Accountability, Assessment, and the Literacies of Information and Communication Technologies

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In this article, we have explored the issues that Ministries of Education confront in their large-scale assessment policies and practices as literacy curricula expand to include the new literacies of information and communication technologies. Based on a series of interviews with Ministry personnel, we have described their current progress to include the new literacies, plans for the future, and the dilemmas and challenges in considering the demands of new times. We argue for a more balanced approach to assessment and accountability, one that recognizes the limitations of current public accountability measures and situates them within a broader assessment framework.

Key words: large scale assessment, Canadian assessment practices, policy, testing, new literacies

Dans cet article, les auteures étudient les enjeux auxquels sont confrontés les ministères de l'Éducation dans leurs politiques et méthodes en matière d'épreuves communes au fil de l'intégration des technologies de l'information et de la communication au sein des programmes de litératie. À partir d'une série d'entrevues réalisées auprès de fonctionnaires de ces ministères, les auteures font le point sur l'inclusion des nouvelles littératies, la planification du développement envisagé, les dilemmes et les défis qu'impliquent les exigences actuelles. Elles préconisent une approche plus équilibrée de l'évaluation et de l'imputabilité, laquelle tiendrait compte des limites des mécanismes d'imputabilité actuels et les situerait dans un cadre d'évaluation plus vaste.

Mots clés : tests communs, méthodes d'évaluation canadiennes, politiques, nouvelles littératies.

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Government and industry around the world are challenging education systems to prepare successful learners, workers, and citizens for the new knowledge-based economy. One critical component of this economy,

competence in new literacies, includes "how to read and produce the kinds of texts typical of the emerging information and multimedia age" (Semali & Fueyo, 2001, n.p.).

The challenge lies in debate around what forms of literacy to teach and what pedagogical options are most appropriate for teaching different forms of literacy. Educators, who are at a critical juncture, are exhorted to expand the notion of literacy not only by government and industry, but also by professional associations such as The National Council of Teachers of English and the International Reading Association (1996). Yet, as Hoffman, Paris, Salas, Patterson, and Assaf (2003) note, basic skills-testing programs, which are increasing in frequency, exert a powerful influence on instruction at all levels, especially in the U.S.A. and U.K. In Canada, standards-based provincial assessments are taking on new significance with the publication of "report cards" that compare and rank schools and school districts (Fraser Institute, 2005).

In this article, we have explored literacy accountability and assessment in the Canadian context. Our examination of ministry of education websites showed that results of province-wide assessments are multi-purpose; they determine individual student literacy attainments, inform parents of their children's literacy proficiency, monitor instruction of the curriculum, and hold schools and school boards accountable. Thus, these assessments have increasing import; yet minimum analysis has occurred of the relevance of traditional print-based literacy, promoted in province-wide assessments, to the new economic and social realities. In the U.S. context, Leu, Ataya, and Coiro (2002) found that "to a remarkable extent, state assessments in literacy completely exclude any of the new literacies that will define our students' future, nor do they have plans to do so" (p. 8). As Canadian literacy educators and researchers, we felt that it was critical to examine the current situation in Canada, particularly because we acknowledge, in principle, the view of Johnson and Kress (2003) that "despite years of debate on the nature of literacy and curriculum and ensuing policy directions, it is assessment—its weighting in the political culture and the means of enforcing that culture, which will guide what is taught and how it is taught" (p. 11).

LITERACY FOR A WORLD IN TRANSITION

We are living in the midst of a period of dramatic global economic change, co-evolving with and fuelled by an equally dramatic technological revolution. These forces combine to radically alter our work, civic, and personal lives (Castells, 1996; Drucker, 1993; Gee, Hull & Lankshear, 1996). In our work lives, the shift to a knowledge-based economy is intrinsically linked with the quickening speed of knowledge change (and obsolescence), rising standards of qualifications for "knowledge workers," and increased integration of ICT [Information and Communication Technologies] in the workplace (Organization for Economic Co-operation and Development, 2001, p. 3). The speed of knowledge change is increasing so rapidly that no matter how current knowledge learned in schools, it will likely soon be obsolete. Moreover, the new economy demands not only new types of knowledge, but also new ways of thinking and taking action, and new learner skills and characteristics (Castells, 1996; Gee, Hull & Lankshear, 1996). These include the abilities to work creatively and productively in teams, frequently in networked environments; to engage in technical and systems thinking; to manipulate abstract concepts and symbols; and to learn, in fact, how to learn (New London Group, 1996). Literacy capacities that government and business deem most relevant for the new economy are "the abilities to 'read' a range of printed, electronic and visual texts; master the new communication technologies via spoken and written language; locate, manage, evaluate and use information or knowledge; and engage critically with media and other texts" (Lonsdale & McCurry, 2004, p. 32).

