MAKING CENSUS COUNT IN THE CLASSROOM

Lesley Hooper
Statistics New Zealand
New Zealand

The New Zealand national curriculum framework provides a context within which Statistics New Zealand can deliver relevant statistical teaching resources to the school sector. The presentation will discuss the 2001 Census Education Resource and its benefits to both students in the classroom and Statistics New Zealand. It will look at the consultation process undertaken with the educational sector to ensure the delivery of an appropriate resource in the two official languages of New Zealand (English and Mäori) and give examples of how the resource was used by teachers to provide interesting, real life learning experiences for their students. The resource was supported by additional teaching material in the education media and on Statistics New Zealand's website as well as key educational websites. Examples of the range of activities will be included.

INTRODUCTION

Statistics are used by all of us in everyday life without many of us thinking of ourselves as mathematicians. A Massey University (New Zealand) study in 1993 (The Mathematical Needs of New Zealand School-Leavers, G Knight et al. 1993) estimated that 67% of the New Zealand work force was involved in some form of data collection and interpretation. Mathematics education in New Zealand aims 'to help student's achieve the mathematical and statistical literacy needed in a society which is technologically oriented and information rich.' (Ministry of Education, 1992). Statistics New Zealand has supported the teaching of statistics in New Zealand schools since 1986 by delivering a school resource as part of the communication strategy for the five-yearly Census of Population and Dwellings. In 1995 the education unit was set up as part of Statistics New Zealand's commitment to servicing the education sector. The unit produces a range of curriculum resources for classroom programmes.

NEW ZEALAND CURRICULUM

In 1990 the New Zealand Government announced its Achievement Initiative Policy for schools. The key aspects of this policy was the development of the *New Zealand Curriculum Framework (Te Anga Marautanga o Aotearoa)* and supporting national curriculum statements in the two official languages of New Zealand, English and Mäori.

The framework defines the requirements for teaching, learning and assessment in New Zealand schools. It sets out the national directions for schooling and provides consistency in classroom programmes throughout New Zealand. Among the principles underpinning the framework is the need for education to be inclusive of all students, and to be responsive to individuals needs, recognising the wide variety of abilities and backgrounds children bring with them.

The framework describes in broad terms the knowledge and understanding students need to acquire in the seven essential learning areas of Mathematics (Pangarau), Social Sciences (Tikanga-a-Iwi), Sciences (Putaiao), Language and Languages (Nga Reo), Technology (Hangarau), Health and Well Being (Hauroa) and The Arts (Nga Toi). It also describes a set of essential skills students must develop in the context of the essential learning areas.

The national curriculum statements for each of the seven essential learning areas describe, in more detail the required knowledge, understanding, skills and attitudes. They specify clear achievement objectives for eight levels from Year 1 (5yr olds) to Year 13 (18 year olds). The achievement objectives broadly define the learning that should be achieved by students as they progress through school and provide a basis for the construction of classroom programmes.

The development of the curriculum statements in te reo Mäori marked a significant new era for Mäori education in New Zealand, Aotearoa. These statements were to have the same aims and objectives of the English statements but provide for learning and teaching through te reo Mäori and through Mäori knowledge and experiences.

STATISTICS NEW ZEALAND

The work of Statistics New Zealand can be summed up by our mission statement which is: "for governments and the wider community to have official statistics that:

- are trusted, of high integrity and quality;
- can be accessed by all; and
- provide relevant and timely information on key aspects of New Zealand's economy, environment and society."

The Statistics Act (1975) sets out the Government Statistician's (Chief Executive of Statistics New Zealand) role and responsibilities for all official statistics. As a government agency, we have an obligation under the Treaty of Waitangi (Te Tiriti O Waitangi) to meet the statistical needs of Mäori. The treaty, which was signed in 1840, lays the foundation for the way Mäori and other New Zealanders share responsibility for New Zealand and is considered the founding document of the nation of New Zealand.

