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Supporting informed learners in the 21st century

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Abstract

This article elaborates the concept of informed learning and locates it in educational, workplace, and community settings. Drawing on existing research into people's experience of information literacy, it identifies critical experiences of informed learners in each of these three settings. It also explores the support required in educational, community, and workplace contexts, which makes informed learning possible. Recognizing strong implications for policy makers in different sectors, the article presents a set of guiding principles for developing informed learning and learners. The idea of informed learning represents and advances understandings of information literacy that incorporate the broader concept of *using information to learn*: those understandings that go beyond the functional or generic information literacy paradigm and draw attention to the transformational, situated, and critical aspects of information literacy. Using information to learn is a natural, but often implicit part of all formal and informal learning environments, and is a vital component of the lifelong learning agendas of many nations worldwide. Supporting informed learning requires conscious attention to the use of information in the learning process, by educators, managers, trainers, and policy makers in all sectors. It requires a far reaching response to policy directions involving a wide range of stakeholders.

Introduction

This article elaborates the idea of informed learning (the kind of learning made possible through evolving and transferable capacity to use information to learn), as an important aspect of information literacy, and a key to realizing the potential of the information society. The article explores

the concept of informed learning across crucial spaces in the information society—education, workplace, and community settings. It identifies:

- informed learning as a critical component of the lifelong learning and information literacy agendas;
- the experiences of informed learners in educational, workplace, and community settings;
- the support required to make informed learning possible;
- the varied and sometimes paradoxical roles of technology in informed learning; and
- a framework for guiding policy directions in a variety of sectors.

In the last ten years information literacy has taken the international political stage, receiving a high level of profiling that has ushered the agenda into a new era. The United Nations Educational and Scientific Organization (UNESCO), the United States National Forum for Information Literacy (NFIL), and the United States National Commission for Library and Information Science (NCLIS) in particular have engaged in international and cross-sectoral advocacy, establishing the value of information literacy in all parts of society. At the same time, we have seen the widespread adoption of information literacy and lifelong learning as required graduate attributes in many educational institutions and professional associations. Information search skills and information use processes have found their way into curricula—from preschool to post-secondary, including colleges and universities—and around the world academic research in the information literacy field has flourished.

Alongside burgeoning interest are also ongoing issues. Information literacy education programs have tended to focus on standards and skills-based intruction, not always extending attention to helping students engage with content through their information use processes; and insufficient attention has been given to understanding and supporting the experience of engaging with information in workplace or community contexts. We have also seen remarkably little questioning of the homogenous flavor often associated with information literacy, and remarkably little acknowledgment of the diverse contexts in which information literacy might be enacted.

Considering the information literacy agenda in terms of effective information use and in different contexts has, nevertheless, become an emerging thread (Bruce, 1997; Bruce, 2008; Limberg, 1998), which has recently enjoyed substantial research attention in educational settings, workplaces, and the community (Lloyd, 2010; Lloyd & Talja, 2010; Lupton, 2008; Somerville, 2009; Tilley, 2008; Yates, Partridge, & Bruce, 2009). This work represents growing interest in information literacy representing different forms of information engagement, thus emphasizing transformation in peoples' experience. Attention to the question of diversity and contex-

tualization must involve asking: what does effective information use look like across contexts, national borders, complex organizations, and community subcultures, including the innovative cultures emerging in digital landscapes.

While information literacy may be understood as crossing the whole spectrum of information use, frequently it remains associated with information skills that represent only one aspect of use. The dominance of the functional view in current thinking about information literacy and information literacy education is well-explicated by Lin (2010). As thinking around information literacy and information literacy education evolves, we need to differentiate between (1) the skills associated with using information in an ever-expanding range of contexts, representing a functional view of information and information literacy and (2) the process of using information to learn, including communicating and creating in these contexts, representing transformative interpretations of information and information literacy. In this article and in the informed learning context, *information literacy* is intended to mean *being aware of our information use experiences* and the many different ways in which we can engage with information, as represented by the *seven faces of information literacy;* and appreciating the transformative character of information and information literacy (Bruce, 1997; Lin, 2010; Lupton, 2008). The concept of informed learning refocuses attention on using information to learn and learners' awareness of their information use experiences as they go about learning. The concept directs attention simultaneously to both information use and learning.