Arguably, in increasingly profound ways, the changes outlined above define not only learning, but also reading, writing, and what it means to be literate (Leu, Kinzer, Coiro & Cammack, 2004). These changes prompt reconceptualized notions of literacy that encompass new media and ICT (Kinzer & Leander, 2003; Kress, 2003; Lonsdale & McCurry, 2004). These new forms of literacy are both verbal and multi-modal. For example, a web page selling goods or services will likely combine text, music, sound effects, and visual images. Or, an advertisement for a movie, radio station, or DVD will offer animation and full motion video. Web pages, websites, e-mail, chat, instant

messaging, video, games, anime, listserves, group lists, hypertext, hypermedia—elementary and high-school students navigate these new genres in their daily lives, forms that are dynamic, interactive, and evolving in sophistication, that require a new set of competencies for participation in the new times and world orders.

These new literacies are not old or traditional print literacy transferred to on-line environments; they involve unique processes and skills (Coiro, 2003; Kymes, 2005; Leu, 2002; Sutherland-Smith, 2002). Leu, Ataya, and Coiro (2002) acknowledge that

while the precise definition of 'new literacies' will never be complete . . . they include a) rapidly locating the most useful information within complex ICT networks such as the Internet; b) reading and critically evaluating that information for validity and utility; c) writing effectively with word processing software; and d) communicating information clearly to others with e-mail. (p. 1)

In a recent Information and Communication Technologies in Schools Survey in Canada, Plante and Beattie (2004) found that nearly all schools are connected to the Internet, with an average student-to-computer ratio of 5:1 and an average of 72 computers per school. More important, as Lenhart, Madden, and Hitlin (2005) determined, the new literacies of ICT are rapidly becoming everyday literacies as teens spend more time online. Given this situation, assessing students' abilities in ICT literacies is increasingly urgent and "as technology becomes more central to schooling, assessing students in a medium different from the one in which they typically learn will become increasingly untenable" (Bennett, 2002, p. 2).

METHODOLOGY

We became interested in Canada's practices with new literacies in large-scale assessments after learning of Leu, Ataya, and Coiro's (2002) investigation in the U.S.A. in which they interviewed persons in each state responsible for literacy assessment about the inclusion of ICT literacy on their mandated tests. We decided to replicate this study in Canada. Table 1 provides an overview of literacy/language arts assessment at the time of data collection for each province. Of the thirteen provinces and territories, two do not use large-scale tests, two

chose not to participate in our study, and two did not reply to our request to participate.

Table 1
Overview of Provincial Language Arts Assessments: Focus, Grades Administered, Administration Cycle, and Language Arts Curriculum Publication Date

	Language Arts Assessment Focus	Grades when Administered	Administration Cycle	Curriculum Document Dates
British Columbia	• Reading • Writing	Grades 4, 7 and 10	Annually for the 3 grades	1996
Alberta**	• Reading • Writing • Viewing • Word Processing (grades 6 & 9)	Grades 3, 6 and 9	Annually for the 3 grades	2000
Saskatchewan	• Reading • Writing	Grades 5, 8 and 11	Bi-annually for the 3 grades	• Elementary 2002 • Middle years 1997 • Grades 10, 11, 12 1999
Manitoba	• Reading • Language Arts • English Language Arts	Grade 3 (Teacher administers) * Grade 6 Optional Senior 4 required	Annually for the 3 grades	• K – 4 1996 • Middle years 1996 • Senior years 1996
Ontario	• Reading/ • Writing Literacy	Grades 3 and 6 Grade 10	Annually for the 3 grades	• Elementary 1-8 1997 • Grade 9 & 10 1999 • Grade 11 & 12 English 2000
Quebec	• Reading • Writing	6th year Primary 5th year	Annually for the 2 grades	2003