THE 2001 CENSUS EDUCATION RESOURCE

The Census Education Resource was developed to help Statistics New Zealand meet the key deliverables of the 2001 Census communication strategy, which were to:

- build public understanding of why the census takes place
- educate and inform the public about the census process
- encourage a relationship between Statistics New Zealand and Mäori that gives Mäori reason to trust the processes and outcomes of the census
- actively promote the availability of the Mäori and English language form.

It also needed to meet the requirements of the *New Zealand Curriculum Framework,* to ensure classroom teachers used the resource. The inter-relationship of the essential learning areas and essential skills gave the opportunity for the development of a cross-curricula resource that provided a real life learning experience for students. The resource needed to be broad-based to allow teachers to adapt the activities to meet the needs of their own students and communities in line with the principles of the framework.

A consultation process was undertaken with the education sector, teacher training providers, advisors to classroom teachers and classroom teachers to determine the content and the most appropriate medium for the delivery of the resource. A cross-curricula resource in hard copy with supporting material on the Statistics New Zealand's website was developed. The resource targetted Years 4 – 10 and was closely aligned to the learning outcomes set out in the appropriate curriculum statements. The resource consisted of an English resource booklet, a te reo Mäori resource booklet (Te kete Tatauranga) and a map, with supporting material on our website. The delivery of a hard copy resource would enable all schools to have access to it, where as delivering an electronic resource would restrict access only to schools who had access to information technology.

As part of the department's commitment to the Treaty of Waitangi a te reo Mäori resource was developed for the Kura kaupapa Mäori schools and the rumaki units in mainstream schools. Approximately five hundred of the 2,700 schools in New Zealand deliver some part of the curriculum in te reo Mäori. Kura kaupapa Mäori deliver the whole curriculum in te reo Mäori, whereas rumaki units deliver only part in te reo. The resource needed to be developed within the philosophy of Mäori education, which is underpinned by Mäori spiritual, and cultural beliefs therefore it would have been inappropriate to merely translate the English resource. The English resource was developed by using the lessons learnt from the 1996 resource and a group of current primary and secondary teachers.. The te reo Mäori resource was developed by a group of Kura kaupapa Mäori teachers and a te reo Mäori language consultant. The learning outcomes for both resources were:

- an understanding of the 2001 Census of Population and Dwellings, its purposes and how it is conducted

- an understanding of the processes involved in providing accurate information about aspects of our society
- an understanding of the wider society and the individual's place in it.

The resource met learning outcomes from the essential learning areas of Mathematics, Social Studies, English, and Technology and the Geography curriculum. Numeracy, Information, Communication, Problem-solving and Social and co-operative skills were all covered in the resource. The learning activities were designed so they could be adapted for younger students or older students eg Year 11 and 12 Geography students used the data provided on the website for their population studies. The collecting statistics section of the resource provided useful information on the survey process for Year 11 – 13 Mathematics students. The inclusion of the sample survey form provided a model for questionnaire design.

The resource provided a cross-curricula learning programme about the census. It strongly emphasised the importance of understanding and interpreting the significance of information. The census was in the sixth week of the new school year so the resource was designed to give students the opportunity to learn more about themselves, their class, and their community. The resource made students the central focus and related the census to them and their peers. Data and facts in the resource were selected with special relevance to young people. In addition, Te kete Tatauranga used data relevant to the Mäori population.

Both the English and te reo Mäori resource provided teachers with a range of activities that would engage students in collecting and interpreting data, understanding the census and census processes, and how census data is used. For example, the 'describing ourselves' section in the English resource and 'ko wai tätou' (Who we are) in the te reo resource had activities where students were asked to collect data about themselves and their community and compare it to data collected by Statistics New Zealand. This met the following achievement objectives (outlined in Table 1) of the statistics strand of the Mathematics curriculum statement.

