

A panel organized by the SIGMAA QL ...

# THE ROLE OF QUANTITATIVE LITERACY CENTERS IN SUPPORTING STUDENTS AND FACULTY

*July 31, 2008  
9:00 a.m. – 10:20 a.m.*



The Mathematical Association of America

MathFest 2008

Madison, WI July 31 - August 2



## Panel Organized by:

- Maura Mast, University of Massachusetts – Boston
- Cinnamon Hillyard, University of Washington Bothell

## Panelists:

- Caren Diefenderfer, Hollins University
- Nicole Hoover, University of Washington Bothell
- Judith Moran, Trinity College
- Corrine Taylor, Wellesley College



# Quantitative Reasoning at Wellesley College

Corri Taylor  
MathFest QL Panel  
July 31, 2008

# Two-Part QR Requirement

## 1. The “Basic Skills”

Requirement is satisfied either by:

- Passing the QR Assessment during Orientation, or
- Passing “Intro to QR” – course that builds logic, math, and statistics skills in real world contexts

## 2. The “QR Overlay”

Requirement is satisfied by taking an approved course that deals extensively w/ the analysis and interpretation of data, e.g.,

- Statistics classes
- Science labs with data collection & analysis

# The QR Assessment



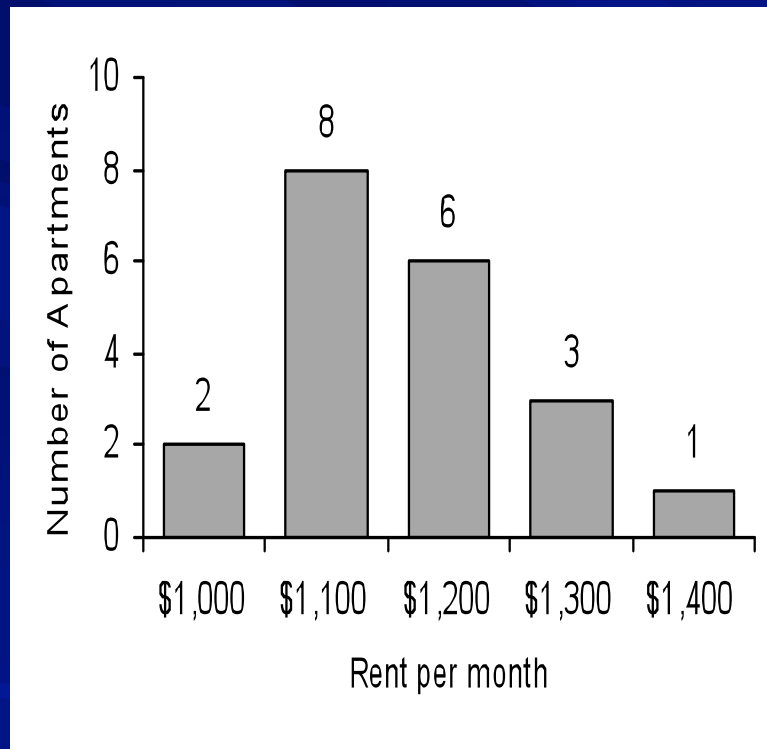
- Study packet sent in summer
- Administered during Orientation
- Test is 90 minutes; 18 questions; 9.5 to pass
- Most questions are NOT multiple-guess
- No calculators allowed

# Sample Assessment Question

Summer sublets tend to be expensive in the Cambridge area. This table from a local housing office advertises the monthly rental costs for two-bedroom apartments. For example, the table indicates that there are six apartments available for \$1200/month. Use the table to answer the following questions.



# Assessment Question Continued



1. What percentage of the apartments sublet for more than \$1,200 per month?
2. What is the mean (average) monthly rent for a two-bedroom apartment?

