



30 November 2006

Draft Curriculum
Ministry of Education
PO Box 1666
Thorndon
WELLINGTON

Dear Sir/Madam

Statistics and The New Zealand Curriculum: Draft for Consultation 2006

As Past-President of the International Association for Statistical Education and a member of the group that has prepared this submission on the Statistics draft curriculum I wish to commend the direction of the draft. I strongly endorse the proposed changes as outlined in this submission and emphasise the need for significant professional development of teachers together with extensive resourcing for successful implementation of this statistics curriculum.

Statistical methodology is increasingly pervading the research fabrics of all fields that advance by employing empirical enquiry. At a much more basic level, as the realisation continues to spread that data beats anecdote as a basis for robust decision making, so too does the recognition of the importance of statistical literacy as a key educational outcome in preparing students to become informed citizens and workers who can function effectively in an information-rich society. For adults to participate fully in public debate regarding national or community issues they need to be able to evaluate statistical information and data-based arguments, and to discuss their opinions regarding such information.

Advancing technology has radically shifted the balance of 'what is worth learning' for the majority of students from the operation of mechanical procedures towards the art of statistical practice, namely using data to learn about real-world contexts. Real statistical practice is about designing empirical studies, uncovering the stories concealed within data and realising their real-world implications. Technology has obviated the need for much of the busy-work that used to obscure the core purpose of statistical endeavour. Unfortunately, statistics educators have been slow to realise the seismic extent of the change. A consequence is that for the vast majority of teachers, if they have received any formal university education in statistics at all, it will have been almost entirely procedural. Few, if any, have had any real exposure to the discovery statistics that is the daily experience of statistical practitioners, or to the types of statistically-informed critical thinking required to usefully critique data-based arguments employed by others.

The main points we want to make here are as follows

- The emerging statistics strands of the mathematics and statistics curriculum are charting a course in the direction laid out above

- Modern statistical thinking and practice cannot be taught or experienced without extensive use of computer software
- The statistical skills of most use to society fall outside the experience sets of almost all current teachers
- Significant teacher development will be required to realise the potential inherent in the new curriculum
- The curriculum must be introduced progressively in a way that allows sufficient time for the requisite development of resources and teacher skills
- Further development of the curriculum (the 2nd tier), implementation strategies and the vehicles for teacher development require the combined expertise of the statistical profession, teacher educators and leading mathematics teachers working together
- New Zealand is very fortunate in that these groups are already working together very fruitfully on these issues

Despite the importance of statistics even to the 1992 curriculum, many mathematics teachers have little if any formal education in statistics. Even for those that have taken university courses in statistics, the emphasis they experienced was primarily on operating mechanical procedures rather than on thinking using data. Traditional models in which the teacher body and textbook writers can be expected to pick up the curriculum document and know how to implement it in the classroom can not work here.

Statistical professionals are experienced in unlocking the stories in data but lack experience in efficiently enculturating teachers in this regard let alone translating their experiences into sets of activities that will work for real children in real classrooms. The required transformation can only come to fruition with the statistical profession, statistics education researchers, teacher educators, and leading primary and secondary teachers pooling their expertise by working together. This is where we are particularly lucky in this country. We have already built good relationships between these groups which have strengthened greatly by working together on drafts of this curriculum. Not only do we have the will to work together we have already found working together on this enterprise to be a fulfilling and fruitful experience and want to continue down this path. Further development must be planned and resourced in a way that takes advantage of this proven capacity to work together, rather than squandering it and letting the potential of the new curriculum slip away.

I believe that with substantial investment in teacher development and resourcing, this statistics curriculum will put New Zealand at the forefront of statistics education.

Yours sincerely



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