Statistics for Everyone: Empowering Faculty to Incorporate Statistics into Their Courses

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Abstract

As part of Fairfield University’s campus-wide initiative to promote quantitative reasoning (QR), two faculty members, one from Mathematics and one from Psychology, created faculty development workshops titled “Statistics for Everyone”. These interactive and interdisciplinary workshops provided valuable background material and teaching resources so that faculty could more confidently integrate statistics into their courses, and thus help students develop statistical reasoning. This poster will highlight the resources and materials presented to the more than 40 workshop participants across campus, and discuss some of the outcomes, successes and challenges of this type of QR initiative.

Initiatives & SFE Goals

Core Integration, Quantitative Reasoning Pathway: “Students must become competent in using, interpreting and presenting quantitative data ...”

Revised Science Core Guidelines: “Students learn the value of scientific integrity and, through their own experience of data collection and/or analysis ...”

Goals of Statistics for Everyone (SFE) Workshops:
- Support faculty in introducing statistical reasoning into their courses
- Provide resources for both faculty and students
- Introduce faculty to available statistical software
- Help students to integrate statistical reasoning
- Engage faculty across the curriculum

Workshop Participants By Disciplinary Area (total: 42)

Sample Participant Modules:
- Predict state obesity rates from average state income (Chemistry)
- Model anger response using politeness and relationship measures (Communication)
- Predict labor cost from firm size and asset size (Business)
- Compare the poverty levels in 2000 and 2009 (Economics)
- Compare the lengths of holding one’s breath under 2 different conditions (Biology)
- Determine if the BPA leach out in bottles depends on country of manufacture (Chemistry)

Resources For Faculty

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Outcomes

Sample Participant Comments:
- “These workshops gave me an introduction to statistics and opened it to all disciplines
- “I’ve incorporated statistics into my courses and opened it to all disciplines
- “I didn’t think about instructing students about statistics in a more in-depth way and gave me – and my students—practical, understandable materials.”
- “I didn’t think about instructing students on how to present the stats.”
- “Gave me confidence to implement more stats into courses.”
- “I’ve incorporated statistics into my Communication Research Capstone.”
- “I haven’t added anything new, but used the materials to make things run easier.”
- “Got to see how others are using stats in their classes.”

Successes:
1. encourage and support faculty who want to incorporate stats into their classes
2. provide resources to faculty and students for their courses and research
3. model integration by having faculty see applications of statistics from a variety of disciplines
4. give students the opportunity to use statistical reasoning in more of their courses

Challenges:
1. Ongoing support for these types of faculty development workshops
2. Requests for additional workshops for more specialized topics

Conclusion

Workshop Elements & Events

Summer 2008
- Statistics for Core Sciences
  - Summarize and graphically represent data
  - Descriptive statistics: Measures of central tendency and variability
  - Compare means with a t-test
  - Analyze categorical data with Chi-Squared tests
  - Assess the relationship between Z variables with correlation and regression
  - Create a module to use in class
  - Use Excel for analysis

Summer 2009
- Statistics for Everyone
  - Repeated the 2008 workshop, added multivariable regression, and opened it to all disciplines

Fall 2010
- Statistics for Nurses
  - Workshop just for the School of Nursing, expanded the 2009 workshop to include ANOVA and the use of SPSS

Summer 2011
- Statistics for Everyone, Advanced topics
  - Reviewed graphical and numerical summaries and introduced ANOVA using SPSS, open to all disciplines

Bibliography


