Painting by Numbers, or Better Living Through Data

Quantitative Reasoning (QR) is the application of mathematical thought and knowledge to authentic, everyday issues; sometimes called quantitative literacy, QR is demonstrated by the inclination and ability to make reasoned decisions using fundamental mathematics. Quantitative reasoning skills are widely recognized as critical to academic success across the curriculum, as well as to broader goals related to personal and career development, and informed citizenry.
— CUNY website

Kenneth Schlesinger

While emerging as a national phenomenon, quantitative reasoning is currently a major initiative at City University of New York. Sometimes referred to as numeracy, CUNY faculty – including library faculty – is committed to instilling in our students an understanding and appreciation of the application and beauty of numbers as an effective means of navigating the complex universe that confronts us. And it's not simply a comprehension of mathematics, but also related components of statistics, data analysis, and graphing. Admittedly – given the strong humanities orientation [and attendant biases] of librarians – this equally presents a challenge and learning curve for ourselves.

For better or worse, today's academic libraries are data-driven. We are required to submit a considerable amount of statistical data to library professional associations. While its tracking and collection can prove time-consuming, we refer to it repeatedly throughout the year to complete reports, make informed service decisions, prepare budgetary justifications for administration, ultimately helping to serve users more effectively.

The range of data collected would astonish those outside the library: door counts (number of daily visitors); circulation, reserve, and interlibrary loan transactions; reference and technology-related queries; book, e-book, and e-journal acquisitions; website visits; user counts of online databases. In fact, in a recent Student Technology Fee meeting, committee members were actually surprised our recommended electronic databases were based on user metrics.

In this numerical issue of Biblio-Tech, library faculty presents and analyzes statistics in such emerging services as virtual chat and Roving Reference. Since we're committed to student success, we share new online tutorials developed to support students to access and comprehend complex company information resources. Further, library faculty is employing Web Usability practices to empower patrons to share how they navigate our ostensibly user-friendly website. Ultimately, our users demonstrate what the Library does best, where we fail, and how we can always do things better.

Kenneth Schlesinger
Chief Librarian

Quantitative Reasoning and Information Literacy

Students entering the workforce will be asked to gather or create data no matter what their field: business students will need to complete market analyses; teacher candidates will be required to execute responsible assessments of student performance; arts and non-profit workers will be asked to justify the costs of their endeavors with quantitative studies that prove their efficacy; and so on. Even students never called on to perform a calculation will likely find themselves greatly affected by the computations of other people, who will use quantitative studies to change practices and workflow, redirect organizational efforts, and of course reallocate budgets.

And quantitative reasoning is no less crucial for civic engagement. One need only visit the homepage of a newspaper to see how frequently statistics and calculations of various kinds are used to justify public policy. From demographic information to budget analyses to performance assessments of government agencies, numbers of all kinds are used to defend or demolish political arguments. And, as is often noted, these numbers and calculations can be incorrect or misleading, and commentary surrounding them is often lacking appropriate depth and nuance.

So, while many librarians may be reluctant to propose that they can teach quantitative reasoning skills – this is not, after all, our area of expertise – we can contribute to this aspect of our students' education by teaching information literacy skills related to quantitative literacy.

Here at Lehman, library faculty has begun to analyze our information literacy efforts for areas of crossover with quantitative reasoning. At the Reference Desk, we routinely help students find reliable data and point out details often overlooked by novice researchers, such as where data come from, who sponsored or produced the research, and the age and scope of the information presented. I have had more than one conversation with a student about what a particular chart really means, and my understanding of what can or cannot accurately be said about it in a paper. And I have pulled out citation style guides and struggled alongside many students who needed to cite a dataset, a graph, or a page full of demographic information.

In our freshman Instruction program, we have consistently emphasized the importance of critical thinking, often challenging students to consider criteria such as accuracy and reliability before selecting a source of information. These factors are just as applicable to the evaluation of a quantitative source as any other.

In upper level classes in Education, Sociology, Science, and Health and Human Services, we often teach students to retrieve statistics from websites and databases, and we discuss the best ways to find data relevant to a particular research topic. Just this semester, I watched my colleague Robin Wright work with an upper level public health student who needed statistics that would help her determine if her paper topic was viable; within minutes, Robin had shown her how to find exactly the kind of demographic data needed and had discussed the implications of this information for the next steps in her research.

To me, the most important goal of information literacy is to create sharp thinkers – individuals who ask good questions about the world, and know how to seek meaningful information related to those questions. As quantitative information takes on greater importance, the need to ask incisive questions about it will increase as well. It is here that information literacy and quantitative reasoning find their common ground – and a common goal.

Jennifer Poggiali

Esther Wilder (Sociology) and library faculty Robert Farrell, Madeline Cohen, Alison Lehner-Quam, and Robin Wright presented quantitative reasoning concepts and resources at *Painting by Numbers: Quantitative Reasoning in the Library* on April 9th.