Quantitative Graduation Requirements at US Four-Year Colleges

January 15, 2010

MAA JMM San Francisco

**Survey Sponsored by SIGMAA-QL and the MAA**

MILO SCHIELD

January 15, 2010

MAA JMM San Francisco

---

**Background**

2007: Lynn Steen compiled a list of 31 four-year colleges that had QR programs or courses.

2008: Lynn transferred his list to SIGMAA-QL: Special Interest Group of the MAA for Quantitative Literacy.

2009: In January, Maura Mast, Chair of SIGMAA-QL, authorized a survey of the Quantitative Graduation Requirements (QGR) at all US colleges.

2009: In March, the MAA agreed to distribute the survey to their liaisons in the fall.

---

**Survey Design and Survey Response**

Fall 2009: MAA distributed survey to the 1,512 MAA liaisons at US colleges.

Response rates (320 replies):

- 26% at US four-year colleges: 275 / 1,075.
- 10% at US two-year colleges: 45 / 437.

This presentation gives results from just the US four-year colleges. Max. margin of error: ± 6 pts.

---

**Types of Quantitative Graduation Requirements.**

30%: Designated quantitative courses offered by mathematics and by other departments

24%: Traditional Math-science division requirement (e.g., 1 math and 1 science)

22%: Designated courses all in math/stat dept

19%: Other (Formal reasoning; other depts.)

5%: Not applicable

---

**2009 Survey Results from US Four-year Colleges**

87% have college-wide quantitative requirement

68% have a quantitative support center

43% can satisfy QR requirement outside math

32% have a pre/entry QR assessment

20% have a post/exit QR assessment

7% have a two-Q (small, big) QR requirement

90% listed specific courses satisfying QGR.

---

**Courses Satisfying the Quantitative Graduation Requirement: Top Six**

[Chart showing the top six courses satisfying QGR]

- Calculus: 92%
- Statistics/Res. Methods: 74%
- Math for Liberal Arts: 63%
- Precalculus/Functions: 56%
- Finite/Discrete Math: 54%
- College Algebra: 50%

Conjecture: At least 20% of US 4-year colleges have a QR course

- 68% of Steen-list colleges did not respond
- Only 4 of the 10 colleges in both surveys indicated having a separate QR course
- QR courses are offered under Math for Liberal Arts, Algebra and Finite/Discrete Math

Consider Madison’s Numbers in the News QR course
- Separate QR course at Univ. Arkansas and Hollins
- Under Math for Liberal Arts at Central Washington

Concerns: Possible Survey Bias/Error

- Possible response bias: 26% response rate
- Ambiguous words/phrases: What is a “college-wide requirement”?
- Undefined terms: Quantitative Reasoning, Quantitative Literacy and Support Center
- Ignorance factor: MAA Liaison may not know what is happening in general education.

Next Steps and Recommendations

1. Submit QGR survey results to MAA Focus
2. Conduct detailed follow-up survey
   - Poll colleges with QR-QL-Stat Lit courses
   - Post results on MAA/SIGMAAQL website
   - Submit to Numeracy and Amer. Statistician
3. Repeat national QGR survey next year
   - Review terms; Add Math for Teachers, etc.
   - Survey QR in Algebra, Math for Liberal Arts

Acknowledgements

The SIGMAA-QL for proposing this survey.
- Special thanks to Maura Mast, 2008 president of the SIGMAA-QL, who directed this survey.

The MAA for conducting the survey.
- Michael Pearson, MAA Director Programs/Services
- Kerry Sullivan, MAA Program Assistant

The MAA liaisons who completed the survey.
- Lynn Steen for pioneering this project.