	Language Arts Assessment Focus	Grades when Administered	Administration Cycle	Curriculum Document Dates
New Brunswick	• Reading • Writing	Secondary Grades 2 and 7	Annually for the 2 grades	1998****
Prince Edward Island***	• Reading • Visual literacy	Grade 9 (15 year-olds)	Annually (OECD/PISA)	1998****
Nova Scotia	• Narrative/ Information Reading • Writing tasks • Visual/medi a text	Grades 6, 9 and 12	Annually for the 3 grades	1998****
Nfld/ Labrador	• Process Writing • Oracy • Narrative/ Information Reading • Viewing • Electronic Text	Grades 3, 6 and 9	Annually for the 3 grades	1998****
Yukon	• Reading • Writing • Viewing	Grades 3, 6 and 9	Annually for the 3 grades	1996*****
Northwest Territories**	• Reading • Writing • Viewing • Word Processing (grades 6 & 9)	Grades 3, 6 and 9	Annually for the 3 grades	1998
Nunavut (no large scale assessment program in place)	N/A	N/A	N/A	2000 (uses Alberta Learning curriculum)

* Department provides assessment materials and professional learning opportunities for teachers in support of assessment of critical competencies in reading for students in the beginning of grade 3.

** Alberta includes the Northwest Territories in its provincial large-scale assessment

*** Prince Edward Island has no provincial large-scale assessment program but participates in the international large-scale assessment program OECD/PISA (Organization for Economic Co-operation and Development/Program for International Student Assessment).

**** Implements the Atlantic Canada English Language Arts Curriculum

***** Yukon Department of Education, Public School Branch relies on the curriculum produced by other jurisdictions, especially the British Columbia Ministry of Education.

Between September 2003 and April 2004, we conducted telephone interviews with one person in each of seven provinces. All interviewees were people at senior levels in their assessment and evaluation departments. Ministries of Education that participated in this study represent 83 per cent of the Canadian public school population. We analyzed interview data quantitatively by adapting Leu, Ataya, and Coiro's (2002) scoring rubric. Unlike the U.S. study, we extended the quantitative data by examining interviews for themes.

We asked Canadian participants the same question that Leu, Ataya, and Coiro (2002) used in the American study: To what extent have states in the U.S. [i.e., provinces in Canada] included in their state assessment practices the assessment of word processing skills, reading and critical evaluation of information on web pages, the use of e-mail, or any of the other new literacies of ICT? In addition to these areas that were covered in the U.S. study, we also asked about inclusion of visual literacy.

Interviews focused on five areas: reading, writing, students with special needs, plans for the future, and curricular area roles and responsibilities. The first part of the interview focused on reading and asked about the assessment of abilities to locate, evaluate, and comprehend information on the Internet, and interpret information in visual forms. To learn about writing assessment, in the second part of the interview, we asked about the option to use a word processor and the ability to express understanding in visual forms. For both the reading and writing areas, we asked respondents reasons for including or not including the above in their present provincial assessments, and whether they foresaw any change ahead in including these areas. The third part

of the interview addressed diversity by asking whether special education students could use a word processor for the provincial writing assessment and what special conditions were available for students for whom standard forms of reading and writing were not an option. The fourth part of the interview asked about timelines for implementing the following: a) the use of word processors during the provincial writing assessment; and b) evaluating students' ability to use e-mail, comprehend online materials, and locate and evaluate online materials. The fifth segment of the interview questioned whether each of the following areas is regarded as a reading assessment issue, a writing assessment issue, a technology assessment issue, or a non-issue for assessment: using word processors, using e-mail, comprehending online materials, and locating and evaluating online materials. The interview closed by asking respondents what they foresaw as general future directions for their provincial assessments, and what roles present assessment measures play in assessment practices and policies.

The focus of our interview questions represented a limited view of ICT literacies; nevertheless, these questions have allowed us to obtain an initial understanding of the place of ICT literacies in large-scale assessment in Canada. Although ICT literacies may be part of other curricular areas, following Leu, Ataya, and Coiro (2002), we limited our investigation to literacy curricula.

