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Quantitative Reasoning, Critical Thinking, and Information Literacy Assignment Guide

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Quantitative Reasoning, Critical Thinking, and Information Literacy Assignment Guide

California State University, Monterey Bay

This assignment guide is a tool educators can use to critically examine and improve their assignment guidelines for the purpose of helping student produce better work. There is no expectation that assignments explicitly address all questions posed in the guide. Rather, each guide poses questions to help educators make decisions about what kinds of prompts to include -- or not to include -- in their assignment guidelines. There may be several different types of assignments that assess quantitative reasoning (QR), including the following:

- **Exam:** Questions on exam may be written to explicitly assess each category of quantitative reasoning or more than one category of quantitative reasoning. The original QR rubric categories may be sufficient to assess the proficiency of students on exam style assignments.
- **Creation:** Students must analyze raw data or develop original quantitative forms. In such assignments Calculation and Representation may feature as a large part of the assignment that does not end up in the final product (e.g., papers or presentations). In such cases, alternative methods of demonstration of these categories may be considered for submission in addition to the final product.
- **Synthesis:** Students must synthesize evidence collected by others (quantitative forms of information) from a variety of sources in support of an argument or purpose of work. In such cases, Calculation and Representation may not feature in the assignment prompts (though students may be asked to assess others' Calculations and Representations through the lens of the other categories of QR).

As you review the assignment guidelines, respond to the questions below ([generated from the quantitative reasoning integrated rubric](#)) and revise your assignment prompts if appropriate and helpful to students. Depending on course level and prerequisites, it may be reasonable to expect students to know how to respond without explicit prompting. Consider providing students with a work sample that illustrates excellent performance. Abbreviations: QR = quantitative reasoning, CT = critical thinking, IL = information literacy.

Issue/Problems (CT)

- Does the prompt define for students what is at issue, or should students define their own issue? If the latter, how explicitly does the prompt define for students the limitations on the appropriate range of issues?
- How explicitly does the prompt define the urgency/need for response?
- How explicitly and narrowly does the prompt ask students to define what is at issue in the task?
- What information does the prompt offer in terms of the audience's background knowledge?

Supporting materials (IL)

- What kind(s) of sources are called for explicitly in the prompt (e.g. peer-reviewed literature only; are newspapers, magazines, blogs, and other forms of popular media acceptable; etc.)?
- What guidance does the prompt offer in terms of quantity and diversity of sources?
- How does the prompt engage students in establishing or questioning the credibility of cited experts and other evidence?

Methodology (QR)

- How does the assignment ask students to explain or justify their creation, development, or

analysis of quantitative forms and applications?

- What guidance does the prompt offer for students about defining the limitations of their analyses?
 - What information are students given about the context in which they are composing? How does the prompt engage students in examining the assumptions relevant to that context?
-

Calculation (QR)

- What guidance does the prompt offer in terms of the kinds of calculations students should perform?
 - What guidance does the prompt offer in terms of presenting those calculations (e.g. how much of their work they should show, the units involved)?
-

Visual representation (QR)

- What guidance does the prompt offer in terms of the purposes for presenting quantitative information as visual portrayals?
 - What guidance does the prompt offer in terms of the criteria for selecting an appropriate form for that information?
 - What guidance does the prompt offer in terms of how to display or present the quantitative form within the final product?
-

Interpretation (QR)

- What guidance does the prompt offer in terms of how students should translate information presented in quantitative forms in their own work? In others' works?
-

Evaluation (QR)

- What does the prompt ask students to do with the quantitative or qualitative information in their sources or from their own work? (E.g. Should they apply it to answer policy questions? Should they use it to evaluate solutions to problems? Should they develop a model?)
 - How does the prompt engage students in qualifying the claims made on the basis of quantitative or qualitative evidence and analysis?
-

Reasonableness (QR)

- What criteria for evaluating reasonableness exist in the situation of the problem?
 - How explicitly are those criteria described (i.e., are they implied by the situation or explicitly described)?
-

Coherence/Purpose (QR)

- What relationship does the prompt call for in terms of the quantitative information and the argument or purpose of the work?
 - What does the prompt explicitly define as the purpose of the evidence (e.g. provide background information, support multiple perspectives, test a hypothesis, etc.)?
 - What information does the prompt provide in terms of appropriate vocabulary and norms of mathematical/statistical arguments?
-

Academic integrity (IL)

- What guidance does the prompt offer in terms of ethical access and use of information? (e.g., personal data, clinical trials, animal trials)
 - What guidance does the prompt offer in terms of reference and citation style?
 - What guidance does the prompt offer regarding the balance of paraphrase, quotation, and summary?
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