

AN EXPLORATION OF THE RELATIONSHIP BETWEEN THE PHYSICAL
INFORMATION COMMONS AND LEARNING COMMONS AND THEIR WEB
SITES

by

Miriam Unruh

A thesis submitted to
the Faculty of Graduate Studies
in partial fulfilment of
the requirements for the degree of
Master of Education

Department of Educational Administration, Foundations and Psychology
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THE UNIVERSITY OF MANITOBA
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Abstract

Information Commons (ICs) and Learning Commons (LCs) are, most often, library spaces that integrated learning, technology, and research with staff resources. Technology was key, but there was no research available on the relationship between IC/LCs and the virtual or digital commons. This study examined if IC/LC websites served as bridges between the physical IC/LCs and their websites. Aspects of the web sites such as visibility, descriptions of the IC/LCs, and services listed were examined. Central to this exploration was asking whether there was an explicit or implicit relationship between the virtual (IC/LC web site) and the IC/LC physical space.

The study was exploratory, and focused on Canadian medical-doctoral universities. Based on a content analysis of ICs/LCs descriptive statements, and an examination of each IC/LC web site it was found that there was limited consistency in what should be included on an IC/ LC website, and how an IC/LC space should operate. Flexible space, food, up-to-date technology, staff support and an emphasis on student learning was found, but none of these features were found consistently across institutions. In addition, only one web site made its connection to the physical space explicit in its design. Based on these findings, implications for both future research as well as practical application were discussed.

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Dedication

This Master's Thesis is dedicated to Clifton Bruce Shaw.

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Chapter 1 Introduction

1.1 *The Context*

Over the past 12 or so years, a shift has taken place both culturally and academically with respect to information and how it is accessed. The adoption of computers, first in the workplace and in the home, the proliferation of the internet and the public's increasing reliance on its services such as home banking, shopping and easily available information, and the growth in digital documents, article, archives and white papers all contributed to this shift. Understandably, libraries, where traditionally information was controlled and organized, were affected by the increased access to information. In fact, there was talk of the demise of the library – particularly of the library as a physical place – but a few innovative library administrators realized that they could transform their libraries to reflect the digital shift (Covi & Kling, 1995). Early to mid 90's, the Leavy Library faced a major library renovation and the administration decided to not only acknowledge the increasing predominance of computers and the internet but also to embrace it by developing one of the first Information Commons (Remy, 2004).¹ This common space would include computers, up-to-date software, access to the Internet and to the increasing number of digital journals and books.

¹ The Leavy Library opened in 1994. I say “one of” because according to the survey results from the SPEC Report (date) there were four libraries with IC before 1995, and two had developed ICs in 1991. One would have been Iowa's Information Arcade, but there is no indication in the research of the location of the other two.

1.1.1 *The Information Commons*

The use of the name “Information Commons” or IC by the Leavy library reflected an increased use and adoption of the term commons in the computing/software community as a metaphor for open discussion and learning. As the use of the term IC increased, its meaning multiplied with respect to digital culture. In fact, the name IC was used to describe three quite distinct yet inter-related commons. These commons –creative, virtual and physical - resemble cultural layers of the same village (Beagle, 2006). The creative or cultural commons are the social norms and ideas that govern village behaviour and attitudes, the physical commons is representative of the buildings and spaces within the village, and the virtual commons is the information and ideas shared by the village and (Beagle, 2006).

This understanding of commons arose with the increasing prominence of the internet and digital information, and until the late 20th century (1990’s) the term commons, in an academic context, referred to the cafeteria or common space in which students could meet (Simpson & Weiner, 1989). Today however, the use of word commons has changed substantially and reflects its original use as well as the more traditional natural-resource commons (e.g., fish, water, trees, grain) and the newly defined knowledge commons (Hess & Ostrom, 2007).

The purpose of this thesis is to first explore the notion of the commons by identifying its various definitions, the criteria that define the various commons, as well as to examine the literature that surrounds the commons model. Second, it is to look at Information Commons/Learning Commons (ICs/LCs) in the context of higher education as

well as the elements that define them. And finally, to look at ICs/LCs in the Canadian context, specifically, ICs/LCs web sites found at medical doctoral institutions.

Chapter 2 Literature Review

2.1 *Defining the Commons*

In order to discuss the commons it is crucial to establish a reference point from which to explore the term. Key to each use of the term commons is the understanding that a community, of one form or another, shares resources, whether it is fields, grain, trees, water, space, networks, roads, parks, buildings² or ideas (Hess & Ostrom, 2007). The concept of sharing ownership and rights is crucial to continuation of a commons whether it is an actual physical space or the ideas shared on-line. Bollier (2007) noted in a recent article that "what unites these different invocations of the commons was their appeal to a fundamental social ethic that was morally binding on everyone" (p.33). Critical to Bollier's writing, is the assertion that "ethical norms" are important, even though they may or may not be recognized in law.

In the literature and in practice, the term commons is used differently depending on the discipline or practice utilizing the term. Political scientists, anthropologists, economists and other academic scholars use the term commons (traditional commons) when they refer to natural or man-made resources such as water, trees or fish, that are shared by

² Developers and builders will also use the term commons to refer to "shared" space, that is not necessarily a commons in the sense used above but is a space where people will congregate or is simply a number of non-residential buildings that were grouped together (<http://www.greatbaycommons.com/buildings.htm>; <http://www.thevillagetc.com/>; <http://www.smartcommunities.ncat.org/success/jordan.shtml>).

a group of people in an organized and coherent manner (Bromley, 1992; Buck, 1985, 1998; Hardin, 1968; Hess, 2000; Hess & Ostrom, 2003, 2004, 2007; Kadekodi, 1992; Kranich, 2004; Ostrom, 1990, 1992a, 1992b; Runge, 1992). Traditionally, the term “commons” refers to property that is not privately owned (Gardner, 2004). As the virtual space grew, the term was adopted as availability of digital information/media expanded because it provided the framework needed to address the legal issues that accompanied that growth. (Benkler, 2000; Boyle, 1997, 2003; Frischmann 2005; Heller, 1998; Lessig, 2002, 2005). Other terms like “creative commons,” “cultural commons,” “innovative commons,” “knowledge commons,” and “science commons,” are used to refer to the sharing of digital ideas, software and media (Garlick, 2005; Lessig, 2002, 2005; Lougee, 2004). The “academic commons” (Bollier, 2001, 2003a, 2003b, 2004; Hess & Ostrom, 2004, 2007), the “teaching commons” (Huber & Hutchings, 2005), and the physical ICs/LCs (Bailey & Tierney, 2002; Beagle, 1999, 2000, 2002, 2004; Bennett, 2003; Church, 2005; Church, Vaughan, Starkweather, & Rankin, 2002; Colson, 2003; Cowgill, Beam, & Wess, 2001; Halbert, 1999; Hales, Rea & Siegler, 2001; Henning, 2005; Kranich, 2003; Lippincott, 2006) refer to the development of intellectual communities in an academic environment.

2.1.1 Everyday Use

The word “common” or “commons” entered the English language around the 13th century (Simpson & Weiner, 1989). The adjective form of the word refers to items, space, resources that were “of general, public, or non-private nature” (Simpson & Weiner, 1989). The noun form refers to a “common body of the people of any place; the community or communality” (Simpson & Weiner, 1989). The more familiar use of

“common” or commons to signify “a common land or estate” was not used in the English language until the late 14th century (1479). This latter designation was the closest in meaning to our modern use of the term “commons” and comes directly from the Latin word “communia.” (Simpson & Weiner, 1989).³ In most cases when individuals were referring to the knowledge or information commons, they were referring to both “common” (n) (i.e., “an area of land shared in common”) and some combination of the various senses of commons.

2.1.2 *Legal Definition*

An understanding of the legal definition of Commons is also important because it informs much of the scholarship on the Commons. The Oxford English Dictionary (Simpson & Weiner, 1989) lists “right of common (*legal*)” as one of the definitions of the noun form of “common.” And, Black's Law Dictionary (Gardner, 2004) defines common land and the Commons in terms of the laws and contracts that determine rights of access. Frischmann (Frischmann 2005), in an article on common management for the Minnesota Law Review explains that “Commons” are generally communally owned and that others are granted access based on certain rules that can be very general to very specific. A golf course, for example, is a Commons. Golfers are allowed access depending on membership, clothing, proper equipment, behaviour and the number of people who were currently playing. As seen above, the definition of Commons has meant various things de-

³ There is also a verb form, but its use is obscure. The verb form of commons means conversation.

pending on the context. Critical to a better understanding of the term Commons, is a historical overview.

2.2 *The History of the Commons*

Although commons have been around for thousands of years, most people are familiar with the commons found in pre-industrial Britain. Commons, in Britain, was the term used for the privilege that was granted to certain individuals who could access manorial land and “take or use some portion of what another's soil produces” (Gonner as quoted by Buck, 1985, p. 3). This use was prevalent in Britain, and usually referred to the use of land by tenants for grazing cattle. It was strictly governed; the tenants could use, for example, fallow fields for grazing during the summer months as long as they used their own field to raise winter feed for cattle. Britain's use of this form of the Commons ended with the development of the cotton ginny. Newly industrialized Britain had an increasing need for wool, and land, previously available for tenant use, was enclosed so that the landowners could raise sheep. This was known as the enclosure of the Commons (Buck, 1985).⁴

⁴ There is conflicting research on this, determined to a large extent by political intent. Some historians believe that the Commons were being enclosed before the advent of the jenny, primarily because commons agriculture was inefficient. Other historians believe that the enclosure happened because of the shift in politics (the move away from a feudal system) while others see the jenny as the primary cause. This last view is the one that is most often promulgated.

The American understanding is quite different from the British and European understanding of the commons. For Americans, the commons is a metaphor for freedom and for free speech: “shared spaces and shared knowledge” (Hess and Ostrom, 2007, p. 13) as others emphasize in their exploration of the commons concept (Boyle, 2003; Hess & Ostrom, 2007; Lessig, 2002). The Boston Commons, initially established as common pasture land in the 1600s (grazing was allowed until 1840), was the first communal park in the United States

In or about the year of our Lord One Thousand Six Hundred thirty and four the then present inhabitants of the Town of Boston of whom the Hon John Winthrop Esq Gov of the Colony was Chiefe did treat and agree with Mr William Blackstone for the purchase of his Estate and any Lands living within said neck of Land called Boston after which purchase the Town laid out a plan for a trayning ("Boston Common," July 7, 2007)⁵

and stands as primary representation of the common's concept.

As seen above, the term commons has had an interesting evolution over time. It began as a shared physical place and more recently is seen to include a place to share information. This rich development over time is related to the complexity and depth of the term used today as seen below.

⁵ Although it is not acceptable scholarship to use Wikipedia as a source, this study sees sources such as Wikipedia as a reflection of the IC philosophy and so will be used where needed (albeit with care).

2.3 *The Commons Today*

Although most people are unfamiliar with the term, Commons are more common than many would think. As the golf example illustrates, we are familiar with the concept of shared land even if we are not familiar with the term commons, and can acknowledge that the practice and use of the commons is still active in one form or another. Examples of other Commons are provincial/state parks, city parks, market districts and even roads (Bollier, 2001, 2003a; Buck, 1998; Hess, 2000; Lessig, 2002). A commons is essentially a resource or a group of resources that individuals share. Common pool resources, as they are called in the literature, include the more traditional resources such as grain, fish, trees, and water (traditional commons) but they may also include such things as air waves, space or scientific studies (global commons); computer programs, network access, digital information (digital or virtual commons); ideas or creative works (innovative commons); academic research, and teaching innovations (academic commons); and shared technology and academic supports (information commons).

Sharing resources is integral to the idea of common pool resources, but so is their depletion. In commons literature this is known as “exclusion” and “subtractability.” How easy it is to exclude others from the resources and how “subtractable” those resources are determines whether they are common pool resources, open-access resources or private resources. As seen in Table 1, common pool resources typically have a high subtractability (i.e., they will diminish with use) and it is difficult to exclude others from using that resource (e.g., fish or water). Open-access resources tend to have a low subtractability (e.g., scenery or roads) and it is very difficult, if impossible to exclude others from using them.

Private resources might have a high or low subtractability but a high excludability (e.g., a private club or a farmer’s crop).

Table 1. *Type of goods (adapted from Hess & Ostrom, 2007).*

		Subtractability	
		Low	High
Exclusion	Difficult	Public Goods	Common-Pool Resources
		Useful Knowledge	Libraries
		Sunsets	Irrigation systems
	Easy	Private Club	Private goods
		Golf course	Personal computers
			Oil

If the resources are carelessly used then they will be depleted or disappear. This “subtractability” and the possibility that the resources will be permanently depleted is what Hardin calls “the tragedy of the commons.” However, there are a number of traditional commons that exist around the world both today and in history. Examples include China's “well field system” (Kadekodi, 1992) Peruvian and Nepal land tenureship (Laats, 1998), joint forest management in India (Kadekodi, 1992), and market-based fish management systems in New Zealand and Iceland (Eythorsson, 2003).

Since the late 80's, the focus of commons scholars has been on the social relationship developed by groups who needed to share a particular resource. Ostrom (1990) in particular was instrumental in developing a system to explain how the commons and their Common Pool Resources worked. She called the social relationship individuals develop to share resources “property regimes.” Common property regimes are an integral part of society. Sport fishing, for example, is regulated by local governments. In Manitoba, for example, people can fish the lakes and streams, but in order to do so they have to have

licenses, use certain kinds of hooks and could only catch a certain number and size of fish (Mahaffy, 2008).

2.3.1 *The Global Commons*

Buck (1998) in her book *The Global Commons* expanded the concept of the commons by applying it to settings with non-traditional resources. These resources - scientific research and exploration, deep sea minerals, geostationary orbits, airwaves and even the air we breathe - do not have the kind of solid presence provided by fish, oil, water, and trees, and yet they are resources that demand management and are, as yet, not claimed by a single nation. These commons include Antarctica, the world's oceans, the atmosphere, and space.

Beginning in the early 90s access to all these domains was challenged, and the enclosure of the global commons was now a possibility as nations fought for control over what they considered crucial resources, primarily space and telecommunications. The United States in particular was moving to enclose both the telecommunications space and outer space. In 1996, Congress extensively revised the 1934 Communications Act (Kranich, 2004), deregulating the airwaves and allowing companies to monopolize the industry. As a result, just ten companies owned most of the United States' magazines, TV stations, publishing houses, movie studios and newspapers. This was in sharp contrast to the fifty companies that were involved before deregulation. The U.S. telecommunication industry was quickly adopting an anti-commons stance. In addition, the United States has just claimed the space immediately above North America as a part of its territory ("US adopts tough new space policy," 2006).

2.3.2 *The Digital or Virtual Commons*

Buck (1998) does not talk about the internet in her book on the global commons, but the International Telecommunication Union's (ITU) stance on internet protocol (IPs) and domain names certainly demonstrated the central role that the Internet played both locally and globally. Even though the internet was developed in the 60's and was beginning to be used by individuals outside the scientific community by the late 80's it did not really start influencing public opinion until the mid-90's and was not ubiquitous until the late 90's - a mere ten years ago (Kelly, 2005). The rapid growth of the internet and the accompanying growth of digital information challenged both the social laws and scholars as they worked to find the language needed to define this new digital setting.

On one hand, the virtual commons meets the established understanding of a commons with a resource regime and CPRs. Referring to the virtual commons as a commons in this sense has important political implications because of the move towards its enclosure. On the other hand, the virtual commons is also a metaphor for a virtual "space" where individuals meet to exchange ideas, creative products, and other goods (i.e., Flickr, MySpace, etc.). This latter use, particularly when talking about the exchange of ideas, arises out of the American concept of the Boston commons and the emphasis on freedom of expression (Hess & Ostrom, 2007).

2.3.3 *Information Commons*

Branwyn and Sugarman (1990), writing at the cusp of the digital revolution described the expanding PTP⁶ (peer-to-peer) network as a commons. They expanded the metaphor of the commons by connecting it to the early Greek agora - a meeting place where individuals could meet and talk politics and ideas. Ten years later, and in a very different digital milieu, Lessig (2002) made an even stronger case than Branwyn and Sugarman for a digital commons. Lessig framed his argument for an innovation commons with the research done on resource regimes, Common Pool Resources, and common-property law. However, while Ostrom (1990), Bromley (1992) and Buck (1998) were primarily concerned with resource management, Lessig (2002) was concerned with how intellectual and digital resources were owned and regulated. Lessig (2002) made the case that digital resources were “non-subtractable.”

Lessig (2002) was concerned with how users were being excluded from access to digital resources. For Lessig (2002), resources obtained from a commons can be taken without asking for permission. It was crucial to Lessig (2002) that this read of commons be used because he was more concerned with access to digital resources than he was with the potential depletion and misuse of those resources. Nonetheless, like Bromley (1992), Lessig (2002) was also very aware that the commons, in particular, and property, in general, were defined by the kind of resource found and their relationship to the community

⁶ Peer-to-peer networks were networks where “the content is being served not by a single central server, but by equal, or ‘peer’ machines linked across the network” (Lessig, 2002, p. 134).

that surrounded them. For instance, this included “the character of the resource and how it relates to a community” (Lessig, 2002, p. 21). These concerns arose out of his awareness that access to previously “free” resources such as ideas, software, music (in some contexts), and images was being increasingly restricted. The concept of the commons then, as a place to gather and share ideas, was increasingly important when talking about sharing digital resources.

2.3.4 *The Creative Commons*

As noted above, Lessig (2002) was concerned with the restrictions being placed on creative works and that these restrictions limited further creativity. For Lessig (2002), the definition of an “Innovative” or “creative commons” was situated between its legal status (e.g., copyright or public domain) and the political analysis of Common Pool Resource use as proposed by others (Buck, 1985; Frischmann 2005; Hess, 2000; Kadakodi, 1992; Oakerson, 1992). He acknowledged that resources, even digital ones can be rivalrous or non-rivalrous (Ostrom, 1990), but he was most concerned with which resources *should be* held in common and how to hold them in common. It was important to note that this last point interests Ostrom and others as well. Digital advocates like Lessig (2002), Benkler (2000), and Bollier (2004, 2007) believed that the community should have much greater access to creative works than it currently does.

Up until 1998, the copyright act protected works up to 50 years after the death of the creator/author, and 75 years for works that were owned corporately (e.g., Disney). The Copyright Term Extension Act, introduced to Congress by Bono (Copyright Term Extension Act. S.505, 1998), extended the copyright for another 20 years. This meant that individual works of art were protected for 70 years and corporately owned works for 95

years (Kranich, 2004). Eldred⁷ with Lessig as his lawyer contested the Sonny Bono Act (Eldred vs. Ashcroft). They lost the case but were inspired to develop the Creative Commons copyright as a response to these new restrictions (Lessig, 2005). A Creative Commons online video states that the Creative Commons license “gets rid of the intermediary” (Creative Commons, 2002). Copyright which occurs as soon as anyone puts pen to paper, hits record, snaps a picture, or paints on canvas covers all the individual artist’s rights. Copyright was all rights reserved. The Creative Commons Copyright, on the other hand, was “some rights reserved” and the artist determines those rights.

At the heart of Lessig’s (2002) and Benkler’s (2000) argument sat the strong conviction that in order to propagate creativity, individuals must be seen as participants rather than as consumers of creative process. Bollier (2004), Director of the Information Commons Project at the New America Foundation and co-founder of Public Knowledge, also used the term information commons a metaphor for the current digital context. For Bollier, information was much like the commons of the 19th century England, and he saw the increasing restrictions on information as “enclosures” (Bollier, 2004). He asked,

Will individual citizens have the same freedoms in the emerging digital society to express themselves as the First Amendment envisioned? Will creators be able to earn a fair reward from their creativity and reach audiences without impediment? Will everyone have access to a robust public

⁷ Eldred owns and manages Eldritch Press (<http://www.ibiblio.org/eldritch>), a website that provides, for free, digital copies of books that were copyrighted through the creative commons and were in the public domain.

“media space” of commercial, amateur and fringe expression, or will it be a closed, centralized system controlled by a few chiefly for commercial purposes? (p.1)

He believed that using the term commons opened up “a new vector of discussion” which “[i]nstead of joining the specious and sterile ideological argument of ‘free markets’ (good) versus ‘government regulation’ (bad), or conjuring up the regulatory history of the New Deal and the Great Society” re-focused the argument on the new kinds of “open social spaces” (Bollier, 2004) where information, art, music and ideas were shared and created. In the past 20 years there were a number of spaces created to further this aim. These include MITs Open-Courses (<http://ocw.mit.edu/index.html>), D-Space (<http://www.dspace.org>) an on-line repository where faculty, librarians and others can share learning objects (LOs), *Berklee Shares* (<http://www.berkleeshares.com>) a site that offers on-line music lessons, *Centre for the Study of Public Domain* (<http://www.law.duke.edu/cspd/index>), and *The Digital Library of the Commons* (<http://dlc.dlib.indiana.edu>) which provided a large amount of material for this study.

The Science Commons was an offshoot of the Creative Commons and worked actively against the enclosure of scientific knowledge by “removing unnecessary legal and technical barriers to scientific collaboration and innovation” (Science commons, n.d.-b). Examples of the Science Commons include *Scholar’s Copyright Project* which supports the use and re-use of scholarly projects on the web, and *Biologic Materials Transfer Project*, a group of lawyers that provide standard transfer contracts that scientists can use in order to lower transfer costs for biological materials (Science Commons, n.d.-a).

2.3.5 *The Knowledge Commons*

Over the past three or four years, the term commons have become a catch phrase or shorthand term for individuals, usually in academic or research areas, who wish to share ideas or develop programs that can permeate the academic boundaries of their “brick and mortar silos.” Kranich (2004) listed five different kinds of these commons (all digital): software, licensing, institutional, subject matter, and research. All five intersected, and all five areas are quickly being enclosed as telecommunication and other corporations (e.g., Microsoft) are working to gain control of the rights over these areas.

Bollier (2004) felt that the enclosure of the information commons carried over into academia. Kranich (2004, 2007), Ostrom (Hess & Ostrom, 2003), and Hess (2000; Hess & Ostrom, 2003, 2004) also saw the digital commons and the academic commons as yet another common pool resource.

2.3.6 *The Teaching Commons*

Along with the development of the academic commons came the development of a teaching commons. Huber and Hutchings (2005) defined a teaching commons as

an emergent conceptual space for exchange and community among faculty, students, administrators, and all others committed to learning as an essential activity of life in contemporary democratic society” (p. 1).

Hutchings and Huber’s (2006) use of the phrase “an emergent *conceptual space*” (my italics) is key here, because in academia, most often, the sharing of a common space is the sharing of ideas rather than an actual physical space. Despite the fact that Huber and

Hutchings use of the word commons was metaphoric and was not situated in the literature on commons, their work adds depth to the established scholarship on the commons.

Teaching as something that should be framed by the commons concept was a radical concept outside the field of the scholarship of teaching. A little over 15 years ago Boyer wrote *A Scholarship Reconsidered* (1990) in which he challenged the academic community to respond to teaching as intellectually and thoughtfully as it does to research. To further the teaching as commons metaphor, Hutchings and Huber pointed out that Shulman (1993) in *Taking Learning Seriously* believed that teaching should be “community property”. And, although it has been slow, there has been steady growth in the area of teaching scholarship and in the process of sharing teaching knowledge and approaches. However, Hutchings and Huber (2006) also pointed out that the success of the scholarship of teaching and a teaching commons depends on how it is used, because its use was crucial; Shulman (1993) noted that “members of [the] . . . community [need to] use, build upon, and develop these acts of mind and creation” (p. 94).

Huber and Hutchings (2006) compared the classroom to “home” and the larger academic community to an “intellectual agora or marketplace”⁸ (p. 55) or commons. Huber and Hutchings (2006) also saw the commons as a “common destination” that faculties, departments, colleges, and universities were all individually traveling to.