Table 1
Achievement Objectives

	Statistical investigations	Interpreting statistical reports
	Within a range of meaningful contexts, students should be able to:	Within a range of meaningful contexts, students should be able to:
Level 2	• collect and display category data and whole number data in pictograms, tally charts, and bar charts, as appropriate.	• talk about the features of their own data displays; • make sensible statements about the situation represented by a statistical display drawn by others
Level 3		• use their own language to talk about the distinctive features, such as outliers and clusters, in their own and others' data displays; • make a sensible statements about an assertion on the basis of the evidence of a statistical investigations.
Level 4	• Plan a statistical investigations arising form the consideration of an issue or an experiment of interest; • Collect appropriate data; • Choose and construct quality data displays to communicate significant features in measurement data.	• report distinctive features (outliers, clusters, and shape of data distribution) of data displays; • evaluate others' interpretations of data displays.

The 'Trends' section in the English resource used data to look at the changes in New Zealand society over the last hundred years and asked students to brainstorm what changes they thought may occur in the next hundred years. The activities in Ngä Kaupapa mahi (classroom acitivities) in Te Kete Tatauranga asked students to interpret a range of data related to Mäori. Both of these sections provided a range of activities that met the numeracy skills of recognising, analysing and responding to information which is presented in mathematical ways, for example in graphs, tables, charts, or percentages that are set out in the *New Zealand Curriculum Framework.* The activities also met several achievement objectives in the Social Studies curriculum statement. Schools' Corner on the Statistics New Zealand's website was used to provide additional data, in a spreadsheet format; a print file of both resources plus some web based classroom activities.

PROMOTION O F THE RESOURCE

An extensive promotional campaign was undertaken to ensure that schools were aware of the resource. Schools were asked to register for the resource even though it was provided free. Adverts were placed in key educational publications. The Newspapers in Education programme run by all the major daily newspapers used the census as the topic for their activity pages prior to census day. Leading educational websites had links to Schools' Corner on our website and in some cases developed their own content to support the census resource. A series of workshops to raise the awareness of the resource and the census with key educational support people were held throughout New Zealand.

EXAMPLES OF HOW THE RESOURCE WAS USED IN THE CLASSROOM

Examples of how classroom teachers used the resource ranged from year 1 & 2 students collecting and graphing data about the contents of their lunch box on Census Day to students conducting a school wide census on various items of interest eg using the library, sports equipment, computer use at home, playground, pre-schoolers in the area and future roll growth. Many schools had students away on school camps on census night so had to complete the census at the campsite. This was an opportunity to provide students with a real life experience of taking part in a survey. The sample form in the resource was used to practise filling out a survey form.

EVALUATION

Eighty nine percent of all primary and secondary schools registered for the resource. Fifty two percent of the schools who undertake some instruction in te reo Mäori registered for a copy of Te Kete Tatauranga. The census education resource files were the most downloaded files from the website in February and March. The evaluation showed that the resource had good links to the national curriculum. Teachers found it user friendly and many commented that they would use it on an on-going basis as a Maths/Social Studies resource. An independent evaluation of Te Kete Tatauranga found that the teachers rated the resource very highly. They felt it was a very good teacher resource and one they could use to support other curriculum learning areas (eg Tikanga-a-Iwi, Pangarau and Hauarau). All teachers who responded in te reo Mäori felt that the te reo Mäori in the resource was of good quality, clear and consistent with the Mäori curriculum documents.

DISCUSSION

The 2001 Census Education Resource was well received by teachers. It fitted well with the national curriculum and provided real-life learning experiences. We intend to continue to develop resources using Statistics New Zealand data to support the teaching of statistics in New Zealand schools. In 2002 we plan to develop an English and te reo Mäori resource using the census results. It is hoped that the resources produced by Statistics New Zealand have helped students to see the relevance and importance of statistics in their lives.

REFERENCES

Ministry of Education (1993). *The New Zealand Curriculum Framework.* Wellington*:* Learning Media

Ministry of Education (1992). *Mathematics in the New Zealand Curriculum.* Wellington: Learning Media