Training Statistics Students to Collaborate in the Academic Environment

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Georgia Statistics Day, 10/30/15

Outline

- History of UGA Statistical Consulting Center
- Consulting Community
- Graduate Student Training
- Outcomes
- Concluding Thoughts

History of UGA Statistical Consulting Center

- The SCC has roots going back prior to 1990
  - List of students willing to do statistical consulting
  - Loosely supervised by faculty
- 1990-2000:
  - The SCC gained a permanent faculty director
  - Two academic, then full year, assistantships
- 2000-2006:
  - The SCC grew very popular and the workload required two faculty directors…

History of UGA Statistical Consulting Center

- 2006-2008:
  - The SCC was a little *too* popular, and went on hiatus due to workload issues
  - Consulting only available through STAT 8000
- 2008 to present
  - One faculty director, one full-time faculty associate director, and 3-9 graduate consulting assistants + graduate student volunteers

History of UGA Statistical Consulting Center

- The SCC is currently supported by the Franklin College of Arts and Sciences, the Office of the Vice President for Research, the Graduate School, and the College of Agricultural and Environmental Sciences
- Currently the SCC offers:
  - Free initial consultation (generally 1 hour +)
  - Longer term consultation available for an hourly fee
  - Data analysis for an hourly fee
  - Reduced fees for grant proposal preparation
- We work with on-campus researchers, off-campus academic researchers, and corporate clients

www.stat.uga.edu/consulting

History of UGA Statistical Consulting Center

- The SCC's mission statement:

  To provide collaborative research assistance to faculty, research staff, and students in all departments of the University of Georgia; to increase the quality of quantitative research performed at the University; and to provide an advantageous educational experience to students of statistics through training as statistical collaborators.

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Consulting Community

- Inspiration from a visit to Virginia Tech in 2011
  - LISA, the Laboratory for Interdisciplinary Statistical Analysis (www.lisa.stat.vt.edu)
- A follow up visit to Purdue and discussion among administrative faculty led to regular interaction of land grant statistical consulting centers
- Involvement in ASA's Section on Statistical Consulting and presentations at Joint Statistical Meetings have increased national involvement

Consulting Community

- Vance (2015) highlights two potential futures for academic statistical consulting:
  - “Bright Future” in which academic statistical consulting centers train consultants in effective statistical consulting and collaboration skills, and promote the impact of statistics in multiple fields of research
  - “Dire Future” in which consulting statisticians become irrelevant due to increasing use of statistical software and specialization, and competition from computer scientists, mathematicians and other quantitative scientists (as already seen with “data science”, big data, analytics, and machine learning)

Consulting Community

- 25 years ago, Kirk (1991) recognized that graduate programs in statistics give little attention to the “human side” of consulting, and cites sources from 10 years earlier indicating the same
- The consensus is, and has been, that in order to maintain and increase the relevance of statistics in academics, we must train our students (and ourselves!) to be effective collaborators

Consulting Community

- Love-Myers et al (2015) define a statistical consultant as one who answers a statistical question for a client; collaboration is defined through the creation of new knowledge that comes from aiding a client to answer research or business questions
- Our current training model at UGA focuses on teaching students the collaborative skills they may not learn in theoretical and applied statistics courses

Graduate Student Training

- Training begins in STAT 8000: Introduction to Statistical Collaboration
- This course is required before working or volunteering in the SCC
- Recent changes to this course include
  - Training on individual aspects of consulting
  - Introduction to Doug Zahn's POWER process (Zahn, 2009)
  - Emphasis on writing
  - Increased interaction among students
  - Increased interaction with the client population
  - Well-vetted projects

Graduate Student Training

- Training continues in STAT 8001: Advanced Statistical Collaboration
- In this elective course, students are matched with an active researcher and work independently with mentorship from instructor
- Students
  - receive in-class instruction on project management, presentation skills, and formal and informal writing
  - give formal and informal presentations
  - review the current literature on statistical consulting
  - practice skills through client interaction
- Roughly one-third to one-half of students in this course will become co-authors on publications

Graduate Student Training

- Students both work and volunteer in the SCC
- SCC activities include
  - Regular meetings with clients, in which one student is a lead consultant and a second is an associate
  - Video review
  - Regular staff meetings
  - Focus groups (consulting, big data, writing)
  - Opportunities for SCC input and leadership

Outcomes

- For students:
  - Better preparation for collaborative work in industry and academia
  - Co-authored publications
  - Increased analytical and technical skills
  - Greater confidence in abilities and, as a result, greater independence

Outcomes

- For clients:
  - Greater access to expertise and research partners
  - Increased confidence in and understanding of quantitative contributions to research
  - Increased flexibility
  - Opportunities to support and partner with SCC in education of our students

Outcomes

- For the SCC and department:
  - Improved reputation with clients and collaborators
  - Increased participation in publications, grant proposals, and other research opportunities
  - Attractive to potential student recruits
  - Heightened visibility to other academic researchers

Concluding Thoughts

- Major changes to SCC process have required time and energy, as well as dedicated personnel
- Communication with other academic consulting centers has been essential
- Student-centered collaborative opportunities have brought many benefits and have few downfalls

References

Roger E. Kirk. (1991) Statistical Consulting in a University: Dealing with People and Other Challenges. The American Statistician, 45:1, 28-34.

Kim Love-Myers, Vance, E. A., Harrell Jr., F. E., Johnson, D. E., Kutner, M. H., Snee, R. D., and Zahn, D. (2015) From Consulting to Collaboration to Leadership: Increasing the Impact of Statistical Practice. In *JSM Proceedings*, Statistical Consulting Section. Alexandria, VA: American Statistical Association. In press.

Eric A. Vance (2015) Recent Developments and Their Implications for the Future of Academic Statistical Consulting Centers. The American Statistician, 69:2, 127-137.

Doug Zahn (2009) The Heart of a Statistician's Career: Relationships and Interactions. Amstat News. Retrieved from http://magazine.amstat.org/blog/2009/09/01/heartofastatcareersept09/

THANK YOU