RESULTS

Through analyses of the quantitative data and the interviews, several themes emerged that we report with the following headings: ICT literacy in present assessments; plans for including ICT literacies in future assessments; and the challenges and dilemmas of incorporating ICT literacies into large-scale assessment. [1]

ICT Literacies in Present Provincial Literacy Assessments

In Table 2, we have summarized the types of ICT literacies presently included on provincial large-scale literacy assessments, aspects of ICT literacies that provinces are contemplating including in future literacy assessments, and approximate timelines for implementing these changes.

Table 2
Summary of ICT Literacies Presently Included and ICT Literacies Contemplated for
Inclusion in Provincial Reading and Writing Assessments

Province	New Literacies Presently Included	New Literacies Contemplated for Inclusion	Approximate Time Table for Change
# 1	• Comprehension and evaluation of online information • Visual literacy • Media literacy	• Use of word processor • E-mail • Locating on-line information • Locate, comprehend and evaluate in an on-line environment	• 2 – 4 years
# 2		Comprehension of on-line materials	• 5 – 10 years
# 3		• Locate, comprehend and evaluate on-line materials	• 3 – 5 years
#4		• Word processing • Locate, comprehend and evaluate on-line materials	• 2 – 4 years
# 5		• Word processing	• 5 – 10 years
# 6		• Word processing • Locate, comprehend and evaluate on-line materials	• Unknown
# 7		• Locate,	• Unknown

Province	New Literacies Presently Included	New Literacies Contemplated for Inclusion	Approximate Time Table for Change
		comprehend and evaluate on-line materials	

Reading. One provincial reading assessment included questions at the grades-6 and -9 levels about comprehension and evaluation of information on the Internet. These were presented as paper and pencil, not on-line, tasks. For example, in the grade-6 reading assessment, students identified the distinctive features of web pages and how this text form differs from traditional print or book forms. These abilities were also represented in the assessment programs in two other provinces, but in subject areas other than reading. In one of the province's writing assessment, secondary students were given a topic to write on and received a reading file about this topic, which included documents from the Internet. Students completed their reading file by obtaining information from pre-selected Internet sites or by independently searching for information on the Internet. However, students were not evaluated on either their comprehension or evaluation of these Internet resources but rather on their final written product. Another province assessed "student skill in accessing, processing, and communicating information in a previous year," but in the technology, not literacy, assessment.

The same province that included comprehension and evaluation of on-line information in their grade-6 provincial reading assessment also assessed students' ability to comprehend ideas in formats other than written text. The questions about a web page described above, for example, required visual literacy. And, using an advertisement that used images of a stuffed animal and a young girl to sell a product, students were asked why the artist included those characters, who the target audience might be, and why everything except the product was portrayed in black and white. Another item was an illustrated information text with comprehension questions about the illustrations. In three other provinces, comprehension of visual texts was part of other

curricular area assessments such as social studies or math, but not reading: "The visual representations are used as aids but they are not being targeted for assessment. For example, chronological timelines have been used in the large-scale tests for the primary level and geographical maps in the large-scale assessment for social studies" (Province 3).

Writing. With the exception of one province, provincial assessors did not allow the use of word processors for large-scale writing assessments. As a pilot project, one province offered schools the option of using a word processor for the secondary writing assessment with the condition that spell checkers be blocked; however, few schools exercised the option. More typically, writing assessments were restricted to paper and pencil where "even e-learners or home-schoolers have to come and sit and write the exams as pen and paper" (Province 4).

One province included visual forms of expression in its writing assessment (e.g., students responded to a poem by drawing a cartoon and used a Venn diagram to show their understanding of an information text). Respondents from two provinces explained that visual forms of expression were part of classroom assessment because they are curriculum-based, but visual forms of composing are not part of the provincial writing assessment. In one of these provinces, assessors included visual representation in a large-scale assessment in technology several years prior, not writing, in which students were asked to "tell what technology means to you by drawing pictures and writing about it in the space below" (Province 6). In two of the provincial writing assessments, students were encouraged to use graphic organizers (webs and diagrams) as part of prewriting, but these were not evaluated with the final written product.