Informed Learning as a Critical Component of the Lifelong Learning and Information Literacy Agendas

The idea of informed learning was developed to direct attention toward those interpretations of information literacy that involve *using information to learn.* The notion of learning lies at the heart of information literacy. For example, information literacy is sometimes promoted as an approach to learning, or a way of learning. The character of learning made possible by information literacy has a special quality. The etymology of the verb *inform* reveals the following meaning: "To give form or shape to; to give vital organising power to; to give life to; to imbue and actuate with vitality; to animate; to mould; to figure, to fashion" (Webster, 1913). We can infer that in the case of informed learning, information use gives form or shape to learning, gives vital organizing power to learning, gives life to, animates, figures, and fashions learning, as well as imbuing and actuating learning with vitality (Bruce & Hughes, 2010) as figure 1 below illustrates.

Informed learning may be defined as using information to learn. It is learning through engaging with or interacting with information. Informed learning is about being aware of the kinds of information we are using, how we are using information, and how different forms of informa-
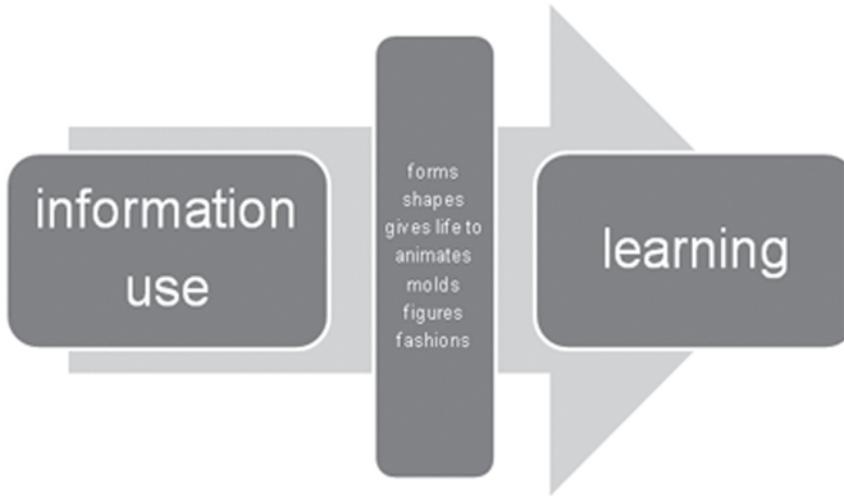
Figure 1. Informed learning: essential meanings

tion come together to inform and transform our work, study, or personal lives. (Bruce, 2008) It enables us to draw on and develop our information literacy, to enrich our awareness of our information use experiences. Thus, informed learning is a holistic pedagogy (Bruce & Hughes, 2010), which builds upon information skills and develops effective, critical, creative, reflective, and ethical information use for learning in any of life's paths. As we promote information literacy and information literacy education in different sectors, we need to distinguish between (a) fostering information skills, and (b) giving those capabilities traction in the process of using information to learn. In other words, information using skills are building blocks for informed learning, rather than the end purpose. Realizing the second of these aspects, making it possible for people to be aware of how they use information to learn, is the special concern of informed learning

Informed learning is thus a learning journey that is also discernible as a journey of using information and becoming aware of our information use experiences. It promotes critical, ethical, creative, and reflective information use. It encourages learners to become aware of themselves as information users, of what informs them and how they are being informed and transformed, as learners. Informed learning occurs as people encounter information, as they engage with information in any context and work with it to "form" their information using experiences.

