EXAMINING THE CONSULTANCY-TEACHING RELATIONSHIP FOR UNIVERSITY BASED STATISTICIANS

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The roles of university-based statisticians typically involve teaching, research, and service with the later often strongly focused on consultation. A review of literature in statistics identified a number of articles about consulting from the standpoint of how it should be done and how we should train our own students to do it, but virtually nothing about how consulting can impact on our other roles, especially teaching. Similar results were found in medicine and psychology. A survey of applied statisticians in education yielded support for our view that consulting can provide many concrete examples for use in class. We also encountered the view that it can promote our professional growth to the benefit of our teaching. Potential negative concerns raised included loss of time for students and role conflict, especially with students with whom we consult.

There are several sanctioned roles for statisticians within colleges and universities. These roles roughly correspond to the traditional institutional missions related to teaching, research, and service where our service often comes in the form of consultation. Unlike the lot of most academicians, the statistician is really expected to perform in all three areas even where institutional rewards go almost exclusively to research and teaching. Because of these factors, we need to efficiently integrate our roles if we are to be effective professionals, be recognized for our contributions, and be reasonably rewarded by our institutions.

Many aspects of our professional work have received considerable attention. Certainly, our professional journals thoroughly document the research aspect of our lives, and anyone interested in the sorts of things we do in that role need but pick up an issue of one of those publications. Matters related to our teaching, while less thoroughly covered, have become more widely considered through sections in those journals, online resources such as the *Journal of Statistics Education*, organizations such as IASE, and events such as ICOTS itself.

Our role as consultants, on the other hand, has gotten much less attention. There certainly have been some thoughtfully considered and well-written articles that cover various aspects of statistical consulting. Recent ones of note include Bentley (1991), Kirk (1991), and Wilson (1992). Such articles are very few compared to articles dealing with statistical research or, even, those dealing with teaching. They mostly focus on how

statistical consultation should be done and, occasionally, on what we should do to train our students to do it. A portion of ICOTS III in New Zealand was devoted to such issues. In general, attention paid to statistical consultation seems to parallel that for professional consultation in other fields including medicine and psychology. Searches of indices in those fields turned up many references to consulting but none that touched on its consequences with respect to teaching or research. In fact, the only publication which we identified concerning the potential institutional benefits arising from consulting was a dissertation done in the early 1980s at the University of Wisconsin-Madison (Logan; 1983).

Certainly, consultation is acknowledged as providing impetus to our role as researchers with the reciprocal benefits of our research informing our consultation. Likewise, research is clearly seen as providing an important foundation for well-informed and lively teaching, although the reverse is less well understood. The potential for using consultative contexts for educating our clients about statistics has been recognized (Russell, 1991). What there seems to be a pronounced absence of are articles that speak to efforts to integrate our consultative role with our more broadly written role as teachers.

To make matters more complicated, the simple dictionary definition of consulting does not fully capture what we do under that label. We do find ourselves consulted in terms of having advice sought by students, colleagues, and professionals from government or business. Yet, often more than that is expected from us. Our roles as providers of advice or expertise often merge irresistibly with that of providers of data analysis and report writing.

CONTEXTS INVOLVING CONSULTATION

Our own involvement with consultation ranges from things we did as undergraduate and graduate students through work done after a lengthy career including a not-for-profit research institute and a major public university. Much of what we have done bears special relevance to applied statistics within colleges of education, where our advanced graduate training has occurred and within which one of us works as a faculty member. The contexts in which we have engaged in statistical consultation have included:

- Internal to home institution

1. With students on thesis or dissertation research
   - As part of advisory committee
   - As short-term resource (formal and informal)
   - As assistant with data analysis
2. With faculty on research projects
   - As short-term resource (formal and informal)
   - As collaborative member of research team
3. With school/college administration
   - As member of ad-hoc committees
   - As individual advisor/data analyst

- External to home institution
  4. With students on thesis or dissertation research
  5. With faculty on research projects
  6. With governmental agencies on research/management projects
  7. With school systems on program evaluations
  8. With private business/industry on specific projects

OUR PERCEPTIONS ON CONSULTING

From the perspective of our home institutions, consulting is an activity with both positive and negative connotations, especially so for external consultation. On the one hand, it is seen as reflecting our value as experts in our field and, thus, represents an activity that reflects well on our home institutions. On the other hand, it does take us away from responsibilities within those institutions and, thus, is explicitly limited. Ironically, consultation within our institutions that may provide direct benefit to others is afforded almost no recognition beyond the occasional word of encouragement unrelated to any financial reward. It is seen as furthering neither an institutional mission of teaching or research. This corresponds well with findings from a broad survey of biostatistical consulting units carried out by Niland, Odom-Morgan, and Lee (1995).

From our own perspectives, consulting has provided a strong grounding for our teaching, giving us many concrete examples as well as experience with situations likely to be of great relevance to the sorts of students in out classes.

SURVEY

The population we wished to assess with respect to their views on the relationship between consulting and teaching was the membership of the American Educational Research Association's Educational Statisticians special interest group. This population of approximately 200 members consists primarily of college and university faculty with

appointments in colleges of education in the United States and Canada. Furthermore, most of those faculty have responsibilities for teaching courses dealing with research methods, measurement, and statistics to graduate level students at those institutions. Because membership is also open to graduate students and to government and non-government professionals with interests in educational statistics but who do not teach, we included screening items in our questionnaire to determine members eligible for our study.