Diverse Students and Large-Scale Reading and Writing Assessments

In all but one province, special education students who had designated status and permission were allowed to use word processors for the provincial writing assessment. Some respondents explained that provincial policy provided special education students in large-scale assessment situations with the same learning adaptations they would use in their classrooms. One respondent noted that in these cases, "spell and grammar checks must be turned off, and writing monitored by the

teacher. We want students to use the word processor more as a tool for their writing, not something that will be an aid" (Province 2).

All provinces provided a variety of special conditions for students for whom standard assessment forms of reading and writing were not an option, conditions that often involved the use of ICT. They reported that these included what is normally done in the classroom, such as alternate settings, English as Second Language dictionaries, additional time, an assistant, access to a scribe, assisted technology (e.g., extra large font), extra lighting, and different response formats (e.g., oral instead of written).

Plans for Including ICT Literacies in Future Assessments

From our interviews, we found that most provinces were planning to permit all students the choice to use word processors for the writing assessment. Two respondents explained that implementation of this plan was in the immediate future and was already being piloted in one of these provinces (as mentioned above). Three respondents indicated this step in their provinces is five to ten years in the future. Two other respondents indicated an unknown timeline, explaining that computers had to be completely integrated into classrooms before considering word processing a standard practice on the provincial assessment.

Our data revealed that only one province plans to evaluate students' abilities to use e-mail, but it will be in the context of pen and paper because "word processing is just a mechanism for students to do a final copy" (Province 1). Three respondents stated that the ability to use e-mail could be included in technology assessment programs to correspond with new provincial ICT performance standards, but no definite plans were in place. In three provinces, e-mail writing was part of the curriculum thus indicating it was probably included in classroom assessment, but there were no immediate plans to include it in large scale assessment.

Five respondents reported that it was likely that their provinces would include in their future reading assessments locating, evaluating, and comprehending on-line materials. One of these provinces was progressing quickly in this direction because their current assessment already included paper and pencil items that targeted these abilities.

Another province was "talking about asking students to read a web page as a text, but not asking them to use links and other on-line features. "We're going to present the page view and ask questions about that information" (Province 2).

Other respondents foresaw longer timelines in their provinces for implementing these changes to their reading assessments. Two provinces had no definite plans to include locating and evaluating on-line information. In one of these provinces, the last Information Technology assessment included locating information but not evaluating or comprehending it. One respondent explained that these abilities could be evaluated through alternative methods to traditional large-scale assessments, such as student files or portfolios, collected by schools, containing evidence of those abilities (Province 3).

In some provinces, there was considerable planning for on-line assessment programs where "students write these exams directly on the Net. But it will still be selected responses (i.e., multiple choice) and reading comprehension" (Province 4). This respondent noted that "one of the questions could be accessing a website and reading this information and reporting on this information." A pilot project was underway in this province, indicating that implementation may be imminent.

With other provinces, plans to include ICT literacies on large-scale assessments were vague. "At some time in the future we will likely be using computers for various reasons. Not just to allow students to respond to various prompts but also in terms of on-line assessment itself. It's quite probably a long way off for us and I think at least five years away—maybe more" (Province 5). These provinces, the ones with less definite timelines, foresaw more conservative future changes in both test content and formats. "Apart from revisiting some of the approaches that we're using in our assessments, for the foreseeable future we're not looking right now into new formats and new approaches" (Province 5).

Challenges and Dilemmas in Including ICT Literacies on Large-Scale Assessment

Our respondents articulated a number of challenges and dilemmas they currently face. These included changing conceptions of literacy,

connections between the curriculum and assessment, equitable ICT access issues, and the differing political and educational uses of assessment results

Conceptions of literacy. Most Ministries were engaged in debates about what counts as literacy as represented on their large-scale assessments. There was a conservative tendency and a resistance to include new or what was perceived as "informal" literacies. For example, one interviewee commented that, "we still like students to be able to write in the traditional forms. We find generally that when students are using word processing, they get closer to an e-mail style of writing or they start using chat room language or acronyms and things like that. We really at this point are still resisting" (Province 2). Our respondents explained the possible consequences of allowing these less formal literacies on their provincial assessments as potentially detrimental to classroom instruction of traditional print-based literacies.

