarity of explanation.
9	Focus on Main Idea: Holistic Rubric	<p>If you were to use this criteria for summative evaluation (to assign a grade) instead of feedback, an example of a holistic rubric criterion that assesses focusing on the main idea based on the criteria given may look like the following:</p> <p>[insert holistic2]</p> <p>Similarly, an analytic rubric for identifying the main idea might look like this:</p> <p>[insert analytical2]</p> <p>We will be using this rubric format throughout the duration of this module, but will be changing the criteria to specifically match our assessments. The basic format was provided by Brookhart.</p>
10	Assessing Analysis: Analyze Arguments	<p>In addition to focusing on a question or idea, students can also be assessed for how they analyze arguments.</p> <p>To assess how students analyze arguments, give students an argument in the form of a text or a speech. Some suggested questions that could be asked to help students analyze arguments include:</p> <ul style="list-style-type: none"> • What evidence does the author give that supports the argument(s)? • What evidence does the author give that contradicts the argument(s)? • What assumptions need to be held for the argument(s) to be valid? • Are any part(s) of the statement irrelevant to the argument(s)? • And finally, what is the logical structure of the argument(s)?
11	Analyze Arguments	<p>The following example presents a brief performance task to assess analyzing an argument that also requires understanding the author’s point of view.</p> <p>Let’s take an agricultural communications course for example. Here, you could ask students to choose an argument from the Food and Agriculture Organization website that has been put forward against the use of GMOs in agriculture – including potential negative effects on the environment and human health and socioeconomic effects. Click on the link to skim through the document. After you finish, close out of the window and return to the module.</p>

		<p>[http://www.fao.org/english/newsroom/focus/2003/gmo8.htm]</p> <p>Instructions for students can go as follows:</p> <p>In a brief paper, analyze your chosen argument in two ways. In the first section, you will analyze the argument made by the author’s point of view. In the second section, you will analyze the argument from your own point of view.</p> <ol style="list-style-type: none"> 1. First, in your own words, state the main point of the author’s argument and explain the reasons the author gives to support this argument. Explain the author’s reasoning. 2. From your point of view, is this a sound argument? Is it valid and logical, and does it make sense? Explain your own reasoning and cite evidence from other literature.
12	Analyze Arguments	<p>When assessing for student’s ability to analyze by focusing on a question, you could use the following criteria for feedback or rubrics for the aforementioned questions. Question 1 and 2 could follow the same criteria, except a slight modification would need to be made to properly assess the student’s point of view. For example, the students’ responses could be assessed for:</p> <ul style="list-style-type: none"> • Clear, appropriate statement of the main point, or for question 2 – the student’s own evaluation. • Appropriateness of evidence. • And soundness of reasoning and clarity of explanation. <p>You can choose to give students the selected criteria when you give them the assignment so that they can self-assess as they do their work. You can also build in formative assessment opportunities by planning for self-assessment, peer assessment, or teacher feedback on drafts of the work in progress.</p>
13	Assessing Analysis: Comparing & Contrasting	<p>Let’s now transition into the final way of assessing analysis: comparing and contrasting. It is important to mention that not all “compare and contrast” tasks require higher-order thinking skills.</p> <p>Simple compare and contrast tasks are one way to show understanding. More complex comparison and contrast questions do require analysis-level thinking and this can be done by presenting students with material or asking them to locate material, and then set a task that requires students to identify various elements in it and organize those elements according to whether they are alike or not alike.</p> <p>To ensure that you are assessing the student’s thinking, you will need to decide if your feedback will be written, in the form of a score, or both. It is hard not to focus on the grammar mechanics, content, and the length when analyzing students’ thinking, but the best way to evaluate a student’s work to compare and contrast is to assess the merits of writing and thinking</p>

		separately. Without separate feedback for thinking and writing, the student could misunderstand a poor grade as that his or her thinking was faulty.
14	Assessing Evaluation	<p>Now that we have discussed ways to assess analysis, let's take a step up to the next level of Bloom's Taxonomy – evaluation. For the next few slides, we are going to uncover ways to assess a student's ability to evaluate.</p> <p>According to Bloom's, evaluation calls for students to “critically examine information and make judgments.” To assess evaluation, you need to create items or tasks that ask students to judge the values of materials and provide methods for their intended purposes. Students can appraise the material against existing criteria or criteria that they create themselves. This kind of evaluation is not a personal preference, but a reasoned evaluation that can be stated as a thesis or a conclusion and supported with evidence and logic.</p>
15	Assessing Evaluation	<p>A popular example for evaluation can be visualized in terms of evaluating livestock for market or breeding purposes. In this scenario, students are provided examples of various livestock in which they can support their decisions of ranking superior stock with evidence and logic.</p> <p>When giving feedback or scoring on a rubric, suggested criteria could include the following:</p> <ul style="list-style-type: none"> • Clear, appropriate statement(s) evaluating the livestock • Appropriateness of evidence • And soundness of reasoning and clarity of explanation <p>This can be translated to a holistic rubric approach, where the criteria could look like the following:</p> <p>Does the student's evaluation identify specific market/breeding characteristics and explain the ranking of animals?</p> <p>A score of 2 indicated that the student's evaluation answers the question above completely and clearly – Specific market/breeding characteristics are clearly identified and evaluated in rank order, reasoning is explained and is related to ranking, and the explanation is clear.</p> <p>A score of 1 means that the question was answered partially, as in only some market/breeding characteristics are identified and evaluated in rank order, and some reasoning may not be clearly explained or not entirely related to ranking.</p> <p>A score of zero means that, no, market/breeding characteristics are not identified, or no evaluation is given. Additionally, reasoning is missing or not related to ranking. Explanation is not clear.</p> <p>Remember that you can also have students develop their own criteria in which they will be assessed.</p>