Nevertheless, teaching was traditionally isolationist and seen as a largely private act (Huber & Hutchings, 2005). Huber and Hutchings made the point that faculty rarely

⁸ I find the use of the word “marketplace” interesting here. In other contexts the word agora is used, I assume, to avoid the economic implications.

allowed others in their classrooms to observe, nor did they share their techniques with the larger community. In fact, as Huber and Hutchings (1990) noted the discussion of teaching problems, unlike the discussion of research problems, was seen as criticism rather than conversation. Thus, they believed that the development of a commons where faculty across disciplines, educational institutions and even countries could gather and share both ideas on teaching and their teaching techniques was crucial.

Although Huber and Hutchings' (2006) use of the term commons was metaphorical, they did describe activities that they consider examples of teaching commons such as conferences (e.g., International Symposium on Improving Student Learning and Society for Teaching and Learning in Higher Education), and pedagogical research (e.g., causal impact of lecturing behaviours on student learning). Most of these commons seem to replicate traditional academic communities; however, the essential concept behind a teaching commons was the push to make what has been traditionally private, public and to share resources.

Although Huber and Hutchings' (2006) use of the term teaching commons was decidedly non-virtual, the phrase is appearing in a variety of on-line settings, and there is an increasing tendency to move conversations about teaching and learning as well as techniques and materials into a virtual information commons. D Space, developed by MIT, is a "digital repository system [that] captures, stores, indexes, preserves, and distributes digital research material" (<http://www.dspace.org/>), and is an example of the kind of knowledge commons being developed by researchers, faculty, and students as repositories for research and teaching methods. *The Visible Knowledge Project* (<http://crossroads.georgetown.edu/vkp/>) was created in order to make available on-line

materials and knowledge that would help “improve the quality of university teaching” (Visible Knowledge Project, 2002). *EconPort*, created by Economic Science Laboratory and the Artificial Intelligence Lab, was developed “to provide microeconomics educational resources to the public, with a particular focus on the use of microeconomics experiments in learning, teaching and research” (Cox & Swarthout, 2007, p. 333). The creators of *EconPort* recognized that microeconomics experiments were useful for teaching and that students using computerized market experiments produced better learning outcomes (Cox & Swarthout, 2007). The Business faculty at California State University developed a teaching commons site (http://www2.cdl.edu/projects/csu_teaching_business) that provides access through the Multimedia Educational Resource (MERLOT) to peer reviewed digital learning materials for their faculty. The MERLOT project (<http://taste.merlot.org/index.html>), an online community where “faculty, staff, and students share their learning materials and pedagogy” (Merlot, 2006, ¶ 1) could also be considered a teaching commons.

Focusing less on collections of teaching tools and more on community, Carleton University developed a teaching commons for faculty who teach first year students (<http://www.teachingcommons.ca/>) by combining learning objects (LOs) with online community conversation. The academic commons (<http://www.academiccommons.org>) has a wider, international audience but its mandate is to “share knowledge, develop collaborations, and evaluate and disseminate digital tools and innovative practices for teaching and learning with technology” (¶ 1). The University of Iowa has an Information Arcade and the University of Calgary changed the name of their teaching commons from

Learning Commons to the Teaching and Learning Centre, with a continued focus on teaching, and a distinct presence on the web (<http://tlc.ucalgary.ca/>).

2.4 *The Information Commons*

Bollier (2005) and others (Beagle, 2006; Kranich, 2003) have noted that libraries were commons long before the introduction of computers. As Bollier (2003b) passionately states

Libraries help educate our children, help citizens make informed choices, and expose everyone to our shared cultural heritage. In libraries, this was not achieved through market transactions with customers, but through tax paid service to all citizens. It was precisely because the transfers of creative works and information were freely available to everyone not just to those who can afford it-that they were so valuable to our society (p. 9).

However, the introduction of computers and the virtual IC added an additional layer to the already existing library commons. The marriage of virtual and physical worlds was an evolving one and the creation of ICs was one of the first representations of that new relationship.

The use of technology to access and manage information was not particularly new to libraries. Most libraries started using computer technology in the late 70s and early 80s with the introduction of Integrated Library Systems, but the interface (command-line vs. WYSIWYG: what-you-see-is-what-you-get) was not user friendly and more often than not “mediated by librarians” (Beagle, 2006). As a result, the library's use of this technology did not have a big impact on the larger public's use of the library itself until the mid

to late 90's⁹ when Window's WYSIWYG interface and the World Wide Web (WWW) became available. With the increase of user-friendly software and the increased use of computers in the home and at the workplace, the shift from librarian mediated computer use to patron/user mediated computer use began to happen in libraries across the country.

Along with ubiquitous computers, came an increased number of available, often free digital articles, data, government documents, white papers and other kinds of information. Increasingly, journal articles became available in a digital format that individuals could access from home. Governments and organizations were putting research, reports, white papers, and other documents on-line for easy access. As well, publishing companies were producing entire journals and books in digital form. This shift was seismic because not only had the information field expanded exponentially, but access to that information had also increased.

The term information literacy, which specifically denotes the management of digital information, is a case in point, and its popularity as a term grew alongside the increased production and use of digital information. In her article on the development of ICs, Cowgill (1998) pointed out that at the Colorado State University (CSU) library “the number of databases available on the Libraries' Web site increased from 50 to over 300”

⁹ The number of computers sold in 1994 (40 million units) was double the number sold in 1990 (Miller & Perry, 1997). Since 1994, the numbers have continued to rise, with an equally dramatic rise in the numbers of people who were online. This dramatic rise began in the mid-90s and by 2005 63% of the American (U.S.) adults over 18 were online (Rainie & Horrigan, 2005).

(p. 434). In the early 90s the term information literacy was only used 17 times in library science literature while it was used 102 times in 1999 (Bawden & Rowlands, 1999), and a recent search (April, 2007) of Library Literature and Information Science database produced 757 results.

“Successful vital libraries” (Cowgill, Beam & Wess, 2001 p.432), adjusted their services so users could not only access and use information, but also learn how to successfully produce research with that information. This shift was important because students and faculty were no longer completely dependent on paper books and journals, they could now research and write papers/articles without ever leaving their computer, and had moved to using the computer as their major production tool. Libraries were beginning to embrace the fact that if the appropriate technology was made available they could be involved in the research/writing process from the first day through to “completion.”

ICs, usually found in libraries, provided up-to-date technology, reference/research and IT support in a location designed for these kinds of digital demands. According to Beagle (1999), the physical space was “specifically designed to organize workspace and service delivery” (p. 82) in order to provide access to the virtual environment/space and multi-media tools. Although the development of the IC by libraries in the early to mid-90s was a reaction to the academic community's adoption of the personal computer as an essential productivity tool and the increasing dependence on digital information, it was also visionary and transformational (MacWhinnie, 2003). As Beagle (1999) points out, the “commons involve[d] [the] functional integration of technology and service delivery [in order] to realign the library with the rapidly evolving digital environment” (p. 83).

Thus, ICs were the foci of many contemporary libraries attempting to maintain the service of users at a new level – that of providing services that were accessible virtually.

2.4.1 *Defining the Information Commons*

Beagle's (1999) definition of ICs as spaces designed to “organize workspace and service delivery around the digital environment” (p. 82) was the definition most often used by researchers writing about ICs. Dewey (1998) noted that his IC was designed to “enhance student learning” (p.3). One of the key ways learning was enhanced was that libraries worked to incorporate other departments, primarily IT and break down information silos. A “continuum of service” sits at the heart of an IC and Beagle (1999) emphasized this when he defined an IC. An IC integrates and crosses over departmental boundaries in order to increase access to information and the production of knowledge for faculty and students. Ideally, ICs work with multiple departments - reference services, media services and data services - to produce a new space that are “organized in support of learning” (Beagle, 1999, p. 82).

Traditionally, ICs were found in libraries and/or were tied to libraries through either administration or budget and, as a result, ICs tend to be library-centric with a focus on technology and service. This focus was maintained in Henning's (2005) description where she lists a variety of IC descriptions with such examples as “technology was integrated with service” (“Philosophy of the Commons”) and students were “put face-to-face with the right people, the right skills” (“Philosophy of the Commons”). However, Kranich (2007) pushed against the conventional understanding and somewhat provocatively described ICs as spaces that created an environment where “traditional boundaries blur and many constituent activities flow across old unit divisions” (p. 100).

It is difficult to create a definitive list of IC components. There are however a number of elements found in almost all commons literature: high-end technology, social-friendly space, and support services that spread across departments, usually reference, and IT (Beagle, 1999, 2006; Bennett, 2003; Church, 2005; Cowgill, et al., 2001; Duncan, 1998; Haas & Robertson, 2004; Halbert, 1999; Henning, 2005; Lippincott, 2006; MacWhinnie, 2003; Spencer, 2006). Other elements often found in ICs are cyber cafés and/or coffee shops, group rooms, high-end peripheral and presentation spaces, games, and music stations. The majority of ICs are primarily for students and typically provide tools and space so that they cannot only access on-line knowledge but also learn and produce more knowledge in the library context.

One-stop shop, continuum of service and integration of technology with service are the three major themes that run through the literature on ICs. Beagle (2006) described ICs as something much more than a computer lab. They “facilitate interaction and serendipitous learning” (p. xviii). His definitive definition was “a cluster of network access points and associated IT tools situated in the context of physical, digital, human, and social resources organized in support of learning (p. xviii).” Haas and Robertson (2004) concluded after a review of the available literature on ICs that most of them include a mix of reference and IT, “one-stop shopping” for library services and “mix of staff including librarians, computer professionals, and other public service staff” (p. 17). Remy (2004), the instructional services librarian at University of Southern California Leavy Library described an IC as a “conceptual, physical, and instructional space that essentially reformulates the academic library to adapt it to a highly digital resource and service environment” (p. 1). Beatty and White (2005) described an IC as an “integrated learning facilit[y],

where the user receives assistance in acquiring information literacy skills and/or technical literacy skills or ‘e-lit skills.’” Lippincott (2006) noted that “the underlying philosophy [of the commons] was to provide users with a seamless work environment so that they may access, manage, and produce information all at the same workstation” (p. 7.2). Earlier, Lippincott (2005) emphasized a point that Beagle (2006) also makes – that the development of ICs/LCs was a move towards non-centric thinking. Indeed, a commons approach focuses on the move away from libraries controlling and even owning information and the move toward co-controlling and owning information. This idea parallels the philosophy behind the participatory web (e.g., Web2.0 and Library2.0).

ICs were not just about resources, “but about relationships and community between the creators and users of information” (Kranich, 2004, p. 1). Bradley (2004) emphasized community, an idea that was hinted at by earlier definition, particularly with the emphasis on group learning, but remains unstated. She noted “the IC was an evolution of information technology centres . . . [with] a renewed emphasis on libraries as places of community-building” (p. 1). Thus, ICs also include community, allowing for relationships to occur between those who create and those who use the information.

Based on the literature search, ICs are spaces, both virtual and real, that provide various services to the user. Significant to ICs is the continued support that libraries provide. This includes a community where relationships between the creators and users of knowledge are encouraged and where IT resources are fluid and continually developing to reflect the currency of the resource.

2.5 *Components of an Information Commons*

The literature was not consistent on the necessary components of ICs and LCs. Moreover, what components were included in various ICs/LCs varied from institution to institution. For instance, ICs existed with technology and learner-friendly space but with limited in-commons support while other ICs had in-commons support and increased technology without the learner friendly space. However, all included some form of space, staffing, and technology.

2.5.1 *Mission Statement*

As ICs/LCs become more established, the importance of vision and mission statements appear more frequently in the literature despite research that shows they are often limited in their effectiveness (Morphew & Hartley, 2006), and are often useful only to the staff that create them (Bennett, 2006; Morphew & Hartley, 2006). Nonetheless, Remy (2004) in a presentation on developing LCs stated that “the first was the idea of diffuse boundaries with a clear mission” (p. 5). Keating and Gabb (2005) also emphasized the importance of developing a mission/vision when creating and/or running ICs/LCs. And Henning (2005b) emphasized the importance of using the mission statement to guide the developing of the commons space; “if the IC was just seen as a learning space, then design for that and if it was also seen as a social space, then different criteria need to be considered” (“Physical Environment” ¶ 1). Bennett (2003), aware of the problems that underlie the development of mission statements, emphasized that the focus should remain on learning, and that a successful *learning* commons (emphasis mine) was one that embraced the larger university vision rather than simply the vision of the library and/or individual administrators (Bennett, 2006).

2.5.2 *Space*

Beagle (1999) described the ICs as a “new type of physical facility” (p. 82). Bennett (2003) noted that “thinking about the library as a social space, rather than as space primarily for undisturbed reading and individual study, involves some recasting of ideas about what makes for success in library thinking” (p. 19). Space was of particular interest because of the shift away from thinking of the library as a warehouse towards thinking of it as a social learning space. An inventory of ICs essential space elements was produced at a 2005 Educause Australasia Conference workshop, and the list focused on location, flexible and movable furniture, the need to have a variety of social and learning spaces within the commons, and appropriate access and security.

Bradley (2004) echoed both Bennett and Beagle's descriptions, describing ICs as bright, welcoming and open spaces. Key to ICs/LCs space was that it be seen as social. So many ICs/LCs made group space not only available in separate rooms but also configured their commons space for groups of students to work together in an informal setting (Lippincott, 2006). The computer tables were often arranged in rounds, and couches and chairs (e.g., living room type furniture) were also often included. Some ICs even provided large-scale presentation technology so that students could prepare their group presentations in the commons.

Aesthetics and food were two elements that seem integral to the ICs milieu. Henning (2005a) in her “Gleanings” noted that “many institutions put a lot of effort into the aesthetics of the space and it made a huge difference in terms of the quality of the environment” (Henning, 2005, “Physical nature”). She also said on the same page that “almost every location allowed food and drink in the commons and many institutions had

cafés on site” (Henning, 2005, “Physical nature”). In addition, how the computer stations and other types of furniture were set up could determine how students learn and how well the commons space works. For example, the "commons curve" (Beagle, 2006) mixed solo and dual-access stations and supported students in both group and individual study sessions.

The inclusion of offices for staff from a variety of departments, including IC staff proper, as well as staff from the writing centre (WC), learning services, and information technology (IT) departments was another IC space issue. Interestingly, a majority of the reports and articles on the development of ICs did not mention office space. However, in conversation on-line (Info-Commons) and in-person (Canadian Learning Commons Conference, 2006) the issue of office space for IC staff was an important one.

The placement of service points was also important (Beagle, 1999; Bradley, 2004; Church, 2005; Samson & Oelz, 2005) because service points (e.g., help-desks) are one of the core concepts of ICs - the “continuum of service.” Most ICs had help desks of some kind, but how many there were and where they were placed varied. Some ICs had one help desk that was staffed just by IT staff, others just by reference staff, some by student peers, and some by a combination of one of the above three. Bucknell University's ICs had three service desks: Reference, Circulation, and Technology (Hales, Rea, & Siegler 2001). The Bucknell IC team was specifically concerned with the development of a new Technology desk that would provide “one-stop shopping” for all of the Library and campus computer needs. In addition they positioned a “Technology Courtyard,” which housed high-end multimedia software, immediately across from the new Technology desk. The Technology Desk was also designed so that staff and students could approach

it from any side, and because staff was placed on either side their visual range was much larger. Nonetheless, Church (2005) discussed the difficulty that students had navigating the multiple service points. As a result of this difficulty, Lied Library at the University of Nevada, Las Vegas U.S., revamped their IC, closed their IC help-desk and put their IT support at the “Research and Information desk” (Church, 2005, p. 78).

Beatty and White (2005) observed that the more integrated a facility was (i.e., computer lab vs. ICs in its own building) the “more likely” it was to support e-literacy. Doing a web-based scan, Beatty and White (2005) looked at 36 ICs and divided them into three types: the computer laboratory, the integrated facility and the IC building. The computer laboratory IC provided technology and sometimes IT support. They also identified two sub-types of integrated facilities: “library only” and “library joint.” Both types were found in the library but the first type had a focus on reference with some technological assistance. Help in the “library joint” was “almost always” available and the “level of expertise was quite high” in both research and IT. The final space configuration of the various ICs buildings, and the services they provided, varied depending on the partners, but at their core “these buildings can be considered true learning centers” (Beatty & White, 2005, p. 6).

2.5.3 *Staffing*

Staffing an IC was a complex endeavour because librarians, IT staff, learning centre instructors and others were asked to do tasks and/or share tasks that normally would not fall under their purview, and traditional departmental boundaries were “blurred” (Kranich, 2007). The expansion of support services to include departments outside of the library was a consistent theme in IC literature. Church (2005), noted that an IC “provides

unique opportunities for campus-wide collaboration with Writing Centers, the Registrar's Office, and other student-centered services” (p. 75).

What, how, and by whom, were all concerns for staff who were accustomed to working within their departmental territories. Librarians were not comfortable dealing with printer jams, word processing or spread-sheet problems and computer interface issues. At the same time they also did not always feel comfortable allowing others, such as IT staff or Learning Centre instructors for example, to respond to reference-type questions. Yet, students would continue to ask librarians to clear paper jammed in a printer, and IT staff their advice on a particular search engine. ICs most often included IT, reference help desks, and in some cases just IT help desks.

Church noted that there was a difficulty in “interweaving” cultures in the IC particularly that of librarians and IT staff. The fact that some spaces only included IT desks was indicative of the disconnect that existed between the new media technology, access to digital information and the more traditional approaches to information acquisition and integration. Thus, Beagle's (1999) call for an “integrated delivery model” a model that placed the emphasis not on technology but on governance and staffing, was timely. MacWhinnie (2003) commented that finding trained staff was difficult and that effective assistance was dependent on staff that were trained to respond to questions that were typically outside of their area of expertise. Haas and Robertson's survey (2005) discovered that 68% of the ICs who filled out the survey had a “specific training program for the library and IT staff” (p. 14). In 16 libraries (72% of the cases) this training included “troubleshooting the computers and peripherals” (p. 14). This last point was of particular importance. Librarians were not trained to provide IT support (Church, 2005; MacWhin-

nie, 2003) but if libraries were going to provide computers and software then students needed that support.

2.5.4 *Technology*

An “ideal” ICs/LCs technology set-up would include ubiquitous access to all possible software packages, current (if not advanced) hardware, access to a high speed network and/or wireless, extensive web-based information literacy resources, student-group-friendly workstation configuration, extensive e-Content and database access, laptop loans, adequate power outlets, and file storage. In some commons, faculty needs were included or in some cases they replaced student needs. If the ICs/LCs either included faculty in their mandate or had faculty focus, the commons usually included access to advanced technology, presentation/media software and curricular support.

As libraries became “the most popular computer lab on campus” (Samson & Oelz, 2005, p. 350) there was an equal demand by students to have “ubiquitous access” to software and digital resources. The growth of the participatory web (e.g., Web2.0) and the ease with which individuals who used technology could access various software tools on their own desktop amplified student and faculty expectations. Students did not want to be restricted in their access to specialty software, such as SPSS for example. Nonetheless, ICs/LCs staff worried about security, copyright, access interfaces, and support.

A number of post-build articles (Church, 2005; Marks & Findley, 2005; Spencer, 2006) however, showed that reality did not always match up with vision. Security, licenses, and training issues interfered with ubiquitous access, budget concerns challenged an institution's ability to keep up with high-end technology, space concerns limited the

number of computers and group rooms, and educational culture balked at providing access to gaming, music and social network tools.

2.6 *The Learning Commons*

While ICs were largely reactionary, a response to rapid changes in information delivery, LCs moved beyond the initial reactionary response in order to transform how the library and the larger university responded to learning outside of the classroom. In a conference presentation “From IC to Learning commons” Beagle (Beagle, 2002) described the development of LCs as “far reaching change,” (p. 51) a change that moved the services in the library away from being library-centric towards a new space that was learning-centric. Bennett (2005) described a LC as space that was “built around the social dimensions of learning and knowledge and would be managed by students themselves for learning purposes that vary greatly and change frequently” (p. 38). A LC moved past the idea of providing a supported learning environment and embraced cross-departmental relationships “that support learning initiatives” and were “aligned with learning outcomes defined through a cooperative process” (Beagle, 2006 p. xviii). That the LC's learning objectives were “aligned... through a cooperative process” (Beagle, 2006 p. xviii) was particularly important so that the learning objectives were defined not by just one department (i.e., the library or IT) but by all the departments working together with group objectives in mind.

2.7 *Canadian Universities and Information/Learning Commons*

The University of Guelph and the University of Calgary were early innovators and the first universities to build commons in Canada. The University of Guelph established their LC in 1996 (Nancy Schmidt, conversation, May 29, 2005) and the University

Calgary opened their new thirty million dollar IC in 1999. And even though the University of Guelph and the University of Calgary were well ahead, the remaining Canadian universities have been slower in building ICs/LCs.

There was no current count of ICs/LCs in Canada, and although information was scant, web site information indicated that the majority of them were built or established after 2002. The reasons for the slow growth had a lot to do with the nature of the institutions. Canadian universities, unlike U.S. universities, were primarily government-funded institutions, and this limited the amount of money available to institutions for renovations/staffing/technology. A thirty million dollar grant from the Alberta government, during the provincial economic boom funded the University of Calgary's IC. And, the University of Guelph, a comprehensive university,¹⁰ in the process of re-organizing departments, moved the learning services unit to a home in the library, appointed a librarian and the current director of the learning services unit as co-directors, and developed the first LC in Canada.

2.8 *Gaps in the Literature*

The nascent nature of the IC literature means that there are still many areas that remain to be explored. Currently there is no established way to determine how, and/or whether students were learning in ICs, and there was minimal research on the impact the IC space had on social learning. In addition, student voices were almost non-existent with

¹⁰ Statistics Canada described comprehensive universities as institutions with a “significant amount of research activity and a wide range of programs at the undergraduate and graduate levels” (Statistics Canada, 2007)

no published data on focus groups, surveys, or other forms of data collection that had taken the students' point of view into account. The one exception was the study done by Foster and Gibbons (2007) at the University of Rochester. Their innovative study took an Anthropological approach, using ethnography to study student learning in the library setting.

At the time of this review, librarians were the only producers of research on ICs. In fact, there were no studies written by individuals who work outside of the library system (i.e., written by a non-librarian); even IT staff have been silent on IC development and theory. The literature written on ICs and LCS reflects this. The focus of the LC literature was on staffing challenges from the perspective of a librarian, the best location of reference/help desks, departmental culture vis a v. librarians, technology, and furniture. There was no literature on the kind of learning that students were involved in while in these spaces. IC/LC theory was limited. Beagle (1999) took an early look at organizational theory with respect to ICs, began to develop a theoretical approach, and developed a definitive definition for ICs (and later LCS). Later, Beatty and White (2005) formulated some approaches to ICs/LCS and eLiteracy, and Bennet (2005) explored library design, student learning, and the resulting ICs/LCS. Both Bennet (2005) and Beagle (2006) developed definitions for LCS. How LCS fit into the larger institutional structure (i.e. the university), how they change the libraries they are in, and whether they are transitional responses to a rapidly changing digital environment, are all issues that remain unexplored.

2.8.1 *Administrative Structure*

Although there were any number of articles that delineated the specific components of a LC (Bradley, 2004; Church, 2005; Church, et al., 2002; Cowgill, et al., 2001; Haas & Robertson, 2004; Henning, 2005; Lippincott, 2004; MacWhinnie, 2003) there was little information on the administrative structure. Haas and Robertson (2004) in their survey of North American ICs looked at funding and staffing but there was no other study that did the same. This meant that there was limited information on supervision, which department tended to coordinate ICs activities/budget, whom they reported to and who reported to them. This was particularly important, as some LCs were moving into their first decade. Traditionally, librarians were responsible for the administration of ICs/LCs. University of Guelph's LC being an exception – this facility had a co-director whose background was learning services and not library services. However, as external service areas were included in the commons environment this changed who was in charge. In fact, some commons, such as McMaster University, were run by a committee (anonymous, in conversation, June 19, 2006).

2.8.2 *Funding*

Funding was another area with limited research. Haas and Robertson (2005) in their survey of North American libraries included questions on funding, but the implications of those funding decisions were not explored. For example, the decision to fund ICs with monies from various departments (often non-dedicated funds) versus providing the ICs with a baseline budget was not well-known. Non-dedicated budgets led to reduced services, out-of-date technology, and/or an inability to match student and faculty needs/demands when funding was cut.

