COLLABORATION AND COOPERATION: THE KEY TO REACHING OUT.

FORBES, Sharleen
School of Government, Victoria University of Wellington, New Zealand
Statistics New Zealand, Wellington, New Zealand
Sharleen.forbes@stats.govt.nz

ABSTRACT

Statistics New Zealand produces and disseminates national statistics so is interested in the statistical capability of key groups of user such as government; the media and Maori (indigenous New Zealanders). In 2006 a network of academics in official statistics (NAOS) was established and its members have presented short courses for government staff (on ethics and legislation, interpreting opinion polls and demography) and actively contributed to the design and delivery of formal qualifications including the Certificate of Official Statistics and an honours/ masters paper in official statistics. This paper will be taught simultaneously to students in at least three universities by individuals from five separate institutions using video-conferencing facilities. The collaborative process and the key roles of the national statistics association in forming collegial relationships and the national statistics office in facilitating between-university cooperation are discussed.

BACKGROUND

Statistics New Zealand's concerns about the overall statistical capability of key user groups are based on anecdotal and research evidence. A lack of quantitatively skilled government policy staff was established by: a Victoria University of Wellington pilot study [qualitative interviews with 10 staff from 8 government departments (Macky & Saffron, April 2004)]; Statistics New Zealand consultation with statisticians and policy managers in 12 agencies in 2008; subsequent endorsement by state sector Chief Executives (Forbes, 2008) and consultation undertaken by the School of Government at Victoria University (Forbes, 2011). As Forbes (2008) stated, Statistics New Zealand is not an education provider so the measures taken to address the statistical gaps of key users rely heavily on informal or formal partnerships with education providers. An example is Statistics New Zealand's collaboration with the New Zealand Journalism Training Organisation on the development of a compulsory statistics unit in the National Diploma in Journalism, the entry-level qualification to a newsroom.

Statistics New Zealand's strategic plan for the next ten years states that progress towards more statistically literate users will initially be measured by whether or not '*a suite of official statistics education programmes is established and educational institutions are willing partners*' by 2014 and the aim is that, by 2020, '*Government departments have adequate statistical capability and are advocates for official statistics education*' (p21, Statistics New Zealand, 2010). To achieve this aim, priority groups of users have been identified: government staff (in particular policy advisors); the media and Maori (indigenous New Zealanders). There has also been a long-standing involvement with statistics in schools that includes producing teaching resources, partially funding of the *CensusAtSchools* project (Davies et al, 2010) and providing input to national statistics curricula developments. A simple justification for Statistics New Zealand's priorities could be: government advisors as they help develop policies that influence the future for us all; the media as they put meaning to official data for many of us; Maori as they are the indigenous people (New Zealand is a treaty nation with 14.6% of people identifying as Maori ethnicity in the 2006 Census) and students as they are the inheritors and creators of our future.

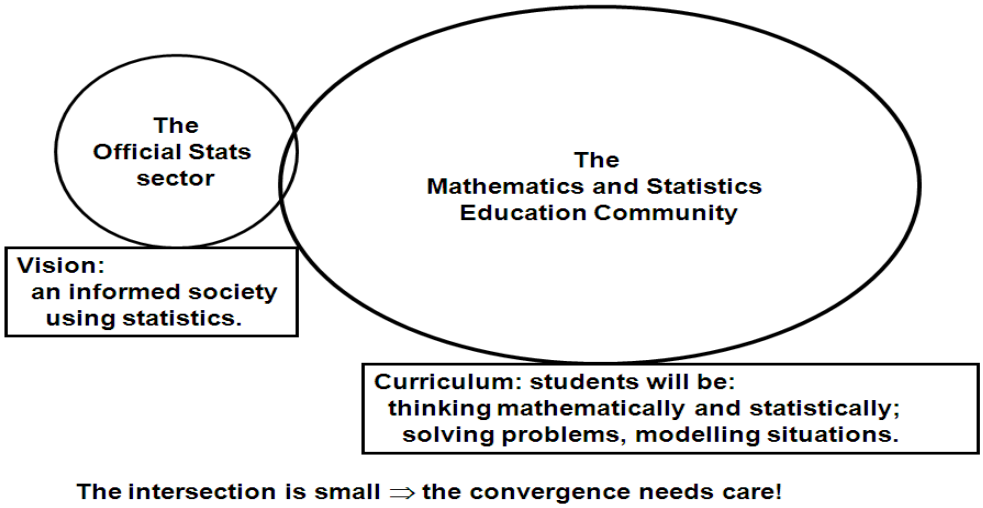
The focus of this paper is on the collaborative and cooperative processes undertaken to enhance the statistically capability of one of these priority groups, government employees.

