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Watching Bald Eagles Change Shifts: Seeking Digital Curriculum Access Across Canada

Lorayne Robertson, Dianne Thomson

University of Ontario Institute of Technology

There is an inconsistency between a growing need for national research on issues of child and adolescent health and the wide range of diverse curriculum responses to health issues undertaken by individual provinces and territories in Canada. Measuring the effect of interventions is more difficult in this contradiction. In this study, the authors uncover a growing need for national research, knowledge mobilization, and the development of a common language and Internet protocols to enable sharing of health education initiatives using the affordances of technology. The authors find that in an era where difficult social challenges for children and adolescents require not only national but global attention, the current jurisdictional structures present significant and challenging barriers to accessing national and global expertise. These barriers will need to be addressed in order to maximize the affordances of digital technologies for knowledge mobilization toward the goal of coherent pan-Canadian health curriculum approaches.

Il existe une incohérence entre le besoin grandissant pour de la recherche nationale relative à la santé des enfants et des adolescents d'une part et la diversité dans la gamme de programmes d'études portant sur des questions relatives à la santé que proposent les provinces et les territoires au Canada. Ce manque de continuité rend plus difficile l'évaluation de l'effet des interventions. Dans cette étude, les auteurs révèlent un besoin grandissant pour la recherche nationale, la mobilisation des connaissances et le développement d'une langue commune et des protocoles Internet pour permettre le partage d'initiatives en éducation à la santé en profitant des capacités de la technologie. Les auteurs ont trouvé qu'à cette époque où les défis sociaux de taille auxquels font face les enfants et les adolescents nécessitent une attention non seulement nationale mais mondiale, les structures juridictionnelles actuelles posent d'importantes barrières redoutables à l'accès à l'expertise nationale et globale. Il faudra surmonter ces barrières afin de maximiser les capacités des technologies numériques en matière de mobilisation des connaissances pour arriver à des approches aux programmes d'éducation à la santé qui sont cohérents de par le Canada.

Health and well-being are vitally important to Canadians. The Human Resources and Skills Development Canada (HRSDC, 2010) Web site provides indicators of well-being in Canada. These include smoking, obesity, and physical activity levels of Canadians. Education can play a key role in addressing these priority areas for the well-being of all Canadians, especially for school-aged children and adolescents and their families. Little research has been published to indicate the level of coherence of the health messages of the provincial and territorial curriculum

policies designed to address these health issues. There is some awareness that various approaches impede a concerted national approach to school health programs. Rootman and El-Bihbety (1998), for example, find that schools are facing significant challenges in implementing health programs due to "provincial, territorial and regional differences in education and philosophies about health" (p. 25).

In this article we outline similar challenges encountered by a research team undertaking a study to analyze Canadian elementary (K-8) health curriculum policies to determine the level of coherence of the various provincial and territorial approaches on key health issues for children and adolescents. The topics researched for coherent messages included body image, obesity, fitness, activity levels, and health and physical education. In this study the research team encountered a paradox connected to the affordances of technology compared with jurisdictional barriers. With relative ease they could visit another province virtually and watch bald eagles change shifts to supervise their young through a live digital feed that provided the real-time sights and sounds of the eagles' world (Hancock Wildlife, 2010). This paradox became significant because the affordances of current technology permitted the transnational, synchronous viewing of the eagles with comparative ease relative to the significant barriers encountered while attempting to access the Canadian provincial and territorial curriculum policy documents digitally. In this article we elaborate on this bald eagle paradox of the potential of today's technology affordances relative to the experienced reality of current pan-Canadian digital curriculum access.

Context

For many reasons Canadian educators would benefit from enhanced pan-Canadian access to the educational curriculum policies of the provinces and territories. When national priorities are identified, the public looks to the education system as one of the institutions responsible for leading the changes. Education provides opportunities to introduce new knowledge, skills, and understandings to children and adolescents to encourage healthy behaviors. Some key examples of using health education to initiate changes in the past include curriculum policies that were designed to promote immunizations or to teach about the dangers of smoking. Currently a need is identified for similar behavior changes to address the rising rates of reported bullying and victimization of Canadian schoolchildren (HRSDC, 1998). Ideally, Canadian researchers and educators working together can generate and share solutions to nationally identified priorities. School-based solutions and quality curriculum resources generated in educational jurisdictions (district school boards, provinces, and territories) could be shared to address national health priorities and benefit children and adolescents.

A number of pan-Canadian agencies are dedicated to issues of child and adolescent health and contribute resources and research to improve children's health. Some of these include Participaction, the Children's Hospital of Eastern Ontario Research Institute, the National Eating Disorder Information Centre, and the Heart and Stroke Foundation. Also, some interest groups associated with education in Canada share educational resources such as the Media Awareness Network and Physical and Health Education (PHE) Canada. PHE Canada's Web site provides centralized digital access to each province and territory's curricular physical education policy documents.

A key voice for pan-Canadian education initiatives is the Council of Ministers of Education, Canada (CMEC, 1997a, 1997b), which has developed a framework for interprovincial

collaboration to focus on increasing awareness of the importance of educational technology in schools and a protocol for collaboration on common learning outcomes in science education. More recently, a pan-Canadian assessment of achievement programs has been introduced (CMEC, 2007). A similar pan-Canadian educational initiative for health literacy (Anderson & Booth, 2006; Nutbeam, 2000) has not yet been realized although the need has been identified (Rootman & El-Bihbety, 2008). At present, no national infrastructure exists for sharing health curriculum policies, which makes it difficult to identify the key pan-Canadian curriculum policy approaches to children's and adolescents' health. Equally important, it is challenging to discern how key research findings about children's and adolescents' health are being addressed through health curriculum policies. Any attempt to grasp overall school health approaches in Canada or to address areas where health approaches are coherent between or among jurisdictions requires a province-by-province, territory-by-territory search to determine specific, regionally developed curriculum approaches to health issues.