Informed learning is grounded in, and emerges from, the information practices of professional, community, or academic life. Information

practices are here interpreted as broad processes of information use, such as organizational or personal decision making, collaborative design, evidence-based practice, disciplinary research, professional and private problem-solving, or more focused activities such as preparing a travel itinerary, report writing, Web-page development, musical score composition, or art work creation (Bruce, 2008). By extension, informed learning is also grounded in interactive, collaborative information practices associated with information exchange and knowledge creation through interactive Web technologies. The question of what are information practices in specific contexts must be answered through understanding those contexts and the people working within them.

The idea of informed learning encourages us to attend to how people use information as they go about learning, both formally and informally, across the many settings in which people would benefit from realizing the potential of information literacy. Once learners (in whatever role, for example, as parents, citizens, researchers, or employees) recognize what constitutes information in their context, and how they are using that information to learn, they can be more in charge of their information environment and how they encounter, source, control, engage with, and learn from information. Information might take the form of pictures, sound, or text, and it could be static, moving, two- or three-dimensional. It may take the form of research outcomes or community discourse; it may be an element of our physical environment (Lupton, 2008) or our physical presence (Lloyd, 2010). Once we appreciate what constitutes information for different groups, and we understand their experience of using information to learn, we are better able to help group members as they use information to learn in their contexts. We can also better support their recognition of the transferability of information-grounded learning experiences to other situations.

EXPERIENCES OF INFORMED LEARNERS

Our global information society is one in which much information is available. An information literate society is one where people are empowered to use information for personal, social, political, or economic benefit. In information literate societies, people have access to appropriate technologies and relevant information. They are aware of, and supported in, their efforts as informed learners; whether in formal education environments as informed scholars, through their contributions to an informed workforce, or through their participation in an informed citizenry.

Informed scholars, an informed workforce, and an informed citizenry are key benefits to be gained from an emphasis on informed learning across society. Informed scholars are informed learners in formal learning communities, such as schools, universities, and research centers, who engage with information to learn in various ways. An informed workforce,

similarly, is one that adapts to change, innovates, and uses knowledge creatively and wisely for many purposes. An informed citizenry is a community of citizens that uses information effectively to learn for health, financial, educational, political, recreational, and other purposes. The following sections identify key experiences of these groups.

Informed Scholars
Informed scholars use information to learn individually and collectively. This occurs naturally throughout the transformative inquiry processes in the disciplinary, multidisciplinary, and transdisciplinary information practices associated with study and research.

Table 1 below outlines how informed learning may be experienced in the scholarly domain of schools, colleges, and universities. The left-hand column identifies each of the *seven faces of informed learning* (Bruce 1997, 2008) while the right-hand column explains the nature of informed scholars' experiences associated with each of the *seven faces.*

A key role of informed learning in scholarly contexts at all levels is to activate and heighten awareness of information experiences. Students from the earliest age may be invited to engage with different forms of information in the learning process. The essence of informed learning is to make explicit awareness of these different forms of information and their use, as well as make explicit the various activities through which information is interpreted and understood. The different experiences could, for example,

Table 1. Experiences of Informed Scholars

Experiences of informed learning	Experiences of informed scholars
Information awareness	Information scanning, exploring and sharing, within formal education and research environments, through using innovative technologies and traditional strategies.
Sources	Sourcing information of all kinds independently and supported by information professionals, including formal and informal sources, textual, oral, or pictorial, to meet independent and collaborative learning needs.
Process	Engaging with information processes to learn through, for example, inquiry, problem, or resource-based learning and research.
Control	Organizing information, making and managing connections between information and learning needs, for all types of assignments and research projects, both independent and collaborative.
Knowledge Construction	Developing personal understandings of knowledge domains through critical and creative thinking processes.
Knowledge Extension	Creating and communicating new knowledge within and between discipline(s), innovating and creating new insights and new solutions to problems as outcomes of learning activities, including assessment and research projects.
Wisdom	Using information wisely and ethically on behalf of others, applying knowledge developed through learning and assessment activities or research projects to further social, economic, and educational well-being.

