Annual Report: Education Committee of NZ Statistical Association: Oct 2009 to Jun 2010

Mike Camden

The team

The team continues to have members in Auckland, Palmerston North, Wellington, Christchurch, and Dunedin. We meet by video and phone, with the support of Statistics NZ. In this period, we had four normal two-hour meetings, and one more on the new NCEA Standards. The team includes people with most of the possible forms of involvement in statistical education. We are:

Alex Neill (NZCER) (Chair)
Alasdair Noble (Massey University) (Our link with NZSA Executive)
Mike Camden (Statistics NZ)
Derek Smith (NZ Correspondence School)
Steve Haslett (Massey University)
Maxine Pfannkuch (University of Auckland)
Murray Black (Auckland University of Technology)
Tim Burgess (Massey University)
Pip Arnold (Cognition Education)
Lindsay Smith (Epsom Girls' Grammar)
John Harraway (Otago University))
Anne Lawrence (Massey University)
David Phillipps (Canterbury University)
Sashi Sharma (Waikato University).

We have been graced with attendance recently by:

Chris Wild (University of Auckland)
Doug Stirling (Massey University)
Melissa Dunn (Student at University of Auckland)

If we need to contact the outside world formally, our usual practice is to do this via the president and executive. We keep in contact with the Ministry of Education's maths specialists, who share our hopes for NZ statistical education. Some members are involved in the Ministry's writing groups. The team includes the president-elect of IASE (as well as a past president)!

The focus and the hot issues

The focus remains statistical education in schools. *The NZ Curriculum* emerged in Nov 2007, with a learning area called *Mathematics and Statistics*. The NCEA standards are being redesigned to assess the curriculum's achievement objectives. These will take effect in 2011, 2012, and 2013, for NCEA Levels 1, 2, and 3 (approximately the last three years of school), respectively. Both the curriculum and the standards assume that students and teachers have access to suitable computer technology. We have had input into the standards, and we have been working on the possibilities for statistical software. Details on these and other issues follow.

NCEA standards

David is on the Ministry's writing group. We've discussed detailed wording of the Level 2 standards with him, and we're working towards Level 3. We're keen for the assessment system to promote the investigative spirit of the curriculum.

NZSA-sponsored speakers at NZ Association of Mathematics Teachers conferences

At NZAMT 11 (Sept/Oct 2009, Palmerston North), our speaker was Cliff Konold, designer of the TinkerPlots software. For NZAMT 12 (July 2011, Dunedin), we are supporting Helen MacGillivray, professor at QUT and president of IASE. Through these sponsorships, several hundred of NZ's leading maths teachers are able to hear and interact with some of the world's leading role-models in statistical education.

Statistical computer technology for schools

We are interested in the development of three free software systems for NZ schools.

John Harraway and David Baird have been working on a version of GenStat that will meet school needs, and on activities that lead students through data exploration of some NZ datasets. Otago schoolteachers who have trialled this are very positive about it.

The Head of Mathematics at Otago Girls High School, Jeanette Chapman, is presenting two special sessions at the ICOTS conference in mid July on what she and her colleagues have achieved at the school using GenStat. Currently they are using it in Year 9 and Year 13, and as an aid for biology students with project work involving data collection.

Chris Wild and colleagues are developing an R package that will present datasets and exploration tools to students in ways that encourage them to interact. The open-ended nature of R means that there are possibilities to take this interaction in new directions.

Doug Stirling is writing a free CAST e-book for students to use when studying for NCEA. It will be split into chapters corresponding to the current NCEA units and include dynamic interactive diagrams to explain concepts plus some exercises. The diagrams will also be provided as a collection of resources for teachers to use in class on a data projector

These systems can assist teachers and students in dealing with new ways of learning inference, such as the resampling methods that occur in the final stage of the curriculum.

The committee is working on a policy statement for NZSA on computer technology appropriate for NZ schools.

NZSA 2010

We are pleased to see that the organisers of NZSA's 2010 conference have continued past practice, and provided a session where teachers can meet some fresh resources and interact with NZSA members.

Curriculum in Australia

A national curriculum is being developed in Australia, and we've been in contact with concerned people there. We're interested in how statistics is handled there, and statistical educators there are watching what is happening here. There are opportunities for some very valuable collaborative efforts, in creating the resources that teachers will need.

Statistics in primary and intermediate schools

Our submission of July 2009 on strengthening the statistics in the 'national standards in mathematics for years 1 to 8' seems to have had some success.

The Ministry of Education called together an 'expert group' in May this year to advise on the future direction of statistics education for primary and intermediate schools. Five members of the committee were in this group. We considered the goal, which may be to enable students to participate in the global community, using evidence-based investigations and understanding of variation. We started developing a set of change-points in students' use of investigations, statistical literacy, and probability, that will assist teachers in planning for and observing student progress. These change-points could be used by teachers in identifying student progress with respect to the 'national standards'. We discussed the possibilities for student-friendly software for school use, and in particular the plan from Auckland University for a student-friendly interactive interface in R, that would liberate the graphical EDA powers of R for school and other students.

Numeracy and Literacy standards

Members made a joint submission to NZQA then in the consultation phase made individual submissions about the statistics standard. We would like it to share the investigative approach of the curriculum.

The future

NZ has or (we hope) will have a forward-looking curriculum, assessment standards that match it, creative teachers, leading statistical educators, and student-friendly software. These things together enable some spectacular possibilities for school statistics in NZ, and a community that has strong skills in using statistics. The NZSA has an essential role in making sure that NZ achieves these gains.