This lack of infrastructure for sharing research and curriculum policy responses represents a gap between the potential for knowledge-sharing on pan-Canadian health issues and the current reality. A lack of physical infrastructure might be overcome, however, by using the affordances of technology to share information. Technology currently affords Canadian educators the capability of accessing and searching the various provincial and territorial curriculum policies using the Internet. Digital technology in Canada has developed to the point that most, if not all Canadian schools are connected to the Internet (Beattie, 2004; Statistics Canada, 2009). While the health education policies for each jurisdiction can be accessed through their respective provincial ministry of education Web sites or through the PHE Canada advocacy Web site (PHE Canada, 2010), this capacity to share knowledge and research digitally has evolved at a rate that could not have been anticipated when earlier health curriculum policies were written. This contributes to the bald eagle paradox mentioned above. Canadian children and adolescents in the 21st century can potentially benefit from digital knowledge-sharing across provinces and territories to address issues of health and well-being, but little has been written about how the opportunities that technology offers for knowledge mobilization might be realized for their benefit.

Currently, most curriculum policies can be accessed online, but each jurisdiction presents its curriculum in a unique format. The policies vary widely in the level of detail of their curriculum policy offerings, the organizing categories, and the areas of emphasis. If Canadian educators were called on today to identify the national approach to a health issue such as physical inactivity, body image, or obesity, there would first be a need to address the jurisdictional curriculum hurdles in order to determine Canada's overall approach. Similarly, we need to understand the diverse Canadian jurisdictional approaches to health in order to identify and address any gaps between research and practice or between health research and health education policies.

Through the affordances of technology, the current digital era offers new opportunities to: (a) share research about health issues, (b) share curriculum approaches that have shown promise, and (c) build coherence around some of the issues that are of the utmost importance to children's and adolescents' health. The research outlined in this article compares the theoretical possibilities that *could be* realized through knowledge-sharing with the reality of barriers encountered when attempting to access health curriculum policies in the current Canadian context. Some theoretical constructs that identify gains that could be realized from sharing approaches to health curriculum include (a) curriculum coherence (Beane, 1995), (b) health

literacy approaches (Anderson & Booth, 2006; Nutbeam, 2000), and (c) knowledge-sharing through the affordances of technology and building bridges and connections.

Theoretical Framework

Coherent Curriculum

Beane (1995) uses the metaphor of *puzzle pieces* to represent fragmented curriculum approaches and the *picture of the puzzle* as the image to represent the clarity of purpose and understanding that might be realized through curriculum coherence. He sees that students and teachers need to visualize the whole picture in order to understand the overall scope of the curriculum. A coherent curriculum asks educators to abandon "specialized loyalties" (p. 1) and reconsider for whom and for what the curriculum is intended. Coherence is gained by connecting curriculum to school life and to the students' experiences in school; students should see an authentic purpose to the curriculum that connects to their lives. Beane suggests that a coherent curriculum addresses the whole person by considering learners' range of experiences and respecting the diversity that they bring. A coherent curriculum also helps students learn by encouraging multiple connections across the curriculum and by connecting their learning to their lives meaningfully, memorably, and purposefully.

Potentially many kinds of coherence could be realized in health curriculum policies such as: (a) a sense of shared purpose or shared approaches between or among health curriculum policies from diverse jurisdictions while respecting the need for some diversity of approaches; (b) coherence between pan-Canadian reports on rates of obesity and physical inactivity (real-life context) and the curriculum policy responses; (c) coherence between research reports of promising health intervention and prevention programs and provincial curriculum policy responses; and (d) connecting the health curriculum to priorities established by global health agencies.

Globally, there has been a call for this brand of coherence. McCall (2005) explains, "Around the world and in Canada, the cancer, heart and stroke, diabetes, and other chronic disease sectors are joining to promote three behaviours: healthy eating, physical activity and not smoking" (p. 18). McCall advocates for coordinated approaches in schools to build coherence connecting, for example, the food offered by the cafeteria with the health curriculum; and connecting the sports program offered in the school with an approach that increases students' activity levels.

The concepts of health literacy (Anderson & Booth, 2006; Nutbeam, 2000) and a health-literate population (Rootman & El-Bihbety, 2008) have been advocated to help educate children and adolescents about health promotion and health risks. Health literacy could potentially become a vehicle for unifying purpose for health curriculum coherence.

Health Literacy

In 2006 the Canadian Public Health Association (CPHA) convened an expert panel to make recommendations for defining and improving health literacy for Canadians and for reducing health disparities across Canada. This panel revealed that more than half of adult Canadians are estimated to have less than adequate health literacy skills, validating their suspicion of a serious health literacy issue in Canada (Rootman & El-Bihbety, 2008). The expert panel defined health

literacy as "the ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course" (p. 10). The recommendations of the panel encouraged changes and coordination of policies to improve the health literacy and well-being of all Canadians.