influence how statements of learning outcomes are developed. Such outcomes could be associated with learning about information literacy as a whole phenomenon. In such instances, students could:

- experience information literacy in different ways as they use information to learn in diverse settings;
- use information effectively in a range of contexts through employing transferable approaches;
- discern ways of thinking about information use which apply to new problems that they encounter;
- consider information as subjective and transformational in character;
- appreciate the socially distributed character of information literacy; that is, the experience of information literacy is reliant on broad networks of people contributing and supporting each other, rather than being an individualistic construct. (adapted from Bruce, 1997, p. 169)

Learning activities and assessment could also focus attention on specific information using experiences associated with the various faces of informed learning. For example, inquiry-based projects could address some or all of the following learning objectives:

- use digital technology for communication and information retrieval (Awareness)
- find information independently or via an intermediary (Sources)
- create information use processes appropriate for the project and taking into account personal heuristics (Process)
- conceptually and physically organize relevant information including references (Control)
- build a personal knowledge base in a new area of interest (Construction)
- work with knowledge, conceptions and personal perspectives to gain new insights (Extension)
- use information judiciously to make a complex decision (Wisdom) (adapted from Bruce, 1997, p. 170)

The above objectives could be applied by requiring students to use different forms of information in order to learn about a new area of interest. Students would also experience different ways of engaging with information, including personal reflection, observation, and interviewing, listening to or conversing with others, and sourcing academic information such as peer reviewed articles and primary sources. Students would then be in a position to compare and contrast what they have learned from different forms of information and ways of using information and to consider how they have contributed to their own developing understanding. Students could be invited also to reflect, individually and collaboratively, on how their personal experience resonates with some or all of the seven experiences of informed learning. (Bruce, 2008; Bruce & Hughes, 2010) For example, uni-

versity students may undertake an inquiry-based team project on the topic of "selecting an ideal study abroad destination" that requires them to:

- use a variety of technologies for communication and information retrieval about a topic of personal relevance to team members, such as choosing a study abroad destination (Awareness);
- find information about various study abroad destinations independently or with the assistance of an information professional (Sources);
- use found information to develop a team wiki that presents advantages and disadvantages of various study abroad destinations (Process);
- organize information by developing an online project log within the wiki to document information strategies and sources used by team members (Control);
- build a personal knowledge base by contributing a profile of a selected study abroad destination to the online portfolio (Construction);
- work with knowledge, conceptions, and personal perspectives to gain new insights about study abroad options through discussion with team members and personal reflection (Extension);
- use information wisely to decide most suitable destinations for each team member (Wisdom).

The above example represents a rich informed learning experience that enables students to learn with and about information. On conclusion of the project they will have used information critically, ethically, and creatively in different forms and ways to learn about different geographical locations, and varied cultural and educational practices, in order to make a wise informed decision about a personally relevant matter.

Informed Workers

In contemporary profit and not-for-profit environments, organizations worldwide are experiencing increasing complexity. Therefore, workplace communities must necessarily become engaged in informed learning. In maintaining competitiveness or market-niche and in anticipating current and potential clients' expectations, awareness of and capacity to use information to learn as individuals, in teams, and within the wider organization is vital. Table 2 below summarizes experiences of an informed workforce.

For an organization, the key reason for adopting an informed learning philosophy would be to build heightened awareness of information experiences, thereby ensuring staff use information to learn. This is likely to involve emphasis on:

- capacity building for fulfilling professional responsibilities rather than specific skills, including elaboration of inclusive communication, decision making, and planning processes and systems (Mirijamdotter, 2010);