2.8.3 *Effectiveness of Information Commons and Learning Commons*

At the time of this literature review there is no research on the effectiveness of ICs (Beagle, 2006). Bennett (2003), however, had surveyed the U.S. libraries that were undertaking new building projects to determine if they were taking student learning into account in the building process, and there were numerous university libraries, Canadian included, that were participating in the LibQual survey which included learning space as one of its variables (LibQual, 2005). A number of individual ICs had also undertaken an evaluation of their services in terms of usage (e.g., gate count, reference questions, etc.).

2.8.4 *Canadian Information Commons and Learning Commons*

There were no studies specifically on Canadian ICs; in fact, there were only two reports available on ICs/LCs as a whole and both focused primarily on U.S. commons (Haas & Robertson, 2004; Henning, 2005). The American Library Association SPEC Kit 281 (Haas & Robertson, 2004) surveyed 123 libraries. Seventy-four libraries responded, and eight of the respondents were Canadian libraries: University of Alberta, University of British Columbia, Library Archives Canada, McGill University, McMaster University, University of Manitoba, University of Western Ontario, and York University. Of those eight respondents, six were libraries at medical-doctoral institutions. Henning (2005) visited twenty-five ICs and only two of these ICs were Canadian (University of Guelph and University of Calgary).

Another study, Bennett's 2004 survey of new U.S. library projects, did not look at ICs *per se*, but the data from his survey was cited in LC/IC literature and he has spoken on this topic at a number of LC/IC conferences. Bennett (2004) surveyed all U.S. libraries with new spaces built between 1992 and 2000 in order to discover how these libraries

incorporated or acknowledged what Bennett felt were two fundamental educational shifts:

- 1) The information technology revolution, and
- 2) The increasing tendency of academic institutions to embrace the social nature of student learning.

Out of this came substantial information on the connection between the library mission to the university mission and the growth of the library. As well, the data he gathered was the only data available that linked new library spaces with student learning, and was invaluable as researchers begin to look at how to evaluate ICs and LCs.

The literature by Canadians on ICs/LCs was also limited (Beatty & White, 2005; Henning, 2005) and even these pieces focused primarily on U.S. LCs. Henning (March 23, 2005) surveyed 25 universities' ICs/LCs in late 2004 and early 2005. Henning undertook a study of North American ICs in order to explore what other commons were doing in order to upgrade and expand the commons at the University of Victoria. Of the 25 commons she visited, only two were Canadian universities (Guelph and Calgary). Her review of LCs was informal, and the results were presented on her personal webpage. However, the material available on ICs was scant enough that her work was cited in new literature on LCs/ICs.

The lack of focus on Canadian commons was partially due to the lack of commons built in Canada when the articles were written. However, there has been a steady growth of a commons community in Canada, and along with it a hint of a Canadian commons' research base. The University of Guelph hosted the first Canadian LCs conference in 2006 and since then Simon Fraser/University of British Columbia hosted the con-

ference in 2007, University of New Brunswick in 2008 and University Saskatchewan is hosting it in 2009. The 2006 conference resulted in a decision by conference attendees (June 20, 2006 - post-conference discussion: "Where did we go from here?") to formalize some discussions on Canadian ICs. Consequently, the University of Manitoba started the CAN-LC listserv and in 2007 a smaller group formalized a committee to begin to develop a conceptual framework for Canadian ICs/LCs.

2.8.5 *University, Library and Information or Learning Commons Websites*

There was no research on IC/LC web sites and the research available on university web sites and academic library web sites is still evolving. Typically, research on library web sites focused on the presentation of content (Duncan & Holliday, 2008) and the integration of information literacy concepts (Humbert & Tilley, 2006). The research available on university web sites more often examined the efficacy and location of links to academic research sites (Fry, 2006; Payne & Thelwell, 2008; Thelwell, 2008), the marketing of university web sites (Kang & Norton, 2006; Welch, 2005) and web site effectiveness (Cohen & Sill, 1999; Ivory & Hearst, 2002; Middleton, McConnell & Davidson, 1999). There was only limited research on the decision or design process involved in developing university library web sites (Connell, 2008; Meyer, 2008; Peterson, 2006), and, in particular, on departmental web sites which were part of the larger institutional web site (Connell, 2008; Moore, 2008). Anecdotal evidence (Moore, 2008) demonstrated that the process of designing departmental web site must take into consideration the aims of the department as well as the university marketing/vision plan. My own experience as a coordinator of a university department echoes Moore's (2008). Where links are placed that will lead to that web site is also typically mandated by upper administration and so

serves as a possible reflection of administrative attitudes towards the importance of that department to the function/role of the web site. The University of Manitoba home page for example places student service links (calendar, fee payment and parking) and research news on the front page (<http://www.umanitoba.ca>) while links to the library and departments are found on pull-down menus.

Most departmental web sites use their site to bring in students and/or to provide information. A large website, like a university website, is composed of hundreds of sub-sites many of which want equal time in the sun. One way to determine how the department/faculty is valued is to look at where it is placed and how prominent it is in the larger web site structure. Zhang, von Dran, Blake and Pipithsuksunt (2001), and Middleton, McConnell and Davidson (1998) found that ease of navigation was crucial to the value an individual placed on a site.

2.8.6 *The Connection between the Physical and Virtual Commons*

Another research gap was the disconnect between the physical ICs and the virtual ICs. There was no doubt that librarians were working to establish the connection between the library as space and the virtual IC, but the connection between the physical IC and the virtual IC was almost non-existent. Any discussion of this relationship happened in conference presentations and/or blogs. In addition, the focus tended to be on how librarians could include the participatory web (i.e. web2.0) into their daily practice.

As a result, there was no research available on the digital presence of ICs/LCs. There was a growing body of literature on library web sites, but in the articles reviewed (American Library Association, 2006; Astroff, 2001; Cohen & Still, 1999; Coombs, 2007; Still, 2001; Wright, 2004), there was no mention of ICs/LCs. No one, except

Kranich (2007), Hess (2003), and Beagle (2006) looked at how the physical IC fit into the larger virtual IC and even this look was cursory, with a clear disconnect between the scholarly resources identified as the knowledge commons, the larger virtual information commons and ICs/LCs (Astroff, 2001; Boyle, 2003; Garlick, 2005; Hess, 2000; Hess & Ostrom, 2007; Kranich, 2007; Lougee, 2004). This disconnect was similar to the culture that exists in the classroom in that, ironically, scholarship and learning were often viewed as separate entities by both the faculty (e.g., their scholarship, the student's learning) and the students' (e.g., the faculty's research, the students' learning). Even where the knowledge and information commons overlapped in virtual spaces like Dspace or physical spaces like ICs/LCs their connection was generally not articulated. There had been extensive work done on community learning/social learning and on community learning as it related to the virtual environment, but no work on how that kind of community fits into libraries or ICs/LCs.

However, two Canadian universities - University of British Columbia and University of Manitoba – had both invested resources in on-line academic communities that resemble a commons. University of Manitoba's Virtual LC (VLC) and the University of British Columbia's Learning Enhancement Academic Partnership (LEAP) sites incorporated online academic resources (e.g., writing tutors, study skill and library aids), resources that addressed non-academic issues such as health and safety, student-relevant social networking tools and other Web 2.0 elements such as tagging and blogs. These virtual LCs arose out of two understandings – one, the commons philosophy as articulated by Beagle (1999, 2006), Bennett (2003, 2006) and others (Bailey & Tierney, 2002; Beatty & White, 2005; Church, Vaughan, Starkweather & Rankin, 2002; Cowgill, Beam & Wess, 2001 &

2006; Henning, 2005; Kranich, 2007; Lippincott, 2006; MacWhinnie, 2003; McMullen, 2007) and two, a relatively new understanding of the Web as an interactive and creative space that allowed for creativity and participation (Web 2.0).¹¹

¹¹ Web 2.0 is also referred to as the "participatory web" by scholars, but Web 2.0 is the more recognizable term and so will be used in this paper.

Chapter 3 The Present Study

3.1 *Introduction*

ICs/LCs are largely defined by the philosophical tenants of information literacy and the understanding that these new spaces would provide “an integrated digital environment” (Beagle, 2006, p. 4). An “integrated digital environment” is one that allows the user to access information as well as information tools from the same location. Beagle (2006) goes further by stating that:

the physical commons was designed to incorporate a cluster of access points to this digital arena, along with tools and trained staff to help users navigate its environment, query its resources, process and interpret its content, create their own knowledge, and package, publish, or present their creations (p. 3).

If, as Beagle (2006) stated, “digital integration” is key then IC/LC web sites have the potential to act as an intersection or meeting place between the rapidly growing digital world and the physical process of “interpret[ing], . . . creati[ng], . . . packag[ing] [and] . . . publishing” content. Nonetheless, despite the fact that physical commons are gateways to the “digital arena” these spaces are still very tied to the physical I/LC.

Stills (2001), in her analysis of library web sites in four countries (U.S., Canada, Britain, and Australia) discovered that there was consistent lack of online instructional materials and/or information on how students could access information remotely despite the large amount of material currently available on information literacy on the main library pages. ICs/LCs with their overt connection between learning, production and research are ideal sites for the presentation of and integration of digital information and vir-

tual information commons. Her study was done in 2001 but there was still little research on library web site engagement with digital space, digital information, and the participatory web (Web2.0) and no research on IC/LC web sites.

3.2 *Guiding Questions and Variables of Interest*

To begin addressing the many gaps identified above, the present study focuses on IC web sites of Canadian universities, in particular, AUCC defined medical-doctoral universities in order to determine:

1. Which Canadian medical-doctoral university had an IC or LC website?
2. Where is that web site located and is it easy to access it?
3. How are ICs/LCs defined?
 - a. The mission statement and/or name?
 - b. Or, services provided?
4. Are the services and space an accurate reflection of that definition;
5. And if there is an explicit or implicit relationship between the digital and knowledge commons and ICs/LCs. In other words, had they presented an “integrated digital environment” that carries over to the digital arena (in this case, the Internet)?

3.2.1 *Definition*

As explained in the literature review, commons found in libraries and in postsecondary institutions had a variety of names: Knowledge Commons, Information Arcade, Information Commons, and Learning Commons were the most frequent names used. However, in the last five to six years, there has been some “settling-in,” with a distinction made between spaces that provided primarily technology and reference and IT support

(ICs) and those spaces that make it possible to extend support outside of the library boundaries to include learning specialists, writing specialists and faculty (LCs). However, using the commons name is fashionable (Lippincott, 2006) and there are spaces created that use the name but are not ICs/LCs. An important question then, when looking at IC and LC web pages is: do the spaces described conform to the definition of an IC or a LC?

3.2.2 *Web Site*

Although ICs are created to bring students into the library, there is also an acknowledgement that students access information and resources outside of the library¹² (OCLC Online Computer Library Center, 2002). Peterson (2006) notes that “libraries are one of the most visited Web pages on a university’s web site” (p. 217), and that these sites are “crucial to delivering data, research tools, and instruction to students, faculty, staff, and community patrons” (p. 217) however, libraries and universities, like many other organizations, are not using the web to its full potential (Wright, 2004). They are often missing chances not only for data delivery, instruction and the provision of research tools, but also for “interactivity and multi-media presentations” (Kang & Norton, 2006, p. 428).

This is not unusual. Even web site developers do not use the web to its full potential (McMillian, 2000, p. 91). This is particularly true of ICs/LCs. ICs have a novel relationship to digital information and the Web because they are constructed to address the

¹² A relatively recent OCLC study (2002) showed that “over 90% access the web remotely from the library via their home computer, and the majority of students (78%) prefer that form of access.”

digital shift. ICs are addressing the digital shift to the extent that they are integrating technology with reference and IT in a physical environment. But, in most cases, this integration does not carry through to the digital arena.

In fact, the web presence of these spaces is more of an afterthought than another entry-way into the ICs/LCs. This is largely due to the role that web sites play in university culture - their primary role is to provide information (e.g., hours of operation, services provided) and to recruit - overall, university web sites do not engage in the larger more interactive or participatory web. This is beginning to change as universities like University of British Columbia and University of Manitoba create web sites that function as virtual ICs. Keeping this in mind, one of the aims of this study is to look at whether universities with ICs are viewing their web sites as part of their commons mandate or whether the web sites serve simply as informational sites.

3.2.3 *Rationale/Vision*

ICs/LCs' mission and vision statements are often determinants of how commons are created and run. Bennett's (2005) report on ICs found that "Some 65±6% of survey respondents reported that their projects are meaningfully influenced by an overall vision statement describing the library's mission and services" (p. 21). The University of Iowa's Information Arcade's mission was to "improve[e] teaching, increase[e] access to educational resources and explor[e] new technologies" (Duncan, 1998, p. 576), was, not surprisingly, focused on faculty needs. California State University's emphasis was on changing service needs and Cowgill, Beam and Wess (2001) writing about their new commons commented that "information technology certainly altered the scope and nature of public service by redirecting reference services philosophy, [and] expectations" (p. 434). As

seen above, the rationale/vision of the ICs/LCs is varied and the present study will also determine if any commonalities exist.

3.2.4 *Visibility*

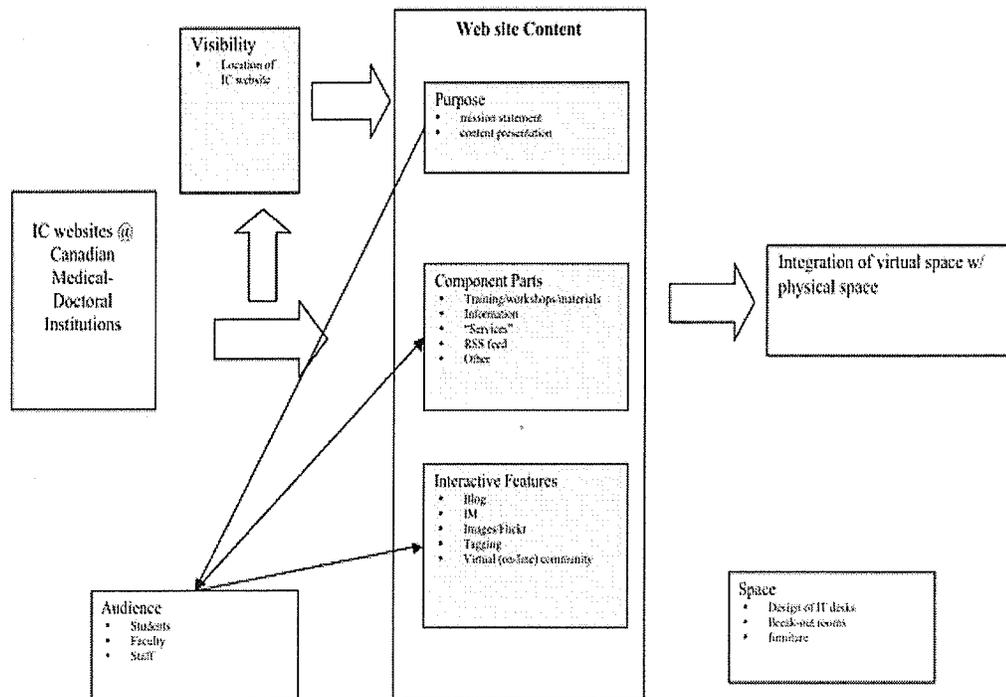
The location and ease of access to the ICs/LCs web site is another crucial element. Although Astroff (2001) noted that library link location is not necessarily an indication of importance the location does speak to their usefulness and availability. Instead, it usually speaks to the inconsistency of design from web site to web site and to each site's internal consistency. Indeed, Thelwall (2003) looking at academic hyperlinks noted “web links represent both anarchy and order” (¶ 3). Nonetheless, where the ICs/LCs web site is in relationship to the larger web site provides information about its function within the larger unit. Each link represented both a decision made by the site designer and a decision for the user (Haas & Grams, 1998). University web sites tend to be informational in nature, so each link represented a hierarchy of information. Links to libraries are often found on the main page of a University, and ICs/LCs which are most often departments in libraries, are not. Here again, visibility seems varied, making this another important foci of the current study.

3.3 *Conceptual Framework*

As seen in Figure 1, the conceptual framework represents the study and the ICs/LCs web page elements that was studied. The left hand side of Figure 1 reflects the first stage of the study and involves the visibility of the ICs/LCs web sites. Visibility in this study is determined by how easily the casual web user could find the site. This portion of the study does not involve content analysis and so is excluded from the “website content” box. The second stage as seen in the top box in Figure 1, involved an exploratory study of

the component parts and interactive features as well as a qualitative content analysis of the mission statement and/or introductory texts, for example “about us” or “policy statements”. The analysis of the component parts (the middle box in the “website content”) and interactive features (the bottom box in the “website content” box) is descriptive in nature. All the areas included in the analysis are shaded in grey. The other boxes “audience,” “space,” “institution,” “technology,” “support” are variables that provide context that is used during coding.

Figure 1. Conceptual framework.



3.3.1 *Unit of Analysis*

A non-random limited sample is used because defining a sample frame and a subsequent sample for ICs/LCs web sites present a number of difficulties. Selecting a sample when doing an analysis of web sites is complex because of the large number and the changing nature of web sites (McMillian, 2000). A web site may be available one day and gone the next (McMillian, 2000), which is true as well for documentation found on the web. This lack of consistency means that finding a truly random sample is challenging. In addition, unlike off-line content, on-line content is not “set” and lists of web sites for a particular topic/subject area/organization are often out-of-date, may contain broken links and/or are inefficient or inaccurate because they are collected by individuals (McMillian, 2000). Listings of ICs/LCs are no different, and currently no comprehensive listing of all the North American ICs/LCs exists.

Using search engines to develop a comprehensive list is also problematic. Search terms need to be accurate and appropriate for the search engine used (McMillian, 2000). In addition, search results are overwhelming and contain a large number of repeats. For example, using Google, the search term “information commons” resulted in 417,000 results and the results included not only “information commons” but also the broader sense of the term - digital and knowledge commons. Searching Google for “information commons +library” resulted in 325,000 web sites. Choosing a random sample from this list is problematic, yielding varied responses from too wide of a population of ICs/LCs. Thus, a more refined focus on a specific cohort of ICs/LCs yields more meaningful information.

ICs/LCs produced by public libraries, secondary schools, and postsecondary schools have different mandates and significantly different populations. Additionally, al-

though there are a number of listings (Beagle, 2006; Haas & Robertson, 2004; Henning, 2005; McMullen, 2007; Murray, 2004) none of them are comprehensive, and in all cases their primary focus is on U.S. ICs/LCs. This means that finding an appropriate sampling frame - "an operational definition of the population of interest" (Shaughnessy & Zechmeister, 1990, p. 81) using listings of ICs/LCs web sites present challenges. Universities, the institutions that house them, in contrast, present a stable population. As a result, the *Register of Postsecondary and Adult Education Institutions* will be used as the sample frame.

3.4 *Research Methodology*

This study is exploratory given the limited research on ICs/LCs, the almost non-existent information available on ICs/LCs in Canada, as well as the lack of research on ICs/LCs web sites (Canadian or otherwise) and how ICs/LCs are interacting with Web2.0 concepts. In addition, content analysis of web pages is still, on the whole, a relatively new area.

3.4.1 *Sample*

Krippendorff (2004) explains that a chosen sample must provide the "research question[s] a fair chance of being answered correctly" (p. 113). The population in this case are Canadian universities and not colleges. The sample is Canadian medical-doctoral institutions, and the sampling frame is the *Register of Postsecondary and Adult Education Institutions*.

Statistics Canada designated university institutional sub-types as "primarily undergraduate," "comprehensive," "medical doctoral," "First Nations and Métis," and "special purpose" (Statistics Canada, 2007). The terms are well known in Canadian post-

secondary education terms primarily because they are used by *MacLean's* for the annual university/college rankings. *MacLean's* adapted their terms from the U.S. Carnegie Classification (Statistics Canada, 2007). There are fifteen AUCC medical-doctoral institutions in Canada.

The sample is also limited to English-speaking institutions because of the intent and meaning of words change from language to language. For example, one phrase used to describe LCs spatially in French-speaking Canada is “Carrefour d'apprentissage” that translates into “Training Crossroads” (Elaine Fairey, personal communication, June 22, 2007). The implication of using “Training Crossroads” instead of learning commons deserves a study of its own. Thus, English language is an important criterion for having a web site included in the current study.

As seen in Table 2, the sample included twelve, primarily English-speaking, medical-doctoral institutions. This group is selected because this type of university provides a well-defined small sample that is framed by one type of institutional structure, having a “broad range of programs” at the undergraduate and doctoral level as well as a medical school (Canada Statistics, 2007) and having a diverse population with a significant portion of them commuting to campus rather than living in residence. Additionally, medical-doctoral universities are considered preeminent Canadian universities with strong reputations and funding, and well-established ties to government and other professional organizations (e.g., medicine, dentistry, law) (Crighton, 2005, p. 3). Choosing one institutional type also removed any other element of institutional variance. This allowed for the collection of data from fairly homogeneous cohort of institutions in terms of the types of

students and faculty/staff at each institution. Findings are more meaningfully interpreted in terms of studying this specific cohort.

Table 2. *Canadian, primarily English-speaking, medical-doctoral institutions.*

University	Website Address
University of Alberta	http://www.ualberta.ca/
University of British Columbia	http://www.ubc.ca/
University of Calgary	http://www.ucalgary.ca/
Dalhousie University	http://www.dal.ca/
University of Manitoba	http://umanitoba.ca/
University of McGill	http://www.mcgill.ca/
McMaster University	http://www.mcmaster.ca/
Ottawa University	http://www.uottawa.ca/welcome.html
Queen's University	http://www.queensu.ca/homepage/
University of Saskatchewan	http://www.usask.ca/
University of Toronto	http://www.utoronto.ca/
Western University	http://www.uwo.ca/

3.4.2 *Content Analysis and Coding*

A content analysis of the IC's mission statement and objectives was conducted by the investigator. Content analysis "is a group of techniques for making inferences from messages" (Leavitt, 1991) and "a method for inquiring into social reality that consists of inferring features of a non-manifest context from features of a manifest text" (Krippendorff, 2004, p. 25). As a result, the web site text, in particular the mission statements,

“about us” and/or the policy statements on those sites was examined to determine if there are any patterns among all Canadian IC/LC web site statements. In addition, the website's component parts such as information (e.g., hours, services, workshops), use of images, template (e.g., library's or university's), and/or RSS feeds, and interactive features such as IM, blogs, use of Flickr, tagging (de.licio.us), assignment calculator and online communities were studied.

Since the study is exploratory the analysis is limited to the investigator's analysis of the content, and inter-rater reliability is not used. All the steps are conducted solely by the investigator and guided by rubrics outlined below. The analysis is open-ended and specific to this study. However, this study provides the basis for future quantitative content analysis. Some initial codes such as “space,” “technology,” “learning,” “support,” and “services” are established. These codes reflected the language used by the current literature to define ICs and LCs. The codes are then further developed following the approval of the proposal and the actual sample data is examined. For the purposes of this proposal it is necessary to use a sample population in order to begin the coding process. As a result, Canadian Comprehensive universities (the same sample used to develop the visibility protocol) ICs/LC s web sites are used.

3.4.3 *Analysis of Web Site Elements*

In addition to the analysis of the “about” statements, an inventory of web site components, available content, and links was conducted. The inventory included what ICs/LCs specific information is available on the home page and sub-pages, and listing of type of service available (e.g. reference, IT support, writing tutors), ICs/LCs hours, and available

software and hardware. Appendix A lists the kinds of questions asked about each web site.

In addition to an inventory of the information provided, the sites are also examined for dynamic web elements such as instant messaging, images from or contributions to Flickr (a web-based photograph service that encourages tagging), links to Facebook, RSS feeds, blogs and online communities as well as more static elements such as online e-workshops, and podcasts.

