The
New Zealand
Statistical Association

10 November 2006

Draft Curriculum Feedback
Ministry of Education
PO Box 1666
Thorndon
Wellington

Dear Sir/Madam

Statistics and *The New Zealand Curriculum: Draft for consultation 2006*

On behalf of the New Zealand Statistical Association I wish to commend the direction that *The New Zealand Curriculum Draft for consultation 2006* has taken in the area of statistics, and to endorse the further amendments on threads two and three to the draft that will be submitted by our Education Committee in conjunction with the Auckland-based group of statistical educators, practitioners and writers led by Maxine Pfannkuch.

Our members work throughout NZ society and are very aware that statistical skills are vital, both for a successful economy and for informed decision-making by citizens. The next generation of adults will need very strong skills in working with data (as in thread one) and in dealing with uncertainty (as in thread three, with our proposed amendments).

The "Three R's" are still vitally important for the economy and for citizenship. The Draft's *Coherent Pathways* section stresses them as being central to the curriculum. However, the nature of these "Three R's" is changing with the increasing complexity of our world, and with data-processing technology. It is vital that literacy and numeracy contain a strong statistical component. Thread one and our proposed amendments on thread two should achieve that, in a way that is accessible to students and makes the best use of their progressing skills with the strands for *Number and Algebra* and *Geometry and Measurement*.

The new subject name *Mathematics and Statistics* indicates that the Ministry, along with the leading mathematics educators who had input into the Draft, have made a major change in their perceptions of this subject. This shift is well presented in the introductory page on the subject (page 19).

This draft very appropriately continues the shift that happened with the *Mathematics in the New Zealand Curriculum 1992,* which made New Zealand a world leader in statistical education. It should ensure that this leadership continues.

Statistics also plays key roles in other curriculum areas, such as *science, social sciences (and their components especially in the senior school), technology*, and *health and physical education*. Each of these areas must reflect consistent messages about and approaches to statistics.

The change in the teaching and learning of statistics will be a large and challenging one for many teachers. If the mathematics teaching community is to make and apply the new shift, it needs to be strongly supported with both resources and professional development, both pre-service teacher training, and in-service training. Teacher content knowledge and pedagogical knowledge of statistics will need strengthening, as many teachers have not formally studied the subject. The shift is major, and the support will need to be commensurate with that.

We in the NZSA look forward to working with the Ministry in every way we can, to ensure that NZ teachers have confidence in this subject and enjoy working with it.

A very important resource for teachers will be the Tier 2 information that will support and amplify the contents of the draft curriculum. Teachers will in all likelihood refer to the Tier 2 material in much of their planning and teaching. Consequently it is imperative that this is produced and reviewed by a range of stakeholders. We need to ensure that it is of the highest possible quality, for its goal of easing the path of teachers towards delivering good learning experiences. The nature and newness of the subject implies that the skills of expert teachers must be pooled with the skills of expert practitioners, in the design and writing of this resource. Statistics and probability are well served by physical and group activities at all levels. Resources for active learning need to be provided.

The resourcing needs to involve some up-to-date statistics-specific resources: hardware, software, interactive learning systems, datasets, the stories behind the datasets and activities for the datasets. The Ministry will have roles in providing and/or seeding or enabling access to these. Much (some software, data libraries) is already freely available.

We are impressed with the resources, care, research and professional development focus that the Ministry has applied in the Numeracy Project. Statistics and probability offer plenty of opportunities for research projects. We would be delighted to see (and to support) programmes like the Numeracy ones, in Statistics.

To conclude, I'd like to state or re-state the following points:

1. The Ministry and its writers have successfully made some major changes in perspective on mathematics education, and we strongly endorse the directions taken.
2. The New Zealand Statistical Association endorses the combined submission from its Education Committee and the Auckland statistics group.
3. The draft implies a larger role for statistical and probabilistic reasoning, thinking and literacy; and this role implies the need for very major provision of support for teachers. This support involves written material (notably the Tier 2 material) and professional development opportunities. It involves both content knowledge and pedagogical knowledge. The resourcing needs to involve some up-to-date statistics-specific resources.
4. All subject areas need to reflect consistent approaches to statistics and probability. The Tier 2 material and professional development events, for the related subjects, need some input from statisticians and statistical educators.
5. Research projects in the teaching and learning of statistics and will be very beneficial to teachers, students, and thereby the economy and society.

I am happy to send an electronic copy of this submission.

Yours sincerely

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