Table 2. Experiences of Informed Workers

Experiences of informed learning	Experiences of informed workers
Information Awareness	Using face-to-face and technology enabled processes to establish workplace relationships and professional networks representing multiple viewpoints and global access trends.
Sources	Selecting credible sources (textual, oral, or pictorial) to engage in evidence-based practice, independently or with information professionals.
Process	Applying information processes appropriate for organizational and professional practices for independent and collaborative information exchange, decision making, and knowledge creation.
Control	Making and managing connections between information use and workplace needs, including capturing and organizing content for access and discovery.
Knowledge Construction	Enabling and constructing corporate memory by developing personal and collective understanding through purposeful planning, reflection, implementation, and evaluation activities.
Knowledge Extension	Applying new insights or solutions to advance individual understanding and team insight through evolving self-awareness and collective engagement as catalysts for innovation and development.
Wisdom	Evolving explicit social benefits for individual, team, and organizational work, including making wise use of information to further corporate social responsibility.

- social collaboration and interprofessional interdependence, rather than emphasis on individual capability, facilitated by organizational leaders and team leaders who aim to further dialogue and reflection for knowledge creation; robust partnerships among organizational workers, initiative beneficiaries, and information specialists, which contribute to collective informed learning processes and ensure their sustainability through ongoing learning relationships; and
- professional development and organizational development opportunities, which focus on intellectual use of (trans) discipline based collaborative information practices; workplace culture which enables cross disciplinary knowledge sharing and collaboration, fortified by human resources and resource allocation incentives.

In corporate workplaces, employees may experience the various faces of informed learning by:

- developing current awareness of commercial information, such as market research reports (Awareness);
- developing and accessing commercial and legal databases (Sources);

- improving information flow within organizations by capturing, organizing, accessing, selecting, and disseminating proprietary "in house" information (Process);
- co-designing, implementing, and evaluating efficient organizational knowledge management systems (Control);
- furthering organizational outcomes through critical and creative use of knowledge through workplace learning initiatives (Construction);
- creating, sharing, and applying new knowledge through cross organizational involvement in the (co)design, implementation, and review of commercial, social, and technological activities and processes (Extension);
- engaging in ethical sharing and transfer of knowledge within and between organizations for corporate risk management and decision making, in complex and ambiguous commercial environments through knowledge management networks and connections. (Wisdom)

Such real-life experiences of learning through information use illustrate the different faces of informed learning as experienced in the workplace context. Toward that end the most promising workplace innovations include encouraging dialogue and reflection through initiation of purposeful sensemaking and knowledge creation opportunities. Evidence-based practice, for example, encompassing both qualitative and quantitative information, and data gathering from both deductive and inductive perspectives can be considered as representing the enactment of informed learning in the workplace. The processes of evidence-based practice are necessarily both situated and contextualized, as well as requiring extensive engagement with information for learning within widely varying workplace environments. Partridge, Edwards, and Thorpe (2010) demonstrate professional engagement with evidence-based practice as a site, or context for, informed learning. They reveal that professionals may experience evidence-based practice as learning from published research, as service improvement, and as a way of being. Such experiences enable employees to access expertise from their internal and external environments and engage in planning, implementation, and decision making.

Informed Citizenry
In the wider community, people need to use information to learn for everyday life purposes in a wide variety of contexts. For example, individuals engage in informed learning to pursue interests around health, finance, politics, recreation, or religion, in settings that include libraries, cultural heritage centers, voluntary organizations, social clubs, and online forums. Awareness of information use and its impact can enhance peoples' life experiences. For instance, table 3 below indicates what might be the experiences of an informed citizenry.