Health literacy has been defined by Nutbeam (2000) as a term that describes a wide range of outcomes of health education that include "the personal, cognitive and social skills which determine the ability of individuals to gain access to, understand, and use information to promote and maintain good health" (p. 263). In contrast to the earlier models of health promotion, however, he enlarges on the concept of health literacy in two key ways. First, he encourages a broader view of the determinants of health: not just health as a personal responsibility, but health as an outcome of personal choices in a larger social and policy landscape. Second, he expands on the concept of health literacy to include not only access to health information, but a commitment to build capacity and empowerment through critical health literacy. His proposed model of health literacy is critical and empowering, connected to both political action and social action. Nutbeam also encourages a critical stance on the outcomes of health policy, asking whether the health promotion is being done *to* people rather than *by or with* people. In a similar vein, Anderson and Booth (2006) identify health literacy as an "important area of study" because it has implications for both quality of life and "human interaction with the world around us" (p. 27). They emphasize that health literacy is "a way to present a consciousness and a concern about self and world in which we live" (p. 28). They relate health literacy to notions of critical literacy wherein students construct knowledge, understand that they have choices, and see that they have the power to explore information and to make informed choices. Anderson and Booth's health literacy concept for schools includes an understanding that schools are parts of communities and that students can be agents of change.

The Canadian Public Health Association's expert panel presents a vision of a health-literate Canada that recommends collaborative efforts by multiple agencies including the education systems to promote health literacy (Rootman & El-Bihbety, 2008). The panel recognizes the systemic barriers that currently exist, which include differences in philosophies about health from the various regions including the provinces and territories. They conclude, "There are many potentially valuable initiatives throughout Canada to address the issues related to health literacy but no mechanisms for sharing best practices on an ongoing basis throughout the country" (p. 37). Health literacy is an example of a unifying concept that might be considered in efforts to encourage health curriculum coherence. Other models may hold similar potential such as school health (Lambert & MacDougall, 2010) or comprehensive school health (Anderson, 2002). Although curriculum coherence can be built through a unifying concept, it also requires mechanisms for sharing and communicating the knowledge; these mechanisms are described below as *bridges and connections*.

Sharing Knowledge: Bridges, Connections, and Affordances

Some theoretical approaches hold promise for building on current knowledge-sharing efforts by building bridges and connections across current divides: (a) between research and practice—knowledge mobilization (Levin, 2004, 2008); (b) between research and policy—knowledge translation (Lavis, 2006); and (c) virtual bridges made possible through technology affordances (McLoughlin & Lee, 2007). In a recent discussion paper, Levin (2008) uses the term *knowledge mobilization* to refer to the relationship between research and

practice: "Knowledge Mobilization is … getting the right information to the right people in the right format at the right time, so as to influence decision-making" (p. 12). He finds that many efforts are currently underway to improve the relationship between research and practice and "literally thousands of organizations, from huge corporations to tiny community groups, are involved in this kind of work at least to some degree (p. 5). Levin cautions that knowledge-mobilization (KM) is not just a case of producing the knowledge, but of "improving the desire and capacity for its use" (p. 8). He sees KM as a newly developing field that can work globally (i.e., across jurisdictions), but also in an interdisciplinary way (across disciplines) although he finds that fields create their own barriers. He explains:

> Interdisciplinary work is difficult not only because different fields of study have different ways of approaching problems, but also because the interpersonal networks of researchers, and between researchers and practitioners, tend to exist within disciplines or fields, not across them. So people interested in KM in health tend not to know or talk to people interested in KM in education and vice versa. Even within a field such as health or education it is difficult to build good networks …; across fields it is even more difficult. Yet many of the central issues, conceptual and practical, are very similar from one field to another. (pp. 15-16)

Levin identifies three elements that need to be in place for sharing research knowledge and practice knowledge. First, the knowledge needs to be produced; then there must be a disposition toward using the knowledge; and finally, some mediation processes are needed for exchanging the knowledge. He identifies barriers to more effective use of KM, which he describes as "multiple and real" (p. 9). These include (a) lack of high quality evidence, (b) lack of interest for the evidence, (c) lack of infrastructure for sharing evidence, and (d) pressures in multiple and contradictory directions.

Knowledge translation is a term that can be used in diverse ways in various contexts, but also represents a bridge for sharing knowledge. Knowledge translation has been defined as "the methods for closing the gaps from knowledge to practice" (Straus, Tetroe, & Graham, 2009) in the field of medicine. Lavis (2006) uses the term in the context of research to policy linkages. He notes that research and policymaking are often distinct processes, but that knowledge translation can build bridges between them. He cites Canadian examples and sees a number of diverse ways that research and policy can potentially connect.

Another form of connection is the building of collaborative communities that can be linked through the affordances of technology: *virtual bridges*. The Internet environment allows for ease of access to information and increasing speed at which information can be communicated and accessed. The affordances of Web 1.0 technologies for communication include access through the Internet to posted Web sites, e-mail, discussion boards, and blogging to name a few. The affordances of the Web 2.0 environment allow for even greater connectivity and sharing of knowledge through instant messaging, file-sharing systems (e.g., Dropbox), and social bookmarking (McLoughlin & Lee, 2007). Social media tools such as Facebook and Twitter are emerging technologies that facilitate sharing and connectivity via Personal Learning Networks (PLN). The affordances of these technologies offer new ways to share knowledge and to effect positive change in the world. For example, library materials and information are now accessible globally, which allows for virtual global access to information and knowledge-sharing and offers the potential to regions disadvantaged in the past from lack of information to have access to information (Kellner, 2000). New opportunities empower individuals and communities

including teachers and students. Opportunities also exist for organizations or regions that have developed competences to share their competences with regions that were somehow marginalized or disadvantaged in an earlier era.

KM, knowledge translation, and sharing and collaborating with digital knowledge are mechanisms that have the potential to build coherence in pan-Canadian health curriculum policies. The research described here looks at the affordances and barriers to coherence across pan-Canadian health curriculum policies using online searching and seeking evidence of coherence across health policies at the digital-access or entry levels, rather than a comprehensive analysis of each province's philosophy. The findings of this study mirror the bald eagles paradox described above with respect to pan-Canadian digital affordances and online curriculum access. Although technology provides the means to access resources on the Internet (e.g., visiting virtual Web sites in real time), the reality is that the materials posted to the Internet also need to be created without barriers to allow the access. The research findings from this study are intended to advise on and support knowledge mobilization for future provincial and regional curriculum policy development, organization, implementation, and review.