16	Assessing Creation	<p>Let's now transition into the highest level of thinking in Bloom's taxonomy pyramid – creation.</p> <p>According to Bloom's taxonomy, creation is "using information to create something new, or putting unrelated elements together to form a new whole, or reorganizing existing elements to form a new structure."</p> <p>To assess students' creation, present students with a task or problem that includes generating multiple solutions, planning a procedure to accomplish a particular goal, or producing something new.</p> <p>Creation is not always "anything goes." In any subject, planning a research paper – deciding on a research question or a method for obtaining information, and developing a plan for synthesizing information into a paper – requires creation. Many wonder if creativity can be assessed, but creation as a form of a performance assessment can indeed be scored with rubrics or given feedback with or without scoring.</p> <p>Performance assessments allow students to be creative, but also give instructors leverage to assess students on the content of their thinking and the clarity of the expression of their ideas.</p> <p>An example of a rubric for creative thinking can be found as a link on this slide, as cited from Association of American Colleges and Universities.</p>
17	Formative, Summative, and Self-Assessment	<p>As we near the end of this module, let's now discuss formative, summative, and self-assessment in regard to analysis, evaluation and creation. Click on the tabs to learn more.</p> <p>Within formative assessment, multiple-choice questions can be used as a check on student understanding. To do this, give the students the opportunity to discuss the thinking behind their choices, either in class discussion or in some kind of structured activity. The instructor could ask two students with different answer choices to explain their reasoning to each other, while the rest of the class observes, followed by discussion of what they learned. Likewise, essay questions could receive feedback in the form of comments only, comments and scores, or provide input for paired discussions and revision.</p> <p>An important part of formative feedback on items or tasks requiring analysis, evaluation, or creation should be feedback on the thinking itself. Instead of solely concentrating on whether students have arrived at an appropriate conclusion, instruct students on the soundness of their reasoning, their selection of evidence, and the clarity of their explanations when providing feedback. This means that instructors should model sound reasoning, good use of evidence, and clear explanations for students. The goal is to help students adjust their thinking so that they can "show what they know" on the summative assessment.</p> <p>Regarding summative assessment, multiple-choice questions would be</p>

		<p>scored right or wrong, and rubrics or other scoring schemes would be used for essay questions and performance assessments.</p> <p>At the end of a unit, it makes most sense to grade the summative assessment with very few comments. However, it is important to comment if there is something significant to say or if a student asks a question about the work, but do not take a lot of time formulating comments students won't have the opportunity to use, especially for learning targets for which you have already finished instruction.</p> <p>Lastly, student self-assessment can require higher-order thinking skills to complete. When students ask themselves "Where am I going? Where am I now? What do I need to do to close the gap?" they are using a combination of analysis, evaluation, and creation.</p> <p>Self-assessment allows students to understand various aspects of their own work (analysis), evaluate these aspects against criteria (evaluation), and discover what the next step should be (creating a plan).</p> <p>An important element to check when self-assessment is not going well, is the quality of the students' thinking. Are they really analyzing their work, or are they just checking the "OK" boxes on a checklist? If that's a problem, are they resisting self-assessment, or do they really need help evaluating their work against criteria?</p> <p>Students need a clear concept of the learning goals and criteria when they are assessing themselves. They need to be able to recognize these characteristics in their own work and translate their self-assessment judgments into action plans for improvement.</p>
18	Review	<p>As we come to a close, let's consider all that we have covered so far. We started this module by exploring three ways we can assess analysis in our students, by assessing their ability to focus on a question, analyze arguments, and comparing and contrasting. Then we examined ways to assess evaluation and creation. Finally, we summed up our discussion by discussing assessments regarding analysis, evaluation, and creation that can be conducted in a formative and summative manner, and through student self-assessment.</p> <p>In the next module, we will be looking at ways to assess logic and reasoning in our students.</p>
19	Sources	<p>Brookhart, S.M. (2010) How to Assess Higher-Order Thinking Skills in Your Classroom. Alexandria, VA: ASCD.</p>
20	Credits	<p>Thank you for viewing this module.</p>