Table 3. Experiences of Informed Citizens

Experiences of informed learning	Experiences of informed citizens
Information Awareness	Establishing social networks and maintaining awareness in interest areas, such as: finances, recreation, legal issues, schooling, political developments.
Sources	Sourcing information to meet personal needs or needs of community/social groups by finding out about topics, such as: schools, the job market, political parties, world events, hobbies, travel information, or home services.
Process	Working out solutions by problem solving and identifying ways of doing things better that work for individuals or their group, in their context. For instance: *Do I start with the Internet? Do I start with a phone call? What steps will work for me?*
Control	Organizing projects at home and in the community to fulfil domestic and social responsibilities; making connections or linkages around projects at home and in the community.
Knowledge Construction	Becoming informed by exploring unfamiliar territory, such as: politics, religion, health, finance, legal issues; or recreational concerns, such as: rock climbing, netball, athletics, needlework, gardening, musical instrument making, or relaxation techniques.
Knowledge Extension	Innovating through designing and making new things; or developing creative approaches and solutions, such as: telling stories, creating music, or producing art, or establishing new ways of handling our relationships.
Wisdom	Making wise choices by choosing to use information for the benefit of others, such as: focusing on the "other person" or group in purchasing, cooking, raising children, and voting.

Informed citizens might experience informed learning in various ways and community settings. For example, Tilley (2008) has proposed six types of virtual communities for people with mobility impairments:

- education-oriented communities involving personal development and capacity building, leading to high levels of empowerment and participation
- fantasy-oriented communities enabling virtual reality, the creation of environments, stories, personalities, and role play
- information-oriented communities including health, travel, and accommodation
- interest-oriented communities including chat rooms, discussion groups, and other communication spaces for focus on high priority issues
- relationship-oriented communities where building a community role, securing personal support or bonding with others is important
- transaction-oriented communities where business transactions are handled

The social character of informed learning is vital in the community, just as it is in education and the workplace. (Lloyd, Lipu, & Kennan, 2010)

In particular, informed learning contributes to social well-being and the development of an informed citizenry. Morris and Creighton (2010) stress that to flourish in a changing social and information environment people need the capacity to make informed decisions on issues that affect their daily lives, such as health, personal finances, and legal rights. Building on the notion of informed decision making, citizens may experience informed learning in the following ways:

- identifying formal and ephemeral information on daily life issues, from publicly available sources that include government agencies, voluntary support groups, and online forums (Awareness);
- accessing community information and social networking sites (Sources);
- forming and participating in ad hoc short- and longer-term community networks to share information and help people stay connected (Process);
- collecting and organizing information that presents a full range of options on particular issues (Control);
- developing resources on issues of community concern, outlining various options and their potential impacts (Construction);
- investigating residents' and business perspectives for a community action plan (Extension);
- applying knowledge of community issues to informed decision making for community development (Wisdom).

A community-generated project at the Center for Colorado & the West (CC&W) illustrates the value of informed learning to advance informed choices and support social action.

- The initiative originated when community members discovered that few images in the Denver Public Library (DPL) collection represented a Hispanic experience (Information Awareness).
- Only 136 of the 100,000 photographs were deemed relevant, and metadata for these photographs provided little information, typically noting "unnamed person" or "may be Hispanic or may be Italian" (Sources).
- In response, CC&W leaders invited the Hispanic community to contribute personal photographs (from scrapbooks and shoe boxes) (Process).
- This resulted in the creation of a 500-image online collection with community-generated metadata (Control).
- Having come to understand the concept of informed learning while working with CC&W staff on the digital image project (Knowledge Base).
- Contributors decided to produce a culturally authentic video promoting awareness of their digital heritage memories. They wrote and rewrote a script expressing informed learning through their cultural lens (Knowledge Extension).
- In addition to this educational video, community members produced a promotional video that advises Hispanic students about locally available

college scholarships so that, informed through successful graduates' testimonials, students will seek the financial aid necessary to attain higher education(Wisdom).

The above-mentioned video illustrates the informed learning experiences of a Hispanic woman in search of information about the past to inform her family's future. At the conclusion of the video, she recognizes "Yo soy Colorado!/I am Colorado!" (Somerville & EchoHawk, 2011). These culturally informed learning experiences stimulated renewal of a Hispanic social action organization, dormant for forty years, which now implements community organizing practices from the Chicano movement in the 1970s to advance civil rights, educational access, and digital presence.