Unfortunately as much as we say our assessments should not drive practice they often do and so if we were to replace a formal business letter on one of our assessments with a write an e-mail to your best friend about a TV show you saw last night, then all of a sudden teachers across the province would be doing that. (Province 2)

Responses about perceived curricular responsibility of the use of word processors, ability to use e-mail, comprehension of online materials, and location and evaluation of online materials provided a window into Ministry conceptions of ICT literacies (see Table 3).

All respondents except one claimed that their provinces considered the use of word processors a technology issue. One respondent distinguished between classroom assessment, in which using a word processor would be a writing issue, and large-scale assessment, in which it would be a technology issue. Using e-mail was considered a technology issue in three provinces, a reading and writing issue in one province, a writing issue in one province (however, this province did not recognize e-mail as a legitimate form of writing, and did not include it in large-scale writing assessments), a reading, writing and technology issue in one province, and a non-issue in another province where the product,

Table 3

Perceptions of Curriculum Responsibility of ICT Literacies in Provincial Assessment Programs

Province	Use Word Processors	Use E-mail	Comprehend Online Materials	Locate and Evaluate Online Materials
1	Technology	Reading, Writing, Technology	Reading	Reading and Technology
2	Technology	Writing (however, is not recognized as legitimate form)	Reading	Technology
3	Writing	Reading & Writing–interactive	Reading (in curriculum now as "variety of formats")	Reading (part of critical reading in curriculum now)
4	Technology–separate from ability to communicate, organize ideas etc	Technology Curriculum based	Technology and Reading–requires higher level mental processes	Technology and Reading–requires higher level mental processes
5	Technology	Technology	Technology	Technology
6	Technology in large scale assessment, writing in classroom assessment	Technology in large scale assessment, writing in classroom assessment	Technology in large scale assessment, reading in classroom assessment	Technology in large scale assessment, reading in classroom assessment
7	Technology	Non-issue–product is focus of assessment not process	Technology and Reading	Technology

not the process, was the focus of evaluation. Comprehension of online materials in large-scale assessment programs was regarded as a reading issue in three provinces, a reading and technology issue in two provinces, and a technology issue in two provinces (with one of these viewing it as a reading issue in classroom assessment). Locating and evaluating on-line materials was considered a technology issue in four provinces (again with one of these viewing it as a reading issue in classroom assessment), a reading and technology issue in two provinces, and a reading issue in one province.

Several people mentioned the lack of effect of technology on assessing literacy ability, such as the use of a word processor on a students' writing.

It really doesn't mean that they are necessarily better writers or better readers because they have given it to you on a typed page because at the end of the day it's the typed text as opposed to a hand-written text. (Province 1)

The issue of the relationship between technology and literacy was a common concern, as captured in this response.

We have to separate the ability to write and to communicate from the technical issue, which is using word software or other tools. Comprehension of on-line information is more than a technical issue because the structure of the Internet is a living tool and understanding that and using those tools are higher mental processes. (Province 4)

Relationships between curriculum and assessment. Most respondents spoke about the assumption of a coherent relationship between the provincial curriculum and assessment. Some provinces had broader literacy curricula in the language arts. Within this group, only one province spoke of the consistency between the mandates of curriculum and large-scale assessment, a key characteristic of successful standards-based school reform initiatives (Darling-Hammond, 2004).

In our curriculum outcomes, our students are expected to be able to read a variety of different kinds of texts. And texts are defined more broadly than words on paper. In our assessments, we include narratives and we include

poems but we include the visuals because it's part of our notion of reading and we include the electronic as part of our notion of reading. (Province 1)

Those from provinces with narrower literacy curricula explained that they did not include new literacies on their current assessments because the curriculum basis is not there.

The need to look at technologies, the need to look at the Internet as a source of information and so on—we don't have that in our curriculum. And because we try to tie our assessments to the curriculum, we can't in all fairness put too great an emphasis on that on our assessments. (Province 2)

Our respondents indicated that their ministries continued to look to the current and forthcoming curricula in planning future large-scale assessments. For example, one person explained that their province's current reading curriculum stated, "The student should be presented with texts on various mediums. This will not give us any other choice than asking ourselves what we can offer in terms of large-scale assessment" (Province 3). This emerging curriculum basis of reading and writing with new technologies also means these new literacies must become part of classroom assessment. The challenge is making the link with the large-scale assessment program. One person explained, "We have already integrated anything that concerns ICT within the curriculum and within the classroom assessment. The step ahead would be to include that in our large-scale assessment" (Province 4).