3.4.4 *Web Site Visibility*

One portion of this study focused on discovering how the ICs/LCs are placed within the institutions' web site hierarchy. The web site discovery steps are as follows:

1. Determine which university has an IC/LC. The Google search engine traditionally found on University home pages is used in order to restrict the search to that university's web pages. The investigator searched each university using first the term commons, then "information commons" and finally "learning commons" (entered separately). These terms is used because of the variation in names used for commons (i.e., "knowledge commons").
2. For each university that have an IC/LC a search for the IC/LC web site is conducted using university provided links. Although there are some instances of commons existing outside of the library governance structure, the vast majority are found within the library and/or under library governance. As a result, the search for the IC/LC started from the main library home page. The home page is scanned to determine if there is a link off the home page to the commons. If not the investigator searched each web site sub-section (e.g. "Services," "Current Students," "Com-

puter Support"). The sub-sections varied from university to university as do the names, so the sub-sections for each library home page is listed.

3. The ease of finding the IC/LC web page is rated (Easy, Moderately Easy, Moderately Difficult, and Difficult).
 - a. Easy - The link to the webpage is found on the main page of the university library.
 - b. Moderately Easy - the link to the IC/LC webpage is not on the main page, but it is relatively easy to find the link to the IC/LC (i.e., a link under "Computers," a link under "Current Students").
 - c. Moderately Difficult - The links to the IC/LC webpage are not obvious and a number of sections needed to be examined before the link is found.
 - d. Difficult - the only way to find the IC/LC webpage is through "Google" or through an email/AIM request for help (i.e., emailing a reference librarian and asking if there is a IC/LC on site).

After finding the webpage, the number of links that needed to be "clicked" on to navigate to that site is counted.

Chapter 4 Results

The information gleaned in the present study provides a picture of the current types of ICs/LCs present at medical-doctoral university campus.

Key to this study was:

- IC/LC web site accessibility and visibility;
- How ICs were defined online either by mission statements and/or name or implied through services provided;
- Whether the IC/LC services and space accurately reflect that definition, and;
- If there was an explicit or implicit relationship between the Digital and Knowledge commons and the Information Commons.

These findings provided information on the components found in Canadian ICs/LCs, the make-up and function of IC/LC web sites, and will hopefully guide current and future administrators in the development and refinement of ICs/LCs.

4.1 *Institutions Included in Study*

Twelve institutions fit the criteria of English-speaking Canadian medical-doctoral institutions: Universities of Alberta, British Columbia, Calgary, Dalhousie, Manitoba, McGill, McMaster, Ottawa, Queen's, Saskatchewan, Toronto, and Western. Below is an overview of each institution.

Founded in 1908, the University of Alberta is located in Edmonton, Alberta (the capital of Alberta). There are approximately 35,000 graduate and undergraduate students enrolled. In addition to undergraduate and graduate programs Alberta offers Business,

Education, Engineering, Law, Medicine & Dentistry, Pharmacy, and Rehabilitation Medicine. (“Students at a glance,” 2009, ¶ 2).

University of British Columbia was established in 1908, and is located in Vancouver, BC and has approximately 50,000 students (“About UBC,” 2009, ¶ 1). In addition to a liberal arts program, undergraduate and graduate programs, the University of British Columbia has Law, Architecture, Dentistry, Kinaesthetics, Medicine, Pharmacy, and Journalism (“Faculties & Schools,” 2009).

The University of Calgary, located in Calgary Alberta, has approximately 27,000 students. It is a 40 year old institution and one of two medical doctoral universities (along with the University of Alberta) in the province of Alberta. The University of Calgary offers professional programs in Medicine Law; Nursing, Social Work, Education, Kinesiology, Engineering, and Veterinary Medicine (“About the U of C,” 2009).

Dalhousie University established in 1818, and located in Halifax Nova Scotia is the only medical-doctoral institution in the province. The student population is approximately 15,000 (“About Dal,” 2009, ¶ 3). The professional programs available at Dalhousie are Law, Medicine, and Dentistry (“Program Information,” 2009).

The University of Manitoba, founded in 1877, is located in Winnipeg, Manitoba and is the only medical-doctoral institution in that province. The UM student population is approximately 26,000 (“Students, Graduates and Staff,” 2009). The professional programs available at University of Manitoba are Law, Medicine, Dentistry, Architecture, Pharmacy, as well as the Asper School of Business (“Academic Programs,” 2009).

McGill University founded in 1821 is located near downtown Montreal at the base of Mont Royal. It was one of five universities in Quebec. The student population is ap-

proximately 35,000 with four professional/medical programs Law, Engineering, Medicine and Dentistry (“About McGill,” 2009 ¶ 3).

McMaster University is located in Hamilton Ontario. McMaster has approximately 23,000 students, and offers Business, Engineering, and Medicine as well as Physiotherapy and Rehabilitation (“About McMaster,” 2009)

The University of Ottawa is located in Ottawa, Ontario. It is the “largest bilingual university in North America” (“Since 1848,” 2009) and offers professional programs in Law and Medicine. In addition it offers other professional programs such as Education, Engineering, Management and Rehabilitation Sciences (“Faculties and Departments,” 2009).

Queen's founded in 1841 is located in Kingston, Ontario, and has total enrolment of 22,000 students (“Quick Facts,” 2009). Queen's university offers Law and Medicine Business, Education, and Engineering (“Academic Departments,” 2009).

The University of Saskatchewan is located in Saskatoon, founded in 1907 and has approximately 20,000 students. In addition to its undergraduate and graduate programs the University of Saskatchewan has Law, Medicine, Pharmacy, Veterinary Medicine and Dentistry programs (“U of S Facts and Figures,” 2009).

The University of Toronto was established in 1827 and is Canada's largest university. Its primary campus is located in Toronto, Ontario. University of Toronto has approximately 65,000 students (“Quick Facts,” 2009). Its professional programs consist of Architecture, Dentistry, Education (OISE), Law, Management, Medicine and Pharmacy.

Founded in 1878, The University of Western Ontario is Canada's oldest university and is located in London, Ontario. According to the “About Western” page the uni-

versity had 30,000 undergraduate and graduate students enrolled. Western has programs in Medicine, Dentistry, and Law.

4.2 *Content Analysis*

4.2.1 *Themes*

The IC/LC Webpage descriptions were coded based on six themes: space, service, technology, research, collaboration, and learning. All themes were consistent with literature on ICs/LCs (Bennett, 2003; Lippincott, 2006; Henning, 2005; McMullen, 2007). There was no one theme that appeared in all of the descriptions, but all the descriptions included at least one of the coded descriptions.

The theme 'space' was applied when "space," "place," "facility," "area," and "rooms" were used in the text. All of the IC/LC descriptions referred to a space. Seven of the ten ICs/LCs descriptions included some reference to the space within the commons, or how the commons space was used. All seven ICs/LCs' descriptions - Alberta, British Columbia, Manitoba, McGill, McMaster, Queen's and Saskatchewan - refer to specific details of the IC/LC space. Space was used in the web site descriptions to refer to areas within the space - "small group rooms," - and its purpose "learning environment." Both of the adjectives "learning" and "study" were used when describing the space, but "study" was used more frequently - "study area," "study facility," "flexible study areas," "group study area" and "group study rooms."

Service was coded when the descriptions used "service," "support," "serve," "help," or "assistance." How service was used in the descriptions varied quite a bit. Seven of the ten universities that had commons - Universities of Alberta, British Columbia, Calgary, McMaster, Queen's, Saskatchewan and Toronto - mentioned service in their

descriptions. In some cases the service described was general, for example, “support service,” “one-stop service,” “institutional services,” or “expert help,” and in other instances it was specific such as “learning support services” “research assistance,” “technical assistance.”

The code “technology” was used for references to hardware (e.g., printers, scanners, wireless), software, and “workstations.” All the ICs/LCs descriptions, except for Manitoba, mentioned technology in some form either with specific reference to the kind of technology that was (or would be) available in the commons (i.e. “software,” “scanning workstations” “computers”) or just generally as “technology.” In most cases the references were to specific types of hardware or software available in the commons.

McMaster included a reference to “information technology” in its description, but that was the only time that phrase was used.

Reference was coded when there was either reference to service (e.g., “research help”), or resources (e.g., “scholarly resources”). Reference was possibly implicit in such phrases as “one-stop service” or “expert help” but those terms were not included as one of the reference codes. There were fewer direct mentions of “reference” than to technology, space, or service. Five of the ten descriptions - Universities of Calgary, Manitoba, McMaster, Queen's and Saskatchewan - included some mention of reference. Information literacy was not mentioned specifically; however, Queen’s description stated that it provided “improved support for accessing and exploring digital resources” and the University of Manitoba description included the phrase “how to do research.”

The codes for learning included “learning” included “mentoring,” “collaborate,” “exploring,” “study,” and “learning.” Seven of the ten LC descriptions’ included a refer-

ence to learning: Alberta, British Columbia, Manitoba, McGill, McMaster, Queen's and Saskatchewan. British Columbia, McMaster, and Queen's described the commons as a "learning space" with Queen's description describing the commons as an "enriched learning space." Queen's description also included references to "collaboration," "exploring" and students' "pursu[ing] and shar[ing] ideas," McGill University and University of Saskatchewan referred to "learning experience" and "success in learning" respectively.

Other terms that were noted, but not coded, were students, food, access and community. Nonetheless, it was worth noting that students were only mentioned three times. Mills described their space as "student-centered," the Manitoba described the VLC as a "great place to meet your fellow students" and Queen's stated that their LC "brings together in one place a comprehensive, integrated set of academic support services and resources for Queen's students." Food, which is often associated with ICs/LCs, is only mentioned by McGill and Saskatchewan.

4.2.2 *Website Descriptions*

The Universities of Alberta, British Columbia, Calgary, Dalhousie, McGill, McMaster, Queen's and Saskatchewan all had ICs/LCs and IC/LC web sites. The University of British Columbia had a previously developed LC that was under construction, and Saskatchewan's was re-developing the LC located in the Murray Library. Both universities had temporary IC/LC web pages and descriptions of the upcoming space. Manitoba did not have an IC/LC but it did have a Virtual Commons.

Only three of the IC/LC web sites had vision or mission statements (British Columbia, McMaster and Queen's) that could be found online, and of those, only British Columbia had theirs available on the website. McMaster and Queen's mission statements

were found in their planning documents and annual report respectively. All the web pages, however, had some form of an IC/LC description.

The University of Alberta had a description of their KC. Space, learning and technology was mentioned in their description, and technology was the main focus of the description. In one paragraph there were seven references to technology. Nonetheless, the first sentence described the space: “spacious desk areas,” and “group meeting rooms,” and made a connection between the space and learning: “a place to come and study, work, and collaborate.”

The University of British Columbia’s Chapman LC existed before the construction of the Irving K. Barber Learning Centre began. There were therefore, three potential descriptions; the initial Chapman LC description, the description used while the commons was under construction and the new description provided once the Chapman reopened in July of 2008. This study analyzed text that was ‘captured’ in January of 2008, while the Chapman LC was under construction.¹³ The January 2008 pre-opening description was

¹³ British Columbia’s Chapman Learning Commons reopened in the Fall of 2008. The new description is very similar to the pre-opening description: The Chapman Learning Commons, located on the third floor of the Irving K. Barber Learning Centre, is a collaborative and innovative learning space that brings together learners of all types--students, faculty, staff and community members--making the most of technology to support and enhance learning and teaching at UBC.

The new web site is located within the Library template and has links to “Learning Resources,” “Upcoming Events,” “Room Bookings,” “Hours,” “About,” and “Contact

short, but included references to learning, service, technology and space. The first sentence introduced services, programming and technology; the second described the space; and the final sentence re-introduced technology. The description of the space focused on the seating configurations – "space for group work as well as comfortable seating for individual study" – and technology - "equipped with wireless access."

The University of Calgary IC's home page provided a one sentence description of the commons. The emphasis of this description was on service – "one-stop service," research, and technical assistance. The space and its accompanying technology were not described.

Dalhousie University had four LCs located respectively in the Killam Library, the W.K. Kellogg Health Library, the Sir James Dunn Law Building, and in the Sexton Library. However, there was a home page for Dalhousie LC with links to all the LCs on campus. The description found on this home page included reference to space, service, research, and technology. In particular, Dalhousie's description included a reference to integrating information with technology, information resources, and the "academic environment."

Us." The Centre column has general information about the Commons, a slide show of Commons pictures that feature students and Commons staff, and a list of News and Events to the left of the center text. The "News and Events" pieces are general and not necessarily LC related. For example, there is a news piece on "UBC Line Key to Increased Transit Ridership and Campus Sustainability."

Each commons also had a description, but all the descriptions were brief and almost identical in content. Each included a sentence on the commons locations and how many workstations each had. Each commons had some variation on the kinds of technology available (e.g., scanner, colour printer).

McGill's IC webpage was a stand-alone informational page, whose parent page was "computers and software" which in turn was organized under "Using the Library" on the McGill Library home page and all information about the LC was included on that page. As a result, just the first paragraph of the page was included in the analysis of the site description. The entire text provided a general description of the commons, information on the donors and a more detailed description of the IC including location, hardware, and software available. The description included space (e.g., "custom designed facility," "private meeting rooms"), technology (e.g., "high-end workstations"), online resources (e.g., "library e-resources," "web tools") and learning (e.g., "enhance your learning experience").

McMaster's LC had a description of the site on the "About" page. The site also had a link to an annual report, which included its vision statement. The commons description found on the web site touched on all the prominent commons themes – "student-centered," "learning space," "scholarly resources," "information technology," "expert help," "instruction," "collaborative . . . study space," and "individual study space." There was no mention of technology except for "information technology," but "space" was included twice - "student-centered learning space" and "collaborative and individual study space."

Queen's LC described space, location, and services provided. It described the purpose of the space to provide "in one place a comprehensive, integrated set of academic support services and resources for Queen's students." This description also mentioned amalgamating staff from a variety of units ("unites staff from formerly disparate service units"), as well as research and technology support for students ("included improved support for accessing and exploring digital resources and technology"). Space, learning and resources/support were its major themes. Technology was mentioned only once in reference to support offered.

The description for University of Toronto's Scotia Bank IC included typical commons themes – technology and support – but the focus was different; its focus was on multimedia and communication. The commons supported email, "document and film scanning," video recording, event recording, and offered help distributing the final product. There was no mention of technology in the description. University of Toronto had another commons, the RBC LC, located in the new Hazel McCallion Academic Learning Centre; however, there was no webpage for this commons and no description, so this commons was not included in the analysis.

The description for University of Manitoba's Virtual LC (VLC) described itself via space, but in this case it was a virtual space and identified as "place." The focus of this description was on learning and community. The VLC was a "place" to "make connections," "meet fellow students," and how to be "a successful student."

The University of Saskatchewan's University Learning Centre (ULC) was under construction. The link to the site referred to the space under renovation as the "University Learning Centre" but the text on the page referred to the space as a LC. The web site for

the ULC provided information on what was in the space, as well as a tag-cloud. A tag-cloud is typically a computer generated list of words pulled from the site (often ‘tags’¹⁴ used to describe content). In this case, the words were neither from the site, nor from tags created by users of the site; instead, they were elements/features that were found in the new ULC. The ULC’s tag-cloud incorporates many of the LC common themes – “flexible study areas,” café, group study rooms, “onsite IT help,” and “success in learning.”

There was an alternate LC Web site on the University Saskatchewan web site, but there were no visible links to it from the library or home page, and was considered, at the time of the study to be a dead site (e.g. a site that still has a viable address but was no longer linked to by the university web site).

4.2.3 *Web Site Discovery*

The twelve institutions that fit the criteria of being English-speaking Canadian medical-doctoral institutions included: Universities of Alberta, British Columbia, Calgary, Dalhousie, Manitoba, McGill, McMaster, Ottawa, Queen’s, Saskatchewan, Toronto, and Western. Seven of the institutions’ had ICs/LCs in operation, two had ICs/LCs under construction, one had a Virtual Commons and two had no ICs/LCs. Included in the analysis were descriptions of the institutions’ IC/LC web sites with particular focus on visibil-

¹⁴ Tags are “non-hierarchical keyword[s] or term[s] assigned to a piece of information (such as an internet bookmark, digital image, or computer file). This kind of metadata helps describe an item and allows it to be found again by browsing or searching. Tags are chosen informally and personally by the item’s creator or by its viewer, depending on the system” (“Tags (metadata),” 2009, ¶ 1).

ity, description of the space, the kind of information provided by these web sites on services, software and hardware, as well as the website’s interactive features and visual presentation. Table 3 lists the institutions, whether they had a commons and the web site, and an URL of that IC/LC with date of access. A content analysis of each IC/LC web description, which are listed in Appendix B, follows the descriptions of the sites.

University of Alberta: Knowledge Common. The University of Alberta’s KC is located in the Cameron Library, the science and technology library, which is located on the primary University of Alberta campus. The KC is in the basement of Cameron Library next to the Technology Training Library (<http://www.library.ualberta.ca/kcommon/>).

The KC home page was informational in nature. It was located within the library template, and its address (<http://www.library.ualberta.ca/kcommon/>) indicated that it was within the library web structure. The home page provided a description of the site and linked to information about the hardware and software, scanning, printing and how to save documents. There was a "contact us" link but no links to KC specific staff or to staff other than librarians. There was also a link to the "AICT Help Desk" which leads to a U of A login page. There were also no explicit links to information literacy, to research, or to learning on this page.

Table 3. *IC/LC web site URLs*

University	IC/LC	IC/LC web site URL if available
University of Alberta http://www.ualberta.ca/	Yes	http://www.library.ualberta.ca/kcommon/
University of British Columbia http://www.ubc.ca/	Yes	http://www.library.ubc.ca/chapmanlearningcommons/welcome.html (January 9, 2008) http://www.library.ubc.ca/chapmanlearningcommons/index.html (April, 2009)
University of Calgary http://www.ucalgary.ca/	Yes	http://library.ucalgary.ca/services/informationcommons/ (January 9, 2008) http://library.ucalgary.ca/infocommons/ (April,

		2009)
Dalhousie University http://www.dal.ca/	Yes	http://www.library.dal.ca/Services/Commons (January, 2008 & April, 2009)
University of Manitoba http://umanitoba.ca/	Yes	http://www.umanitoba.ca/virtualllearningcommons/ (January, 2008 & April, 2009)
McGill University http://www.mcgill.ca/	Yes	http://www.mcgill.ca/library-using/computers/commons/ (January 9, 2008)
McMaster University (http://www.mcmaster.ca/)	Yes	http://library.lib.mcmaster.ca/mills/learningcommons/index.htm (January 9, 2008)
Ottawa University http://www.uottawa.ca/welcome.html	No	
Queen's University http://www.queensu.ca/homepage/	Yes	http://www.queensu.ca/qic/ (January 9, 2008 & April, 2009)
University of Saskatchewan http://www.usask.ca/	Yes	https://library.usask.ca/ULC-LTP (January, 2008 & April, 2009)
University of Toronto http://www.utoronto.ca/	Yes	http://www.utoronto.ca/ic/ (January, 2008 & April, 2009)
Western University http://www.uwo.ca/	No	

The webpage was difficult to find. Alberta had no link to their commons from their home page. There was a link to the libraries found under "quick links" on Alberta's home page. There was also no link to a commons from the library's home page. The link to the KC was on the "Computing" page as well as on the "Learning Services" page. It was four 'clicks' in (Alberta home page > Libraries home page > Learning Services > Knowledge commons and TTC intro page > Knowledge commons or Alberta home page > Library home page > Computing > Knowledge commons). The user would need to know that it was listed under computing or under learning services. Learning Services is a small link at the bottom of the page.

Service was limited to support for the technology in the KC. There were links to the AICT (Instructional Computing Labs) help desk, a listing of public computing services (which also lists the KC), and a link to a list of other computer labs on campus. Links lead to booking study rooms, information on linking laptops, hardware & software, a floor plan using university disc space, saving, scanning and printing.

The KC had 140 computers, three "scanning workstations," four printers, and one colour printer. All computers included productivity (Microsoft Office), multimedia (Macromedia Studio 8), and accessibility software (Zoom text, JAWS) as well a variety of other tools (see Appendix D). Certain computers in the KC (labelled KCA-W) had SPSS. The scanning stations use home page software and also had Adobe Photoshop CS2.

There were no interactive features or RSS feeds specific to the KC page. The Cameron library provided IM access to the reference librarians and RSS feeds for news, new books, ejournals, library instruction, "Winspear Business & Economics News with a Canadian Twist," "Coutts Canadian-Flavoured Education News" and the "BiblioBlogue." In addition, the Cameron Library had a Facebook page with news, information on Cameron hours, IM, a listing of workshops, and a Flickr feed of Cameron library images. Individuals on Facebook could become "fans" of Cameron Library. None of these features were directly associated with the KC; however, there was news of the KC on the Facebook page (accessed on May 10, 2008). In addition, the Cameron Library was undergoing renovations (this included the KC) and had a blog chronicling their progress (a link to the blog was on the University of Alberta's library home page).

The KC had its own logo, and the web site had a large picture of students working at computer stations placed in the middle of the web page. There was, however, on the

“Picture Album” page a picture of a large sign located in the Knowledge Commons that said “Learning Commons.”

University of British Columbia: Chapman Learning Commons. University of British Columbia’s Chapman LC is part of the new Irving K. Barber Learning Centre (IKB). The Chapman LC existed before the development of the IKB Centre (<http://www.library.ubc.ca/chapmanlearningcommons/history.html>) and was situated at the center of the main floor of the main UBC library (main concourse). The IKB Learning Centre¹⁵ had its official opening in April of 2008, but there was no online indication that the Chapman LC was also open.

At the time of the study, the Chapman LC web site stated that “The Chapman LC was currently closed to allow for the construction of Phase 2 of The Irving K. Barber Learning Centre at University of British Columbia. The LC will reopen in the completed

¹⁵ The Irving K. Barber Learning Centre was described as a “revolutionary and evolutionary facility dedicated to the intellectual, social, cultural, and economic development of people in British Columbia.” It was built around the older (1925) UBC main library. The Centre houses a portion of the library collection (21 million books), the archives, the Chapman LC, informal study areas (1,500 study seats), a variety of classrooms and study rooms, a theatre, café, reading room, as well as a number of departments (School of Library, Archival, and Information Studies (SLAIS) Center for Teaching and Academic Growth (TAG), Office of Learning Technology (OLT) and the Gateway Programs – Arts One, Science One, Coordinated Arts and Coordinated Science).

Learning Centre early 2008"¹⁶ ("About the Commons," 2008, ¶1). There were links in the right hand column to "Alternate Study Space," "Citation Guides," "Laptop Lending," "AMS Tutoring," "Academic Integrity," and "LEAP" and links in the left hand column to "Library & IT," "Learning Resources," "About," "Contact Us" and "The Library." "Learner Resources" leads to the UBC Library "Instruction Centre" (<http://www.library.ubc.ca/home/instruct/welcome.html>). The new Chapman page linked to LEAP, a site rich in resources and Web2.0 features (instant messaging, blogs, online survey, and available tutors),¹⁷ and Citation Guides.

¹⁶ British Columbia's "About" page was unavailable during the website-capture period. As a result the "about" statement was not included in the analysis.

¹⁷ LEAP was a virtual space created to integrate multiple resources on one website. It was "an innovative collaboration between students, faculty and administration developed to strategically coordinate the use of resources to better meet the learning and research needs of UBC students." LEAP was interactive (e.g., survey, RSS feed, interactive quizzes and blogs), integrated information from a variety of departments, and presented a web presence that was a place not just another informational site. The connection between this site and the Chapman Learning Commons was well established as of April 28, 2009 but that relationship was tenuous when the initial study (January, 2008) took place. At that time the Chapman Commons was still under construction and although there was a link to LEAP there was no clear indication that LEAP was a Chapman LC project and so was not included in the study.

The University of British Columbia had a link to the Library's home page from the University home page. There was no mention of a commons on the home page of the Library's home page, but there was a link to Irving K. Barber Learning Centre (IKB) which houses the new Chapman Learning Commons.¹⁸ The Chapman page was moderately difficult to find. It was potentially available within three clicks from the University home page, but that depended on where it was on the library "feature" rotation. These features were rotated on the Library home page every time the page was refreshed. The resources shown appeared to be random. In first ten refreshes Chapman appeared twice. Chapman was available within four clicks if the user clicked on "Branches" and a link to the Chapman LC site was in the drop down menu. A link to Chapman is also found on the IKB home page under "Programs and Services," as well as a link on the home page to the Second Canadian Learning Conference.