The Support Required to Make Informed Learning Possible

In order for informed learning to flourish in scholarly, workplace, and community contexts, it is essential to provide present and potential participants with a supportive environment, built upon understanding and enhancing information and learning processes; and to introduce opportunities for the uptake and adoption of new practices. Depending upon the context, those responsible for providing a supportive informed learning environment include university administrators, academic deans, classroom teachers, library administrators, museum directors, corporate executives, HR developers, community leaders, and government officials. Supportive informed learning environments are inclusive, with regard to learners' social, cultural, and educational backgrounds, learning and teaching approaches, and information types and sources.

Providing such support involves being aware of what constitutes information and what it means to be information literate in that society or cultural context, especially when it involves harnessing technologies and elaborating infrastructures, fostered by policies (Catts, & Lau, 2008), services and educational programs to further an information society. Research recently undertaken into the experience of informed learning for healthy aging illustrates the importance of understanding informed learning in specific contexts (Yates, Partridge, & Bruce, 2009). For example, if people in a local community are to become more aware of health information and use it effectively, project planners need first to understand what community members consider to be valuable information, what their preferred sources are, and how they prefer to engage with information (use it to learn). Sample sources might include people—friends, elders, nurses, doctors; paper—newspapers, magazines, pamphlets; electronic sources—static, interactive or other form. Planners from more privileged backgrounds should not assume that their notions about preferred sources and formats are transferrable to others, nor that their assumptions about

best practices for information literacy transfer across communities. Rather, the real life experiences of the population to be served should inform planning decisions; what *using information to learn* (being information literate) means to them, in the present situation, must become the starting point for the conversation. If it becomes clear that changing (or enhancing) peoples' ways of being information literate requires new educational, training or change management processes, this must occur through inclusive participative planning processes.

Throughout, the focus on using information to learn must extend beyond issues of information access. An example from community health illustrates this point. A recently published annotated bibliography about connecting older adults to Internet information (Barnett, 2009) reveals that almost all the available literature focuses on issues of accessibility or usability, with a few papers about teaching older adults to evaluate health information. While accessibility (the availability of the information or technology) and usability (the user-friendliness of the information or technology) are important foundations, they are not sufficient for persons seeking meaningful engagement with information to learn about health.

Of vital importance to informed learning environments are library and information services, and especially information professionals that have strong understandings of information literacy and learning. As we observe increasing seamlessness between different contexts and sectors, the concept of the informed learner establishes a critical link between the settings. As boundaries continue to blur we see formal education brought to workplaces, and the workplace comes to formal education settings; informed learning is vital to community learning, community learning intersects with and fortifies academic learning, whether that learning is formal or informal in nature. We also see archives, museums, libraries, and galleries become much less independently defined. Community based libraries, museums, and galleries have key roles to play with educational institutions in advancing formal and informal experiences aimed at furthering informed learning among people of all ages and cultures.

Creation of enabling informed learning environments is best accomplished through inclusive collaborative design processes (Somerville, 2009). Often, this will involve employing appropriate technologies and building new organizational structures to extend existing one-on-one and group communications and relationships. Examples of how this can be achieved in scholarly, workplace, and community contexts are presented below.

Supportive Learning Environments in Scholarly Contexts
Supportive scholarly contexts, such as schools, universities, and research centers, are learner-centered and foster collaborative and independent learning. Vital elements of informed learning in scholarly contexts include: reflective learning, which promotes inquiry, reflection, and prob-

lem solving; thoughtful and effective management of information re-
sources; self-directed learning individually and in teams; research-based
learning that activates and extends prior learning; and curriculum that
encourages reflection on the implications for self and others of learning.

Informed learning is underpinned by cohesive and relevant curricu-
lum. Learning activities are designed to ensure that students develop
critical, creative, and ethical information using practices while construct-
ing new subject knowledge. Assessment activities align with learning out-
comes and enable students to apply a varied range of information using
strategies in challenging yet meaningful ways, for problem solving and
decision making. Students continuously engage in thoughtful dialog and
reflection about what they are learning as they engage with their informa-
tion environment. They are encouraged to consider how their learning is
influenced by different sources and technologies and understand which
information processes best suit their learning needs and styles (Bruce,
2008; Bruce & Hughes, 2010; Jacobs, 2008).