Our respondents also recognized the powerful place of technologies in students' reading and writing in and out of school. For example, in the province that provided students with printouts of Internet resources for the writing assessment, our interviewee discussed how

the students tend to ignore more and more the documentation that we offer to them and just establish their own, so we are telling ourselves that we have no other choice but to help our students learn to read and write with these technologies. (Province 3)

The guiding principle for future assessments seems to be that as curriculum changes to reflect expanded notions of literacy, so too should assessments.

Access to ICT. All respondents spoke of the complex and practical issues related to technology access in expanding large-scale assessments to better capture the new ICT literacies in the curriculum. One respondent described this situation as "a tension between the opening towards the technologies and also the whole aspect concerning an assessment tool that would strive to make sure that all students be placed in similar conditions of test administration" (Province 3). Concerns were expressed generally about equitable access and specifically about the quality of computers and software available for the assessment, as well as students' regular opportunities to use word processors for composing.

The main obstacle to be removed as we progress is the issue of access, access to technologies in our schools, so we must give access to our students. This varies a lot throughout [our province] right now. There are schools where the students arrive at school with their own laptops, while some other schools are not very well equipped. (Province 3)

Although nearly all schools in Canada now have computers, and 90 per cent of schools are connected to the Internet, computer access and quality of access, even where computer-to-school ratios are reasonably high, varies greatly among schools (Plante & Beattie, 2004). As well, differences between students' access opportunities and experiences with technology vary within schools. Ministries are aiming for a "level playing field" between schools and students before they feel they can legitimately consider implementing assessment of ICT literacy.

It would be seen as an advantage for those students who have the capability to use computer equipment as opposed to those who can't because there's a certain software they might have access to that other students wouldn't have access to. (Province 5)

One respondent reported that the matter of computers in schools was a "major issue with some schools trying to get rid of computers because students have access at home and in public libraries. Computers, therefore, are seen by some as an unnecessary and huge expense for schools" (Province 2). This respondent explained that "because our

province doesn't have a mandated policy that schools must follow regarding technology, many schools are going on their own way." De-emphasizing technology was one of these ways. "Because of this variance across the province it will be a while before we in testing and evaluation start using some of these technologies in our assessments" (Province 2).

Concerns with the use of computers and online tests in large-scale assessment also included issues of reliability and validity. One respondent explained that "one of the reasons why we're not looking at technology or looking at the Net in a more serious way is that we see a lot of problems with reliability. Even security, too, becomes an issue" (Province 2).

Tensions between political and educational uses of assessment results. Interviewees in the Ministries of Education saw test results as multi-purpose.

Our assessment tools are useful for piloting the system, for evaluating the system, for our institutional evaluation, that is to say for figuring out how our students fare against a specific standard. They are also used to illustrate coherence between practice and curriculum, and they are useful for the implementation of new curricula. (Province 3)

However, the people we interviewed wrestled with the issue of using the results of their large-scale assessments for political and educational purposes. They spoke of pressure from government to be accountable to the public and how

we in testing and evaluation have tried to make sure that these kinds of initiatives don't simply serve political ends, but they also serve our education systems, not so much as holding teachers and school boards accountable but more to identify students who are having difficulties so that we can support them. (Province 2)

As more provinces move to publication of the large-scale assessment results, one respondent expressed growing concern about the public's ability to fully interpret the results.

People sometimes don't see all those factors that may influence the result. For example if we were to publish that our students in our schools were having difficulty using technology to find information on the web—that is a generalization that wouldn't be true in this school versus that school and could in fact be very damaging. (Province 2)

CONCLUSION

For this study, we were motivated by our desire to explore how current accountability measures in Canadian education address the new literacies of ICT, particularly those most relevant for new times. Through a series of pan-Canadian interviews, we found that Ministry of Education personnel were wrestling with these issues and were at various stages of innovation in their responses.