Research Methodology

This study uses technology to analyze the degree to which provincial and territorial jurisdictions in Canada might share health curriculum policies and best practices. In order to accomplish this, the research team selected some health-related topics and undertook a digital search to determine the accessibility of Canadian health curriculum policies with respect to these topics. Some of the 25 search terms included *healthy, well-being, exercise, body image, nutrition, eating*, and *weight*. These search terms enabled the research team to uncover most of the health curriculum learning outcomes or objectives related to these tags. These objectives are not found only in health documents, but are embedded throughout the health, physical education, science, language, career documents, and integrated curriculum documents. The research team was attempting to simulate a search that might be undertaken by a teacher seeking curriculum guidance in teaching a health-related topic, a parent looking for pan-Canadian approaches to health learning, or a research team investigating evidence of research into practice. The research findings from this study will provide feedback to educators and curriculum developers who wish to undertake a similar process to analyze curriculum responses to health issues.

The findings in this article present a snapshot of the curriculum documents located at the time of publication; online provincial and territorial curriculum policies are a moving target. Over the three years during which this research was conducted, many curriculum documents emerged online, were removed, revised, or became password-protected. The database was continually updated throughout the project. For this reason, the current findings can represent only a snapshot of a moving target.

The next step in the research process was to design a database consisting of the elementary-level (Grades 1-8) health, physical education, science, English language arts, and social sciences documents for each province and territory including both dedicated (i.e., subject-specific) and integrated documents. In the database, searches were again conducted for 25 key words in each province and territory's curriculum policies to identify whether these topics were addressed in the curriculum and if so, to identify the context of the curriculum policy in which they were addressed. The following materials were excluded from the study: (a) materials that were not available online (i.e., available only in print), and (b) curriculum exemplars. If kindergarten

documents extended to Grades 1, 2, or 3, the Kindergarten curricula were also included. The original plan included a database of all of the curriculum policies, but this became impossible to maintain because it is difficult to capture Web sites that are text only or those that hold hundreds of single-page portable document format (PDF) documents.

The next step involved examining each specific curriculum document to understand how the curriculum policy was organized. In order to triangulate findings, this work was done separately by three researchers who prepared their own analyses and then met intermittently either online or face-to-face to share findings and compare analyses. Next, a compilation of health approaches across the curriculum documents was developed and sent back to two of the research team members to verify the findings. Although this represents a significant amount of work beyond a cursory examination of the documents, it would be premature to consider this research a definitive outline of all the health curriculum approaches. Nor would it be considered a detailed examination of the documents, but rather a way to demonstrate how an interested person might investigate pan-Canadian curricula digitally to determine how a topic such as *body image* is addressed in curriculum documents across grades and provinces. We hope that the findings of this study will provide some insight into what is required today to perform such a task, and in so doing will suggest some directions for future curriculum development to improve health literacy in Canada.

Findings

First, we explore findings related to the online accessibility of the curriculum policy documents and naming protocols. We then present findings on the variability of the approaches to health curriculum. Specific findings are summarized in Appendixes A and B.

Accessibility

It is not possible to conduct a general online search from province to province to locate the health and physical education student-learning outcomes by grade in order to compare them. Not every province provides grade-specific student-learning outcomes that can be located through Web searches. Outlined in Appendix A are the document titles that were located at the time of publication, their URLs, and a note about their basic online formats. Appendix B contains a listing of all of the grade-specific and general curriculum guides.

Curriculum documents related to K-8 physical and health education could be located for most of the provinces and territories. Although there is a range of accessibility options, most of the documents were available as PDFs. The Northwest Territory's health curriculum was available in 2010 as a series of individual lessons, but was accessible at the time of publication. For purposes of digital searching across that curriculum, the text for each grade was imported into a Word document. Newfoundland and Alberta offer their health curriculum documents as a series of PDFs where each link opens in a new window; this slows the search process (see Appendix A for a listing of the documents, formats, and Web sites).

Variability

The provinces and territories vary in how they organize their curricula by grades and school divisions; the words *primary* or *elementary* have variable meanings in each jurisdiction; for

example, *primary* can be a grade or more than one grade in most provinces, and the word *elementary* can be used to describe multiple configurations such as K-5, K-6, or K-8. This becomes significant when one is seeking grade-level comparisons in learning outcomes across the provinces. Most provinces use grades for secondary school, but the curriculum documents for Manitoba refer to the secondary school grades as Senior 1-4. Some provinces include Kindergarten in their curriculum documents whereas others do not. Nova Scotia uses the term *grade primary* to refer to Kindergarten. Not all the provinces or territories identify the grade levels of their documents, the year of the document's publication, the name of the province or territory, or the title of the document on the title page of the document or in the filename of the PDF.

Some provinces provide models to guide viewers as they navigate through their curriculum policy documents. In addition, terminology varies from province to province (detailed in the province-by-province summary below), but some of the provinces use identical curriculum terminology in contrasting ways. Here is an example.

The Manitoba curriculum is coded from general to specific as follows:

K Knowledge or Skill
1 General Student Learning Outcome number
5 Grade
B Strand
1 Sub-strand
A Sub-theme within a sub-strand (when appropriate)

The general learning outcome in Manitoba is a broad curriculum category or curriculum organizer. In Ontario, a similar curriculum organizer is called a *strand*, but this does not have the same meaning as a *strand* in Manitoba. A strand in a Manitoba curriculum document is a cluster of specific student learning outcomes within a general student learning outcome. In Manitoba, each of the general learning outcomes has one to four strands: this may mean that the strands are more specific than the outcomes. In Ontario, the strands appear to be less specific than either the general or specific outcomes. Because of the variable applications of the same terms, each province requires a road map to help to navigate its curriculum.

