QL/QAR Assessment Plan

Quantitative and Analytical Reasoning GELO - Quantitative Literacy ILO

Graduates of Westmont College will apply relevant scientific, mathematical and logical methods to analyze and solve problems effectively and be able to utilize the results appropriately when making decisions.

0.1 Components of QR

"We encourage QR because it is a useful tool that can often help students better understand and express their own ideas concerning issues that they believe are important."

1. **Basic skill set**. Without a nuanced understanding of basic mathematical concepts like ratios, percentages, and averages it is impossible to apply that quantitative knowledge with a high degree of sophistication.

2. **Implementation of skills in context**. "The test of any literacy is whether a person naturally uses appropriate skills in many different contexts." Contextualized problem-solving requires students to engage in intellectual transference, applying lessons learned in one setting to a newly discovered problem. To teach QR in context, effective programs must "permeate the curriculum, not only in the sciences but also in the social sciences and, in appropriate cases, in the humanities" (Bok 2006).

3. **Communicating contextual applications**. This includes visual presentation through tables and figures in addition to writing with numbers.

4. **Habit of mind**. Students with the ability to communicate quantitative evidence in context must acquire the habit of mind to approach questions with a quantitative lens (Steen 2001, Hughes-Hallett 2003, Steen 2004). Steen argues that students "need a predisposition to look at the work through mathematical eyes" (2001).

1 Assesssment Tool

1.1 Past Tool - QLRA

Multiple-choice QR tests inherently prompt students to apply quantitative reasoning.

1.2 Proposed Tool - QuIRK - Assessing QR though Writing

1.2.1 Rationale

This QR assessment tool was developed by the Carleton College Quantitative Inquiry, Reasoning, and Knowledge (QuIRK) Initiative. The tool was designed to assess QR components 2-4 and emphasises the role of QR in all disciplines. It can be compared in many ways to "writing across the curriculum."

Advantages of Assessing QR using Writing Samples:

- Insight on Student Choice

- Recognizing QR as a Category of Evidence

- Recognizing Human QR Choice in Writing

- Benefits to Faculty

1.2.2 Basics

1. Writing samples are collected, with their prompts.

2. Each assignment categorized as QR Centrally Relevant (QR is central to the main thrust of the argument) QR Peripherally Relevant (QR would strengthen the argument by providing context, enriching description, or presenting background) QR Irrelevant

3. Within the appropriate category, the paper receives a score taking into account the effective integration of QR reasoning

4. Common errors are also noted and penalized (e.g. counts or averages with no context, switching up orders of conditionals, many, few, etc. – "weasel words")

1.2.3 Examples

QR Centrally Relevant: potential uses of numbers to address a central question, issue, or theme.

- An evaluation for a Sociology course of the deterrent effects of capital punishment on violent crime.

- A lab report for a Biology course on allelic frequency in two populations of gall fly larvae to assess potential genetic variation and physical location differences in gall flies.

- An analysis for an English writing course of whether the 2001 No Child Left Behind Act benefits America's education system.

QR Peripherally Relevant: potential uses of numbers to provide useful detail, enrich descriptions, present background, or establish frames of reference.

- A Psychology paper tracing possible psychogenic pain mechanisms that discusses the incidence of psychogenic pain in an opening paragraph.

- An evaluation of the nature of community in a contemporary mall observed for an American Studies course that discusses the popularity of malls in an opening paragraph.

2 Assessment Plan

2.1 Process

1. Collect student writing samples from every senior in Spring 2023 using ChalkandWire

    (a) Students will choose and upload a writing sample **they have already written** which fits a provided prompt.

    (b) Coordinate with Senior Seminar/Capstone Instructors to distribute prompts and to provide accountability for students submitting the writing samples (e.g., a point value for the course).

2. Groups of faculty members will be trained on the QuIRK rubric and will assess the writing samples in May.

3. Data will be analyzed over the summer of 2023.

2.2 (Possible) Sample Prompt

Please submit a paper you have already written for a course at Westmont. This paper should

1. be a piece of writing of which you are proud

2. have been completed within the last three semesters

3. (preferably) be chosen from a course within your major

4. demonstrate the ability to articulate a clear and effective thesis and to develop that thesis fully and consistently throughout a piece (?)

2.3 Closing the Loop Activities

Intended: Professional development activities educating professors on QR instruction across the curriculum and providing support for specific actions such as enhancing course assignments and writing new rubrics.

Not-Intended: To change the language of the GELO or to create a course which would teach to this assessment.

3 Questions and/or Suggestions?

*All quotations as well as significant content and themes have been taken with permission from the Carleton QuIRK website.