Services located in the Chapman LC were non-existent because the LC was closed. However, they list a number of services available on campus (e.g., AMS Tutoring, LEAP, room bookings, laptop lending).

No software or hardware was listed on the Chapman LC site.¹⁹

¹⁸ The history and current status of the UBC LC was discussed at the 2nd annual Canadian LC conference (June, 2007).

¹⁹ The new site noted that the LC "will soon provided access to a variety of technologies including multimedia software and hardware."

There were no interactive features on the LC page. There was a link to LEAP, which was designed as an interactive site that contained a number of Web2.0 features including blogs and interactive quizzes.

The Chapman LC home page was not located within an established template. The left-hand column had a picture of the backs of students graduating as a watermark. In the right-hand column was a small picture of a student borrowing (or returning) a laptop, a window in the Chapman LC, and a picture of Kay and Lloyd Chapman who donated the monies necessary to build the Chapman LC.

University of Calgary: Information Commons. The IC was located in the MacKimmie Library. There were two other, smaller, commons located in the Health Sciences Library and the Law Library. The Law IC had a webpage with information on technology, hours and available services (<http://library.ucalgary.ca/branches/law/about/facilities/linfo/>). The Health Sciences IC did not have a page. Instead, there was a link to information on booking rooms in the IC space (<http://library.ucalgary.ca/branches/hsl/hsic/>).

MacKimmie Library was the largest library on campus and provided documents from all disciplines. The commons provided “one-stop service for library research and technical assistance,” and that “service was jointly provided by the University Library and Information Technologies” (“Information Commons,” 2009, ¶ 1).

The University of Calgary IC home page had top tabs, left hand column links, and centre column content as well as a bottom banner. The top tabs, and the bottom banner were part of the library and the links in those areas were found on all the library pages. The tabs were "Home," "Catalogue," "Research Databases," "Reference Sources," "E-

Journals," "Subject Resources," "Services," "FAQs," and "U of C Homepage."²⁰ The bottom banner had a "Our Past/Our Future" logo (Alberta Heritage Digitization Project), "Our Roots," and links to Archives & Special Collections, Image Centre, The Nickle Arts Museum, University Press, Acceptable Use, Policies, and Site Map. All of these sites were library related projects.

The centre content on the home page included a brief description of the space, services offered, hours, and where other campuses ICs were located. In addition, in larger font at the bottom of that section, were links to IC policies ("Food and Drink," "Computer Use" and "Unattended Workstations")²¹, as well as the "Library Code of Conduct," and a link to "User feedback." Contact information for the LC coordinator, Susan Beatty, was prominently displayed just below the main text.

The left hand column was divided into three sections "Information Commons," "Quick Links," and "Library Information."²² The latter two were found on all the library

²⁰ When the new IC home page was put up the tabs were changed to "Home," "Online Resources," "Books," "Journals," "Research Support," "Services," and "News."

²¹ These policies were removed when the new version of the IC Web site was put up August, 2008

²² The Quick Links were "Book a Workroom," "Information Commons," "Login & Troubleshooting," "My UofC Portal," "Renew Books," "Request Interlibrary Loan," "Site Map," and "U of C Computer Account/E-mail." The Library Information links were "Contact Us," "Hours," "Service Points," "Maps & Directions," "What's New," and "Policies."

pages, but the "Information Commons" section was only available on the IC home page. The Information Commons' left-hand column links were "Services," "Technical Support," "Hardware & Software," "Library and Computer Instruction," "Information Commons Hours," "User Tips," "IC Planning Documents," "IC Learning Aids," "User Feedback," and "Book an IC Study Room." All these sub-pages were informational in nature.

The "Services" page included information on reference assistance, computing assistance, assistance in the use of maps, air-photos, data, GIS, & statistical resources (MADGIC), interlibrary loans, and adaptive technology. The "Technical Support" page itemized the kind of technical support available (software installed on the computers, wireless connections in the IC, printing and scanning), and a number of technical tip sheets. The "Library and Computer Instruction" page included library and computer instruction and workshops, the library tour schedule, contact names for the LEAP-ESL program, a link to the "Writer's Block Series" and information on consulting with a librarian. The "Information Commons Hours" page included hours for the IC, the IC service desk, reference phone hours, the interlibrary loan hours, the MADGIC hours and the hours for MacKimmie Library.

The "User Tips" page included "service features," hours, "special media area" (e.g., scanning, adobe documents etc.), "Get Help" (e.g., IT and Reference), how to save documents securely (e.g., on the server), first come first served computer policy, free instruction, workrooms, policies and a listing of the quiet study areas (e.g., the workrooms in the IC were quiet study areas). The "IC Planning Documents" page consisted of one link that lead to an earlier IC home page with links to documents created while planning the IC.

The "IC Learning Aids" page contained "IC Technical Support Sheets" (e.g., printing, saving files, headphones, USB keys, wireless, and CD Burners), a link to "Microsoft Office Training Manuals," U of C's "Student Computer Support" home page, a link to "Electronic Publishing: Thesis & Document Formatting" which included thesis templates for LaTeX and Word, a listing of Information Technology (IT) services, and links to full-text online computer software manuals (available to U of C staff and students only).

The link to the library from the Calgary home page was under "Quick Links." There was a link to the Calgary IC on the Calgary Library home page. Also on the Calgary Library home page was a "What's New" section. Under that section was a news item about writing tutorials available in the IC, and an IC feedback form. The IC was available one click off the U of C Library home page and two clicks from the U of C home page. The site was very easy to find (See Appendix C).

The primary services offered in the IC were reference and IT (information technology). However, there was a pilot project started October, 2007 that incorporates writing tutors into the IC. Writing workshops ("Writers Block Series") were offered in the library space, but were not IC specific.

The software available on IC computers was Microsoft Office products, including FrontPage, Adobe Reader, and Firefox. On the media computers Adobe Professional products were available, and the "Adaptive" computers offer such programs as Zoom Text and Inspiration.

There were no interactive features visible on the IC page. All information was flat-text except for book a workroom feature which allowed users to book a study room online. The contact information provided an email link and a phone number, but no IM.

The IC web page was logically organized and presented information in a coherent manner with logical links. There was only one image on the IC pages, and it stayed consistent - a picture of pen on a pad of paper. There were no other pictures, and no pictures of the IC space and/or of students.

Dalhousie University: Learning Commons. There were LCs located in every library at Dalhousie (Kellogg, Sexton, Killam and Law). The main LC was located in Killam Library, the central Dalhousie Library (Nikkel & Kutty, 2004). The Killam Memorial Library was the "largest library in the Maritimes" and received a major government grant in 2002 to renovate its space to accommodate a Learning Commons (Nikkel & Kutty, 2004, p. 11).

There was a homepage for each LC as well as a general LC homepage. The general or main LC home page described the LC, and then listed the types of hardware and software available. There were links, at the top of the center column, to the four libraries with LCs. The individual library LC web pages all had one sentence descriptions. There were no links, except through the Dalhousie logo, at either the top or the bottom of the page. The left hand links on the LC home page were consistent throughout the Dalhousie library pages, except that the "Services" link was un-collapsed (i.e., shows its sub categories) on the LC page. The LC specific links were "Hours," "Policies," and "Support." The centre text contained the description. The LC home page also described the kind of technology available and listed the type of "productivity software" available and where it was located. The Killam LC home page provided substantial information on the types of services available for students, while Sexton, Kellogg and the Law library provided very brief descriptions of the technology available.

Dalhousie Library was a prominent link off the Dalhousie University home page. The Dalhousie Library had no direct link to their LC. The first section checked was "Services," and there was a link to the LC found on this page. The link to the LC was in the list of services in the menu at the side. Dalhousie LC was moderately easy to find.

The services listed on the web site indicate that reference and IT support was "available at all LC locations." However, the Killam library had incorporated both a reference and technical services desk into its commons and offered a wider range of services. In addition to IT and reference, there was writing, Geographical Information Systems (GIS), and Statistical Computing support (by appointment only for faculty and graduate students); in addition, there was a Maths and Stats Help Centre (<http://www.mscs.dal.ca/learning/learningcenter.html>).

The Dalhousie LC website also provided a detailed list of hardware and software. The commons had what they called express workstations and scholar workstations. The express stations provided general access to the library catalogue and resources. According to the web site, the express stations were available to everyone, including individuals outside of the Dalhousie system (e.g., not students, staff or faculty). Scholar workstations were intended for students, staff and faculty. All of these workstations had Microsoft Office 2007, SPSS, and Minitab. Other workstations, depending on their location (e.g., Kellogg, Sexton, Law) had different software available. For example, the Law library had WordPerfect, Sexton had Matlab and Hysys, and the Killam LC had Microsoft FrontPage, Adobe Creative Suite (as did Kellogg) and Video editing software. Killam also had a number of GIS computers placed in the GIS support area, and adaptive software installed on all of the scholar stations in the Killam, Kellogg and the Law libraries.

The interactive features available on the LC web site were limited. There was instant messaging available on the front page of the Dalhousie library page but it was not visible from the LC page. There was an assignment manager which can be found under "How did I" in the left hand link column. There were no RSS feeds, blogs or podcasts connected to the LCs. However, there was a news and events blog found on the Dalhousie library page.

The main LC page had one picture of students working in the commons. Subsequent pages (e.g., Services, Policy, and Hours) had no pictures. The Killam Library LC Service page had no pictures. The Library web site library, including the LC web page, used the Dalhousie template and the Dalhousie colours.

The University of Manitoba: The Virtual Learning Commons. There was no visible link to an IC/LC on the UM Library webpage, or the Elizabeth Dafoe Library, but on the map of the Elizabeth Dafoe Library there was an IC labelled on the main floor (http://umanitoba.ca/libraries/units/dafoe/about/floor_plans.html). However, on the UM's home page was a link to the Virtual Learning Commons (VLC). As the name indicated, this was a virtual commons but it was not connected to physical space. A report on the development of the LC at the UM web site (2006) makes an explicit reference to the Virtual LC as an element of the LC in-development (Learning Commons Task Force, 2006), but this study was primarily concerned with the relationship between the physical commons and the virtual commons.

There was no description of the physical IC. The VLC description was:

a place to make connections and meet your fellow students. It's also a great place to find out how to be a successful student - how to do research, write A+ papers,

hone your study skills and effectively manage your time so that you can get everything you need to do, done (“About the Virtual Learning Commons,” 2005 ¶ 1).

The only commons web site found on the University of Manitoba site was the VLC. There was no web site for the IC identified on the Elizabeth Dafoe library map. The VLC had three columns, a banner and footer. The left hand column had three categories – “Home Communities,” “Tools,” and “Resources.” *Home Communities* linked to “Undergraduate,” “Graduate” and “International.” The *Tools* links were “Assignment Manager,” “Online Writing Tutor,” “Online Help,” “Calendar,” “Workshops,” “Site Map,” and “Daily Sudoku.” *Resources* links were “Start @U1,” “First Year,” “Computing,” “Libraries,” “Study Skills,” “Time Management,” and “Writing.”

The centre text consisted of list of what appears to be discussion topics. Some examples of discussion topics were “What course was an easy social science or humanities course?” “Input on Intro to Philosophy/World Religion???” “Need good tickets to see Oasis in September.” “Who wants to play tennis?” “The tuition thaw” and “How did you like workshops?” When the mouse moved over the topics a box pops up with a snippet from the last entry. Users can organize these discussions by “activity,” “random cloud,” “alphabetically,” “recently added,” “top 20” or by “category.” The right-hand column has a link to the login page, a “Photo Gallery” which was a feed from the UM Flickr site, and a “Featured Profile.” The featured profile was similar to a Facebook profile and included favourite music, movies and other interests.

The “Tools” section was limited to UM students/faculty/staff, but the “Resources” section was available to all site visitors. Each page in the resource section was nested with the UM template format. Most of the resources were content based sections (e.g.,

“Computing,” “Writing,” “Study Skills,” and “Time Management”). The content sections were two column pages with the left-hand column staying the same as the VLC’s home page. The right-hand/centre column consisted of topics that were organized in a non-linear manner with each topic framed by a blue triangular shape which was circling around a central topic (e.g., “Writing” in this case). There was also a link at the top of the page to a site map for each section, which was presented in outline form.

No physically located services were linked to from the VLC but there was an online writing tutor associated with the VLC. There was also online content (e.g., “Writing,” “Study Skills”) available under “Resources.” This content was available to all site visitors not just UM students.

No hardware or software was listed in the VLC. There was no hardware or software associated with the Information Commons identified on the University Library map, but the libraries did list, under “Services” available computer labs.

There were a number of interactive features associated with the Virtual Learning Commons: assignment calendar, calendar, “to-dos,” “user profiles,” and interactive tutorials associated with the content portion of the site. The interactive tutorials were available to anyone visiting the site, but all other interactive features were only available to an individual with a UM account.

The VLC is located within the UM template but the UM logo found in the left hand corner was a dead link; it was a live link on all other UM pages. The UM template consisted of a banner with UM links and three columns. Most of the site’s look was determined by the UM template’s look. There were pictures in a Flickr stream in the right hand

column. There was no explanation of the site on the VLC home page; information about the VLC was found on the "About" page linked from the home page.

The University of McGill's Redpath Information Commons. The University of McGill's IC web site indicated that the IC is located on the main floor of the Redpath Building, at the north end of the main floor of the Redpath Library. The site information shows that the IC provides computers, appropriate software, access to the library databases, and private study rooms ([http:// www.mcgill.ca/library-using/computers/commons/](http://www.mcgill.ca/library-using/computers/commons/)).

The IC web page was not a home page, instead it was a sub-page of McGill's Library "Computers and Software" page. Any links off of this site were links found on all the other McGill library web pages and there were no links that were IC specific. The McGill Library template in which the IC page was located had tabs, a header, footer, left column links and a right column events, news links, as well as links to McGill maps. The centre content, which was IC specific, described the IC, its history, stated that the space was only available to McGill staff and students, and provided some information on the Info Café, which was associated with the IC. There were breadcrumbs at the bottom of the page that led to "copying and printing" and were not connected to the IC.

There was a direct link to the McGill library from the home page. There was no link to the McGill IC from the University home page. There was also no direct link to the IC from the McGill Library home page. There was no link under "Using the Library" on the home page. The link to the IC was found on the "Computers and Software" page which was a sub-page of "Using the Library." The IC link was in the left-hand column and was not found in the centre text. There were four 'clicks' necessary to reach the

McGill IC (McGill Library home page >"Using the Library">"Computers and Software">information commons). The IC webpage was difficult to find.

No information on services offered was provided on the McGill LC page. The closest information desk (reference) was the Birks Reading Room (found under "Seeking Assistance> ask us") and there was no mention of IT support available at that desk. The site did show that there were seven group rooms available for students. These rooms had LAN plug-ins as well as access to wireless for users laptops.

The description provided on the IC web page noted that the IC had 43 computers, 2 printers (B&W and colour), wireless, Microsoft suite, DVD players and CD readers/writers. There was no information available on how the machines were configured and if the software varied from machine to machine.

The web page was informational and no interactive features were available on the IC page. McGill library had an RSS feed for announcements and IM chat.

The IC page was very clearly situated within the McGill Library template. There was a picture on the page. The picture was small, black and white, semi fish-eye view of a computer screen and students/staff working at computer stations in the distance.

McMaster University's Mills Learning Commons. The Mills LC was on the second and third floors of Mills Memorial Library with the "private study" rooms located on the third floor. The commons was operated under a partnership between Centre for Leadership in Learning (CLL), Centre for Student Development (CSD), McMaster University Libraries, and University Technology Services (UTS) (<http://library.mcmaster.ca/mills/learningcommons/about.htm>).

The Mills LC's home page was a page with four pictures titled "Explore: About Mills Learning commons," "Inquire: Library and Research Help," "Learn: Learning Support," and "Experience: IT Support." And each picture was a hot link that lead to that page. Each of these pages was situated within the McMaster University template, as were all larger McMaster Library Web pages, and was not a LC-specific template. Despite the location of the pages within the larger McMaster template, the links in the left hand column were consistently LC specific. Each library page had an identical head which contains a library search box and an "Explore" drop-down menu with links to "Library Quick Links" "LibAccess: off-campus Access" "Library Catalogue" "Hours" "Forms" "Renew Books" "Recommend Books/Journals" "Supporting Your Library" "Contact Us" "FAQ" "University Technical Services" and University Home Page." The footer contained an email address for "Library Web Team," update date (November 29, 2007), and a stable URL for the page.

McMaster had a link to the library from the home page. The McMaster Libraries home page had a link to a LC in the left hand column. There was also a link to the LC in the left-hand column under "Services" on the Mills Library home page. Information about the LC at McMaster was also found under "Library Computer Services" which had a link called "Software available on computers in the Learning Commons" (under "Library Services") and a link to "Learning Support" under "[. . . more services]" on the McMaster home page. The "learning support" link took the user to a sub-page of the Mills LC web page also called "learning support." These various routes all took four

clicks, but the primary link took two (see Appendix C) and The Mills LC was difficult to find.²³

The Mills LC provided reference, IT support, as well as "Academic Skills Counselors" and "Peer Helpers." Also available were writing clinics, workshops (e.g., library research, writing and study skills), and online academic skills workshops.

There was no information on the number of computers available, but Mills did list software available (e.g., Microsoft Office suite, Adobe Professional 8, citation software, SAS and SPSS, programming software, adaptive software such as Zoom Text, and idea mapping software). All listed software was available on all computers (http://library.mcmaster.ca/mills/gen_camp_apps.htm).

The LC's "Academic Skills" partners provided downloadable audio/video based workshops in multiple formats. In addition, individuals could IM both the reference and IT staff. McMaster Library home page had a news and events RSS feed, and a library wiki designed for first year students.²⁴

Each web site section had the picture which was also found on the opening flash page, and which acts as a link to the respective page. For example, the "About" page had

²³ As of September 22, 2008 the McMaster Library's webpage was completely revamped and the Mills LC web site was no longer available onsite. It was possible to find it using Google, but not possible to find it via links on the McMaster website.

²⁴ The McMaster Library home page has evolved significantly since this study was started, and now hosts a larger number of interactive/web2.0 features (<http://library.mcmaster.ca/>)

a picture of male student (e.g., facing forwards and pictured from the waist up) holding a sign that reads “Explore,” and the “Library and Research” page had a picture of a woman holding a sign that says “Inquire.” Clicking on those pictures brought the user to that webpage.

Ottawa University Commons. There was no commons at Ottawa University. There was a link to "Student Mentoring Centre" from the main page of the Morriset Library. This Centre provided study skills, writing and research help. The Centre administration was a partnership between SASS and the Library. There were also a number of web-based interactive features they provided on the library home page – an assignment calculator, a research basics online tutorial, and access to reference support through MSN.

The Queen's Learning Commons. The Queen's LC opened 2005 (Babington, Condra, Reynolds, Whitehead, & Whitehead, 2006) and was “driven by student interests and the initiative and creativity of staff in several different University units who [we]re weaving their specialties together to support academic success” (p. 2). Like McMaster's LC, Queen's LC also had a number of partners: the Library, IT Services, Learning Strategies Development, Library Services for Students with Disabilities, and the Writing Centre.

The LC Home Page did not use the library or the University template. The header and footer were part of Queen's University template. The header had a drop down list of links to the University (not the library) and footer had the copyright date, general information about Queen's and contact information (e.g., a phone number). The LC page had a left-hand column, a right hand column, center text, and a sub-header, which was outside the Queen's template header. The LC header had links to “About,” “Workshops,” “As-

signment Calculator,” “FAQ,” “Links,” “Contact,” “Feedback,” and “Finish Your Certificate!” The left-hand column contains “Quick Links” which were “Workshop Registration,” “Assignment Calculator,” “MyQueen's Portal,” “Hours,” “Inquiry at Queen's,” “Book a Group Study Room.” The right-hand column contained RSS news feed stories that appear to be LC related (“Register for Winter Workshops,” “Inquiry @ Queen’s Undergraduate Research Conference,” “Winter Computer Skills Workshops”) since these news stories only appear on the LC page. The Centre column consisted of links to the various service partners (e.g., I.T., “Learning Strategies Development” department, Reference services, Disability Services and the Writing Centre) but with a focus on the task required (e.g., solve, learn, find, access and improve).²⁵

There was a link to the Library from Queen's home page under "Resources." There was also a link to the Queen's Library LC off of the Libraries' home page. The Library home page was divided into various text boxes that ran in three horizontal columns. The Link was in the centre column under "Help." It took two ‘clicks’ to access the Queen’s LC from the Queen’s Library’s home page. The Queen’s LC was easy to find.²⁶

The LC offers workshops in “Accessibility Skills” (i.e., introduction to accessibility software), “Computer Skills,” “Learning Skills,” “Library Research Skills,” and “Writing

²⁵ Solve your computer problems with IT Services; Learn better with Learning Strategies Development; Find all your research material at the Library; Access Library Services for Students with Disabilities; Improve your writing with the Writing Centre

²⁶ A link to the Queen’s Learning Commons is now available off of the Queen’s University home page under “Resources.”

Skills.” They also offered a QLearn Certificate program which awarded students who take eight workshops from any of the group listed above. Writing and learning development tutors/instructors were available for one-to-one appointments, and there was “walk in” IT support. All of the LC’s partners were located in the Learning commons.

IT was listed as a partner on the IC home page, but there was no mention of hardware or software on the IC page or any of the LC child pages, and no indication that computers were a part of the Queen’s LC. However, in Queen's LC's annual report (2005/6) they noted that there were 150 computers available for student use in the LC (Babington et. al, 2005).

There were two interactive features, the assignment calculator, and an RSS feed to LC specific news. The RSS feed was not special to the LC. There was a RSS specific news feed for most major departments. The LC did not have podcasts, but Queen's had Alumni Events, special lectures, campus tours, and a history of Queen's available on iTunes U.

Each topic on the Queen’s LC parent page (e.g., Solve, Learn, Find, Access, and Improve) was associated with an icon. “Solve” (e.g., IT) had a laptop icon, Learn (e.g., Learning Strategies) had a post-it with “to do” on it. “Find” (e.g., Reference) had a magnifying glass. “Access” (e.g., Library services for students with disabilities) had a person touching a Braille output device, and “Improve” (e.g., Writing) had a picture of Escher’s “Writing Hands.” Each icon led to a separate site, and the individual sites did not repeat the original icons.

Queen's LC also had a banner that was different from the banner used by the library. The LC used the same red used in the Queen's header (red) and had a picture of the

Stauffer Library. Queen's Library used that banner to advertise its space (the banner was found in the right hand column at the bottom under "News" but not part of that section). There was no left hand column.

The University of Saskatchewan Learning Commons. The University of Saskatchewan LC was a new space and was under construction at the time of this study.²⁷ The web page description stated "The Murray Library Building was undergoing exciting changes over the next year and a half to create the new LC – a more functional and relevant space for students and faculty."

There was no LC web page, but there was a LCs' renovation page. This was a solo page and was situated within the library/university template. The University of Saskatchewan's template pages used the entire screen (many of the university web sites in this study did not use the entire screen) and were made up of multiple text boxes organized into three columns with a left hand column that stayed consistent from page to page. All template pages had a header and footer.

The Library home page used the same anchored left-hand column but the links were library focused links rather than the University of Saskatchewan template links. In the left-hand column was "Login," "Your bookmarks," "U of S Library" and "University Learning Centre." The library header had links to "Home," "Our Catalogue" "Ask Us," "How did I...?" The rest of the page was divided into text boxes that run, including the

²⁷ A Google search produced another LC website, but there were no useful links to it on the Saskatchewan site. There was one link found via the IT help desk and the Disability services page describes the site.

left-hand column, four columns wide. One of the text boxes was titled "Spotlight" and there was a link to the "University Learning Centre/Library Transformation Project," described as a LC on the project page, in this box. The footer listed the library address and contained three links: "Contact Us," "Copyright" and "Job Opportunities."