In numerous instances, variable terms are applied to the same curriculum element. General learning organizers can be called (a) strands (Ontario); (b) goals (Saskatchewan); (c) competencies (Quebec); (d) both strands and outcomes (New Brunswick); (e) general curriculum outcomes (PEI); or (f) organizing strands (Newfoundland). See Appendix B for a listing of curriculum documents and the organizing elements for each. Specific student learning outcomes are called expectations in Ontario, but the term *outcome* is used in Alberta for both the general and specific learning statements. In Saskatchewan, the specific learning statements are called outcomes.

Most of the provinces provide learning outcomes (expectations or objectives) for various stages of schooling, but not necessarily for every grade. Quebec provides learning outcomes in a two-year cycle. Nova Scotia and Newfoundland provide learning outcomes in a three-year cycle as well as some grade-specific outcomes. The rest of the jurisdictions appear to be moving toward learning outcomes for every grade. This variation in outcome cycles makes grade-specific comparisons of learning outcomes challenging across all provinces and territories.

The provinces vary in their naming conventions for curriculum documents as the various

provinces combine diverse subjects. It is not possible to download single elementary health curriculum policies for each province and territory by searching their Web site. For example, seven provinces have posted an online physical education (PE) specific curriculum, whereas two provinces (Manitoba and Ontario) have posted a combined health and physical education (HPE) curriculum. Quebec's program is an integrated approach rather than subject-specific. Nova Scotia has a combined HPE overview document with separate documents for health (Grades 4-6) and PE (for Grades 7-9), so not all grades can be found at this time. For the Northwest Territories (NWT), the PE curriculum is found on the Alberta Education Web site, and the health curriculum is found on the NWT Web site. The Nunavut Web site indicates that they follow Alberta's curriculum; the Yukon Territory follows British Columbia's curriculum.

Most of the curriculum jurisdictions have posted stand-alone elementary health documents online (Manitoba and Ontario are exceptions with the HPE combination). Curriculum guides for BC are called Integrated Resource Packages (IRPs); there are separate PE and Health/Career IRPs. New Brunswick also presents health in an integrated unit format in a K-2 policy document. Health curriculum is also found in the diversity document for BC entitled *Making Space: Teaching for Diversity and Social Justice B.C. (K-12)*; this document is located in the Applied Skills subject area of their Web site.

The names of the health curriculum documents also vary: (a) health and career education in BC; (b) health and life skills in Alberta; and (c) school health in the Northwest Territories. Health learning outcomes are also found in the science curriculum documents of a number of provinces: Manitoba, Ontario, New Brunswick, Newfoundland, and Nova Scotia. In these instances, the health curriculum generally appears in the Grade 5-level science documents.

Organization of the curriculum divisions assigned to the documents also varies widely among the provincial and territorial documents. Some are K-5, K-7, K-9, and K-12. Some start at Grade 1, for example, 1-5, and 1-3; whereas others are ungraded and state *primary* or *elementary*. These curriculum division distinctions may vary among the curriculum documents for the same province. For example, the physical education documents in BC are K-7, 8-10, and 11-12, but the health documents are K-7, 8-9, and 10. The BC health curriculum ends at Grade 10, followed by the guideline *Graduation Transitions* (2008), which includes health learning outcomes that can be achieved in or outside a classroom setting.

Provinces and territories vary in their overall level of specificity (from general to detailed) of many aspects of curriculum: (a) the learning outcomes, (b) the level of detail of pedagogical explanations, and (c) levels of teacher support materials provided. Some jurisdictions provide extensive support to teachers, whereas others provide only the learning outcomes. Provinces and territories also vary in how they view health: from whole-person or comprehensive school health approaches to other simpler approaches such as *calories in, calories out*. These findings invite a more detailed, critical analysis of the approaches across the jurisdictions, but this is beyond the scope of this article.

Summary of Findings

Two main issues are encountered when one attempts to determine a pan-Canadian health approach or a response to an identified health issue. First, the paradox: the affordances of technology are now available, but significant barriers block a coherent approach to health issues. Online curriculum is still in its relative infancy, so there is a wide variation in the organization of the Web sites for each province. This creates variability in the level of accessibility of the

curriculum policy documents for each province and territory. The Web-posting format of some of the documents also creates a wide range of ease for searching and downloading; some documents download instantly or can be searched easily in their online format using hyperlinks (e.g., Saskatchewan). For others, the online format is difficult to navigate, and the online searching is cumbersome and time-consuming. Some regions such as Nunavut follow the curriculum of other provinces.

The naming of the curriculum policy documents themselves varies widely for determining any grade-specific approaches or learning outcomes. A system of clear naming protocols including dates would be helpful.

The second major issue is with respect to the wide variability of applications of curriculum terminologies. Identical terms are used in varied and contradictory ways, and curriculum construction terms that have identical meanings have a wide range of names.

In Appendix A we outline the Web sites for each of the curriculum documents for health and physical education and indicate the format for the online document presentation. In Appendix B we outline the major topics or curriculum organizers in each of the health and curriculum documents. In both appendixes, the provinces and territories are organized generally from west to east across the country.

