For Students in Non-Quantitive Majors

40% of college graduates are in non-quantitative majors: majors that don't require any math. Such majors include English, history, political science, philosophy, religion, music and art.

These students in these majors are more likely to become judges, journalists, policy analysts and social leaders.

These majors don't need college algebra, statistics or calculus. They do need to think critically about numbers in the news.

Strong Focus on Rates and Percentages

The math studied in this course is based on the statistics that appears in everyday newspapers, journals and government publications.

The focus is on basic descriptive statistics: counts and totals, ranks and percentiles, percentages and rates, means and medians.

Using ordinary English, students are expected to describe and compare rates and percentages presented in tables and graphs.

A cutting-edge web-program reads each student's description, decodes the syntax, infers the semantics and gives immediate feedback. Non-native speakers find this program helpful.

Students also use a new graph-based technique to calculate the influence of confounders. This multivariate technique is readily understood by non-numerate students.

Supported by the W. M. Keck Foundation

The W. M. Keck Foundation gave a $500,000 grant "to develop statistical literacy as an inter-disciplinary curriculum in the liberal arts."

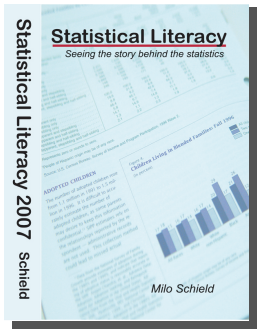
For students, the grant resulted in:

- a student-tested, critical-thinking textbook,
- thousands of field-tested Moodle exercises
- cutting-edge web programs

For teachers, this grant resulted in:

- a template to evaluate numbers in the news
- a web-based instructor-training program
- over 30 scholarly papers on this course

A draft of the AACU article, Statistical Literacy and Liberal Education at Augsburg College is at www.StatLit.org/pdf/2005SchieldAACU.pdf.



For more on the Statistical Literacy textbook, see www.StatLit.org/Schield.htm.

The W.M. Keck **StatisticalLiteracy®** Course

A numbers course students like!

Seeing Behind the Numbers

For students in non-quantitative majors

Complete with a student-tested textbook, Moodle exercises quizzes and exams.

Copy at: www.StatLit.org/pdf/2008StatLit2A.pdf

Numbers in the News

Statistical Literacy studies numbers found in experiments, observational studies, surveys, models and medical tests. Here are some examples:

- Magnet Reduces Severe Pain
- Smoking can Lessen IQ, Thinking Ability
- Weight Lifting May Cut Teen Diabetes Risk
- Women Get Paternal Clues in Men's Faces
- Kids with High IQs Become Vegetarians
- Did Catholics Give More Support for Hitler?
- Evolution Pro & Con: A Survey
- Global Warming Projects a "Hot Planet"
- Cancer Diagnostic Test has High Error Rate

Student Assessment

For each topic, students complete a short multiple choice exercise on Moodle. They recieve immediate feedback and a chance to improve their scores. Each week, students analyze the numbers in a news story and write up their evaluation.

At the end of each chapter in the book, students complete a Moodle test involving multiple-choice and essay questions.

The mid-term and final exams include material from the chapter quizzes and require the students to analyze a numbers-based news story they haven't seen before.

By linking weekly assessment to evaluating numbers in the news, the goal of the course is maintained throughout.

Structured Approach

Students need a structured approach to analyze news stories that employ numbers as evidence. This course uses a critical thinking approach.

- What is the point of the story?
- Is there association or causation?
- How well do numbers support the point?

Students study the **Take CARE** methodology to analyze the four main influences on numbers:

Context:
What associated factors are
- controlled for by the study design?
- controlled for by ratios and comparisons?
- controlled for by selection and modeling?
- not controlled for (potential confounders?

Assembly:
Can the number be influenced by choice of
- definitions for groups or measures?
- comparison or mode of presentation?

Since all statistics are socially constructed, this activity requires hypothetical-thinking: a new and challenging activity for most students.

Randomness or Chance:
- What is the margin of error?
- Is the association statistically significant?
- Can statistical significance be influenced?

Error or Bias:
- What are plausible sources of error or bias?

Student Response

Students value this course:
After taking Statistical Literacy, students were asked to evaluate the course.

These percentages agreed or strongly agreed:
81% developed critical thinking skills.
77% practical/relevant to major or work
75% practical/relevant to personal/civic life.
57% should be required for all students

These percentages are encouraging, since almost all these students started the course saying they would not take it unless it was required.

CAPELLA UNIVERISITY

Students value critical thinking:
Statistical Literacy has been taught online by Capella University. When compared with all other general education courses, Statistical Literacy ranked in second place on critical thinking. Philosophy was first while traditional statistics ranked last (15th out of 15).

When asked if they would recommend the course to other students, Statistical Literacy ranked 6th. Traditional statistics ranked 15th.