STATISTICS NEW ZEALAND AND STATISTICS EDUCATORS

While many, but not all, of the staff in Statistics New Zealand, have expertise in statistics only a few have expertise in education as well. In general, these are secondary and tertiary teachers who have changed professions. They are a key resource, having knowledge of current curricula and important networks with colleagues in educational institutions. In the main, they are not specifically

employed to deliver statistics education but, for more than two decades, Statistics New Zealand staff have collaborated with statistical educators in New Zealand, promoting the use of official statistics products in classrooms and creating new products for use at all levels of education. There are benefits for both parties: the statistical agency gains publicity for specific activities (such as the Census), adds value to its published statistics by increasing the range of uses and users, creates greater awareness of its products, and provides development and presentation opportunities for staff; statistics educators increase the number of data sets available for student use, improve access to these data sets, and get exemplars for use in the classroom. Although their central interests are in agreement the number of people who belong to both groups is small (figure 1). This resource needs to be carefully managed to obtain maximum value from the collaboration between the national statistics office and education providers.

Figure 1: The overlap between official statisticians and statistics educators in New Zealand



A key coordinating agent for the intersecting group is the New Zealand Statistical Association (NZSA) as almost all its members, both Statistics New Zealand staff and statistics educators, are members of this association forming strong collegial relationships through national conference attendance and committee work. A keynote address at one national conference discussed the interface between official statistics and statistics education (Forbes, 2009b). Since the inception of the association's education subcommittee in 1986, NZSA has had strong involvement in the development of the New Zealand school statistics curriculum (Ministry of Education, 2008), regularly held teacher or education sessions at its national conferences and actively promoted discussion on education issues. For the entire lifetime of the NZSA's education committee Statistics New Zealand has had at least one staff member working actively on it, often as the convener. On occasions Statistics New Zealand staff have had partial release from normal duties to help implement new school curricula. Membership of this committed has allows Statistics New Zealand to keep up to date with changes in statistics education and to have input into policy advice (such as in the recent school curriculum). The importance of a strong national statistics association is not unique to New Zealand. For example, the Philippine Statistical Association founded their Statistical Training Center in 1953 to provide training for government statisticians (Bersales, 2010). In some regions it has been the United Nations that has established institutes to deliver training to national statistics office staff. Examples include the Statistical Training Programme for Africa (Ching'anda and Ntozi, 1998) and the Statistical Institute for Asia and the Pacific (SIAP) http://www.unsiap.or.jp/about_siap/aboutsiap.php. The focus of this paper, however, is not training within the national statistics office, although staff can and do participate in the external training discussed below.

INCREASING STATISTICS NEW ZEALAND EDUCATION OUTREACH

The first step in developing a strong and active 'outreach' education programme in Statistics New Zealand was some internal re-focussing. In September 2006 a General Manager, Statistics Education and Research was appointed with the capacity to recruit three staff. In November 2006 Statistics New Zealand's Board approved an education strategy consisting of three components. The first, called *Go Stats! The Power of Numbers* was for Statistics New Zealand staff and described a three level framework – Quantitative Skills and Knowledge required by all staff, Basic Statistics for first level analysts and Core Statistics for second level analysts. The second component, *Go Stats! Beyond the Numbers,* discussed below focussed on initiatives for up-skilling government employees and the third, *Go Stats! Understanding the Numbers* was for other groups of users (e.g. schools, the media, private businesses and Maori). A range of areas within Statistics New Zealand have responsibility for parts of this third component. The education area develop official statistics datasets (synthetic unit record files) for use by teachers in school classrooms, hold teacher workshops at conferences, jointly fund and administer (with the Ministry of Education) the *CensusAtSchools* contract delivered by Auckland University (Wild & Arnold, 2008) and is responsible for developing training programmes for government employees. The publications area run workshops at business organisations throughout the country and maintain a Schools Corner with classroom resources and newsletters on the Statistics New Zealand website (www.stats.govt.nz/tools_and_services/services/schools_corner)..