Discussion

The findings of this study provide an indication of the wide range of variability related to access of Canadian health curriculum policy documents using online searches. The study also presents an initial understanding of access issues related to the wide variability in the terminology used by diverse jurisdictions. There are discrepancies between the affordances of technology for sharing curriculum policies and best practices and the reality of the barriers encountered in accessing health curriculum policies across the provinces and territories. The findings of this study present what we term the bald eagle paradox: Canadians can use technology collectively to observe the birth and feeding of an eaglet in real time across the country (an affordance), but encounter significant challenges with sharing understandings about curriculum approaches to address health issues that are of national concern (barriers). Some of the provincial and territorial Web sites use hyperlinks to organize the curriculum for easy access, a direction that should be encouraged. Jurisdictions should also consider the download time for their documents; in some instances the computer will time out before it downloads files on some education Web sites.

A minimal first step toward increased knowledge-sharing might be naming protocols for curriculum documents that include publication dates, titles, and target grades or ages of students for whom the curriculum policies are designed. All curriculum documents need to be posted online in a searchable and downloadable format that does not require opening dozens of PDF documents to create a single curriculum policy document. Second, because curriculum terminology varies among documents and is sometimes contradictory, charts might be provided to explain how varied curriculum terms (such as the overall curriculum organizers) are used in each jurisdiction. In the interest of cross-jurisdictional comparisons of learning outcomes, the provision of cross-grade analyses to show how curriculum outcomes are constructed in higher and lower grades would be instructive. These areas could be addressed while respecting the need for individual and diverse approaches. The format and naming protocols alone, however, are not the significant aspects of curriculum. More important are the health messages that they bring to

Canadian educators, whose responsibility it is to translate these messages for children.

The rights of the provinces and territories to design curriculum are enshrined in legislation (Constitution Act, 1982). However much has changed in the almost three decades since then. There is a need to revisit the responsibilities of the provinces and territories to facilitate sharing and collaboration of information and expertise. Much could be done to continue to build on present knowledge-sharing while respecting the rights of each jurisdiction. This calls for a deeper critical analysis of the messages of each health curriculum policy and KM that crosses jurisdictional boundaries. The global trend in health education is moving away from single health intervention strategies toward comprehensive approaches (McCall, 2005). This may be an optimal time for curriculum developers to re-examine how curriculum policies might be aligned across provinces for more coherent health-related curriculum approaches. As curriculum policies undergo cyclical review in each jurisdiction, and other jurisdictions' documents are easily accessible online, there is a need to share knowledge of best practices and connections to research.

Ultimately, access to digital curriculum is only an initial step. Increased levels of coherence as well as a national coordination effort are logical next steps to enhancing sharing and understanding regionally developed curriculum policies. Knowledge-sharing and KM would support the need to identify a national agenda of improving child and adolescent health. More work in sharing across jurisdictions would also support a research agenda that would investigate the effect of key initiatives aimed at addressing national health priorities for children and adolescents. The Comprehensive School Health approach is receiving global attention and may be one such vehicle for national consideration; the focus on health literacy (Anderson & Booth, 2006; Nutbeam, 2000) might be another alternative for consideration. There is also a need for more critical research to examine the key messages and underlying philosophies of the health and physical education curriculum policies. This is the important conversation that begins with sharing best practices in education related to children's and adolescents' health.

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Lorayne Robertson is the Director of the Graduate Program in Education at the University of Ontario Institute of Technology and a former school superintendent. Her research interests include critical literacy, body image, and technology affordances.

Dianne Thomson is an adjunct professor in the Graduate Program in Education at the University of Ontario Institute of Technology and a former secondary school principal. Her research interests include physical education history, critical health literacy, and school geographies of health.

Appendix A

Online HPE Curriculum Documents

Link	Document Name	Format
British Columbia/Yukon Territory		
www.bced.gov.bc.ca/irp/pdfs/physical_education/2006pek7.pdf	Physical Education K to 7: Integrated Resource Package, 2006	PDF
www.bced.gov.bc.ca/irp/pdfs/physical_education/2008pe810.pdf	Physical Education 8 to 10: Integrated Resource Package, 2008	PDF
www.bced.gov.bc.ca/irp/pdfs/health_career_education/2006hcek7.pdf	Health and Career Education K to 7: Integrated Resource Package, 2006	PDF
www.bced.gov.bc.ca/irp/pdfs/health_career_education/2005hce_89.pdf	Health and Career Education 8 and 9: Integrated Resource Package, 2005	PDF
Northwest Territories		
http://www.ece.gov.nt.ca/Divisions/kindergarten_g12/indexK12.htm	K-9 NWT School Health Program, 1991 NWT Skills for Healthy Relationships, 1996 e.g., Example: Gr. 3, Growth and Development, 1991	HTTP
http://www.ece.gov.nt.ca/PDF_File/curriculum%20by%20subject/Administrators%20Handbook%20nov.pdf	Administrators Overview: Physical Education K-12 (Alberta program of studies)	PDF
Alberta/(Nunavut uses these resources)		
http://education.alberta.ca/media/450871/phys2000.pdf	Physical Education K-12, 2000	PDF
http://education.alberta.ca/teachers/program/pe/resources/pe-guide.aspx	Physical Education guide to implementation	HTTP → PDF's
http://education.alberta.ca/teachers/program/health/resources/k-9health.aspx	Health and Life Skills K-9, Guide to Implementation, 2002	HTTP → PDF's
Saskatchewan		
https://www.edonline.sk.ca/webapps/moe-curriculum-BBLEARN/index.jsp	Grade-by-grade K-9 P.E. curriculum documents (2010)	PDF
	Grade-by-grade K-9 Health education documents (2010)	PDF
Manitoba		
http://www.edu.gov.mb.ca/k12/cur/physhlth/foundation/index.html	K-4 Physical Education/Health Education, 2001	HTTP → PDF
http://www.edu.gov.mb.ca/k12/cur/physhlth/foundation/5-8/index.html	Grades 5 to 8 Physical Education/Health Education, 2002	HTTP → to PDF
http://www.edu.gov.mb.ca/k12/cur/science/found/5to8/5c1.pdf	Grade 5 Science: Cluster 1, Maintaining a Healthy Body, 2000	PDF

