Quantitative Reasoning Workshop  
February 27, 2019  
3:00-4:45

Participants:
- Missy Alexander, Academic Affairs  
- Stavros Christofi, Mathematics (Chair)  
- Rona Gurkewitz, Computer Science  
- Robin Gustafson, Psychology  
- Becky Hall, Assistant Dean of MSAS/Mathematics  
- Bill Joel, Computer Science  
- Rondall Khoo, Psychology  
- Jess Kraybill, Psychology  
- Sam Lightwood, Mathematics  
- Albert Owino, Physics, Astronomy, and Meteorology: Meteorology  
- Chuck Rocca, General Education Committee Chair/Mathematics  
- Michael Shoushani, Mathematics  
- Lai Van Vo, Finance  
- Howell Williams, Social Sciences: Political Science

Agenda:
1. Review the process and results of the first assessment of the quantitative reasoning competency.  
2. Discuss options to improve the assessment process.  
3. Explore ways to improve QR skills.  
4. Consider any potential curricular changes that might support improved QR skills.

A pilot assessment of the QR competency was conducted by a group of volunteers who teach QR courses. Josie Hamer, David Burns, Bill Joel, and Robin Gustafson developed a rubric (adapted from AAC&U). Becky Hall, Michael Shoushani, Josie Hamer, and Robin Gustafson rated the artifacts (via the Aqua platform). Each participant contributed sample assignments which were evaluated by another member of the group. 37 artifacts were included in this analysis. (See attached assessment report.)

Participants in the workshop discussed
- the challenges of using full tests vs. single questions (multipart) for assessment  
- potential revisions to the rubric  
- establishing target scores for this outcome  
- potential revisions to the learning outcomes  
- potential Tier 2 QR and/or requiring a second QR encounter in a second discipline

Recommendations for next steps
1. Appoint an ad hoc committee to develop guidelines for QR artifacts submitted for assessment. These guidelines should be broad enough to include many teaching strategies while establishing some basic information. A reader from another course/discipline should be able to reasonably evaluate the performance of the student in all four categories.
2. Make minor revisions to the learning outcomes to align with the rubric (application is assumed/built into the artifact rather than being a separate assessment category), to be in a more logical order, and to clarify interpret and explain.

3. Review the language of the rubric to better align with “cognitive outcomes”

4. No target scores were established, but generally speaking 2 or higher is a potential goal.

5. The sample size should be expanded for the next assessment.

The larger goals of Tiers and repeated competency parameters should result from more robust assessment of the full gen-ed program which will not be complete for several years.

Existing Definition and Learning Outcomes

QUANTITATIVE REASONING COMPETENCY

Definition

Quantitative reasoning is the ability to recognize, interpret, and use quantitative information in a variety of situations in order to understand and create arguments supported by quantitative evidence. Students possessing quantitative reasoning skills will be able to solve problems, draw conclusions, and make informed decisions based on quantitative information. Further, they will be able to communicate their ideas or conclusions in a variety of appropriate formats (i.e. using words, tables, graphs, equations, etc.).

Outcomes

Upon completion of the Quantitative Reasoning Competency, students will be able to:

- Analyze: Make judgments and draw conclusions about quantitative information while recognizing its limitations;
- Apply: Use quantitative principles, theories, and methods to solve real world problems;
- Calculate: Apply appropriate computational procedures to solve problems;
- Interpret: Explain quantitative information presented in textual, visual, or notational forms; and
- Represent: Present quantitative information in a clear and appropriate form.
Potential Revisions to this Competency

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Definition

Quantitative reasoning is the ability to recognize, interpret, and use quantitative information in a variety of situations in order to understand and create arguments supported by quantitative evidence. Students possessing quantitative reasoning skills will be able to apply quantitative principles, theories, and methods to solve problems, draw conclusions, and make informed decisions based on quantitative information. Further, they will be able to communicate their ideas or conclusions in a variety of appropriate formats (i.e. using words, tables, graphs, equations, etc.).

Outcomes

Upon completion of the Quantitative Reasoning Competency, students will be able to:

1. Represent quantitative information in clear and appropriate forms;
2. Apply appropriate computational procedures to solve problems;
3. Analyze quantitative information to make judgements and draw conclusions, while recognizing the limitations of such analysis; and
4. Interpret quantitative information presented in textual, visual, or notational forms with reference to quantitative principles and theories.