REACHING OUT TO GOVERNMENT EMPLOYEES

Government employees that either produce or use official statistics include Statistics New Zealand's own staff some of whom have participated in each of the following initiatives. However, the initial focus for statistics training was on those government employees that provide advice directly to government. From the outset, it was clear that achievement of real change in statistical capability for this group was dependent on collaboration with education providers. Initial discussions with the State Services Commission (the agency responsible for cross-departmental state sector issues) and Learning State (the Industry Training Organisation responsible for state sector training) on ways of reaching and up-skilling government employees resulted in the development of a national Certificate in Official Statistics. The objective was to both raise the profile of official statistics in government agencies and to provide basic statistics training. But there was only a small team of staff within Statistics New Zealand and major issues to be resolved, including course content and delivery. In December 2006 academics from the statistics departments of all New Zealand universities were invited to meet and give advice. By the end of one day the structure of the certificate (number of courses, etc.) and the material to be covered was determined, together with a commitment from several universities deliver courses. The Network of Academics in Official Statistics (NAOS) was born!! It now meets annually and members both give advice (collaborate) on official statistics education initiatives and work cooperatively (sometimes even taking the lead) on joint projects.. All the members hold senior positions and have some freedom to make decisions for their respective institutions.

The four major initiatives developed so far for up-skilling government employees have all actively involved NAOS members. The least formal is the Official Statistics Seminar Series, one hour lunch-time seminars often presenting the results of official statistics research. The Official Statistics Training Series are one-day workshops. Those presented by NAOS members include "Truth, damned truth and statistics", "How I learned to stop worrying and love the survey cycle" and "Confidentiality and official statistics". The National Certificate in Public Sector Services (Official Statistics), commonly called the Certificate in Official Statistics, registered on the New Zealand Qualifications Framework (New Zealand Qualifications Authority, 1991) in 2007 is a 40 credit, vocational level 5 qualification (equivalent to first year university) comprising five units and assessed on a competency basis. Students do it part-time over an eighteen month period. Although the qualification sits outside of the university system NAOS members (academics) designed and delivered each of the units taught. After four cohorts totalling 70 enrolments and over two years of experience the certificate was formally evaluated and the results reported in International Association of Statistical Education conferences (e.g. Forbes, 2009a). The fourth, and most recent, initiative is an honours/ masters paper in official statistics. Discussions are also underway with the New Zealand's capital city university to include a compulsory statistics/ official statistics paper in its Masters degrees in Public Policy and

Public Administration. Eventually it is hoped that there will be a stair-cased suite of official statistics training for government staff, both with and without qualifications.

HONOURS/ MASTERS PAPER IN OFFICIAL STATISTICS

Conceptually this paper arose from a quick analysis of New Zealand university courses that indicated that (outside of economics papers) there was only a very small amount of course content explicitly devoted to official statistics The occasional lecture is given in undergraduate statistics courses and small sections of optional basic statistics modules in the Masters of Public Policy at Victoria University cover the usage of official statistics but there are some important areas that are not covered in any of these courses including the use of administrative data to generate statistics, demography and macroeconomic indicators. A similar situation exists in other countries. In South Korea, Ahn, Buhn & Kim (2003) '*conducted a survey to examine what university professors think about official statistics and found that they were mostly ignorant about them*' (p 461).

In New Zealand, there is evidence that senior state sector managers expect newly recruited staff to have attained basic statistical skills and knowledge in their university degrees (Forbes, 2011) so a mismatch between their expectation and reality exists. NAOS thought that an honours/ masters paper specifically in official statistics would be one step towards addressing this gap and provide a win-win situation for participating institutions if it was developed cooperatively, had teaching shared across universities and was delivered using new videoconferencing technology. The national statistics office gains by raising the profile of official statistics with statistics graduates and creating a course that may attract future employees to the agency. Universities offering the course add another option to their post-graduate statistics selection with only a small amount of (or, in the case of one university, no) additional teaching. All the course providers also learn how to use a new technology that has the potential to increase students' access to specialist teaching. The idea for the paper came from Statistics New Zealand but the subcommittee set up to progress and deliver it is convened by an academic, Professor Alan Lee of Auckland University. The academic members in NAOS suggested the student target be extended from applied statistics majors to students from a wide range of disciplines to provide access to the course for a wider range of potential government employees. There is currently limited opportunity for new university qualifications in New Zealand but this paper could, in the future, form the basis of a Graduate or Postgraduate Diploma in Official Statistics.