Link	Document Name	Format
Ontario		
http://www.edu.gov.on.ca/eng/curriculum/elementary/healthcurr18.pdf	The Ontario Curriculum, Grades 1-8: Health and Physical Education, 2010 Interim version(revised)	PDF
http://www.edu.gov.on.ca/eng/curriculum/elementary/kindercurrb.pdf	The Kindergarten Program – 2006	PDF
http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf	The Ontario Curriculum Gr. 1-8: Science and Technology, 2007	PDF
Quebec		
http://www.mels.gouv.qc.ca/DGFJ/dp/programme_de_formation/primaire/pdf/educprg2001/educprg2001-091.pdf	Quebec Education Program: Preschool and Elementary Education: Ch. 9: Physical Education and Health, 2001	PDF
New Brunswick		
http://www.gnb.ca/0000/publications/curric/hcgr8.pdf	Health Education Curriculum Gr. 8, 2005	PDF
http://www.gnb.ca/0000/publications/curric/hcgr7.pdf	Health Education Curriculum Gr. 7, 2005	PDF
http://www.gnb.ca/0000/publications/curric/hcgr6.pdf	Health Education Curriculum Gr. 6, 2005	PDF
http://www.gnb.ca/0000/publications/curric/healthk-5.pdf	Health Education Curriculum K-5, 2001	PDF
http://www.gnb.ca/0000/publications/ss/YouandYourWorld.pdf	You and Your World Curriculum K-2, 2005	PDF
http://www.gnb.ca/0000/publications/curric/MiddlePhysEd.pdf	Middle Level P.E. Curriculum Gr. 6 -8, 2002	PDF
http://www.gnb.ca/0000/publications/curric/elementarypysed.pdf	Elementary P.E. Curriculum K-5, 2000	PDF
http://www.gnb.ca/0000/publications/curric/grade5science.pdf	Atlantic Canada Science Curriculum Gr. 5, 2002	PDF
Prince Edward Island		
http://www.gov.pe.ca/photos/original/eecd_phyeduK6.pdf	Prince Edward Island P.E. Curriculum: K-6, 2011	PDF
http://www.edu.pe.ca/curriculum/gr7-90203final.pdf	Intermediate Program of Studies	See p. 28 for P.E.
http://www.gov.pe.ca/photos/original/k_doc.pdf	Kindergarten Integrated Curriculum Document, 2008	PDF
http://www.gov.pe.ca/eecd/index.php3?number=1026202&lang=E	P.E.I. Health Curriculum: Gr. 1-3, 2006	HTTP → PDF
http://www.gov.pe.ca/eecd/index.php3?number=1026202&lang=E	P.E.I. Health Curriculum: Gr. 4-6, 2009	HTTP → PDF
http://www.gov.pe.ca/eecd/index.php3?number=1026202&lang=E	P.E.I. Health Curriculum: Gr. 7-9, 2007	HTTP → PDF

Link	Document Name	Format
Nova Scotia		
http://www.ednet.ns.ca/pdfdocs/psp/psp_03_04_full.pdf	Public School Programs Handbook, 2003-2004	PDF
http://www.ednet.ns.ca/pdfdocs/curriculum/ActiveHealthyLiving2005_sec.pdf	Foundation for Active, Healthy Living: P.H.E Curriculum K-12, 1998	PDF
http://www.ednet.ns.ca/pdfdocs/curriculum/Health4-6_web.pdf	Health Education Curriculum Gr. 4-6, 2003	PDF
http://www.ednet.ns.ca/pdfdocs/outcomes/by_subject/phys_ed_7-9.pdf	Physical Education Curriculum Gr. 7-9, 1999	PDF
http://www.ednet.ns.ca/pdfdocs/curriculum/Science5_web_secured.pdf	Atlantic Canada Science Curriculum: Grade 5 – 2008	PDF
Newfoundland		
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/health/index.html#primary	Towards a Comprehensive School Health Program: A Primary Health Curriculum – [n.d.]	HTTP → PDF's
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/health/index.html#elementary	Towards a Comprehensive School Health Program: An Elementary Health Curriculum – [n.d.]	HTTP → PDF's
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/health/index.html#adolescence	Adolescence: Healthy Lifestyles (Health and Personal Development Curriculum) – [n.d.]	HTTP → PDF's
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/earlybeginnings/index.html	Early Beginnings: A Kindergarten Curriculum Guide	HTTP → PDF's
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/physed/index.html#primary	Physical Education Primary and Elementary – [n.d.]	HTTP → PDF's
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/physed/phys_ed7-8-9.pdf	Physical Education Gr. 7-9: Interim Edition, 2004	PDF
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/science/elementary/gr5.pdf	Gr. 5 Life Science: Meeting Basic Needs and Maintaining a Healthy Body	PDF

Appendix B

Curriculum Documents and Organizing Elements

British Columbia/Yukon Territory

P.E. documents	Organizers	Health documents	Organizers
Physical Education K to 7: Integrated Resource Package – 2006	1. Active Living 2. Movement Skills 3. Safety, Fair Play and Leadership	Health and Career Education K to 7: Integrated Resource Package – 2006	1. Goals and Decisions 2. Career Development 3. Health
Physical Education 8 to 10: Integrated Resource Package – 2008		Health and Career Education 8 and 9: Integrated Resource Package – 2005	1. Education and Careers 2. Health

Note. There are two Integrated Resource packages (IRP) for Health.
Grade-specific outcomes are provided under each organizer.

