



## Overview of the levels of ICT and information literacy skills in Canada's preservice teachers

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### ABSTRACT

To better understand the strong relationship between ICT and information literacy competencies, this short paper first describes their roles in the various education levels in Canada, including initial teacher training. We then provide an overview of empirical studies on the levels of ICT and information literacy competencies in Canada's preservice teachers and offer explanations for these levels. We conclude by proposing solutions to improve the situation, notably through effective approaches to training Canada's future teachers in ICT and information literacy competencies.

### Keywords

ICT competencies; information literacy competencies; initial training; Canada; preservice teachers



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## INTRODUCTION

Today, information and communication technologies (ICT) are indispensable in education. According to [1], most societies agree that they must be key aspects of education policies if we are to effectively prepare future citizens to live in a knowledge and information society. Canada's approach to the role of ICT in education is well aligned with this view. ICT feature prominently in the directives of the *ministry of Education*, throughout the entire education system, including initial teacher training programs. Thus, preservice teachers must develop ICT competencies so that they can use them effectively in their teaching practice [2]. However, even though computers and the Internet have been ubiquitous in Canada's schools since the mid-1980s and the late 1990s, they are seldom well integrated into the teaching practices of inservice teachers [3] or pre-service teachers [4]. This is a troubling state of affairs, which is exacerbated by the fact that the Internet has become "the" information source of choice for elementary and high school students in Canada [5, 6] as well as their teachers [3] and preservice teachers [4]. To navigate surely through the vast, ever-swelling sea of electronic information, everyone must be able to use technologies in education. They must be able to identify the information they need, find it, assess it, and use it appropriately and effectively [7]. Indeed, these competencies are increasingly perceived as absolutely essential if one is to succeed in one's studies and in the knowledge economy [8]. In addition, inservice and pre-service teachers must master these skills to teach 21<sup>st</sup> century students [9]. For instance, many students ask their teachers to explain the Internet plagiarism rules [5]. However, unlike in France and the United States, Canada does not have specifically trained and designated teachers to help students develop these competencies [10]. In fact, the teacher/librarian position was eliminated from Canada's school system at the end of the 1970s, in the wake of slashes in government funding for school libraries. Moreover, the few librarians that remain in the schools have little pedagogical training. This is why teachers have to take the lead by training their students in information literacy competencies. To better understand the strong relationship between ICT competencies and information literacy competencies, we first present a brief definition of information literacy, followed by the roles of ICT and information literacy in the various education levels in Canada, including initial teacher training programs. We then provide an overview of empirical studies on the levels of ICT and information literacy competencies in pre-service teachers in Canada, and we offer some explanations for these levels. We conclude by proposing solutions to improve the situation, notably through effective approaches to training Canada's pre-service teachers in ICT and information literacy competencies.

### Information literacy: what is it?

A number of models have been proposed to define and describe information literacy competencies. According to [11], the most widely accepted model, which was adopted by the *Conférence des recteurs et des principaux des universités du Québec* [Conference of Rectors and Principals of Quebec Universities] [12], was developed by the Association of College and Research Libraries [13]. Accordingly, "An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally"<sup>1</sup>

This comprehensive model covers all the above-mentioned competencies before (step 1), during (steps 2 and 3), and after (steps 4, 5, and 6) documentary research. However, there are some limitations with respect to ICT, primarily because it was conceived for paper-based research, and therefore does not account for certain salient aspects of online research.

First, it proposes an eminently linear process, which goes against one of the fundamental characteristics of the Internet: networking. Consequently, other processes, such as network research for documentary sources (i.e., looking for a source that was cited in another source and that appears relevant to the original search) were not taken into account in the ACRL model, although they are highly suited for the Internet and its users. Working in complementarity with the linear process implicit in the ACRL model, other processes in line with networking would therefore gain specific benefits of online documentary searches.

Second, as the term suggests, information literacy competencies neglect an inherent dimension of ICT: communication, which has been enormously expanded with the introduction of Web 2.0. As underscored by [14]: "In Web 1.0 a few authors provided content for a wide audience of relatively passive readers. However, in Web 2.0 everyday users of the web use the web as a platform to generate, re-purpose, and consume shared content" (p. 4). Applied to documentary research, we can see the strong growth of the communication dimension in ICT over the information dimension, which formerly dominated. We may add the highly prescient words of [15] that, "There is every reason to believe that the 'communication' aspect of ICT has been largely underused to date compared to the 'information' aspect". Thus, the ACRL model appears to correspond more to Web 1.0 as described by [14] than to Web 2.0, because it does not account for the

<sup>1</sup> <http://www.ala.org/acrl/standards/informationliteracycompetency>



participation that is so prevalent among Internet users today, as they use Internet communication tools to create and distribute knowledge online.

In sum, it appears that current definitions of information literacy competencies from the ACRL perspective [13] allow for little flexibility, and do not account for the specificities of online documentary research, even though this is the most widespread method used today, as we shall see below. We conclude that the current conceptualization of information literacy leaves room for improvement before a fully relevant online version can emerge.

## The roles of ICT and information literacy competencies in Canada's education system

In Canada's elementary and high schools, ICT and information literacy competencies appear to be strongly associated [16]. Such is the case as they are presented in the *Québec Education Program* [17]. Among the many aspects covered in this reference framework are the cross-curricular competencies that students are required to develop throughout their schooling, from kindergarten to high school graduation. These are generic competencies, "because they transcend the various subject areas. They are developed gradually both at school and elsewhere, and their development continues after elementary school, and indeed, throughout a person's life" [17]. Competency 6 is "To use information and communications technologies (ICT)" [17]. As for information literacy competencies, although the *Québec Education Program* makes no explicit mention of these, they are integrated into the program under the above-mentioned Competency 6. This competency includes the ability to use ICT effectively and appropriately (e.g., to find relevant sources of information), to process the information (e.g., use it to solve academic problems and do assignments), and to diversify their use and develop critical judgment of the sources found (e.g., explore a multitude of information sources and understand the relevance of the information in them).