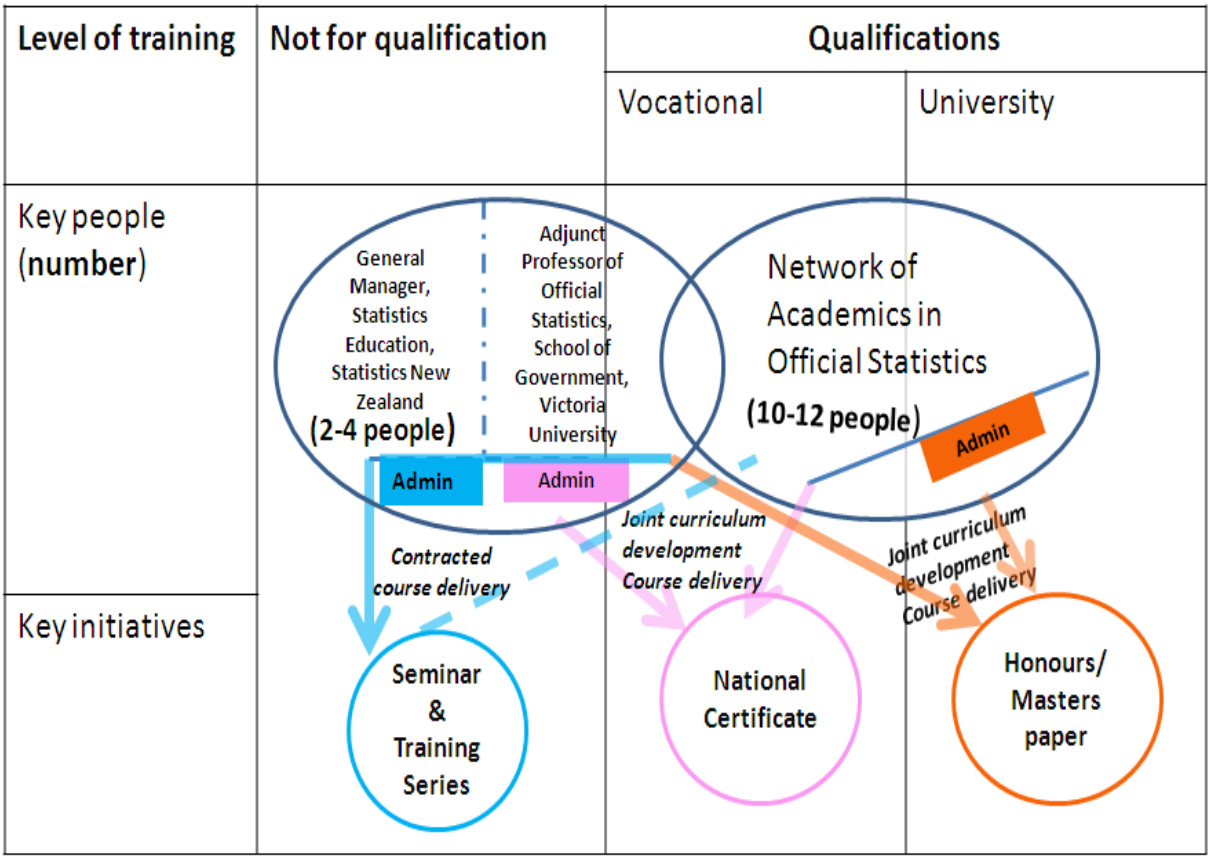
At least three New Zealand universities will offer the course to students in the second teaching semester of 2011. Four universities together with Statistics New Zealand will teach modules within the course as shown in the draft outline (Appendix). The use of video-conferencing facilities to teach of the teaching and learning nodes has already been successfully trialled. New Zealand universities have similar but *not* identical teaching terms so some negotiation was required to determine common teaching dates and times when the technology was available at all the sites. New Zealand universities also do *not* all have the same number of credits per paper. The compromise reached was that the course will be taught in two hour weekly slots for 12 weeks with those universities requiring a more credits giving students additional individual projects. Another area of negotiation was prerequisites and it was agreed that students would generally need at least second year basic statistics (hypothesis testing and estimation) but that allowance could be made for interested social science and public policy students that might not be as well prepared.

