

## Discussion of papers at ASA meeting, 2004

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I will first make some comments on two of the three papers, leaving aside the BLS paper which deals with international statistical training. I will end my discussions by some comments on the training program developed by Statistics Canada to meet our needs.

The two papers dealing with “domestic” training are both addressing the same basic underlying problem: the fact that there is far too little productive interaction between “theoretical” and “applied” statisticians – to whom my predecessor referred to as “white collar” and “blue collar” statisticians respectively. As a result, government statistical offices end up having to hire professional staff who are either less than adequately trained in theory, or theoretically well trained statisticians who have little idea (and perhaps even little interest) in the wide ranging work of government statisticians. This divide has been well known for decades, indeed 25-30 years ago the International Statistical Institute established several task forces to try to suggest ways to improve what is clearly an unhealthy situation. While addressing the same underlying issue, the approaches described in the US and Irish papers are quite different.

The paper by Cynthia Clark and her co-authors outlines an approach that is dealing with the issue in depth – but fairly narrowly. The Joint Program in Survey Methodology offers a full set of courses in survey methodology and does so at many levels: leading to a certificate, an M.Sc., or a Ph.D. This is what I mean by its depth. However, survey methodology is only *one* of the many disciplines which are needed in well functioning National Statistical Offices (NSO’s); hence my comment about the narrowness of the initiative. The Program is clearly successful, both from the perspective of its graduates and their management; and I like the fact that it has been repeatedly evaluated. Of course, the Census Bureau, and the Washington area more broadly, has a large advantage: its long history of pioneering in survey methodology, over a period of several decades, established the needed critical mass of professionals in this field. Looking at it from the perspective of most other statistical offices, the experience might not easily be repeatable, certainly not in the short run.

The following are a couple of questions that went through my mind as I was reading the paper:

- How much of the Joint Program is, in fact, an in-house Census Bureau program? What I mean is: what proportion of the teaching staff involved are current or past members of the Census Bureau?
- If a substantial proportion of the teaching is done by “regular” University of Maryland teaching staff, how is the relevance of the course maintained? For example, are there staff exchanges between the Bureau of the Census and the University? Are University staff involved in some other way, e.g. through fellowships, authoring of papers jointly with Census Bureau staff, and so on.

Turning to the Irish paper, it addresses the same basic problem: i.e. that the “white collar” staff of most universities don’t train the “blue collar” statisticians needed by government statistical offices. But the Irish paper describes an approach that is almost diametrically opposed to that outlined in the American paper. In Dublin they opted for teaching a lot of topics useful for government statistical work, but the approach must be very light indeed, since there is only a single course, presumably 3-4 hours a week over one or two semesters, yet it encompasses an awful lot of territory. Indeed, the course covers, at some level, the history of Irish government statistics, their statistics legislation, several process topics (such as non-response, quality control, confidentiality protection practices, business registers), a wide range of subject matter (national accounts, balance of payments, international trade, demography, agriculture, industry and labour market statistics, prices, retail sales, transportation, tourism, and vital statistics). And, to keep the interest of the theoretically inclined students, index number theory, as well as the theory of relational data bases.

The Irish course is only, it seems, two years old, so no in-depth evaluation was carried out. However, it would be eventually interesting to assess what proportion of the students end up in the Irish NSO. As for the rest, it would be interesting to find out how the course affected their subsequent careers, for example did they become knowledgeable and regular users of Irish government statistics. Another test of the usefulness of the course would be if the Irish statistical office decided to enrol a significant number of its staff in the course.

Faced with the same problems as the Census Bureau and the Irish statistical office, Statistics Canada adopted an approach that is somewhere between that of the two papers. It has taken a broad approach, like that described in the Irish paper, but one that goes considerably deeper – although not quite as deep as the University of Maryland program. First of all, we adopted as an article of faith that training is essential for *all staff*, including but not restricted to survey methodologists. We set as a goal that each line area spend roughly 3% of its budget on training – that is over \$12 Million dollars (Canadian). But, recognising the difficulty of finding the right kinds of courses at universities, we set up an in-house Training Institute, whose logistics are run by a very small staff of administrators, but most of whose course offerings are given by regular Statistics Canada employees. A few of these are on full-time assignment in the Institute for a couple of years, but most of them are teaching on a part-time basis – thus keeping their experience firmly rooted in our practice.

One course is compulsory for all professional staff – we call it our “flagship course”. It briefly covers our business from “soup to nuts”. The course starts with an interaction with a real client; it proceeds with the design of a questionnaire that will illuminate the problem highlighted by the client; next comes sample design, development of field procedures, the selection of a sample, interviewing the selected households, process the collected data, and finally write an analytical report for the client. The entire course takes 6 weeks and it is full time for its participants. There is also an equivalent course dealing with business surveys. Some 230 students are taking one of the two variants of this course annually. As a footnote, I might mention that this course is an adaptation of a

course initially developed by the Census Bureau, which was mostly used to train visiting foreign statisticians.

Another major course, also of six weeks duration, on a full time basis is devoted to what we call Data Interpretation; it covers not only techniques of analysis, but also how to write up the findings in an intelligible manner. It is compulsory for certain subject matter professionals.

Most of our other courses run from 2 to 5 days. In survey methodology, broadly interpreted, we offer in a typical year close to 20 different courses ranging through questionnaire design, longitudinal surveys, sampling theory, treatment of non-response, imputation, 4 different courses on time series analysis and seasonal adjustment, quality control, data analysis, record linkage, and so on. In a typical year each of these courses is taken by 10 to 25 students.

In addition to these courses, which anchor our training program, we offer a wide range of courses in various areas of subject matter: macroeconomics, principles of sociology, labour economics, sociology of the family, the system of national accounts, input-output tables, income and expenditure statistics, courses at various levels on our business register, on our electronic data dissemination system, ten different courses on communicating each geared to communicating with a different client group, writing for the media, effective use of graphics, and so on. Finally, there are another 20 or so courses on generic skills: mentoring, career management, presentation skills, and so on.

Finally, in addition to our wide range of in-house courses, we also collaborate closely with the two universities located in Ottawa. In cooperation with Statistics Canada, they both developed and/or adjusted some their courses to meet our requirements. As a result, in a typical year some 40-50 of our employees take courses with them, leading to a Statistics Canada certificate in economics or sociology.

The message, if there is to be one, is that statistical organisations use a wide range of skills, most of which are not taught in universities. Yet, if we are to be successful, we have to have staff who, collectively, possesses and keeps up with all of the needed skills. We all have to invent the approach that works best for us, taking into account our respective histories, culture, facilities, and size. From this point of view both of the papers, and more importantly the approaches described in them, are most welcome and need to be applauded.