Quantitative Reasoning Across the Curriculum, A Supplement
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By Brooke McLane-Higginson

EA: Just over half of the EA programs reported at least a minor emphasis in quantitative reasoning. Most of these used quantitative reasoning in measuring materials and planning art projects (everything from welding to bookbinding to film processing to mounting completed projects). However, many programs also required project proposals with budgets, and a few required grant proposals as well. Some programs included QR skills by studying lenses, optics, physics, discipline-specific technologies, music theory, demographics, and chemical mixing. One EA program included "workshops on QR for artists, including proportional reasoning, linear perspective, and tessellation."
Although few EA-only programs involved QR, an additional 8 EA programs listed under Core, EWS, or IA had major QR emphases, and an additional 22 EA programs listed under these same categories reported minor QR emphases.

Core: Core, more than other planning units, seemed to incorporate QR through specific workshops or as a component. Those who reported a major emphasis often used QR to help students understand sciences (from astronomy to microbiology), to gather and analyze data, or to do other work with statistics. Core programs with minor emphases used QR in terms of computers, budgets and funding, stats, economics, and assessing the "value" of natural resources. Skills specifically mentioned in minor emphases are graphing, using Excel (1 program), using GIS (1 program), and Metric conversions.

ES: Many ES programs reported a major emphasis in QR without much more explanation—QR was incorporated through daily or weekly exercises in various sciences or statistics. Three faculty also mentioned "hypothesis testing." For ES programs reporting a minor QR emphasis, many did calculations, read scientific papers, did labs or field work, or worked with statistics.

EWS: EWS faculty reported that they used QR in more of a non-traditional mathematics way, including probability, quantum mechanics, disease outbreak investigation, topography, game theory, test development, and random mutations in evolution. EWS, too, used lots of statistics, but here more faculty mentioned an emphasis on the *meaning* of statistics than in other planning units. In programs with minor emphases, QR was often used as one way of looking at a particular concept or question—that is, QR seems to have been purposefully incorporated into otherwise more qualitative topics (students created quantitative rubrics for comparing schools to enlighten their understanding of different pedagogies, students analyzed income and employment rates of minority groups to better understand dominant culture).

CTL: Though only two CTL programs reported a major QR emphasis, this number can be misleading because 11 Core, EWS and IA programs that intersect with CTL reported major emphases in QR. Of the two CTL-only programs, one focused on measurement while the other looked at "the role of math in physical science, the nature of mathematical proofs, and Pythagorean theory as a unifying idea in mathematical physics." In addition to CTL's 13 programs reporting a minor emphasis, another 30 CTL programs listed under Core, EWS, or IA reported minor QR emphases. In CTL-only programs with minor emphases in QR, faculty most

frequently mentioned QR workshops and *interpreting* statistics. The more notable uses of QR were assessing the economic conditions of hip-hop artists, group brainstorming and individual research regarding problems that arose when writing science fiction, and learning logic through Socrates. One faculty commented that "students like the graphs and statistics in terms of how they represented history," while another mentioned "huge differences in the students' abilities to apply QR."

IA: In IA programs, statistics is again the most popular use of QR, shortly followed by other sciences (environmental, building, physics, chemistry). The following other uses were mentioned once each: empirical research, navigation, piloting, logic, and computation.

SI: SI is where QR thrives—many faculty simply said 'it was a math program' or 'it was all QR' and left it at that. Here, far more than in other planning units, many faculty commented that QR was "essential," contained in "every component," "in every aspect," or "integral," to the program. These SI responses contain much evidence of 'traditional math' like trigonometry and calculus, as well as statistics, computer science, and mathematics applied to every kind of science.

SPBC: Half (6 of 12) of SPBC programs reporting a major QR emphasis mentioned finance, budgeting, or financial analysis. Three used QR in terms of data or statistics, and in the other three it is unclear how QR was used. Two faculty commented here that students were "challenged" or "had difficulty" with QR skills, and one concluded that "all came away with enhanced skills." For minor emphases, again many programs worked with budgets and business math, and again many programs worked with statistics and critiquing statistics. Two faculty incorporated game theory. One faculty commented that when interpreting tables of data, "students were bored."

A Note on Math Anxiety and Approaches to QR:
About seven Core and EWS respondents, as well as one from SI and two from SPBC, mentioned that students had trouble working on QR skills, that many students hated or were afraid of math, or that they had an easier time getting students to work QR skills in reasoning- or logic-oriented ways, rather than with straightforward traditional math. One Core faculty commented that working QR through practical applications "was very effective, because the students didn't really know they were doing math!"