On the University of Saskatchewan home page there was no link to the library. However, on each web site page there was a consistent "Quick Links" box on the right-hand side of the page and this box contained a link to Library. A link to an information page about the re-construction of the library and the LC was in the centre column of the library main page template. The link referred to "Student Learning Centre" but the text on the "We're Renovating" page referred to the space as a "Learning Commons." If the user was looking specifically for a LC it would be difficult to find because there was no link that explicitly stated it was linking to the LC. However, if users were familiar with the connection between the University Learning Centre and the LC then the site was easy to find. It takes one 'click' off the main page of the library to reach the LC "under-construction" web site.

Since the LC was under construction there were no services per se. However, because the LC was a partnership between the University Learning Centre and the Library it can be assumed that there was writing, academic skills, and math support. In addition, the tag cloud contained "IT Help" and "Research Help" which indicated that there would be technology and reference support.

There were no interactive features on construction site, but the library web site did provide a bookmark tool called "Your bookmarks," RSS feeds, and a blog on the LC renovation. The use of a cloud-tag and blog was an indication of the participatory web

ethos although neither was interactive. On this page there were also two rendered drawings of LC service desks.

The University of Toronto's Scotia Bank Information Commons. The University of Toronto's Scotia Bank IC was established in 1996 (MacWhinnie, 2003) specifically to provide technology and technology support to students (Beatty & Mountifield, 2006). The IC is located in the library building but is not part of the library proper and provides no connection to reference or library services (Beatty & Mountifield, 2006).

The Scotiabank IC home page had its own page structure and was not a part of either the University or Library template. It also had its own URL (i.e., it was not a subsection of the Library URL). There was center text which described the function of the commons and the services it offers. The left hand column had a number of links; the right hand column contained "did you know" information about the commons as well as a Google search box for the IC. The header contained tabs to a variety of commons services.

The University of Toronto had a link to its libraries off the home page. The Libraries' home page had no indication of an IC/LC as either a link or text. A search of the four tabs at the top of the screen (Resources and Research, Library Services, General Information, and Help) on the library home page also produced no link. A search of the individual libraries (Mississauga and Scarborough) did not produce a link to an IC. However, the page "Computing and Connections" under "Library Services" had a link to an IC at the Robart's Library (St. George Campus). The Scotiabank IC was difficult to find. A user needs to look first under "Services" and then know to look under "Computing and Con-

necting” - U of T>Library>Library Services>Computing and connecting>information commons.

All services provided at the Scotiabank IC were for technology, media production and new media. The services listed were computer access facilities, help desk (e.g., technological support: i.e., webmail, internet wireless access, password changes, printing), digital studio (e.g., image scanning and editing, OCR, print design and web design and support), licensed software office, media production, new media suites, and media distribution.

There was no information available on the number of computers available. It was mentioned that all the computers had access to email, the laser printer (fee based), and Microsoft Office. The computers in Roberts’ Computer Access Facilities (CAF) had access to the colour laser printer, as well as to scanners, and “graphic and webpage design software (Adobe Creative Suite, Dreamweaver)” (Scotiabank Information Commons, 2008). It was unclear whether the CAF was considered part of the IC.

There were no interactive features available on the IC page. The University of Toronto Library system had IM but no other visible interactive features on the home page other than a link to eTools which included such things as RefWorks, Racer (e.g., Rapid Access to Collection by Electronic Request), myLibrary and article finder.

Scotiabank IC did not use the University or the University Library template. It used a three column format with a banner. In the banner area was a picture of various service points in the commons, with people featured prominently.

There was no evidence that University of Western Ontario had either an Information or Learning Commons. The University of Western Ontario's Library was linked from

the home page. The link was under "Finding Your Way." There was no mention of an IC/LC on the Library home page. A check of the menu items at the top of the screen ("Home," "Contact US," "Off-Campus Links," "Hours," "Libraries," "Catalogue," "Help," and "Quick Links") produced no links to an IC/LC. A search of each individual library also produced no results. The Weldon library had a cafe with writing tutors who were available for drop-in appointments. A Google search (using first "information commons" and then "learning commons") of the Western web site indicated that Huron Library had a LC. Huron College was an affiliated college and so the IC will not be considered in this study.

Chapter 5 Discussion

Twelve Canadian medical-doctoral university LCs/ICs were the focus of the current study. Of specific interest were the various components – visibility, services, software and hardware, interactive features, and visual presentation - that comprised the LCs/ICs and the extent to which similar patterns existed among these different universities. The commonalities and uniqueness of each of these components were further identified below.

5.1 Commons Descriptions

In one of the first studies on development of learning spaces in libraries, Bennett (2006) suggested that in order to be successful, learning-spaces need to develop mission or vision statements that are aligned with the larger institutional mission, and that address, systematically, student learning within these spaces. From his research he concluded that most of the mission statements for new spaces in libraries tended to be library-centric and did not take into account student learning or classroom teaching.

It was difficult to determine if ICs/LCs at Canadian medical-doctoral universities are aligned with the university's mission or take student learning into account since there is only one IC/LC mission statement, British Columbia's, included on an IC/LC web site. Two other institutions, Calgary and McMaster, have mission statements found elsewhere online. Calgary's is available in the planning documents they make available on the LC web site, and McMaster's mission statement is found in the library's annual report.

Typically, mission statements are used to set strategic goals and to motivate staff (Morphew & Hartley, 2006). This, then, could explain the lack of mission statements on the web sites as well as the location of Calgary and McMaster's statements. Mission

statements are often used primarily for internal use and potentially to guide the development and/or the administration of the ICs/LCs rather than as public statements of intent. However, since one of the questions is whether the web sites' mission statements presented an accurate picture of the physical IC/LCs, IC/LC webpage descriptions are used instead to assess what the purpose of the ICs/LCs are and how that purpose is presented to the users.

Typical elements of an IC/LC include a space designed specifically for learning, technology, the provision of academic resources, a focus on student learning, collaboration between a variety of departments, student services not typically found in the same space, increased access (i.e. ICs/LCs open 24 hours) and food (laxer food policies and the inclusion of cafes). None of the descriptions includes all of these elements, but all the descriptions mention at least two of them. McGill's IC web site description is the only one to mention "extended access" (i.e. extended hours) and food ("conveniently located next to a food court").

In the literature on ICs/LCs space is central because it is the reorganization or rebuilding of existing space or the construction of new space that produces a commons. Even if new technology is introduced, staff is reorganized and expanded, and/or the traditional library service refocused without a revision/ing of the space there is no commons. When listing the key elements to LC planning Henning (2005) noted that the design of the space and institutional agenda are necessarily connected. Proponents of ICs/LCs (Bradley, 2004; Bennet, 2006; Beagle, 2006; Lippincott, 2006) believe that an IC/LC space should be bright, open, flexible, welcoming, social and informal.

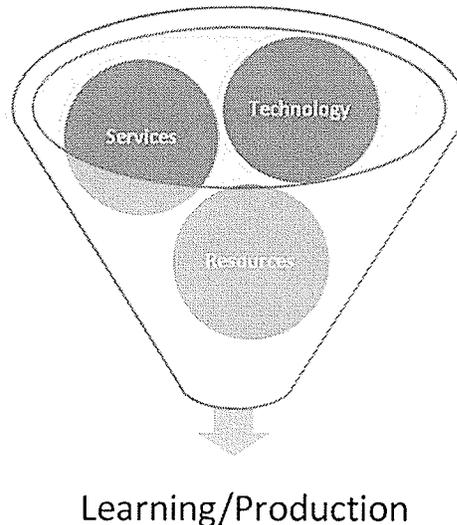
A description of LC space (place) is found in all the “about” statements except for one, Toronto. How space is defined varied to a degree, but the statements really only had two ways of describing the space. They either saw the space according to its functions (e.g. group rooms, a place to study) or its purpose (e.g. inviting, collaborative, student-centered).

However, when presenting the space to users, function rather than purpose is highlighted. Alberta’s, British Columbia’s, Dalhousie’s, and McGill’s descriptions of space are defined by their function. Alberta’s LC is a “place to study,” British Columbia simply has a “space” and “comfortable seating for group work.” Dalhousie and McGill both describe their commons as a “facility.” Dalhousie has a “state of the art facility” and McGill a “custom designed research and study facility.” In contrast, the purpose or intent of the space is the controlling idea behind McMaster and Queen’s descriptions of space. McMaster’s space is “active” and “student-centered” and Queen’s is “collaborative” and “inviting.”

At the time of the study Manitoba, Ottawa, Saskatchewan and Western had no LC (although Saskatchewan’s web site shows some evidence that they had some version of a LC previously). Though Manitoba had no physical LC the VLC’s About statement does describe it as a “place” where students can “make connections and meet your fellow students,” and “find out how to be a successful student.” And Saskatchewan’s cloud contains phrases like “flexible study areas,” and “group study rooms” which indicate an awareness of key LC concepts.

As seen in Figure 1 there is an essential relationship between service, technology and resources in a LC. Beagle (1999) noted the importance of this relationship when he described the IC/LC space as a place that “organizes workspace and service delivery around a digital environment” (p. 82), and Leavey librarians (location of the first North American LC) Crockett, McDaniels and Remy (2002) re-emphasized this relationship when they stated that the Leavey Library’s commons is a space where students can access “large collections of electronic resources and productivity tools on every desktop *along with* in-person research and computer consulting assistance” (my italics) (p. 16). They go on to say that, previous to the development of the commons space, there is no place where students could access “both reference and computer assistance” (p.16).

Figure 2. Relationship between service, technology and resources.



Service is included in most definitions of an IC where an IC is seen as a “one-stop shop,” a place where students (and sometimes faculty) can find help for not only research, but also technology, study skills, writing and sometimes even academic advising and career counselling. The type of staff (i.e., writing tutors, academic advisors, counselors, librarians, computer technicians) and the inclusion of services that extend across de-

partments is key to the LC concept in contrast to an IC which is typically more library centric and tends to be information rather than learning focused (Bennett, 2006).

Five of the seven universities with active I/LCs – Calgary, Dalhousie, McMaster, Queen’s and Toronto – include some form of “service delivery” in their descriptions. Queen’s description is the most extensive and articulate: “comprehensive, integrated set of academic support services” and “unites staff from formerly disparate service units who assist students through individual consultation, workshops, peer mentoring, and collaboration.” Calgary lists “one-stop service” as a feature, McMaster has “expert help” and Toronto provides “frontline support/help.” Dalhousie’s commons” brings together resources to help students, faculty and staff integrate resources.” Here, however, it is unclear whether “resources” refers to staff or to general print and digital resources.

When the web sites were captured, British Columbia and Saskatchewan both had LCs that were under construction. Nonetheless both provided web sites with descriptions that indicate some form of service in the IC/LC. British Columbia’s description states that it “offers learning support services” and Saskatchewan lists “research help.” British Columbia’s online mission statement provided a list of services such as “learning support services and programs, including tutoring, writing and research support, study skills workshops, [and] academic peers.” Alberta, Manitoba and McGill do not mention service in their descriptions. Both Alberta and McGill’s descriptions focus on space and technology. Manitoba’s space is virtual but it does have a link to an online tutor.

This element is mentioned the least. Only four of the libraries – Calgary, McGill, McMaster and Queen’s — refer to reference and/or library resources specifically. Calgary is traditional in its approach and refers to “library research,” Dalhousie mentions

“information resources,” McMaster acknowledges the changing landscape and refers to them as “traditional and emerging scholarly resources,” McGill states that it provides access to the “library’s e-resources” and Queen’s refers only to “digital resources.” Dalhousie makes a reference to “resources,” but it is unclear if they are referring to staff resources, information resources or both.

Alberta’s description focuses only on technology as does Toronto’s. Toronto’s IC however, fulfills a very different function than any of the other ICs. Its primary purpose is to provide digital/technical support to Toronto students and staff. There is no obvious connection to the University of Toronto library and students do no academic work in the space. In contrast, Alberta’s space exists to provide the technological resources specifically for academic production. British Columbia specifically mentions a number of resources, but none of them are library resources.²⁸ University of Saskatchewan makes reference to “research help” but not the resources themselves.

Calgary, Dalhousie, McMaster and Queens, four of the seven universities that had active ICs/LCs, make the connection between reference and technology explicit in their descriptions. Calgary’s very brief description does not mention technology specifically but does say that they provide “one-stop service for library research and technical assistance.” Dalhousie describes the kind of technology available in the commons space but also states that it “combines information resources with advanced technology and brings

²⁸ British Columbia’s LC was under construction when this study was conducted, which could be a reason for this exclusion, but the newly opened Commons also does not include any reference to library resources.

together expertise and resources necessary to help students, faculty and staff integrate information with technology.” McMaster’s description is more global and uses the term “information technology” rather than the word technology or computer. Queen’s description mentions technology, but combines it with digital resources and service (“offers support for accessing and exploring digital resources and technology”).

Neither British Columbia’s nor Saskatchewan’s temporary descriptions make the relationship between technology, library research and support explicit, although both mention that access to technology and support are elements of their commons. British Columbia offers “access to a variety of technologies” and “learning support services” but those two features are not explicitly connected while Saskatchewan’s word-cloud lists “onsite IT help” and “research help.” It is important to note, however, that British Columbia’s vision statement does make the connection explicit, stating that the commons space “brings together learners of all types . . . making the most of technology *to support and enhance* learning and teaching” (my italics) and “our friendly student staff are available . . . to help you with your academic, technical, and directional questions” (my italics).

Alberta and McGill, the two ICs with descriptions that place more emphasis on technology, make no connection between it and support for it. Alberta describes itself as a “technology resource” with “200 computers . . . scanning workstations, printers . . ., and software for your scholarly needs” while McGill’s space is “equipped with high-end workstations fully configured with access to all of the library’s e-resources, web tools, etc.” Alberta’s IC does, however, provide an AICT help desk and another link to library contacts, which includes the number for the Cameron Library service desk.

Key to LC spaces is that students should be learning rather than just gathering information. As Bennett (2006) asserts in *Libraries Designed for Learning* “information is secondary” (p. 39). It is discouraging then to find that only McMaster and Queen’s mention learning specifically in their descriptions, and just Queen’s makes learning the focus of its description. McMaster describes the Mills Learning commons as a “learning space” while Queen’s stresses that the space is an “inviting, collaborative learning space where people *pursue and share ideas*” (my italics) and an “enriched learning environment.”

Dalhousie, McMaster, and Queen's descriptions are the most reflective of the current understanding of what an LC should represent, describing not only the space and its purpose but also how the commons integrates services, including research and learning support. Dalhousie’s description stated that their LC “brings together expertise and resources,” while McMaster’s stated that their LC “integrates traditional and emerging scholarly resources, information technology, expert help, [and] instruction.” Queen’s description of its LC is the most expansive; it described integrating “disparate” departments to “assist students through individual consultation, workshops, peer mentoring, and collaboration.”

Alberta and McGill’s descriptions more closely resembled the more recognizable computer lab. Although both of these spaces emphasize the increased access to technology and information resources there is no mention of the other elements of an IC/LC – staff support for students using the space. Toronto’s IC fits an earlier description of an IC, in that it offers both technology and staff support. In fact, in MacWhinnie’s (2003) description of an IC she stated that they were “central or major access point to provide information resources and technology for the academic community that allows students,

faculty, and researchers to integrate new technology into their work” (p. 245). But this IC does not resemble the more current understanding of that space (Beagle, 2006; Bennett, 2006; Lippincott, 2006) in that it does not mention flexible space, the incorporate of external departments like academic support centres or even the library, or most importantly does not mention learning.

British Columbia, Manitoba and Saskatchewan all had descriptions of physical spaces that were either under construction or did not exist. British Columbia and Saskatchewan’s spaces were under construction. Manitoba’s LC is still in the planning process (LC Proposal, 2006), so the Virtual Learning commons, linked from the University home page, referred to a virtual space only. British Columbia’s description identifies service (e.g., "learning support services and programs"), space (e.g., "space for group work as well as comfortable seating for individual study") and technology (e.g., "a variety of technologies including multimedia software and hardware" and "wireless access").²⁹ The VLC description focuses on community (e.g., “a place to make connections and meet your fellow students”) and resources (e.g., “how to did research, write A+ papers, hone your study skills and effectively manage your time”). Services are offered (e.g., Online Tutor) but they are not mentioned in the description. Saskatchewan’s LC page did not include a description; instead it had a cloud tag which listed all the key LC terms.

²⁹ The new UBC description was expanded with descriptions of the types of services offered, but still placed an emphasis on learning and support. This new description included one important change; the emphasis on all the types of learners found on campus – “students, faculty, staff & community members.”

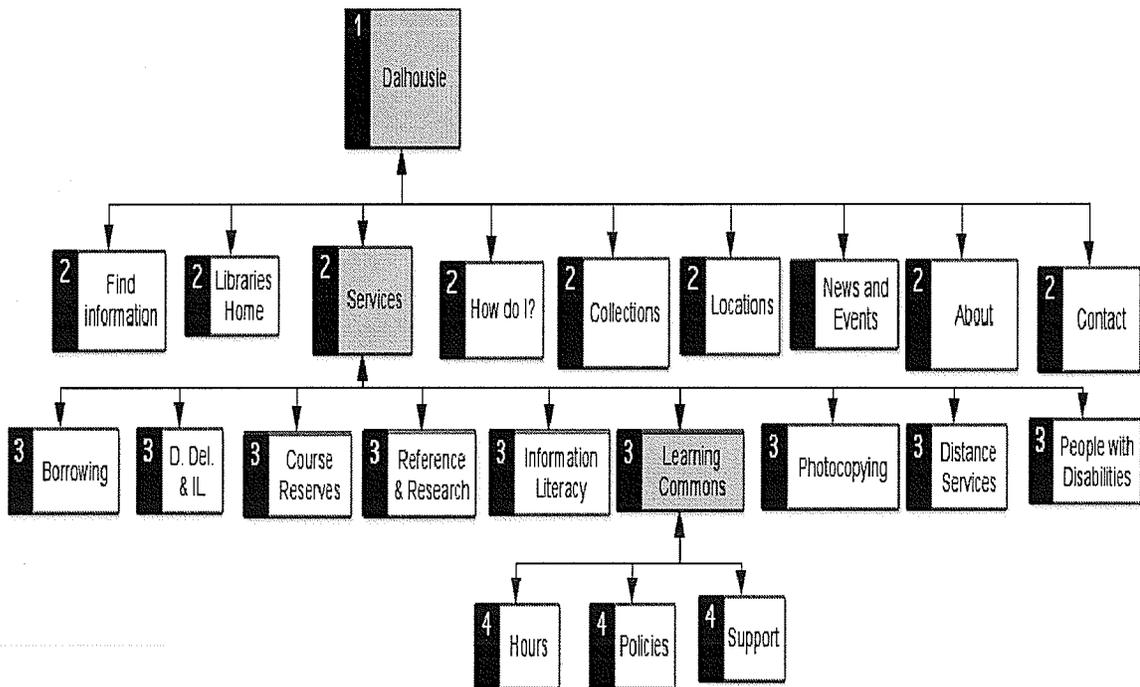
5.2 Home Pages

One of the questions of this study is how the IC/LC web site is placed in the university and/or library web site hierarchy. Is the IC/LC space highlighted on the library/university website? Also, are the IC/LC web sites presented as spaces that are separate from the library, or as just another department/space in the library? In most cases the web sites are not distinct – they use the library template with library tabs/links placed prominently on the web site and their URL is an extension of the library's URL (e.g., <http://library.mcmaster.ca/mills/learningcommons>). It is clear when visiting the sites that they are all part of the department of the library, and it could probably be assumed that they would offer services similar to those offered by the library.

Alberta, British Columbia, Calgary, Dalhousie, McGill, and McMaster IC/LC web sites are all located within their respective library web sites. Alberta, British Columbia, Calgary, Dalhousie and McMaster are home pages located within the library website. Manitoba, Queen's and Toronto are all home pages and stand on their own. All three have their own URL and are not embedded in either the University or library template/website, although Manitoba's site used the University web site format. This number can be further reduced by Manitoba's lack of physical commons and Toronto's different focus which is not on academic learning or writing, scholarly production or research but on the development of appropriate technological skills and the production of media materials. McGill is not a home page; instead, it is a sub-page to "Computers and software," which in turn is a sub-page to "Using the Library." Queen's, as a result, is the only university with an operating IC/LC that matches the current definition of an IC/LC that has its own URL and stands as its own home page separate from the Library.

As already noted, Alberta, British Columbia, Calgary, Dalhousie and McMaster are all children pages of the Dalhousie Library home (parent) page. Each of these IC/LC web sites has standard library template links as well as links specific to their webpages. Each of these IC/LC web sites is, to a certain extent, defined by their location in library web site hierarchy. Dalhousie’s LC website, for example, is located under services and its pages are terminal. As seen in Figure 3, the organization of information on the Dalhousie web site is hierarchal and the IC/LC webpage fit well into a traditional tree structure. Also, if you follow the logic of the structure, then Dalhousie’s IC/LC is seen as a service to library users, at the very least by the site designers and most probably by the librarians who made decisions on web site organization and content.

Figure 3. Dalhousie web structure.

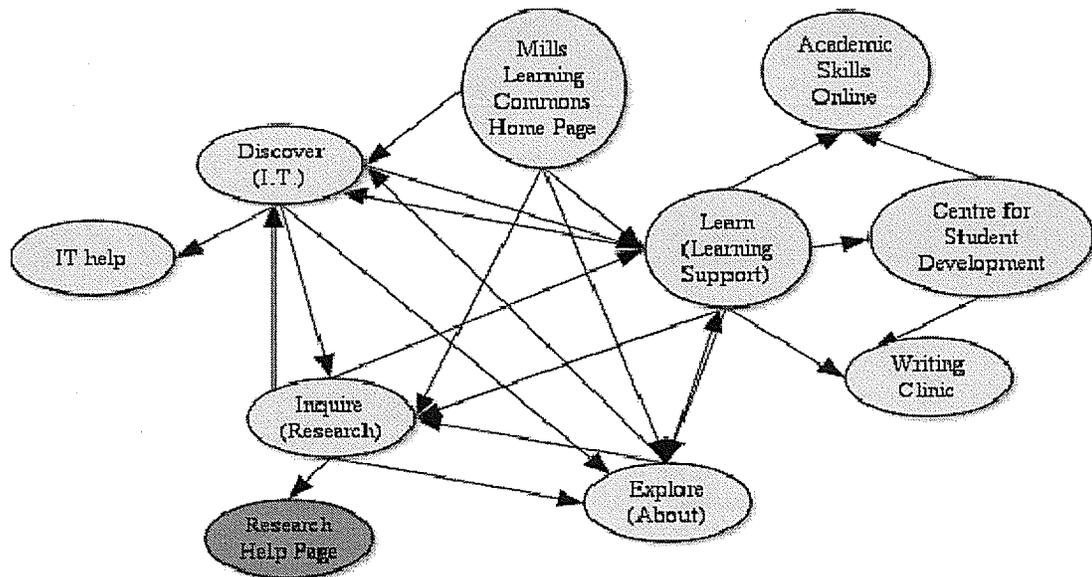


Toronto’s IC/LC web site is hierarchal, like Dalhousie university’s website, but its status as a standalone home page meant that all the links lead to IC-specific sub-pages;

there is no reference to the library and the only reference to the University of Toronto is limited to a hot link via the University of Toronto logo at the top of the Scotiabank Information Commons home page.

McMaster’s IC/LC web site is located in the library template; however, the only links to the McMaster Library are those to the individual libraries found at the top of the page and a hot link via the university logo. McMaster’s site also has a more complex architecture with a “cover” page that consisted of five links that lead to five separate pages. As seen in Figure 4, all the links referred to each other and created a “web” of information rather than a hierarchy of information.

