Continuing the Journey: Improving a site-specific statistics pathway

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First, some context...

JCC
- ~10,000 students
- 4 campus locations
- 39% male; 14% non-white
- 56% full-time (12 CR)
- 25% transfer out

Our Department
- 15.9% of all contact hours
- 8 full-time, ~40 adjunct
- Moderate adjunct turnover
- ~5 stats sections/sem.
- 2 stats specialists

Jackson, Hillsdale, Lenawee
- ~$42k median household
- 8-10% unemployment
- ~20% non-white
- 2 small Unis, 3 small LAC
Course Structure (Summer 2011)

Developmental

College-Level

- Basic Mathematics
  - Pre-Algebra
  - Beginning Algebra
    - Intermediate Algebra
      - Statistics
      - Precalculus
        - Calculus Sequence
Why do our own thing?

Exigency of change
"You've got one year -- make it work!"

Existing Introductory Statistics
A new path to a familiar destination

Flexibility for instruction and curriculum
Meeting our particular needs (and quirks)
Design as Balancing Act...

And, it's *always* a moving target!
Major Challenges...

Textual

Curricular

Instructional

Institutional

Technology

Student Population
Text-Based Solutions

- Uniform use of custom (online) book HW system
- Uniform use of a course pack of typed notes
- All ancillary materials collectively built and shared
General Topic Outline

Unit 1: Operations and Expressions
  - Working with integers and decimals
  - Working with equations, formulas, and unit conversions

Unit 2: Probability
  - Basic rules of probability
  - Fractions embedded

Unit 3: Introduction to Statistics Language
  - Data classification
  - Sampling methods and experimental design

Unit 4: Frequency Distributions and Graphical Displays
  - Ratios, percents, Sigma notation
  - Consuming and producing graphs and tables
Curricular Solutions, cont.

Unit 5: Descriptive Statistics
- Measures of central tendency
- Measures of variation
- Measures of position

Unit 6: Exact Linear Relationships
- Graphing lines
- Using equations to make predictions
- Slope, y-intercept, $y = mx + b$

Unit 7: Approximate Linear Relationships
- Scatterplots
- Linear Regression
- Basic correlation
Example Activities & Projects

One long tunnel (equations and formulas)

Housing Affordability (unit conversions)

Probability on the Roulette Wheel

Mini-Research (in class) warmup

Yummy graphs (describing data)

Airfare vs. Distance (linear models)
Instructional Solutions - Training and Selection

- Multi-day workshops (content & tech) based on interest
Instructional Solutions - Staying Connected

- Online forum, Conference calls, Email, Observations
Instructional Solutions

Faculty Management
   Collect feedback and monitor interest and capability

Supplemental Instruction
   Slowly introduced -- strong success

Tutors
   Capacity building for "statistics" tutors

Support for the Ill-prepared
   Binders of completed notes; Videos
Instructional Solutions

- Useful, flexible instructional materials
Institutional Solutions

Faculty buy-in
   Every department & program solicited for wants/needs

Placement issues
   Shifting from algebra-scores to reading comp scores

Student Services/Advising
   Continuing to meet ALL campuses... *multiple* times
Technology Solutions

Ti-83/84
- In class (SmartView)
- YouTube videos

Excel
- YouTube video tutorials

Online data sources and applets
  e.g., GapMinder

Making use of 'native tech'
- Smartphones, Google Docs
YouTube Video Tutorials
Student Project Examples

- Pretzel M&M's (Snack Size) Frequency
- Pretzel M&M's (Med Size) Frequency
- Airfare vs. Flight Distance
- Pretzel M&M's (Medium Size) Frequency Pareto
Overall Success Rate (FA11):
Students Passing MAT 033 with a 2.0 or higher

\[
\frac{85}{130} = 65\%
\]

Success Rate for students who passed 033 in FA11, then took 133 in WN12:

\[
\frac{38}{56} = 68\%
\]

Where did the other 29 FA11-successes go?
Winter 2012 Students

Overall Success Rate (WN12):
Students Passing MAT 033 with a 2.0 or higher
\[
\frac{52}{122} = 43\%
\]

Success Rate for students who passed 033 in WN12, then took 133 in SP12 or FA12:
unknown at this time
Searching for Answers

% of DE Subject Area Placements Comparison

- Zero: Fall 2011 - 2.6%, Winter 2012 - 2.2%
- One: Fall 2011 - 67.5%, Winter 2012 - 54.4%
- Two: Fall 2011 - 23.1%, Winter 2012 - 27.8%
- Three: Fall 2011 - 6.8%, Winter 2012 - 15.6%
Some interesting finds

ACT "placed" students
● Fall 2011 - 30/35 = 86% successful
● Winter 2011 - 13/35 = 37% successful

"New" to JCC students
● Fall 2011 - 58/131 = 43% (64% success)
● Winter 2011 - 12/124 = 10% (45% success)
More interesting finds

Weakest performing demographics
- Age: 20-24 years - $\frac{23}{47} = 49\%$ successful
- Gender: Males - $\frac{37}{79} = 47\%$ successful

Strongest performing demographics
- Age: 30+ years - $\frac{46}{72} = 65\%$
- Degree Program: Assoc. Arts - $\frac{28}{37} = 76\%$
Moving Forward:

Advising & Placement Issues

Instructional Improvements & Variable Support by Term

Curriculum/Textbook Adjustments

Collect/compile data & Share
Thanks!

All our materials* are (and will be) available here:

[bit.ly/jcc033](bit.ly/jcc033)

Please share your thoughts, ideas, and questions!

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