Supporting Data-Driven Math in Canadian Schools: Statistics Canada and *Census at School*

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1. Introduction

Through its program of Education Outreach, which includes the *Census at School* project, Statistics Canada is introducing statistical concepts to school age children.

Statistics Canada's data and expertise are supporting the Canadian school curriculum that includes a new emphasis on mathematical literacy. The Ontario Education document *Leading Math Success* (www.edu.gov.on.ca) defines mathematical literacy as "a knowledge base and the competence and confidence to apply this knowledge in the practical world. A mathematically literate person can estimate; interpret data; solve day-to-day problems; reason in numerical, graphical and geometric situations; and communicate using mathematics." The *Census at School* project engages students from grade 4-12 in real-life, online data collection and analysis, thus providing a practical application of statistics and probability, one of the five major strands of the mathematics curriculum.

2. Data Driven Math in Canadian Schools

Canadian students generally perform well in math, compared to students in 31 other countries. The most recent OECD study from the Project of International Student Assessment (PISA) (www.statcan.ca) shows Canada ranking sixth in the world in math. Students from certain Canadian provinces such as Quebec and Alberta scored even higher. To support Canada's journey to an information society, the Canadian education system is challenged not only to maintain but to better these math scores, as well as to develop students' technological literacy and data management skills.

In Ontario, Canada's most populous province, data-driven learning plays an important role in the curriculum and begins in the primary grades. Students start in kindergarten with simple data discovery, moving to sophisticated data applications by the end of secondary school:

- Grade 1 students, who are approximately 6 years of age, are helped to collect, organize and analyze data based on first-hand information.
- By Grade 5, 10-year-old students develop and implement a plan for collecting, displaying and interpreting data to answer a question.
- In grade 8, 13-year-old students are able to evaluate and use measures of central tendency and variability.
- By grade 10, 15-year-old students find and model data that are meaningful to them and conduct analysis using linear and quadratic equations.
- In the new grade 12 course, *Mathematics of Data Management*, 18-year-olds learn how to apply sampling, modeling and statistical analysis techniques to everyday topics and issues. They produce a culminating project using real data that is worth 20% of the course mark. Statistics Canada sponsors Data Fairs to showcase exemplary student data projects.

3. Learning by Data Discovery- *Census at School*

The Ontario math curriculum (www.edu.gov.on.ca) notes "Students should actively explore situations by experimenting with and simulating a variety of probability models. The focus should be on real-world questions and use of evidence-based approaches. "

That guideline is made to order for the *Census at School* project. Last year, its inaugural year, over 8,000 students responded to the *Census at School* online questionnaire. The students enjoyed the fact that they collected their own class data online. Math teachers were enthusiastic for this bilingual project that fits curriculum in measurement, data management, graphic displays of data, estimating, and different ways of recording data. The ultimate teacher endorsement came from L. Scanlon, a special education teacher in Ontario: "My students got more out of this project than any text book or teacher could communicate."

Census at School not only supports math and technology curricula in schools, it also builds a teacher community of interest that is continuously connected to Statistics Canada. The online registration function allows us to stay in touch with teachers and hear back from them. This ongoing communication is crucial as we add new lessons and information to the project website in preparation for the 2006 national Census.

4. *Census at School* and Canada's 2006 Census

Gathering census information involves a partnership with all Canadians. A good deal of resource is spent in promoting the national census and the education community has typically been a key stakeholder group. For example, schools ordered over 25,000 Census Teacher's Kits in 2001. However, communicating with the school market has been a stop and start process on a five year rotation, with outcomes that are difficult to measure.

The *Census at School* project allows an ongoing and iterative outreach to schools. The project also promotes a model of online data collection, which will be offered as a new reporting option for the 2006 Census. By participating in an online survey at school, students become comfortable with the technology and bring a helpful message home to parents and caregivers. Youth can be particularly influential in areas of high immigrant and allophone populations, where good census response depends on positive perceptions and understanding of government programs.

We intend to raise awareness of the online reporting option in the media by highlighting *Census at School* student results in articles appearing before the 2006 Census. We hope that 20% of Canadian census respondents will use the online response option in 2006.

5. Conclusion

Census at School furthers the mandate of Statistics Canada's Education Outreach program by providing a technology-based statistical literacy project to support math curriculum in Canada. It also keeps the national census visible in schools through a cost-effective, ongoing communication program with teachers.

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