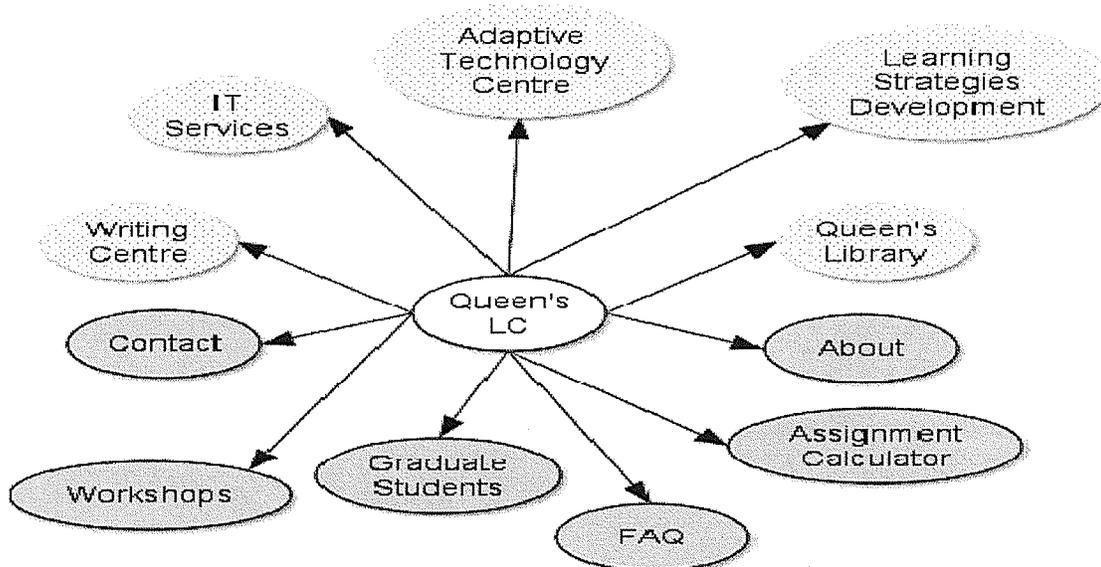
Figure 4. McMaster’s Learning Commons’ web site structure.



External links to the library are also defined by the LC, so links to library reference are on the "Inquire" page and the links to the Writing and Academic skill centre are all on the "learning" page.

As seen in Figure 5, Queen's LC web site is also non-hierarchical in organization, but it functions more as a hub, with links to all the LC partner web sites as well as LC specific pages, than as a web like McMaster's web site. The lower bubbles are all sub-pages of Queen's LC website, using the LC's URL and template, while the upper bubbles are University departments with their own links and structure. The Stauffer LC's webpage does not present these pages hierarchically sub-pages or not – they appear as a linked list. Instead, the links make the connection between the activity and the linking department explicit. For example, the link to the Library is "Find all your research material at the library" and the word "library" is a link. And, although information on hours, and types of computers is available the emphasis is placed on services.

Figure 5. Queen's Learning Commons' web site structure .



The IC/LC web sites are, on the whole, static and designed to share information, and not to highlight or incorporate web-based tools and resources. Individuals using these web sites would be looking for computer programs available, hours the commons is open, or possibly what kind of services are available in the commons. In addition, with the ex-

ception of Queen's, Manitoba, and Toronto, the sites are unbranded and do not have a presence that is separate from the larger library.³⁰

Alberta, Calgary and Dalhousie IC/LC web sites are primarily informational. The sites provide information on hours, services, policies, and hardware/software. There are also links to research help, and information literacy but these are library template links, available just on the library pages not IC/LC specific and with no explicit connection made between the potential activities occurring in the LC and the information supplied on the Library and/or LC website, although Dalhousie's IC/LC description – “help students, faculty and staff integrate information with technology in the academic environment” - does indicate that this kind of work is expected in the I/LC.

Differences, although limited, are in web site format, specifically in how and what information these web sites provide. This is further emphasized with the “about” statements. All the physical sites provide technology, but not all provide information about the technology available. This is particularly true of sites that place an emphasis on service and learning (e.g., Queen's, British Columbia, and McMaster). In addition, the location of these web sites on either the university's or library's web site differed according to purpose. In most cases, the ICs/LCs, unless they are outside the library structure, are located under either “Computing” or “Services.”

³⁰ Interestingly, the two stand alone sites, McMaster and Calgary, were no longer in existence as of Fall, 2008. Calgary has rebuilt its web site within the library template, and McMaster's web site has been removed all together.

5.2.1 *Visibility*

There is no consistent link location to ICs/LCs' web sites from institution to institution, nor is there consistency on ease of access. For an overview, a list of all the web sites, the links necessary to access them, and their ease of access (visibility) rating is available in Appendix C. Manitoba, Queen's, and Calgary IC/LC web sites are the three most prominent web sites. A link to Manitoba's IC/LC web site is located on the University of Manitoba homepage. Manitoba's IC/LC web site is novel in this study, as noted earlier, because it is virtual and not connected to a physical IC/LC; nonetheless, its placement on the University homepage indicates a commitment on part of University administration to the concept. Queen's and Calgary's IC/LC links are not as prominent, but links to their site are on their library's home page.³¹ All three of these web sites are "easy" to find. All the remaining IC/LC web sites are placed deeper into the web site hierarchy and "moderately difficult" to "difficult" to find.

Both British Columbia and Dalhousie are "moderately easy" to find. Neither IC/LC web site is linked to from the library home page; however, both sites have links placed in logical locations and are prominently placed in that location. British Columbia's Chapman LC is found as a "stand alone" entry under "Branches" (pull-down menu) and under

³¹ Queen's web site was revamped for the Fall of 2008 and a link to Queen's LC is now on the university home page. The Calgary Library also redesigned its home page in fall of 2008, but did not move the link to the IC; it was still found under "quick links." As of November 2008, Queen's and Manitoba were the only two universities that provided a link to the LC web site from the University home page.

“Programs and Services” (pull-down menu) on the Irving K. Barber home page. It is also found, on rotation, on the UBC library home page since it is part of a list of “featured sites” that rotated (every time the screen is refreshed a new ‘featured’ site appeared). The link to Dalhousie’s LC web site is located under “Services” on the Library home page. This is a logical location but there is no indication of the site on the home page. A user would need to be looking for the site in order to find it. Nonetheless, its location under services means that users, just browsing what is available in the library, could find information on the commons. Even under construction, Saskatchewan's LC is “moderately easy” to find. There is no link labelled as Learning or Information Commons, but there is a link to the construction web site off the Library home page. However, the link is entitled "University Learning Centre / Library Transformation Project" and so could be problematic for anyone looking specifically for a commons.

Based on the rubric supplied in the methods section, all the remaining IC/LC web pages are “moderately difficult” to “difficult” to find.

The remaining sites, Alberta, McMaster, McGill, and Toronto are "difficult" to find. All these sites require a minimum of five clicks to reach the site. None of the links are available on the University or Library home pages, and all are buried in sub-pages. The link, for example, to Toronto’s Scotiabank IC is found under “Computing and Connections” which in turn is a sub-link under “Services.” Much like Dalhousie’s website, a user would need to be actively seeking the site to find it. McMaster's site is particularly difficult to find because it is associated with a place (Mills Library) rather than function, and finding it required clicking on all of McMaster's Library's links.

5.2.2 *Services*

The commons web sites demonstrate a range in service provision; from none to a variety of academic support services (see Appendix C). How the Web sites introduce and integrate service elements (i.e., in-person IC/LC support) reflect the diverse understanding of ICs and LCs and how commons are presented via their "about" statements, descriptions and/or mission statements. Advocates for ICs/LCs promote the importance of an "integrated delivery model" (Beagle, 1999), and Cowgill et al (2001) believe there should be "technically proficient staff," but not all ICs/LCs default to integrated service, and in some cases do not provide service at all.

Curiously, the word service is not used even though librarians think of themselves as service professionals and the convenience of "one-stop" shopping for services is often proclaimed as a principal attraction of the commons" (p. 183). Nonetheless, eight of the ten Web sites list the support available in the commons. Although all the sites did not use the term "service", they use equally understandable terms such as "support" or "help." And, a link to those services is evident on the IC/LC web sites. Nevertheless, only British Columbia, Queen's, and McMaster make the relationship between service and the commons explicit.

British Columbia, McMaster and Queens all present commons spaces that resemble what Beagle (2006) calls "learning commons"; spaces that are "organized in collaboration with learning initiatives sponsored by other academic units, or aligned with learning outcomes defined through a cooperative process" (p. xviii). This description is particularly true for both Queen's and McMaster's LCs; both web site descriptions state that the

spaces are co-administered cross-departmentally. McMaster's LC (Mill's LC) web site states on its "About" page that "The Mills LC is a partnership between:

- Centre for Leadership in Learning (CLL)
- Centre for Student Development (CSD)
- McMaster University Libraries
- University Technology Services (UTS)"

Queen's states that its partners are:

- Library
- IT Services
- Learning Strategies Development
- Library Services for Students with Disabilities
- Writing Centre³²

When the study was started, the Chapman LC (UBC) was under construction. As a result they offered no services. However, although their site did not indicate that there is a formal partnership between various departments their vision statement stated that "the LC works closely with departments across the UBC Library as well as units across campus in the development and delivery of programs and services," and they made the availability of those services explicit. In addition, the current website

³² The revamped Queen's web site had a logo that incorporated the three services offered. Their logo stated "Please go the Queen's LC for writing help, study skills help, and library help." (<http://www.queensu.ca/qlc/index.html>)

(<http://www.library.ubc.ca/clc/>, last accessed August 25, 2009) shows a rotating slide show with pictures of AMS tutors, math tutorial help, IT help, and student peers.

Calgary and Dalhousie's LC provide the reference and IT service that is more typically associated with an IC (Beagle, 2006; Bennett, 2008; Lippincott, 2006). In both cases, technical support is available whenever the commons is open, while reference support is only available at certain times. Although neither commons appear to have an (administrative) partnership with the Writing Centre, the Writing Center has a satellite of their services in the commons.

The Toronto Scotiabank commons provides technology and multimedia support; there is no visible connection to reference or other non-IT related learning supports. Manitoba's Virtual LC provides a link to an Online Writing Tutor service; a service that is only accessible via log-in. All the rest of the support is text-based (e.g., tutorials and handouts) and programmatic (e.g., assignment manager, calendar and workshop registration). At the time of the study Saskatchewan offered no actual support because it is under construction; nonetheless, it mentioned in-person support on their construction web site and there are substantial cross-departmental services mentioned on the website. Alberta and McGill have no indication, on their website, of service support.

5.2.3 *Software and Hardware*

In the process of talking about the need for increased funding MacWhinnie (2003) points out that traditional "dumb terminals" are not suitable for ICs and that they needed to provide "a full range of software and/or multimedia tools for preparing projects from beginning to end" (p.244). Lippincott (2007) listed "pervasive technology" as an essential LC component and noted that LC workstations should include "rich application suite[s]."

other research packages such as SPSS and GIS software, and improved internet access so that students can download or work with large multimedia files (p. 7.2). And Beagle (2006) explains that the space needs to allow its users to “package, publish, or present their creations” (p. 4).

It is not surprising then that all the IC/LC web sites mention technology at some point on their website. Where technology is mentioned, and how much information is provided, however, varies a great deal. This variation could be an indication of the focus or intent of that particular commons. Does the space more closely resemble an IC with the focus on production and information literacy, or a LC with its focus on student learning? What seemed clear is that on the whole the descriptions that reflected an IC ethos rather than an LC ethos provided more detailed information on the kinds of hardware and software available.

Alberta, Calgary, Dalhousie, McGill, and to some extent Toronto’s Scotiabank IC provided information on the number of machines and the kind of software available on their respective commons’ spaces. Neither Alberta’s KC nor McGill’s IC show any evidence on their web sites of reference or IT support³³. The Toronto Scotiabank IC advertises IT support in the IC space, but did not provide reference and/or other academic supports. As noted above, Dalhousie’s emphasis on technology did not indicate lack of sup-

³³ Articles written about McGill’s IC when it was still in the planning stage indicate that there was to be full-time reference and IT staff associated with the space (Etheridge, 2000); however, an article written post-construction makes no mention of in-Commons support (Reynolds, 2006).

port since their space provides reference, IT, support for Geographical Information systems, Math and Writing support. And Calgary, which emphasizes technology in its description, providing detailed descriptions of the number of workstations and type software available, does provide both reference and IT support in their commons.³⁴ British Columbia, McMaster, and Queen's LC all present more typical LC spaces with support services and administrative involvement from multiple departments, and all three web sites mention technology in their descriptions, but provide no information on the type of technology or number of computers.³⁵

The integration, or not, of adaptive equipment is another question asked during the web site discovery process. Alberta and McMaster both integrate adaptive software with Zoom text and have adaptive software packages installed on all the IC workstations. Calgary and Dalhousie provide adaptive equipment and software, but on separate stations.

McGill, Queen's and the Toronto Scotiabank commons do not mention adaptive equipment or software. Queen's only mentions their workstations in supplementary documents, so there could be adaptive software or hardware provided but not documented. Alberta's Knowledge Commons, Calgary's IC and Toronto's Scotiabank IC all

³⁴ And as of Fall, 2008 the Calgary IC also offers a satellite of their writing centre in the IC space.

³⁵ It was possible to find information on the kinds of technology offered by reading McMaster and Queen's LC's annual reports and planning documents. Also, the newly revamped McMaster Library provides detailed information on the kinds of software available on the Library machines (source).

provide multimedia software. Both Alberta and Toronto's spaces provide multimedia software on all their commons workstations, while Calgary provided it on two workstations.

5.2.4 *Interactive Features*

As noted above, except for a handful of researchers, the relationship between the physical commons and the virtual commons is almost invisible in literature on ICs/LCs (Beagle, 2006; Hess, 2003; Kranich, 2006). Beagle (2006) contends that not only is the commons a physical space, but it is also a virtual space and that it "denoted a pervasive online environment in which a wide variety of electronic resources and services can be accessed through a single graphical user interface." And Bennett (2008) argued that "higher-education can ill-afford to ignore any opportunity to secure much needed productivity gains through information technology" (p. 15). What constitutes those resources and services is changing as the virtual space changes but they include "audio and video media, aggregated databases, and course management systems, learning objects, hypertext writing spaces, geographic information systems, video-gaming content, virtual reality simulations, blogs, wikis, cognitive tools, and collaborative work-group software" (p.15).

With this in mind the primary aim of this study is to determine if there was, either intentionally or not, a connection established between the on-line/virtual commons and the physical commons. And, except for Manitoba's Virtual Commons and British Columbia's link to LEAP, none of the IC/LC web sites provide any substantive interactive

features or electronic resources³⁶ other than those traditionally associated with today's library (i.e. aggregated databases). In fact, in most cases the web sites function purely as informational sites with information on services, hours open and the type of hardware/software available. The library web sites are also traditional in their approach to on-line information.³⁷

Alberta, McGill and Toronto's IC/LC web sites have no interactive or participatory web elements; they also provide no explicit connection to the library's electronic resources or to tools/information that would help users navigate online information. UBC and McMaster do have links to instant messaging, University of Calgary and Queen's have software to book a group room online, Queen's has an assignment calculator and Saskatchewan has a bookmarking feature that appeared to be University of Saskatchewan specific.

Dalhousie does have links to its library's online resources ("How Do I?" and "information literacy,"). The "How Do I?" webpage lists a number of tutorials covering a

³⁶ Fall, 2008 Queen's LC added on-line workshops on learning, studying and library research.

³⁷ with the notable exception of McMaster's new web site (Fall, 2008); it provided a number of aggregator tools, and has established a presence on Second Life [Second Life is "is a virtual world . . . [which] enables its users, called Residents, to interact with each other through avatars. Residents can explore, meet other residents, socialize, participate in individual and group activities, and create and trade virtual property and services with one another, or travel throughout the world" ("Second Life," 2008)].

range of topics from library research to writing, and "information literacy" a link found under services has a significant number of online information literacy tutorials including a number available in languages other than English. Neither of these links is LC specific, they are Dalhousie library links and found on every library page, but they are available on the LC page as part of the template and listed in the same place as the link to the Learning commons. None of the other universities have links to online library support that are as visible or explicit on the LC page.

The exception is LEAP, a webpage linked to on British Columbia's LC webpage, and the University of Manitoba's Virtual Commons. Both are created to amalgamate learner resources in one virtual space while encouraging online participation (Learning Commons Task Force, 2006). LEAP is not a commons and so is not considered in this study; however, because of its connection to British Columbia's LC,³⁸ an analysis of it should be considered for future studies.

Manitoba's Virtual Learning commons is more visibly aligned with a commons. It is called a commons, and it consciously integrates a number of departments (Student Resource Services, the Learning Assistance Centre, UM Libraries, and the Learning Technology Centre) in a virtual environment that emphasizes the social nature of academic life (Siemens & Tittenberger, 2007). The site also uses the logo associated with the LC development committee (Learning Commons Task Force, 2006), and is included in the

³⁸ LEAP was linked to from the Chapman LC (British Columbia), there was an extended presentation on LEAP at the 2007 LC conference, and two Chapman LC staff sat on the LEAP committee (<http://leap.ubc.ca/about/>).

LC strategic plan – “An extensive virtual LC component, which will enable students to participate in learning activities offsite” (LC Report, 2006, p. 5). The VLC provides online resources for both graduate and undergraduate students. The graduate section is organized around the “graduate life cycle,” with information on plagiarism, graduate culture and thesis writing. The Undergraduate section is aimed at providing learning and writing information with sections on study skills, writing, and time management. The undergraduate section also includes links to an online writing tutor, an assignment manager, and Sudoku.

There are a number of participatory web elements on the VLC site; the student profiles, rotating Flickr pictures, a UM student community organized around "to-dos" an online writing tutor feature and the assignment manager. According to Siemens and Tittenberger (2007), “the VLC serves a dual role of social and academic integration, [and] offer[ed] a central point of connection for learners to each other, to ideas, to areas of interest, and to support resources” (p. 13).

5.2.5 *Visual Presentation*

At the time of the study, all the web sites, except Toronto’s Scotiabank Commons, are framed by their respective library or the university template although Manitoba, McMaster and Queen's placement in the template is primarily visual since they use few to none of the standard template links on their respective pages. The majority of the IC/LC web sites did not have IC/LC specific brands, but four of the ten web sites, Alberta, McMaster, Queen’s, and Toronto, did have LC specific brands. Pictures of the IC/LC spaces are also lacking. Alberta, Calgary, and McGill have a picture of the space on their sites, but in all cases it is only one picture. The remaining sites have images of some kind

but no image of the space. Saskatchewan, which was under construction, provided a rendered drawing of the future service desk but no pictures of the spaces that the students would use.

Alberta, British Columbia, Manitoba, McMaster and Toronto have ‘brands’ that are site specific. McMaster’s opening flash page, which no longer exists, with (Inquire, Learn, Know and Explore) is innovative in its use of branding. The look of the web site made a definite statement about the purpose of the space and its connection to LC concepts. The remaining brands are significantly less obvious; however, Manitoba’s leaf (see Figure 7) could be seen as a leaf from the tree of knowledge.

Figure 6. University of Manitoba Virtual Learning Commons icon.



Alberta and Toronto’s brands’ visual references are less clear (see Figure 8 and 9).

Figure 7. University of Toronto’s Scotiabank Information Commons’ icon.



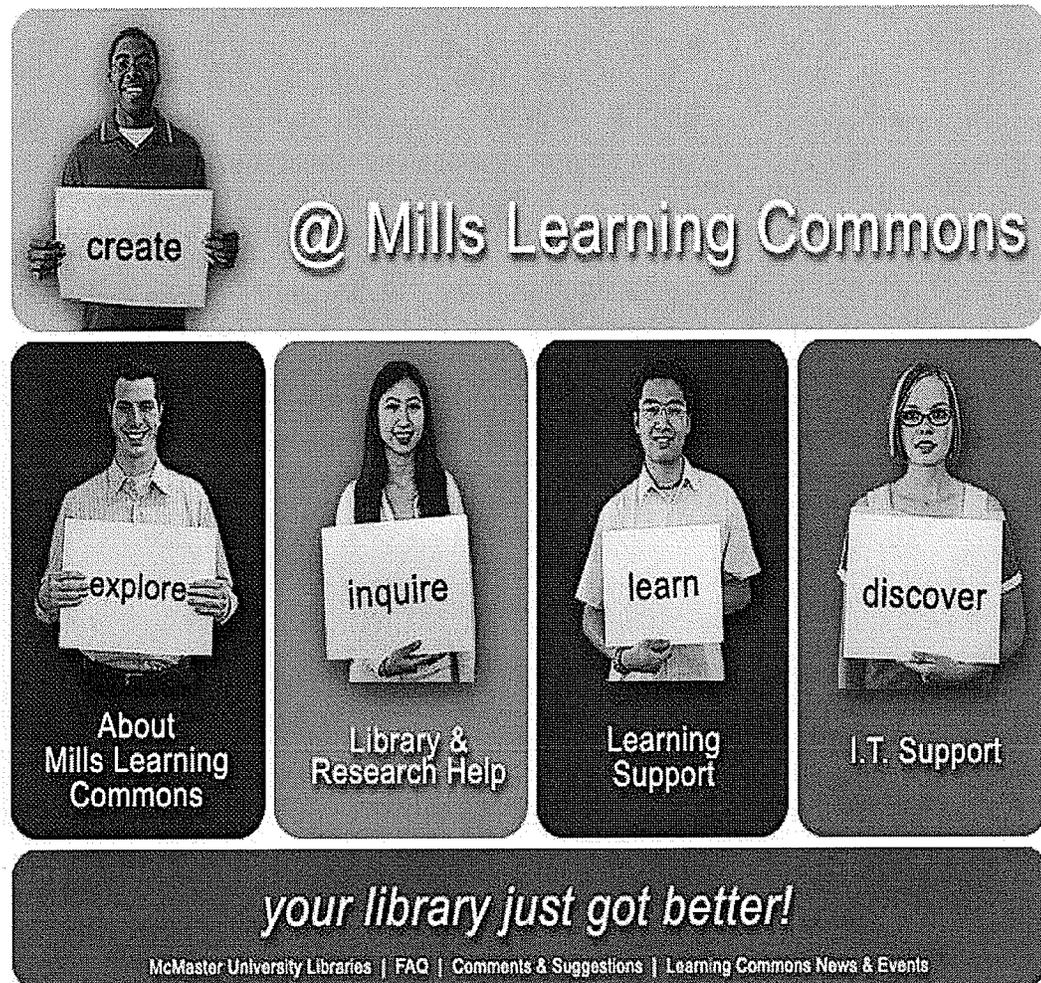
Figure 8. University of Alberta's Knowledge Common's icon.



Their web sites are visually static, and provide only general information about the space and services offered. There is no reason for users to access the web site except for general information. Even site specific information - services and hour - is limited.

The three exceptions are Manitoba, McMaster and Queen's. Manitoba has rotating pictures via Flickr, and a tag cloud. The entrance to the McMaster LC is a series of students holding signs (Figure 10)

Figure 9. McMaster's Mills Learning Commons splash page.



and Queen's actively constructed a web site space that links to external resources and makes their relationship to learning and research explicit with a variety of icons (see Figure 11).

Figure 10. Queen's Learning Commons centre column content.

Welcome to the Queen's Learning Commons:

*Inquire, discover & learn in a collaborative, integrated,
student-centred environment.*



SOLVE your computer problems with ITServices



LEARN better with Learning Strategies Development



FIND all your research material at the Library



ACCESS Library Services for Students with Disabilities



IMPROVE your writing with the Writing Centre

If you are unsure which service meets your needs visit the main information desk in Stauffer Library and the QLC Student Assistants will be happy to point you in the right direction.

Chapter 6 Overall Findings

6.1 *Overview*

The present study provided an overview of twelve Canadian medical-doctoral university LCs/ICs. Of specific interest are the various components – site description, site location, web site structure, services, software and hardware, interactive features, and visual presentation - that comprise the LCs/ICs and the extent to which similar patterns exists among the twelve universities.