The instrument we designed for the study is included in the Appendix. It was intended to help us identify eligible members, determine their involvement with teaching and consultation, and solicit their views on how consulting may affect their instruction, both positively and negatively. Since we did not want to introduce any of our own views on the later issues, open-ended items were used to solicit respondent information.

Because nearly 90% of the members had supplied e-mail addresses with their membership applications, we elected to focus our data collection efforts on that portion of the membership. The survey was initially sent to the list of e-mail addresses in early October. Roughly, one third of the initial distribution was returned as undeliverable due to defects in the e-mail addresses or members changing institutions. More current addresses were found from institutional e-mail directories for all but about 10 of the members and the survey was re-sent. A follow-up distribution was made in early December to those currently identified as non-respondents and whose e-mail addresses did not indicate employment at governmental agencies or commercial organizations. Our final response rate was approximately 31%, lower than we would have liked but judged adequate for our purposes. Of those who responded, 13 were not currently involved in teaching and 1 indicated no involvement with consulting leaving us with useful responses from 40 individuals.

RESULTS

The eligible respondents to the survey nearly all reported involvement with consulting activities both inside and outside of their home institutions. Typically they reported that from 5 to 10% of their time was directed toward consulting within their home institutions. Slightly more time was reported directed toward consulting outside of their home institutions. Given that most faculty in U.S. and Canadian institutions are on contract for only 9 to 10 months per year, a fair amount of consulting done externally

probably reflects work done by faculty during non-contracted time. Within our own institutions, guidelines for external consulting (for pay) suggest that 1 day per week during the academic year is as much as one should do.

There were 67 distinct responses elicited under the heading of benefits for teaching and 6 under the heading of disadvantages. The number of benefits cited ranged from 1 to 5. The responses were subjected to a content analysis yielding 4 broad categories of benefits apart from the single response indicating that consulting provided no benefits for teaching. The most popular beneficial aspect of consulting cited was its providing examples for use in classes. In many instances, respondents also reported using data from consulting (with permission) to form the basis for classroom examples, class assignments, and examination questions. This was noted by 83% of the respondents. The other very frequently cited benefit was consulting providing opportunities for professional growth that would indirectly benefit teaching. This was noted by 50% of the respondents. One respondent indicated that consulting provided another opportunity to work with students (presumably in consulting with them about their own work) and one other indicated that they directly involved their students in consulting projects.

Only 11% of the respondents indicated potentially negative consequences for teaching. Nearly all of the negative consequences mentioned cited loss of time for work with students. Two of the respondents also made reference to specific difficulties tied to internal consulting with students. Those difficulties all involved the potential for such work to create conflicts between consultant roles and teaching roles with students becoming dependent on the consultant instead of being self-reliant.

DISCUSSION

The primary benefits cited by the respondents to the survey coincided with the experiences we have also had. Consulting clearly provides benefits for teaching through the availability of “real world” examples that can be used to make statistics coursework less abstract. Likewise, the challenges offered by consulting on real projects provide considerable impetus for us to learn and grow professionally to the benefit of our teaching. While rarely noted, pitfalls for teaching arising from loss of time arising from external consulting and inadvertently encouraged dependencies are real concerns that must be watched carefully if we are to maximize the productive integration of our teaching and consulting roles.

REFERENCES

Bentley, D. L. (1991). Training students for statistical consulting. In Vere-Jones, D. (Ed.) *Proceedings of the Third International Conference on the Teaching of Statistics*. International Statistics Institute: Voorburg, The Netherlands.

Kirk, R. E. (1991). Statistical consulting in a university. *American Statistician, 45*, 28-34.

Logan, L. B. (1983). *Relationships Between Higher Education and Industry: A Study of State Colleges and Universities*. The University of Wisconsin - Madison.

Niland, J. C., Odom-Morgan, T. L., and Lee, J. (1995). A survey of biostatistical consulting units throughout North America. *American Statistician, 49*, 183-189.

Russell, K.G. (1991). How statistical consultants in universities can contribute to statistical education. In Vere-Jones, D. (Ed.) *Proceedings of the Third International Conference on the Teaching of Statistics*. International Statistics Institute: Voorburg, The Netherlands.

Wilson, W. J. (1992). Statistical consulting is scholarship. *American Statistician, 46*, 295-298.

APPENDIX

Survey of Perspectives on Consultation and Teaching

Do you teach university-level courses as part of your regular professional employment or on a part-time basis?

No _____ -- *please skip to the end of the questionnaire*

Yes _____

How many classes do you teach in a typical year? _____

Have you provided consultative services to anyone?

No _____ -- *please skip to the end of the questionnaire*

Yes _____

How many days of consultation would you provide in a typical year as part of your work within your home institution? _____

How many days of consultation would you provide in a typical year independently of your work within your home institution? _____

Do you see any benefits for your teaching arising from your consultative activities?

No _____ -- *please skip to the end of the questionnaire*

Yes _____

How do you see your consultative work benefiting your teaching? *(Please take as much space as you would like in responding to this question.)*