



The Adventure and Importance of Teaching Quantitative Literacy

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Curriculum Renewal Across the First Two Years (CRAFTY) is a subcommittee of the MAA's Committee on the Undergraduate Program in Mathematics (CUPM). This article is the fifth in a series about general recommendations to renew mathematics course work and instruction.

As more colleges and universities offer quantitative literacy (QL) courses, faculty members have come to realize that these courses provide an amazing teaching opportunity. Teaching QL courses can be simultaneously challenging and rewarding. Challenging because teaching a QL course forces us to confront our beliefs about what constitutes college-level mathematics. Rewarding because we see students becoming much more familiar with the quantitative world around them. Many faculty teaching QL choose to experiment with innovative pedagogies and step out of their comfort zone with course content, making these courses both liberating and demanding.

Interestingly, there is no universally accepted definition of “quantitative literacy” or

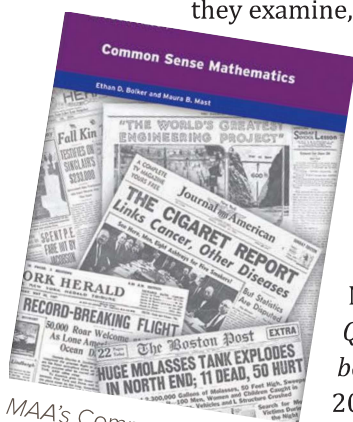
“quantitative reasoning.” There is no traditional syllabus etched in stone and passed down from teacher to teacher. Quantitative literacy has been described as a “habit of mind” or a “predisposition” to carefully critique and analyze quantitative information. Helping to create quantitatively literate graduates should be a goal for all educators as “quantitative literacy empowers people by giving them tools to think for themselves, to ask intelligent questions of experts, and to confront authority confidently” (Steen, *Mathematics and Democracy—The Case for Quantitative Literacy*, Woodrow Wilson National Foundation 2001). Institutions usually adopt or develop QL courses that meet the needs of their own students within the context of the institution’s mission and educational goals.

If you find yourself preparing to teach a QL course, take some time to explore and familiarize yourself with the exciting and innovative resources that are becoming available. Turn your mathematics course into a course on social justice or a course on the use of quantitative information in the media. Focus on game theory or integrate an intensive spreadsheet component to your course. Increase active learning by incorporating role-playing activities or community service elements in your QL course. Whatever the focus, work to support quantitative-literate graduates. Most important, make sure that students will never ask the question “When will I ever use this?”

Curricular Materials

Bennett and Briggs’s *Using and Understanding Mathematics: A Quantitative Reasoning Approach* (Pearson, 2014) has been a go-to text for a number of years. It includes material on critical thinking, numbers in the media, personal finance, probability and statistics, and linear and exponential modeling.

Published in 2016 by the MAA, Bolker and Mast’s *Common Sense Mathematics* uses real-life scenarios as they examine, among other topics, estimation techniques, units, absolute and relative change, means, and weighted averages. Many of their examples come straight from media headlines.



MAA's Common Sense Mathematics.

If you wish to focus entirely on news articles, consider Madison et al.’s *Case Studies for Quantitative Reasoning: A Casebook of Media Articles* (Pearson, 2010), which is a collection of newspaper articles together with study questions for students.

Offered through the online platform MyMathLab®, Gaze’s *Thinking Quantitatively:*

Communicating with Numbers (Pearson, 2015) incorporates numerical literacy, real-world problem solving, and the use of spreadsheets in its approach to QL.


If you are looking to create multiple pathways relevant for different majors, options include the Charles A. Dana Center’s Quantitative Reasoning course (<http://bit.ly/dana-ql>) or the Quantway curriculum maintained by the Carnegie Foundation for the Advancement of Teaching (<http://bit.ly/carnegie-ql>). Both curricula include a customized prerequisite course that provides developmental students an accelerated pathway to and through their college-level QL course.

A fundamental component to quantitative reasoning is the ability to communicate, orally and in writing, with and about quantitative information. Many existing and emerging QL materials feature activities to support student presentations, projects, or writing assignments. Making room for students to communicate may require faculty to rethink their classroom role and learn about alternative approaches to assessment. It provides a wonderful context in which to think deeply about student learning.

Resources

As one might expect, student project ideas and descriptions of innovative pedagogy for QL courses can be found on many internet sites. The Science Education Resource Center at Carleton College (<http://serc.carleton.edu/nnn/QLprojects.html>) hosts an extensive collection of projects from a variety of disciplines and offers a plethora of resources and ideas.

For scholarly writings and research papers related to QL and how to assess QL, peruse the online open-access journal *Numeracy*. Current and future QL instructors should join both the MAA’s special interest group on QL (SIGMAA-QL, <http://sigmaa.maa.org/ql/>) and the interdisciplinary National Numeracy Network (<http://serc.carleton.edu/nnn/index.html>). Both of these communities offer access to materials, meetings, workshops, and colleagues committed to improving the quantitative literacy of our students and all members of society.

Finally, keep an eye out for an upcoming MAA Notes volume dedicated to QL, which will contain more extensive descriptions of current approaches, philosophy, and resources. Teaching quantitative literacy in our colleges and universities is an important and rewarding endeavor. Get involved now and enjoy the adventure! 

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