# Intro to QR Course

- Lectures and computer labs (using Excel)
- Emphasis on practical uses of logic, math, stats  
often QR skills taught “just-in-time”
- Topics include:
  - \* Education data
  - \* US demographics
  - \* Astronomically large to microscopically small – a physical sense of space
  - \* Personal finance
- *Using & Understanding Mathematics: A Quantitative Reasoning Approach*, by Bennett & Briggs

# QR Overlay Courses

## ■ Types of courses:

- Statistics classes with computer labs
- Science classes with hands-on laboratories involving statistical analysis
- Others: PHIL 209: Scientific Reasoning

## ■ Topics covered:

- Framework for data analysis
- Methods of data collection & measurement
- Representing & summarizing data
- Confidence intervals; hypothesis testing
- ANOVA; multiple regression

# QR Overlay Courses in....

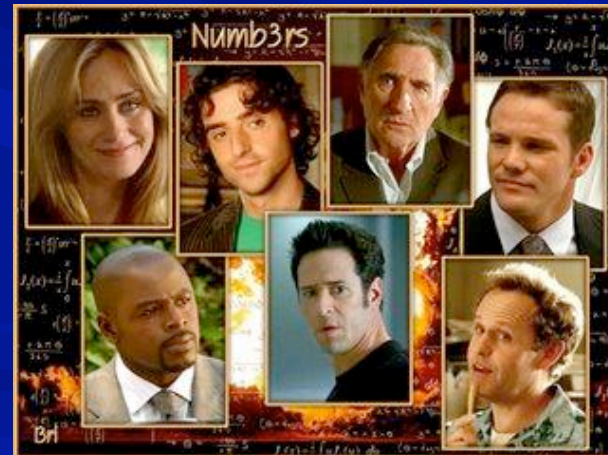
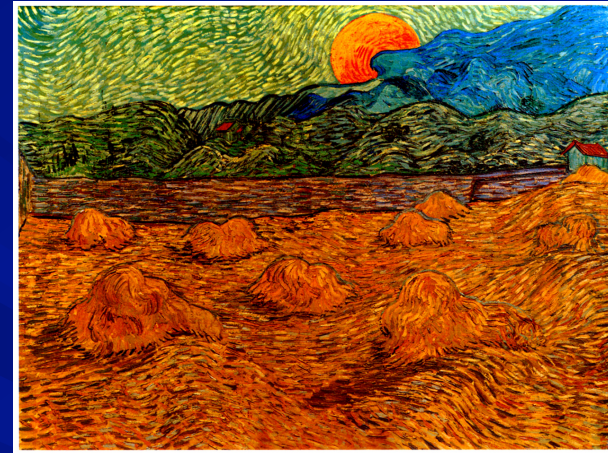
- Astronomy
- Biology
- Chemistry
- Computer Science
- Economics
- Education
- Environmental Studies
- Geology
- Mathematics
- Philosophy
- Physics
- Political Science
- Psychology
- Sociology

# We in the QR Program (Two Full-Time Faculty)

- Administer the QR Assessment
- Teach the “Intro to QR” course and some QR overlay courses (in Math, Econ, Education, BioStats)
- Coordinate with LTC for tutorial services
- Ensure QR overlays meet guidelines
- Support instructors of present & future QR overlay and other quantitative courses
- Run “Celebrating QR Connections” series

# Celebrating QR Connections

- QR & Art,  
Spring 2004
- QR & Biology,  
Fall 2005
- QR & Forensic Evidence,  
Spring 2007
- QR, Polls & Predictions,  
Fall 2008



# Support for our QR Program

- Faculty initiated from the beginning
- QR requirements since 1997
- Students appreciative of program
- 2003, gift of \$160,000 for series, etc.
- 2004, endowment of program, \$3 million
- QR is important part of Wellesley culture

# **The Role of QR Centers in Supporting Students and Faculty**

**Caren Diefenderfer  
Hollins University**

**MathFest 2008  
SIGMAA QL Roanoke, VA**

# QR Requirements at Hollins

“New” Gen Ed program  
(fall 2001)

Education through Skills and Perspectives  
(ESP)

Two QR requirements

(q) Basic Skills (fall 1998)

(Q) Applied Skills

# The Center for Learning Excellence

Houses the Writing Center and the QR Center

Student tutors are available

Peer mentors for classes that request one

Tutor training class

Faculty workshops

Future “vision” for the Center?

