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Creating Rubrics

Louise Pasternack, Teaching Professor, Chemistry

What it is

Instructors have many tasks to perform during the semester. Among those is grading, which can be subjective and unstructured. Time spent constructing grading rubrics while developing assignments benefits all parties involved with the course: students, teaching assistants and instructors alike. Sometimes referred to as a grading schema or matrix, a rubric is a tool for assessing student knowledge and providing constructive feedback. Rubrics are comprised of a list of skills or qualities students must demonstrate in completing an assignment, each with a rating criterion for evaluating the student's performance. Rubrics bring clarity and consistency to the grading process and make grading more efficient.

Rubrics can be established for a variety of assignments such as essays, papers, lab observations, science posters, presentations, etc. Regardless of the discipline, every assignment contains elements that address an important skill or quality. The rubric helps bring focus to those elements and serves as a guide for consistent grading that can be used from year to year.

Why does it matter

Whether used in a large survey course or a small upper-level seminar, rubrics benefit both students and instructors. The most obvious benefit is the production of a structured, consistent guideline for assigning grades. With clearly established criteria, there is less concern about subjective evaluation.

Once created, a rubric can be used every time to normalize grading across sections or semesters. When the rubric for an assignment is shared with teaching assistants, it provides guidance on how to translate the instructor's expectations for evaluating student submissions consistently. The rubric makes it easier for teaching assistants to give constructive feedback to students.

In addition, the instructor can supply pre-constructed comments for uniformity in grading.



Some instructors supply copies of the grading rubric to their students so they can use it as a guide for completing their assignments. This can also reduce grade disputes. When discussing grades with students, a rubric acts as a reminder of important aspects of the assignment and how each are evaluated.

How to do it

Below are basic elements of rubrics, with two types to consider.

I. Anatomy of a rubric

All rubrics have three elements: the objective, its criteria, and the evaluation scores.

Learning Objective

Before creating a rubric, it is important to determine learning objectives for the assignment. What you expect your students to learn will be the foundation for the criteria you establish for assessing their performance. As you are considering the criteria or writing the assignment, you may revise the learning objectives or adjust the significance of the objective within the assignment. This iteration can help you hone in on what is the most important aspect of the assignment, choose the appropriate criteria, and determine how to weigh the scoring.

Criteria

When writing the criteria (i.e., evaluation descriptors), start by describing the highest exemplary result for the objective, the lowest that is still acceptable for credit, and what would be considered unacceptable. You can express variations between the highest and the lowest if desired. Be concise by using explicit verbs that relate directly to the quality or skill that demonstrates student competency. There are lists of verbs associated with cognitive categories found in Bloom's taxonomy (Knowledge, Comprehension, Application, Evaluation, Analysis, and Synthesis). These lists express the qualities and skills required to achieve knowledge, comprehension or critical thinking (Google "verbs for Bloom's Taxonomy").

Evaluation Score

The evaluation score for the criterion can use any schema as long as it is clear how it equates to a total grade. Keep in mind that the scores for objectives can be weighted differently so that you can emphasize the skills and qualities that have the most significance to the learning objectives.

Other thoughts

It is beneficial to view rubrics for similar courses to get an idea how others evaluate their course work. A keyword search for "grading rubrics" in a web search engine like Google will return many useful examples. Both Blackboard and Turnitin have tools for creating grading rubrics for a variety of course assignments. For more information, please contact cerweb@jhu.edu.

II. Types of rubrics

There are two main types of rubrics: holistic (simplistic) and analytical (detailed). Selecting your rubric type depends on how multi-faceted the tasks are and whether or not the skill requires a high degree of proficiency on the part of the student.

Holistic rubric

A holistic rubric contains broad objectives and lists evaluation scores, each with an overall criterion summary that encompasses multiple skills or qualities of the objective. This approach is more simplistic and relies on generalizations when writing the criteria. The criterion descriptions can list the skills or qualities as separate bullets to make it easier for a grader to see what makes up an evaluation score. Below is an example of a holistic rubric for a simple writing assignment.

Evaluation Score	Criterion
Proficient, 10pts	Writer expresses ideas clearly and provides logical references and citations. Attention is given to the audience and writer avoids the use of jargon or idioms. There are no grammatical or writing mechanic issues.
Adequate, 6pts	Writer's ideas are clear but lack suitable references for defense of the ideas. Jargon or idioms appear occasionally. There are a few grammatical or writing mechanics issues.
Inadequate, 3pts	The writer's ideas are muddled and few references or citations are given. Jargon or idioms confuse the audience. There are more than 5 grammatical or writing mechanic issues.

Analytical rubric

An analytical rubric provides a list of detailed learning objectives, each with its own rating scheme that corresponds to a specific skill or quality to be evaluated using the criterion. Analytical rubrics provide scoring for individual aspects of a learning objective, but they usually require more time to create. When using analytical rubrics, it may be necessary to consider weighing the score using a different scoring scale or score multipliers for the learning objectives. Below is an example of an analytical rubric for a chemistry lab that uses multipliers.

Objectives	Excellent (3pts)	Acceptable (2pts)	Needs work (1pt)	Missing (0)
Multiplier x1 Identification of potential errors <ul style="list-style-type: none">Solubility of productLosses when filteringTransfer losses from filter paper to vial	Recognizes all 3 of the major losses with no major errors identifying errors.	Recognizes 2 out of the 3 major losses but has a major error in understanding.	Recognizes 1 or 2 out of the 3 major losses with a major error.	Does not recognize any of the potential errors.
Multiplier x2 Procedures used to minimize errors <ul style="list-style-type: none">Amount of water minimizedAcetone was addedCare taken to minimize transfer loss	Recognizes at least 2 of these techniques with no major errors in techniques.	Recognizes at least 1 with no major errors in identifying procedures or 2 with 1 major error.	Recognizes 1 procedure, but has other errors in identifying procedures.	Does not recognize any of these procedures.

Author's Background

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Louise Pasternack earned a Ph.D. in chemistry from Johns Hopkins. Prior to returning to JHU as a senior lecturer, Louise Pasternack was a research scientist at the Naval Research Laboratory. She has been teaching introductory chemistry laboratory at JHU since 2001 and has taught more than 7000 students with the help of more than 250 teaching assistants. She became a teaching professor at Hopkins in 2013.