

Quantitative Literacy Through Student Inquiry

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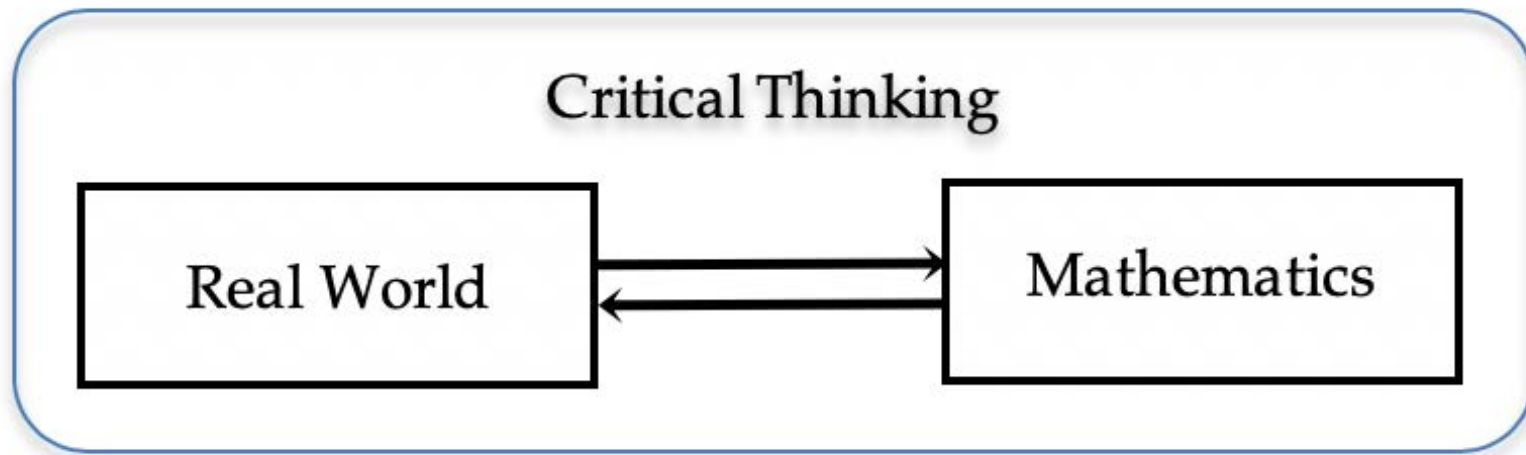
Ohio University, Athens

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Virtual Conference



The essence of Quantitative Reasoning

The interplay between the real world and mathematics is central to quantitative literacy, quantitative reasoning, statistical analysis, and mathematical modeling.



The 6 competencies of Quantitative Reasoning

- **Interpret.** Glean and explain mathematical information presented in various forms: sentences, tables, graphs, diagrams, and equations
- **Represent.** Convert information from one form into another
- **Calculate.** Perform arithmetical, mathematical, and statistical computations
- **Assume.** Recognize, make, and evaluate underlying assumptions in estimation, modeling, and data analysis
- **Analyze.** Develop conclusions based on quantitative information and critical thinking
- **Explain.** Organize, contextualize, synthesize, and present thoughts and processes using mathematical and statistical evidence

The four pillars of Inquiry

	Mathematical Space	Social Space
Student Behavior	1. Engage deeply with meaningful tasks	2. Collaborate with classmates in processing ideas
Instructor Behavior	3. Inquire into student thinking and reasoning	4. Foster equity, respect, and responsibility

(cf. Laursen & Rasmussen, 2019; White et al., 2020)

Three types of Inquiry

- Mathematical problem solving (Pólya)
- Statistical problem solving (GAISE)
- Mathematical modeling (GAIMME)

A progression of presentations & projects

- Miniproject 1: Presentation only
- Miniproject 2: Presentation only
- **Personal finance**
- Miniproject 3: **Medical testing**
- **Statistical study**
- **Final project: Modeling**
 - Proposal presentation & written proposal
 - Progress report
 - Final presentation & written report

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