# More Information

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[www1.hollins.edu/depts/qr/index.html](http://www1.hollins.edu/depts/qr/index.html)

# The QL Requirement at Trinity College

Judy Moran



## History of QL Requirement (the old days)

- Established by vote of faculty in 1986
- QL proficiency determined by an in-house exam given to all incoming students
- Non-proficient students required to take Math 101, a foundations course designed and taught by founding Director Tim Craine
- Study assistance provided by student tutors

## Components of Trinity's QL Requirement today

1. **Faculty general education requirement** instituted by faculty vote in 1986 (but the definition of QL has been debated and specified by the emerging QL community).
2. **Math Center Advisory Committee** of nine faculty from across campus, including one member of the Math Department, and Associate Dean of Faculty

### 3. Assessment of all incoming students in four areas:

#### Numerical Relationships

proportions, percents, estimation

#### Statistical Relationships

data analysis, elementary probability

#### Algebraic Relationships

modeling, functions, algebra

#### Logical Relationships

fallacies, arguments, counterexamples

## 4. Foundation Course and Quantitative Support

*Math 101: Contemporary Applications: Math for the 21<sup>st</sup> Century*



# Tutoring in Trinity College's Math Center



## 5. Other QL courses that satisfy the requirement:

*Fallacies for Fun and Profit* (First-year Seminar)

*Mathematics of Equity* (Math Distribution & QL Credit)

*Skepticism and Belief* (Science Distribution & QL Credit)

*Visually Displaying Data: Graphical Literacy*

(Math Distribution & QL Credit)

*Geometry in Art and Architecture* (Math Dist.& QL Credit)

## Problem:

Trinity's QL requirement is still the province of the Math (soon to be Quantitative) Center.

Although many faculty use more quantitative tools in their courses, there is no institutional incentive for them to do so.

**QL-enriched courses** QL Across the Curriculum course development supported by grants from the Dean of Faculty's office and the **NNN**:

*Introduction to Earth Science*

*Adjustment and Transition: The Political Economy of Sub-Saharan Africa*

*Introduction to Environmental Science*

*Math, Disease, Race and Colonialism in the Americas (history)*

*Introduction to Health and Human Rights*

*Introduction to American Public Policy*

*Foundations of Modern Science (First Year Seminar)*

*Math as Music, Music as Math (Tutorial College)*

*World Population (Sociology)*

# University of Washington Bothell's Quantitative Skills Center

Nicole Hoover, Director

# University of Washington Bothell

- ▶ Founded in 1990
- ▶ Present Enrollment: 1,560 FTE
- ▶ Programs of Study:
  - § Business (BA, MBA)
  - § Computing & Software Systems (BS, BA)
  - § Interdisciplinary Studies (BA)
  - § Nursing (BSN, MN)
  - § Education (M.Ed.)
  - § Policy Studies (MA)
  - § Cultural Studies (MA)\*
  - § Environmental Science/Studies (BS/BA)
  - § STEM (BS)\*

\*new programs

# Quantitative Skills Center (QSC) History

- ▶ 1998 – Faculty Instruction & Research Committee saw need for QL support
- ▶ Wanted something different from other math centers
- ▶ Some faculty were concerned it would be a “crutch”

# Beginnings of QSC

- ▶ In 2000 – Doors opened with Cinnamon and 1 student tutor
- ▶ Open  $\approx$  12 hours/week
- ▶ Located in small study room in campus library