Although all provinces represented in our study included a range of genres and use of visual texts in their reading and writing assessments, they are, for the most part, some years away from incorporating ICT literacies in any significant way. The same trends were revealed in the U.S.A. where the majority of state literacy tests do not assess comprehension and evaluation of information on the Internet, and do not allow use of word processors for assessing writing (Leu, Ataya, & Coiro 2002). As well, most of the individuals responsible for literacy assessments in both the U.S.A. and Canada regard locating, evaluating, and comprehension of on-line materials as a technology, not a literacy, issue.

Plans for inclusion of the new literacies of ICT varied among provinces from definite to vague, with immediate to distant timelines. Some aspects of ICT literacies were more readily included than others, and paper and pencil approaches, rather than on-line contexts, were more likely to be used in provinces that plan to include ICT literacies in their assessments.

Those responsible for large-scale assessments grappled with issues that directly influence the design of the instruments: conceptions of literacy, relationships between the curriculum and assessment, access to and equitable opportunities to use ICT, and tensions between political and educational uses of assessment results. There may be other interest-based debates related to challenges facing those responsible for large-scale assessment, such as opposition from psychometricians to move

away from a print medium for testing, but these did not emerge in our data.

TOWARDS AN EXTENDED AND BALANCED APPROACH TO LITERACY ASSESSMENT AND ACCOUNTABILITY

Assuming that accountability in education is important and that assessment powerfully influences pedagogy, we found it encouraging that some provinces are beginning to develop multiple means of assessment. Ministry officials in two provinces planned in the next year to introduce portfolios on CDs at specific grade levels as part of their formalized assessments. However, the interviews reinforced how unreasonable it is to expect traditional assessment programs, as currently constructed, to adequately measure the skills required for twenty-first century living and working. A number of alternative assessment techniques could be included in students' portfolios such as performance assessment based on planning, undertaking, and completing a task or project, assessment of a larger unit of work, done either individually or as a group, which would facilitate developing the kinds of networking and social skills that learners will need increasingly in workplaces of the future. Innovation in technology directed towards knowledge mobilization could be developed in the service of giving multiple stakeholders access to such accounts of classroom work.[2]

However, moves in this direction will be successful only if, as the International Reading Association's (1999) position paper on assessment states, researchers "find ways to link performance assessment alternatives to questions that external audiences must address on a regular basis" (p. 7). These questions should include how Canadian schools are preparing students for the new literacies generally required for the new economy (Government of Canada, 2002). Models of alternative assessments that can answer this question are emerging in other educational systems such as in New Zealand and Great Britain (Johnston & Costello, 2005). If Canada moves to an assessment system that values teachers' informal assessments and on-going performance and portfolio assessments, as England has done, then teachers will need help in constructing more systematic and rigorous procedures that would include the reconceptualized notions of literacy discussed here.

Other considerations are a) the effects of bi-annual, even annual, assessments – cycles that increase pressure for computerized responses, that lead to over sampling of narrow and/or traditional aspects of literacy and under-sampling of new literacies and the instructional implications that follow; b) the use of alternative sampling strategies so that different children take different sections of an assessment as is done in New Zealand; and c) the use of authentic performance tasks such as in New Zealand where children critically select from a set of books those that they deem should be in their library (Johnston & Costello, 2005). Finally, triangulation of multiple data sources, rather than single measures, is essential to determine a child's literacy abilities to give accounts to parents and the wider public.

We do not hold policy makers or test designers accountable for the current dilemmas in and limitations of large-scale, province-wide assessment. Our interviewees were unfailingly committed to fair and ethical practices and showed great concern for issues of equity. Rather, we suggest that the community of educators needs to define the limits of possibility for any form of single, large-scale assessment, to bring rigour to alternative forms, and to raise awareness of reconceptualized notions of literacy and the attendant assessment issues among parents and the public. It is in this spirit that we undertook this study.

NOTES

[1] To preserve the anonymity of respondents, we identify provinces by numbers. Our intent was to provide a wholistic view of assessment in Canada, not to provide a comparison among provinces. We have edited quotations of those interviewed for smoother reading.

[2] The Multiliteracy Project (www.multiliteracies.ca) is currently developing such a system.

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