Statistics Students' Skills: What Does the Workplace Need?

Presented by:

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Westat

Topics

- Statistical skills
- In addition to statistical knowledge, what skills do employers need from new graduates?
- Communications
  — Oral
  — Written
- Organizational skills
- Leadership
- Ethical principles

Why I'm Interested

- Westat
  - Director, Statistical Group
  - Consulted on Quality Improvement
- ASA
- Special Faculty at the Joint Program for Survey Methodology
- GMU Statistics Dept. Advisory Board

Westat

- Survey research, primarily government customers
- 2000 employees at Rockville Headquarters
- 10,000 temporary field staff
  - In-person interviewing
  - Measurement, including testing
  - Phone interviewing
- Surveys
- Case Control studies, Epidemiological studies, Clinical trials

Westat Statistical Group

- 70 MS & PhD statisticians

- Authors, presenters, instructors

- Areas of expertise:

  — Survey Methodology: reducing total survey error

  — Sample Design/Selection: Weighting, Imputation, Variance Estimation

  — Analysis: Multiple/Logistical Regression, Survival Analysis, HLM, Propensity Scores

  — Item Response Theory

Survey Methodology

— Reducing total survey error

— Improving response propensity

— Assessing potential bias

— Minimizing recall errors

Sample Design/Selection

— Sample Designs

— Weighting

— Imputation

— Variance Estimation

Analysis

— Multiple/Logistical Regression

— Survival Analysis

— Hierarchical Linear Models

— Propensity Scores

— Machine Learning

✦ Boosted regression

Software Skills

— SAS

— SUDAAN

— SPSS

— Stata

— R

— Python

We assume…

- Graduates receive
  - — Deep and broad statistical knowledge
  - — Experience with relevant software
  - — Experience solving statistical problems
- What else will they need in the workplace?
  - — Can graduate programs provide these skills?
  - — Should graduate programs provide these skills?

What Else do Employers Need?

- Communications
  - Oral
  - Written
- Organizational skills
- Leadership training
- Ethical Principles

Organizational & Leadership Skills

- Organizing a task into components
  — Assigning responsibilities
  — Providing support
- Estimating effort
- Scheduling tasks
- QC the process

Ethical Principles

- Confidentiality & Privacy
- Informed Consent
    — IRB
- Conflicts of Interest
- Objectivity, Impartiality
- Professional Competence

Summary

- Statistical & computer skills
- Communications
- Organizational skills
- Leadership training
- Ethical principles