Enticing Queensland Teachers and Students with Real Data

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1. Introduction

Queensland has conducted two "Census at School" projects since 2001. It has been enlightening for my statisticians who conducted the Censuses: it opened their eyes to statistics in the world of school education (as opposed to official statistics). In addition, it has been wonderful to watch the ways it has helped improve the use of statistics in Queensland Schools.

2. Background

The Office of Economic and Statistical Research (OESR) decided to conduct a "Census at School" project (Davies and O'Connor, 2004) in 2001 to complement similar projects being conducted in the United Kingdom and in Canada. The aim of the project was to promote the Australian National Census of Population and Housing held on 7 August 2001. Queensland, having its own Government Statistics Office, has always conducted an additional promotional campaign to that provided by the Australian Bureau of Statistics (ABS) because population counts affect the level of Commonwealth grants paid to the States.

3. Census At School phase 1

A primary objective of this first phase was to raise awareness among school students, teachers and the wider school community of the National Census of Population and Housing. The activity also aimed to develop an interesting and applicable teaching resource. Most of the project was conducted over the Internet, to foster use of this technology by both students and teachers.All schools in Queensland, including State, Catholic and Independent schools were invited to participate in *CensusAtSchool*. Promotional materials and website pages were designed to appeal to children while reflecting the content of the *CensusAtSchool* forms.

Schools registered on-line, downloading information, promotional materials and instructions from the website. As schools registered, registration details in each field were saved into a Notes view. Students completed the forms manually in the classroom, and returned the data in spreadsheets by email. Spreadsheets appropriately formatted for data entry and with several rows of example data, were available from the website to assist students and teachers.

Data received by OESR was validated and cleaned and results and worksheets developed from the data. Clean data were loaded into an Access database for use in the Random Data Generator. This facility enables students to take a random sample of the *CensusAtSchool* results for use in the classroom or for projects.

The project was a learning experience for OESR as well the school community. While there was enthusiasm and high participation in completing the census form as a classroom activity, many schools did not follow through with data entry and return. In some schools, data entry was a classroom task allocated to students, in others teachers supervised or completed this task, while in others it was a technology hassle. Additionally, some schools experienced problems with IT firewalls.

In the 2001 *Census At School* project students answered questions about their age, their household, their pets, favourite subjects and sporting team. Information was returned on 14,667 students including 8129 primary school students and 6538 secondary students from three metropolitan regions and eight other regions covering the state of Queensland. This represents returns from over 40% of all schools in Queensland.

Worksheets were developed by staff at OESR. The worksheets and a summary page of interesting results were posted on the website and circulated back to all schools. The feedback from schools was very positive

with children reporting that they thoroughly enjoyed the activity the teachers were equally enthusiastic and were delighted to have a "safe" website they could get the kids to visit. Teacher difficulties and lack of confidence were a restriction in this first project. Many teachers were unable or lacked the confidence to create web worksheets; though we did have teachers approach us with ideas and drafts.

For me the highlight of project was watching the kids at one school build a bar chart against a wall with small wooden blocks with each child aged 10 placing a block in the column representing the month in which they were born. To see the understanding of statistics dawning on them and see statistics live in the making is something I will always remember.

4. Census At School phase 2

CensusAtSchool was conducted for the second time during 2002/3 in collaboration with Sport and Recreation Queensland. All Queensland schools were again invited to engage Years 5 to 10 students in the census. The questions elicited information on sport and physical activity undertaken at school, during and out of class time. Additionally the questions were designed to link with objectives within the Health and Physical Education Key Learning Area of the Queensland Education curriculum to enable integration of the census activities into teaching and learning practices within the classroom.

Information was returned on 16,122 students, including 8,267 primary school students and 7,855 secondary school students. To attempt to overcome teachers' apprehension about the technology and supply these teachers with links to extra support material, the *CensusAtSchool* information was linked to the Communication Network site in Education Queensland. This proved a useful link.

5. Moving Lower

In July 2004, I was approached by my local school to work with the Grade 2 teachers (children aged about 7) on their mathematics and statistics they were teaching. During this second half of Grade 2, the children were developing bar charts, counting various items and practicing addition and subtraction. The concepts of pies being divided were being introduced as a simple introduction to fractions. In August the children (25 in each class) developed bar charts using months their birthdays fell in. I came and talked about my profession and showed them a variety of different graphs with different content used in government – line graphs of numbers of poker machines, bar charts numbers of people admitted to hospitals, pie charts of expenditure, along with tables and maps of numbers of fires etc. The children were fascinated by someone having a job that used mathematics and statistics - living proof there is a career path. I also discussed how information in collected and the students expressed a desire to be involved in a survey. *CensusAtSchool* immediately sprung to mind and a cut down version of the original phase 1 questionnaire was developed. This simplified questionnaire omitted questions about favourite activities and sporting teams. The survey conducted in class with the teacher having to assist with postcodes but no other help was required.

I put the analysis into a formal report, just like the ones I had shown them earlier. This was enthusiastically received by the children. They wanted to know more about themselves and how they compared to others: in Queensland and the rest of the world. The teacher was very happy: she has a tool she can use again, and material she can link the curriculum to children. The children had a special affinity to the data – it related to them and they were enthusiastic every time it was used in a discussion. The teacher used it as the basis for different types of graphing, social topics and other mathematic topics.

6. Conclusions

The exercise in the Grade 2 proved that this project can be run in a variety of age groups and would be enthusiastically received at any level. The children loved having information about themselves and using this in discussions. The linkages their teacher made with the other topics proved how useful one set of data can be: the price of spending a lesson collecting this information and uploading it and then accessing the results was paid off several times over by the usage that was made of the data. On seeing the different subject areas it was used in emphasised that *CensusAtSchool* could be run in any subject class.

REFERENCES

Davies, N., Connor, D. (2004). *CensusAtSchool:* Collecting and Disseminating Real Data for Real Learning. In: Proceedings of the 20th Annual Statistics Methodology Symposium. Ottawa: Statistics Canada (to

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