Northwest Territories

P.E. documents	Organizers	Health documents	Organizers
Administrators Overview: Physical Education K-12	1. Activity 2. Benefits Health 3. Cooperation 4. Do it daily for life	K-9 NWT School Health Program, 1991 NWT Skills for Healthy Relationships, 1996	Contains a series of lessons and topics

Note. The P.E. program for the NWT follows the Alberta P.E. program of studies.

Alberta/Nunavut

P.E. documents	Organizers	Health documents	Organizers
Physical Education Kindergarten to Grade 12 Guide to Implementation, 2000	1. Activity 2. Benefits Health 3. Cooperation 4. Do it daily for life	Health and Life Skills Kindergarten to Grade 9 Guide to Implementation (2002)	1. Wellness Choices 2. Relationship Choices 3. Life Learning Choices

Note. Has an overarching wellness education model. Nunavut follows this curriculum.
The NWT follows Alberta's P.E. curriculum.

Saskatchewan

P.E. documents	Organizers/Goals	Health documents	Organizers/Goals
K-9 grade-by-grade P.E. Education documents (2010) are available on the Saskatchewan Curriculum Website	1. Active Living 2. Movement 3. Relationships	Grade-by-grade K-9 Health Education documents (2010) are available on the Saskatchewan Curriculum Website	1. Skills, Understandings, and Confidences 2. Informed Decisions 3. Engagement and Action

Manitoba

P.E. and Health documents are combined	Organizers/Outcomes
K-4 Physical Education/Health Education: A Foundation for Implementation – 2001 Grades 5 to 8 Physical Education/Health Education: A Foundation for Implementation – 2002	1. Movement 2. Fitness Management 3. Safety 4. Personal and Social Management 5. Healthy Lifestyle Practices

Note. The learning outcomes posted are grade-specific or may be tracked across grades for each general outcome.

Ontario

P.E. and Health document is combined	Organizers/Strands
The Ontario Curriculum, Grades 1-8: Health and Physical Education, 2010 Interim version(revised) The Ontario Curriculum, Grades 1-8: Health and Physical Education, 1998	1. Active Participation 2. Fundamental Movement Skills 3. Healthy living

Note. There are Living Skills expectations (outcomes) to be addressed in conjunction with the overall and specific HPE expectations. The curriculum can be accessed by grades or through summaries of topics and strands across grades. A Daily Physical Activity in Schools Resource Guide (2005) can be accessed online from within the 2010 HPE curriculum document.

Quebec

P.E. and Health document is combined	Organizers (Competencies)
Quebec Education Program: Preschool Education and Elementary Education: Ch. 1: Physical Education and Health (2001)	1. Movement Skills 2. Interaction with Others 3. A Healthy Active Lifestyle

Note. Curriculum is organized in two-year cycles.

New Brunswick

P.E. documents	Organizers	Health documents	Organizers/Strands/Outcomes
Elementary Physical Education Curriculum K-5 – 2000 Middle Level Physical Education Curriculum Grades 6 -8 – 2002	1. Doing 2. Knowing 3. Valuing	Health Education Curriculum K-5, 2001 Health Education Curriculum Gr. 6, 2005 Health Education Curriculum Gr. 7, 2005 Health Education Curriculum Gr. 8, 2005	1. Caring for Yourself, Your Family and Your Community 2. Personal Wellness 3. Use, Misuse and Abuse of Materials (emphasizing Media Literacy) 4. Growth and Development

Note. An integrated unit plan *You and Your world (K-2)* supersedes the Health Education, Guidance, Science and Social Studies curriculum documents for those 3 grades. The documents from K-5 have a two-year cycle, but become grade-specific at Gr. 6. Summary charts provide an overview of the curriculum organizers and outcomes per grade (e.g., Health, K-5, 2001, p. 6).

Prince Edward Island

P.E. documents	Organizers	Health documents	Organizers/Strands/ Outcomes
PEI Physical Education Curriculum: K-6, 2011	1. Active living 2. Skillful movement 3. Relationships	Grade-specific health documents Gr. 1-9, published 2006-2009	1. Wellness choices 2. Relationship choices 3. Life learning choices

Nova Scotia

Health and P.E. are combined in one document: Foundation for Active, Healthy Living: Physical and Health Education Curriculum – 1998 (K-12)	
P.E. Organizers (Outcomes or Organizing Strands)	Health Organizers (Outcomes or Organizing Strands)
1. Knowing 2. Doing 3. Valuing	1. The Body, Growth and Development 2. Strategies for Healthy Living 3. Values and practices for Healthy Living 4. Strategies for Positive Personal Development and Healthy Relationships

P.E. documents		Health documents	
Physical Education Curriculum: Grades 7-9 – 1999	Has grade-specific outcomes	Health Education Curriculum: Grades 4-6 – 2003	Has grade-specific learning outcomes

Note. The curriculum outcomes in the HPE document are presented at Grades 3, 6, 9 and 12.

Newfoundland

P.E. documents	Organizers	Health documents	Organizers
Physical Education Primary and Elementary – [N.D.] Physical Education Grades 7, 8 and 9 Interim Edition – 2004	1. In Movement 2. About Movement 3. Through Movement	Towards a Comprehensive School Health Program: A Primary Health Curriculum – [n.d.] Towards a Comprehensive School Health Program: An Elementary Health Curriculum – [n.d.] Adolescence: Healthy Lifestyles (Health and Personal Development Curriculum) – [n.d.]	1. 11 organizing strands or topics for elementary 2. 7 organizing strands or topics for Adolescents – some strands specific to older grades

Note. There are key stage curriculum outcomes (KSCO) for Gr. 3, 6, and 9. There are grade-specific outcomes which may or may not change from grade to grade.