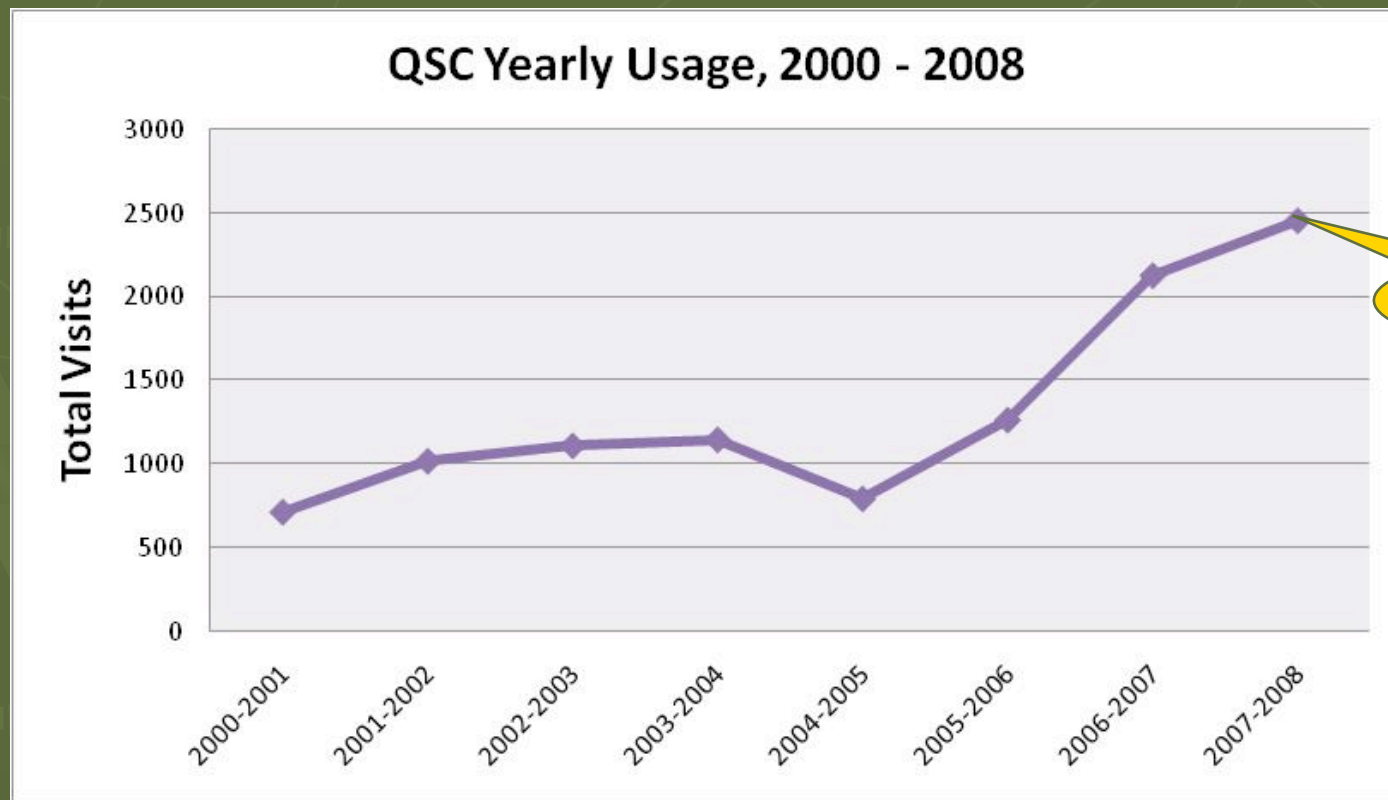
# The QSC Today

- ▶ 2 staff positions
- ▶ 13 student tutors (2-4 working at one time)
- ▶ Open 50 hours/week
- ▶ Located in its own suite
- ▶ 7 computers
- ▶ Seats  $\approx$  25 students



# QSC Statistics

- ▶ Almost 10,600 visits since opening in 2000
- ▶ This year we averaged  $\approx 60$  visits each week



# Supporting Students & Faculty

- ▶ Peer tutoring
- ▶ Classroom support
  - § Faculty consultation
  - § Classroom activities
- ▶ Workshops
  - § Excel
  - § SPSS
  - § Algebra Refresher...



# Some Areas We Support

- ▶ Precalculus, Calculus, Statistics
- ▶ Logic behind programming
- ▶ Finance
- ▶ Economics
- ▶ Some sciences
- ▶ Quantitative research design and analysis
- ▶ Quantitative software such as Excel, SPSS, Maple, etc.



# Challenges

- ▶ Training tutors
- ▶ Keeping up with who's doing what!
- ▶ Getting faculty to incorporate QL into their courses



# Opportunities

- ▶ Students have better understanding of the mathematics they are using
- ▶ Students able to see connections
- ▶ Students stop asking “When will we ever use this?”
- ▶ Great learning opportunity for tutors