COMMENTS

Collaborations between national statistics offices and universities to provide statistics training exist in many parts of the world. The Philippine Statistical Research and Training Center had forty-seven local universities and colleges as training affiliates in 2010 (Selda, 2010). Some national statistics offices have informal collaborations with universities to deliver official statistics training, for example the University of Maryland and University of Michigan Joint Program in Survey Methodology (Tourangeau & Lepkowski, 2008) in the United States. Others have formal partnerships, such as that between the United Kingdom Office of National Statistics and Southampton University, http://www.southampton.ac.uk/socsci/socstats/moffstat/programme.html and (Brown, 2007). The University of Wollongong in Australia and the University of the South Pacific in Fiji provide teaching specifically in official statistics but what appears to be unique about the New Zealand experience is

the collaboration and cooperation of almost all the national universities together with the national statistics office to design and deliver courses in official statistics (both within and *external* to the university system). New Zealand universities compete for both students and funds and the financial incentive for the universities to participate in this training is limited. Our achievements have relied far more on maintaining strong collegial relationships. The establishment of a formal network has played a major role in this. Another enabling feature has been having a convener (Statistics New Zealand) that is independent from the universities. A facilitator without university affiliations allows robust discussions to take place without underlying competitive tensions resulting in high levels of across-university interaction and cooperation. However, it does need to be acknowledged that the individual academics comprising NAOS are dedicated to furthering statistics education and willingly contributed their time and expertise. Figure 2 demonstrates that key people as well as key initiatives are needed for innovation in statistics education.

Figure 2: Key people and initiatives in official statistics training for government employees



CONCLUSION

The training developed by Statistics New Zealand for enhancing the statistical capability of its key users has relied on forming strong partnerships with statistics educators. Its outreach programmes for state sector employees include training without attached qualifications (the Official Statistics Seminar and Training Series) and formal qualifications (the Certificate of Official Statistics and an honours/ masters paper in official statistics). Collaboration was useful for generating the ideas behind these programmes. However, the implementation of each involved active cooperation between all the parties. Both the national statistical association in providing a forum for developing collegial relationships and the national statistics office as an independent facilitator between universities played key roles. The formation of a formal network between participating institutions was also a critical

component. The initiatives implemented to date demonstrate that large and lasting changes in official statistics education can be made, even with small groups of people, when all the collaborating parties have some seniority in their institution, are committed to and work jointly to achieve a common goal.

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Appendix

Draft course outline for honours/ masters paper in official statistics

Session	Institution teaching	Topic
1	Statistics New Zealand	Overview, Underlying principles, Key case studies (observational, not experimental) advantages and limitations
2	Victoria University Statistics	Administrative, survey and census data , concepts of measurement and framework. Variable and collection standards.
		ASSIGNMENT – 20%
4	Waikato University Population Studies	Demography – fertility, mortality, migration – age structure analysis
5		Demography – population projections, policy implications, life tables, cohort control
		ASSIGNMENT – 20%
6	Auckland University Statistics/ Social science	Health statistics – age standardization, morbidity statistics, registers, relative risks, odds ratios, other risks, confounding
7		Other social statistics– , data sets and data access age
		ASSIGNMENT – 20%
8	Canterbury University statistics	Data visualisation and GIS data
9	Victoria University statistics	Survey design and analysis (cross-sectional, longitudinal, rotating panel), data cleaning, editing/imputation, post stratification, survey weights
10	Auckland University statistics	Data matching
		ASSIGNMENT – 20%
11	Statistics New Zealand	Economic statistics, time series, seasonal adjustment, Indices (CPI, PPI)
12	Statistics New Zealand Waikato University	National accounts, GDP Comment. Other measures of well-being and progress.
		ASSIGNMENT – 20%