The ICs/LCs web site content reflects, on the whole, what is represented in the description. Alberta's description for example, places an emphasis on technology and the focus of the Knowledge Commons web site (<http://www.library.ualberta.ca/kcommon/>) is on technology. Another example, Queen's Learning Commons, emphasizes learning, and support for learning in both its description and its web site. Dalhousie's web site, on the other hand, is less consistent. Its description states that it "brings together the expertise necessary to help students, faculty and staff integrate information with technology" yet its web site makes no explicit link to support, even its "support" page does not provide information on available staff to help students.³⁹

What is considered to be an IC or LC varies across campuses. Alberta's Knowledge Commons, Toronto's Scotiabank Commons and McGill's Information Commons are all

³⁹ The Killam LC, one of four Dalhousie Commons lists, on its page reference, IT, Geographical Information Systems (GIS), math and writing support, so at least one of the Dalhousie Commons has extensive, cross-departmental support but this kind of support is not highlighted on the LC home page, or on any of the other pages.

what Beatty and White (2005) call the “computer laboratory” which provides technology and in some cases IT support. Calgary and Dalhousie are “library-only” integrated facilities with the focus on technology and reference support while, British Columbia, McMaster and Queen’s ICs/LCs are “true learning centres” with an emphasis on cross departmental support and administration.

Also startling is how invisible or hard to find many of the ICs/LCs were. The IC/LC web sites are often not only sub-pages of the library home page, but sub-pages of sub-pages with no explicit links to lead the student to that site. Overall, IC/LC web sites are associated with the university library and seen as an academic unit within the library, and often as sub-units of units (i.e., “Computers and Services”). Most IC/LC web sites have no more importance in the library hierarchy than any other unit within the library. However, at the time of the study, the two commons that had web sites which most accurately resembled the current understanding of an LC, McMaster and Queen’s, are linked to from the library home page.

How the site looked and its use of branding to associate it with an idea varied across campuses. Half of the web sites, Alberta, Manitoba, McMaster, Queen’s, and Toronto, have their own brand. In most cases, this brand is localized and not used to advertise the space on the web. McMaster and Queen’s, however, have visually distinctive web sites that are intentionally associating a look with an idea. McMaster’s bright, engaging splash page (see Figure 10) is particularly distinctive.

The results from this study show that IC/LC web sites have not been responsive to the quickly evolving World Wide Web. The IC/LC web sites are informational rather than interactive with no opportunity for students or other users to comment on or partici-

pate in the presentation of the information on the IC/LC pages. The study shows that there is only limited connection between the physical IC/LC space and the virtual space both in terms of the web site itself and its promotion of other digital literacies like information literacy and comfort with online library resources. The IC/LC web sites functioned as promotional brochures that highlighted the physical space which was, in most cases, clearly just another library unit rather than reducing the barrier between the work that “belongs” in the library and the work that is actually being done (e.g., writing, learning, socializing).

6.2 *Implications*

The findings of the present study provide significant implications for administrators, web designers, IC/LC teams and students. These implications include a re-evaluation of how web sites function, their purpose/role within the larger university web site hierarchy as well as their response to the continually changing World Wide Web. When they were first introduced, ICs/LCs were examples of innovation in an academic environment. Library and university administration recognized that libraries needed to adjust to the quickly changing digital environment and re-created the library spaces to reflect and lead the way into the new digital frontier. Changing the physical space to capitalize on technology and highlight the social nature of learning and developing student support services that are cross departmental is transformative. However, as the digital world evolves, it is important that ICs/LCs do not stop at the renovation of the physical space but also adapt their digital spaces to reflect and possibly contribute to quickly expanding digital boundaries. In the last year (2008), for example, the eBook market has exploded with the introduction of the Kindle and iPhone applications; ubiquitous comput-

ing is beginning to transform how we access, use and produce information; personal web spaces (e.g., iGoogle is very basic example of such) are growing; and initiatives like MIT's Open Courseware (<http://ocw.mit.edu/OcwWeb/web/home/home/index.htm>) and the OER Commons (<http://www.oercommons.org/>) are changing the educational landscape.

This study showed that the majority of the Canadian medical-doctoral IC/LC web sites are not adjusting or adapting their digital environments to reflect, let alone push, the digital frontier. It is important that IC/LC administrators and staff see that the IC/LC digital space is as important as the IC/LC physical space, and re-evaluate their web presence. At a minimum, IC/LC web sites need to include RSS feeds, on-line comment boxes; instant messaging that links students not only to reference staff but also to writing tutors, IT staff, and even possibly to academic advisors. As well, web sites can be used to actively incorporate the different ways that students can learn and create in both the physical and digital space.

Part of valuing the digital space is advocating for the prominent placement of links to either the IC/LC web site or to a digital space that promotes IC/LC ideals. The placement of links to web sites is often determined by the university communication team who has the whole institution to consider (Moore, 2007), and so the visibility of a particular IC/LC may be dependent on convincing upper administration to see the IC/LC as an integral part of the university rather than as a separate library sub-unit.

It is important to develop web sites that are more in tune with the digital and knowledge commons that frame them, and that they are developed with the same focus and energy that went into developing the physical IC/LC. However, these changes need

to be made thoughtfully and with an understanding of how they could impact student learning. A recent study on learning spaces, done by JISC (2009), emphasized the importance of pedagogically driven design. Some of the changes can be quite simple. Glasgow's Caledonian University for example, has a learning café with computers, and each computer has a welcome page that "encourages users to explore their learning preferences and time-management skills over a cup of coffee, and links to mind-mapping software introduce an essential tool for learning support" (JISC, 2006, p. 5).

Keeping all the above in mind, there are certainly difficulties in developing and re-developing digital spaces. There are a diverse number of stakeholders – librarians, IC/LC staff, web site designers, university communication staff and university administration. All of them need to be involved at certain points in the process, and all come from different cultural perspectives. In addition, web sites in large institutions are designed as promotional tools which put web designers and IC/LC staff in a difficult position when their innovations do not mesh with the university goals.

Finally, responding to new emerging technologies and web trends is complicated at best. Even relatively straightforward tools like blogs and wikis are work intensive, and require a change in how information is viewed, produced, and shared. In addition, students will use these resources only as long as they support them in their learning, so providing relevant content is crucial. The combined strengths of the IC/LC administrators, web designers, educational designers and other IC/LC staff are key to developing useful and current web spaces.

6.3 *Implications for Future Research*

The findings from the present study provide significant implications for future research related to ICs/LCs. Future studies should interview pertinent IC/LC staff on their web development process; be extended over a two or three year period to track the evolution of IC/LC web sites; assess student IC/LC web site use; investigate international ICs/LCs and/or Canadian French-language IC/LCs; expand the study to look at ICs/LCs at comprehensive and primarily-undergraduate universities, and study the connection between “learning centres” and IC/LCs.

Any future study should include interviews with pertinent IC/LC staff on their web development process. This exploratory study is designed to look at IC/LCs only via the web sites with no contact with IC/LC administrators or staff. As a result, the study could only access information available on the web. Although this provided a particular, potentially useful, view of the IC/LC web sites – demonstrating how someone would view the sites if he/she accessed them only via the web – it lacked the depth that would have been provided by interviews with IC/LC staff and/or on-site visits. In addition, the Web is constantly changing and the study was conducted during a finite time period (January 9 and 12, 2008) which meant that it could not account for the evolving nature of the web and the fact that web sites are regularly updated.

Research needs to focus on the evolution of a web site. Web site development tends to be a fluid process. Extending access time and or tracking the evolution of a group of web sites is particularly important for university and academic library web sites because they are just now beginning to respond to the changing nature of the WWW. During the process of writing this thesis, for example, British Columbia’s web site went from inac-

tive, because of construction, to active; Calgary's site was re-organized and integrated into the Library's template; McGill and McMaster's site disappeared altogether, as of December 19, 2008 there are no available links to the site; and Queen's re-vamped their parent page, added a logo as well as a number of new features.

Web site innovations are important to consider, but assessing how students use the web sites is also critical. Web site design should take into account, not only current eLearning theories and the constantly changing nature of the internet, but also their own student population. How does each institution's population use the university and library's web space? Typically studies of student use and learning tend to focus on what the university staff hope or expect that students are doing (i.e., LibQual and NSSE). Foster and Gibbons (2007), however, took a different approach, and developed an ethnographic study that looked at what the students are doing from their perspective. A similar study that examined how students use the digital space as they learn would also be useful. It is imperative at this stage to look closely at what role the web site plays both inside and outside the university as well as how it is used by students and staff.

The majority of research is on North American ICs/LCs. It would be instructive to investigate ICs/LCs in other languages and cultures. Is there the same kind of literature, research and development happening in Universities whose primary language is French (i.e., Laval, McGill)? What about universities in Europe and other institutions around the world? To what extent would similar findings be uncovered? To what extent are north-western universities leading or following other universities in the development of ICs/LCs?

This study looked only at medical-research universities, but it is equally important to look at comprehensive and primarily undergraduate universities, and to look at whether the development of ICs/LCs varies according to institutional type. A study using a random selection of Canadian universities would be invaluable. This could include pooling focus groups of Canadian students from a number of provinces and educational backgrounds, thereby providing the important perspectives of the end user - the students, faculty, other academic staff and increasingly users who are not necessarily members of that particular (or any) academic community.

Finally, there is a move for libraries to re-envision themselves as learning centres or learning spaces (Bennett, 2006). Bennett's (2006) study looks specifically at the creation of U.S. learning spaces, but there is no work done on the same developments in Canada. In addition, there is no work done on how LCs are, or will be, positioned in the new spaces. For example, the Hazel McCallion Academic Learning Centre (<http://www.utm.utoronto.ca/library/>), which opened in the fall of 2006, made no mention of the RBC Commons. In contrast, the newly opened (fall, 2008) Irving K. Barber Learning Centre (<http://www.ikebarberlearningcentre.ubc.ca/>) highlights the Chapman LC. At the same time, during the study McMaster, which has been advancing the innovative use of digital space (Coleman & Millar, 2008), removed their Learning Commons web site. What do these trends mean for IC/LCs, for libraries, and for the development of information and knowledge commons in general?

Each of these implications requires further research. By conducting studies in each of these areas and addressing these research questions, a more definitive picture of the

current state of IC/LCs will be uncovered, providing even more valuable information on the impact of IC/LCs on the end users.

Chapter 7 Conclusion

The present study focuses on determining how IC/LC web sites represented their respective physical spaces and whether these representations conformed to a current understanding of what makes up IC/LCs. The study also includes an exploration of IC/LC web site specific features and asks whether these features fostered the Commons ethos. The study shows that the IC/LCs at Canadian medical-doctoral universities do not consistently take one form, with IC/LCs ranging from what appear to be computer labs to IC/LCs that are closer to "learning centres" (Beatty & White, 2005). The study also demonstrates that most of the IC/LCs web sites are secondary to the physical ICs/LCs.

As a whole, universities are still tied to the physical space of the classroom, the study area, and the library and, in most cases, ICs/LCs, despite pressure from the ever growing digital space, are no different. However, if ICs/LCs are going to continue to be effective and current, it is important that they also consider the digital space that frames and relates to the physical space. This is critical given that more and more users are digitally savvy. In a recent ECAR study (Salaway, Caruso & Nelson, 2008), 80% of the respondents owned laptops (up from 65.9% in 2006) and spent 19.6 hours per week online.

Ideally, transformational IC/LC web spaces should serve as the bridge between the physical space and the digital space; these spaces should incorporate not only students, faculty and librarians, something many IC/LC web sites are not doing, but also "learning institutions, learning content providers, and also family, friends, colleagues and other peers, including virtual ones - via chatting, for instance" (Punie & Cabrera, 2006, p. 33). Punie and Cabrera (2006) envision a learning space that incorporates "personal space on

the Internet that contains all relevant learning information" and "a physical space where teachers and learners can meet" (p. 33).

The problem for libraries is more complex of course than engaging in Web2.0 activities or expanding their understanding of the commons. Libraries, and the IC/LCs that are associated with them, are increasingly defined by the movement to enclose and limit the digital space (virtual commons) - particularly as digital copyright is contracting. IC/LC spaces, both physical and virtual, can provide actual examples of learning that are not confined to certain tasks or specific spaces. The idea that grew the IC/LC movement was the desire to create spaces that acknowledged research, writing, and academic learning, but also the development of communities (learning and otherwise). Developing a presence in the virtual commons (digital space) promotes the idea that the learning commons is everywhere and accessible to everyone. The LC is everywhere, and potentially, accessible to everyone. The only limitation to engage with and participate in the common digital space should be the access to appropriate tools and individual desire.

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Appendix A

Web Site Analysis Questions

1. Is there a mission statement? In this case, the mission statement needs to be titled either "Mission Statement," or "Purpose," or "Vision."
2. If there was a mission, this statement will be used as a unit of analysis.
3. If there was no "mission statement" was there a descriptive section or paragraph i.e., "about us"?
4. The "about us" will then be used as a unit of analysis.
5. How many elements (component parts) were visible on the front page of the IC/LC? (This a cont of the components listed below; links,
6. What were the components, what format did they take and what links/information was included? (Table 3) I will be looking for elements like
 - a. Template
 - i. Library?
 - ii. University?
 - b. Link format
 - i. Tabs
 - ii. "Quick Links"
 - iii. Body links (links found in the body of the text)
 - iv. Side-bar links
 - v. Template links (links that were found on all the university/library pages)
 - c. RSS Feeds
 - d. Interactive features
7. Types of information Provided
 - i. Hours. What were they?
 - ii. Staff support (If information provided, what kind of staff support was offered?)
 1. Reference
 2. IT

3. Writing
4. Study Skills
5. Other
- iii. Software (What kind?)
 1. MS Office
 2. Media software (i.e., Photoshop, Adobe Professional, Movie editor)
 3. SPSS
 4. GIS software
 5. Other
- iv. Policies
 1. Computer use
 2. Food
 3. Other
- v. FAQ
- vi. Other
- b. Informational links?
- c. Tabs?
 - i. Are they part of the library template?
 - ii. I/LC specific? (if so, what were then?)
 1. FAQ
 2. IT support
 3. Mission Statement
- d. RSS Feeds
 - i. News
 - ii. Blog
 - iii. Other?
- e. Interactive Features
 - i. Instant Messaging (IM)
 - ii. Blog

- iii. Podcasts
 - iv. Assignment manager
 - v. Online community
 - vi. Tagging (e.g. de.licio.us)
 - vii. Other
 - f. Images
 - i. How many?
 - ii. Function?
 - 1. Design?
 - 2. Illustration?
 - iii. Subject?
 - 1. People
 - 2. Computers/technology
 - 3. Space
 - 4. Other
 - g. Are "Quick links" used? What were they?
 - h. Other Components?
8. What was the IC/LC web "relationship" with the library?
- a. Template?
 - b. If no template were there links to other library resources
 - c. Do those links make an explicit connection between learning in the commons and the larger library (i.e., "Links that will aid your research" or "Research support" rather than "databases"
9. With the university?
- a. Template (in some cases the library template was different than the university template
 - b. Are there links to other university departments
 - c. Do those links make an explicit connection between learning in the commons and the university (i.e., "Stressed about your final paper?" rather than Counselling; "Working in groups" rather than Learning Assistance Centre)

Appendix B

IC/LC Web Site Descriptions

University	Commons	Available Web Site Description
Alberta	Commons	The Knowledge Common, or "The KC", offers our university community a place to come to study, work, and collaborate. As a technology resource, the KC has over 200 computers for your use, as well as scanning workstations, printers (B&W and colour), and software for all your scholarly needs. We also offer Internet connections and a wireless environment, and spacious desk areas for working on your personal laptop. We also offer group meeting rooms for collaborative work.
Calgary	Commons	The Information Commons provides one-stop service for library research and technical assistance.

Dalhousie	Commons	<p>Welcome to the Dalhousie Learning Commons! Each location is equipped with a state-of-the-art facility that combines information resources with advanced technology and brings together expertise and resources necessary to help students, faculty and staff integrate information with technology in the academic environment.</p> <p>There are 2 main types of workstations available, Express and Scholar. Express machines are available for public use, and have internet access for using the Novanet catalogue and library databases.</p> <p>Scholar workstations are restricted to users with Dalhousie network access, and have a variety of applications such as Microsoft Office, SPSS, and Minitab. All workstations have the Microsoft XP Professional operating system, plus a variety of common plug-ins and applets.</p>
McMaster	Commons	<p>Mills Learning Commons is an active, student-centered learning space that integrates traditional and emerging scholarly resources, information technology, expert help, instruction, and collaborative and individual study space.</p>

McGill	Commons	<p>This custom designed research and study facility in the Redpath Building (map) is equipped with high-end workstations fully configured with access to all of the library's e-resources, web tools, etc. Private meeting rooms are available to enhance your learning experience. And, not only are we conveniently located next to the food court, we offer extended access hours when you need us most!</p>
Queen's	Commons	<p>The Queen's Learning Commons (QLC) is an inviting, collaborative learning space where people pursue and share ideas. Centrally located in Stauffer Library, this enriched learning environment brings together for the first time in one place a comprehensive, integrated set of academic support services and resources for Queen's students. It unites staff from formerly disparate service units who assist students through individual consultation, workshops, peer mentoring, and collaboration, and includes improved support for accessing and exploring digital resources and technology.</p>

Toronto	Commons	<p>Scotiabank IC - The Information Commons (IC) provides front-line support/help to students, faculty, and staff for several institutional services such as institutional email (UTORmail) and general Internet access (browsers, wireless, UTORid password changes, etc.). We also offer a number of other services including, software sales (Licensed Software Office), document and film scanning (Digital Studio), video editing (New Media Suites), event recording (Media Production) and distribution (Media Distribution).</p> <p>Use the tabs above for direct links to the various units within the IC. A brief description of each unit is given below.</p>
British Columbia	Under construction	<p>The Chapman Learning Commons is currently closed to allow for the construction of Phase 2 of The Irving K. Barber Learning Centre at UBC. The Learning Commons will reopen in the completed Learning Centre early 2008.</p> <p>The Learning Commons offers learning support services and programs, as well as access to a variety of technologies including multimedia software and hardware. The Learning Commons includes space for group work as well as comfortable seating for indi-</p>

		vidual study. The entire space is equipped with wireless access.
Saskatchewan	Under construction	café, expanded wireless, flexible study areas, exhibitions, group study rooms, more washrooms, onsite IT help, research help, state-of-the-art instruction rooms, subject librarians, success in learning
Manitoba	No Commons Virtual Commons	The Virtual Learning Commons is a place to make connections and meet your fellow students. It's also a great place to find out how to be a successful student - how to do research, write A+ papers, hone your study skills and effectively manage your time so that you can get everything you need to do, done.
Ottawa	No Commons	
Western	No Commons	

Appendix C
Website Visibility Table

University	I/LC	I/LC Website	Ease of Access? Easy, Moderately Easy, Moderately Difficult, Difficult	Ease of Navigability to IC/LC
University of Alberta	Yes	Yes	Difficult	(5) U of A >Library home page >Learning Services>Knowledge Common/TTC>Knowledge Common
University of British Columbia	Yes	Yes	Moderately Easy	(4) UBC>Library>Branches>Chapman (5) UBC>Library>Branches>IKB>Chapman (3) UBC>Library>Chapman (if it was the featured site) (5) UBC>Library>IKB (if it was the featured site)>Programs and Services>Chapman
University of Calgary	Yes	Yes	Easy	(3) Calgary >Library>information commons
Dalhousie University	Yes	Yes	Moderately Easy	(4) Dalhousie > Library> Services> Learning commons
University of Manitoba	No	Yes	Easy	(1) Manitoba>Virtual Learning commons
McGill University	Yes	Yes	Difficult	(5) McGill >Library>Using the Library>Computers and Software>information commons
McMaster University	Yes	Yes/No	Difficult	(4) McMaster>Library>Mills>Mills Learning commons Find the site was non-intuitive Note: as of September, 2008 a

				link to the LC web site no longer exists.
Queen's University	Yes	Yes	Easy	(2) Queen's > Library home page > LC (Feb. 2008) (1) Queen's > LC (September, 2008)
University of Saskatchewan	No	Yes	Moderately Difficult to Difficult	(3) U of S > Current Students>Library> University Learning Centre / Library Transformation Project
University of Toronto	Yes	Yes	Moderately Difficult	(5) U of T>Library>Library Services> Computing and connecting>information commons

Appendix D

Website Discovery Table

Commons	Services	Software & Hardware	Web site Features	Visual Presentation
University of Alberta's Knowledge commons	No people services in the KC, but a link to the AICT help desk. The links under Services were all informational in nature.	Technology was listed – the software provided was standard (Microsoft Office) with Web design software (Macromedia) and Accessibility software on all computers. Some also had SPSS	No features on the KC site. The Library had RSS, IM, a blog and a Facebook page.	Logo In Library template Central picture of students using the KC Description of the KC Three sub-pages: Maps, Pictures and Feedback and Suggestions
University of British Columbia's Chapman Learning commons	Tutors – Math, Writing, AMS (AMS was fee based) LEAP [Learner Resources]	Pictures indicate there were computers in the space, but there was no mention of technology on the LC site.	LEAP: surveys, IM, RSS, student submitted picture,	No logo Within the UBC template (IKB in particular) Chapman commons was under construction and the site served as a place mark. Pictures of the Chapman LC and the space were in the right hand column. Links to alternate services were in the left hand column.

University of Calgary's information commons	Reference Computer MADGIC (GIS & Data) Adaptive Technology Group rooms Satellite location for Writing Tutors in IC [Services]	Hardware and software listed. Software includes Microsoft Office and Open Office; adaptive software (Zoom text, Dragon etc.) was on separate workstations (2).	Meebo	No logo Library Template February One picture – pen and paper September library template picture (picture of a library)
Dalhousie University's Learning commons	“Research and technical support” [Support]	Microsoft Office, Minitab SPSS, SciFinder Scholar, Maple, ArcGIS were available in all locations. Killam, the largest commons has 140 “scholar” stations and 28 “Express” stations.	None. There was an online booking system.	No logo. Within the library template Picture of the commons . Stand alone page – i.e. no child pages associated with the site. However, each library has a description of its LC.
University of Manitoba's Virtual Learning commons	Online tutor for writing [Tools]	None	Online Tutor Assignment Manager Social Networking Profiles Sudoku Flickr Videos	Logo Within the UM template (as was the library) Flickr pictures Profiles Link heavy left-hand column Social networking in middle Site as of September – social networking section smaller and videos added.
McGill University's Information Commons	Extended hours	43 workstations Microsoft Office CD/DVD	None	No logo Library template Picture of computer Stand alone

<p>McMaster University Learning commons</p>	<p>Library and research, Learning, IT [Library & Research Help Learning Support I.T. Support] – all as separate links.</p>	<p>No information available on the # of computers, but there was an extensive software list available - http://library.mcmaster.ca/mills/gen_camp_apps.htm</p>	<p>IM Digg, Facebook, Delicious, Furl and Stumble Upon were available on all McMaster library pages – this only with the new library site</p>	<p>Logo – no, but the site was branded. “Explore, Inquire, Learn, Discover” Library had its own template, but that changed with September’s new website. Now the library was located w/in the McMaster template. And the LC no longer ‘exists’ Logo It’s own template No pictures, but icons associated with departments. Site was not text heavy</p>
<p>Queen's University Learning commons</p>	<p>Learning IT Reference [QLC Services] – placed prominently under logo.</p>	<p>No computers or software were mentioned on the LC site but the FAQ states. “If you had a NetID and password (all Queen's students and staff had these) you had access to all of the computer stations in the QLC as well as the laptops available on three hour loan from the circulation desk.”</p>	<p>RSS news feed</p>	<p>Logo It’s own template No pictures, but icons associated with departments. Site was not text heavy</p>
<p>University of Saskatchewan University Learning Center/Learning commons</p>	<p>Under construction, but connected to the University Learning Centre and the tag cloud indicates that there will be reference and technology help.</p>	<p>Under construction</p>	<p>Under construction Tag cloud Construction blog</p>	<p>No logo w/in Library template Arch. Drawing of service desk Link to blog Tag cloud</p>

<p>University of Toronto Scotia Bank Information Commons</p>	<p>Technology & multimedia [Help Desk] – tab at the top.</p>	<p>No #'s but 3 types of workstations – Infostation (Library materials and email); Internet Office Computers (Microsoft Office software) and Design Computer that include the all the above software as well as web design software.</p>	<p>None</p>	<p>Logo Within the library template Picture of activities in the commons 3 column template</p>
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