For their part, Canada's colleges and universities have recently made ICT and information literacy competencies "must-haves" for their students [18, 19]. A unique feature of Canada's education system is the *college d'enseignement general et professionnel* [general and vocational college] (cégep). These two- or three-year postsecondary institutions provide preuniversity courses as well as vocational courses that prepare students for the working world (<http://www.fedecegeps.qc.ca>). Quebec's Ministry of Education, in its *Action Plan for the Integration of ICT in College Teaching 2009–2012*, states that one of the issues is "To contribute to student acquisition of ICT and information literacy competencies" [20]. Meanwhile, most of Canada's universities have adopted policies or programs based on the ACRL standards for information literacy [12] for training their students in information literacy competencies. For example, the Université de Montréal has a policy for training in information use [21], the Université du Québec has a program for the development of information literacy competencies (<http://pdci.uquebec.ca>), and the Université Laval has a training program to help students develop competencies in using documentary tools. Other Canadian universities, such as Bishop's University, have mandatory practical courses on information literacy as part of most of their academic programs (<http://www.ubishops.ca/index.asp/registrarial-services/index.html>).

With respect to Canada's initial teacher training programs, many authors have stressed the importance of ICT and information literacy competencies as key components of teacher training [9, 22, 23, 24, 25]. [23] argue that if preservice teachers had better information search and processing skills, they would more readily develop autonomous learning. [9] add that this training is essential to enable learners to navigate the knowledge waves effectively and on their own. Moreover, [24] contend that teachers must create the conditions for their students to develop critical attitudes so they can judge the relevance of information they find on the Internet. According to [25], it is crucial for librarians, as information literacy experts, to collaborate with teachers so that students can build their information literacy skills. However, the teachers are left with the main burden of integrating information literacy competencies into education.

In sum, in Canada, both ICT and information literacy competencies are considered essential at all education levels, and are closely interconnected. But have these competencies been adequately developed in preservice teachers? The next section presents an overview of the literature on the two competencies in Canada's preservice teachers.

## Overview of the levels of ICT and information literacy competencies in Canada's preservice teachers

Just like their students [6], Canada's preservice teachers turn to the Internet first to find information to use in their studies [4, 26]. A similar observation was made in teacher internships, where one of the main uses of the Internet was information searches for purposes of planning, developing teaching materials, and teaching [27]. At the same time, when asked how they feel about their self-efficacy in finding information on the Internet, using search engines, and teaching information literacy competencies, the majority of preservice teachers perceive themselves as competent or even very competent [4, 22, 25, 26]. On the other hand, the marked use of ICT primarily to find information that is available on the Internet and the feeling of self-efficacy in finding and using it masks a more troublesome reality. In fact, many preservice teachers lack ICT and information literacy competencies. Moreover, many tend to be quickly satisfied with their Internet search results [25, 28], which implies a relatively superficial search strategy [29]. In addition, many preservice teachers do little or no planning for their information searches, often relying on inefficient hit-or-miss methods [22, 29]. Furthermore, many find it difficult to assess the relevance or ethical value of the information they find. Only 45% of 2,065 students surveyed by [4] reported that they had verified the authenticity of the information they found on the Internet, and the majority of preservice teachers in [28] did not respect the rules for plagiarism when they copied and pasted materials from the Web. Similarly, although [24] observed that the majority of 36 preservice teachers interviewed in their study considered a number of assessment criteria for Internet information (e.g., author's identity, educational background, and field; site owner's credibility), their





classmates told a different story. And whereas another 40 preservice teachers were assigned to assess the information contained on 300 websites of their choice, they used only 1.34 criteria on average to do so. Furthermore, the most frequently used assessment criterion was the strength of the relevance between the information on the site and the search topic (45.4%), far outstripping the second most frequently used criterion, which was the amount of information on the site (10.9%). [24] were surprised that, in an online assessment, the participants focused mainly on these two rather expedient criteria and neglected to consider the quality of the information, which other participants considered essential.

In sum, many preservice teachers in Canada show a substantial lack of ICT and information literacy competencies, even though they will be called upon to guide their students in these areas. How can we explain this state of affairs? The next section offers a few suggestions.

## Solution avenues

To recap, in today's education systems, where learners use ICT mainly to seek information and process it, ICT and information literacy competencies have become indispensable. Nevertheless, preservice teachers in Canada are inadequately trained and appear to have few competencies in these areas. To remedy this situation, we propose some avenues worth exploring. First, universities in Canada could attempt to increase the number of courses on ICT competencies in initial training programs. Although not a panacea, the Education Faculty at the Université de Montréal came up with one potential solution. They decided to spread out the course on the pedagogical integration of ICT over three years in the initial training program instead of concentrating it into one course. This enables students to continuously develop their ICT competencies throughout most of the program. Additionally, technological competencies, and particularly those required for online documentary research, could be assessed as part of the entrance exams for teacher training programs, like the French language competency test. In Quebec, all students enrolled in teacher training programs must pass a French language test as part of their initial training program in order to obtain a teaching diploma. The same incentive could be used for documentary research. Finally, information literacy, because it involves cross-curricular skills applicable to all university courses, would gain by being taught to all university teachers, and not just those who give courses in the pedagogical integration of ICT. For example, it would make it easier for teachers to explain how to do a documentary search as a required part of an assignment. However, this would mean that university professors would have to have solid information literacy competencies. This raises new questions in turn, which could be explored in future studies.

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