Chapter 12

The Learning Toolkit: The Design, Development, Testing and Dissemination of Evidence-Based Educational Software

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ABSTRACT

In this chapter the authors summarize the design, development, testing, and dissemination of the Learning Toolkit—currently a suite of three highly interactive, multimedia tools for learning. ABRACADABRA is early literacy software designed to encourage the development of reading and writing skills of emerging readers, especially students at-risk of school failure. The authors highlight the important modular design considerations underlying ABRACADABRA; how it scaffolds and supports both teachers and students; the evidence on which it is based; the results of field experiments done to date; and directions for future research, development, and applications. They also present ePEARL and explain how it can be used with ABRACADABRA to promote self-regulation, comprehension and writing. They briefly discuss ISIS-21 the prototype of a tool designed to enhance student inquiry skills and promote information literacy. As an evidence-based toolkit available without charge to educators, the authors believe the suite of tools comprising the Learning Toolkit breaks new ground in bringing research evidence to practice in ways that promote wide scale and sustainable changes in teaching and learning using technology.

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INTRODUCTION

Canada is generally seen as a literate developed nation, with a well-developed and successful education infrastructure. Like all impressions, however, it is important to go deeper and explore the evidence. How well then is Canada really doing in terms of literacy? PISA 2006: Science Competencies for Tomorrow's World, reports the results from the most recent PISA survey, focuses on science, mathematics, and reading. The Programme for International Student Assessment (PISA) is a triennial survey of the knowledge and skills of 15-year-olds, and the product of collaboration among participating countries and economies through the Organization for Economic Co-operation and Development (OECD). OECD draws on leading international expertise to develop valid comparisons across countries and cultures. More than 400,000 students from 57 countries, making up close to 90% of the world economy, took part in PISA 2006. The average performance of Canadian students was in the upper quartile on the PISA measures of reading (OECD, 2000, 2006; Statistics Canada, 2004). By itself, these results seem encouraging.

Nevertheless the same reports noted that about 25% of the Canadian students tested performed at or below Level 2. These 15-year-old students encountered basic difficulties in “Locating straightforward information, making low-level inferences of various types, working out what a well-defined part of a text means, and using some outside knowledge to understand it” (OECD, 2000, 2006; Statistics Canada, 2004). Such basic difficulties, played out across the nation, have a significant impact on the economic well-being of all Canadians. Recently the results of national and international surveys—the Adult Literacy and Life Skills (ALLS) survey by Statistics Canada and the Organization for Economic Cooperation and Development (OECD) disseminated by the Canadian Council on Learning (2007)—suggested that almost half of adult Canadians have only low-level literacy skills. The survey established five levels of literacy, with level 3 considered to be the minimum level of skill required in today’s society. Results showed that only 58% of Canadians achieved level 3 or above in the category of prose literacy. The ALLS survey was conducted in Canada, the United States, Italy, Norway, Switzerland, Bermuda, and the state of Nuevo León, Mexico. More than 23,000 Canadians took part in the survey that tested prose and document literacy, numeracy, and problem-solving skills. The survey also showed that there has been virtually no improvement in Canada’s results since the previous surveys.

Paul Cappon, President and CEO of the Canadian Council on Learning, responded to these findings (2007) by arguing that there is an urgent need to develop a more cohesive approach to ensure that Canadian adults have the literacy, numeracy, and analytical skills they need to reach their full potential. He drew specific attention to the urgent need to understand why our current literacy and learning programs are not succeeding in order to develop more effective approaches.

Is the United States doing better than Canada? The same international research (OECD, 2000, 2006) shows the US fairing worse than their northern counterparts. For example, Finland was the highest-performing country on the science scale, with an average of 563 score points. Six other countries had mean scores of 530 to 542 points: Canada, Japan and New Zealand, and the partner countries/economies of Hong Kong-China, Chinese Taipei, and Estonia. Australia, the Netherlands, Korea, Germany, the United Kingdom, the Czech Republic, Switzerland, Austria, Belgium and Ireland, and the partner countries/ economies Liechtenstein, Slovenia and Macao-China also scored above the OECD average of 500 score points. The United States performed below the OECD average, with a score of 489, ranking 36th out of 57 countries. Less than 10% of American students scored at the highest proficiency levels, contrasted with more than 20% of students in
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