Students are supported by educators who themselves are informed
learners, engaged in continuously developing their own subject knowl-
edge and information practices. Informed educators act as learning
guides and consultants to their students, fostering independent research
and co-creation of new knowledge. They ensure students are equipped
with understandings and capabilities to take advantage of a range of estab-
lished and emerging technologies and to interact safely, responsibly, and
productively in online environments. Informed educators embrace social
and cultural diversity, creating inclusive learning environments that en-
able students to share varied knowledge and experiences and so develop
rich, inquiring, and mutually respectful world views. Librarians, technolo-
gists, learning designers, learning support staff, as well as discipline based
teachers must all work together to support such contexts.

Supportive Learning Environments in Workplace Contexts
To make an informed workforce possible, information professionals (li-
brarians, knowledge managers, information managers, record keepers),
human resources personnel (e.g., workplace trainers), and technology
professionals need to work closely together. Information professionals
create information and learning spaces and help access and organize re-
sources on behalf of, and in collaboration with, their clients. Eilean Craig,
in the National Health Services, Scotland, for example, has developed an
information literacy framework to assure an informed workforce for NHS
Scotland (National Health Service Scotland, 2008).

Supportive organizational environments attribute value and provide
resources for the free flow of information in various ways that include:
environmental scanning, sharing business and competitive intelligence,
introducing appropriate technologies, and enabling access to online in-

formation, both internal and external to the organization. They facilitate access to current and relevant information, as well as supporting corporate memory, through e-libraries, knowledge management processes, and professional information services. They foster regular, ongoing professional learning, mentoring, and networking opportunities to support research, innovation, and enhanced productivity. An overarching concern is promoting ethical use of information, related to professional, corporate, and personal codes of ethics.

Supportive Learning Environments in Community Contexts
To make an informed citizenry possible, information professionals (librarians, knowledge managers, information managers, record keepers) in libraries, museums, galleries archives, and similar information spaces, technology professionals, and others (professionals in health services, financial services, legal services) need to maintain collaborative working relationships. People of all ages, backgrounds, and cultures need to be supported in their quest to learn in the community context.

Characteristics of supportive information environments in the community include:

- government and community support for information services;
- up-to-date information technologies, enabling access to online information;
- free access to information with emphasis on open source initiatives;
- educational opportunities online, in libraries and within community spaces, to increase awareness of the many processes and options available to them;
- availability of resources and community education around personal needs, including managing personal/home finances; entertainment; creativity, such as photography and video production and editing; information and communication technologies (ICTs) including Web-page design and construction, computer file management, effective use of e-mail and mobile devices;
- availability of community resources and education around using information resources critically and ethically to learn; understanding their intended audience and the purposes of the authors or designers; understanding the drivers, the motivations, the passions of significant others from whom we may choose to learn; engaging safely and responsibly in online environments;
- a rich and diverse information environment, focused on enhancing creativity in culture, science, and personal well-being;
- an inclusive environment in which diverse values and life philosophies are valued and celebrated, raising awareness of how beliefs influence our decisions and actions and relations with other people.

Cultural agencies, including libraries, should consider formalizing the *educator* roles of professional staff. Public libraries, for example, tend not to acknowledge their own role, or the role of librarians as educator (Harding, 2008); and while libraries in formal education settings do so, the wider educational community may not readily recognize this role.

THE VARIED AND SOMETIMES PARADOXICAL ROLES OF TECHNOLOGY IN INFORMED LEARNING

What are the roles of technologies in informed learning? Technology here is interpreted broadly as information and communication technologies (ICTs), both computer and noncomputer based. Computing related hardware and software tools might include mobile devices and social networking media, as well as the many other emerging forms such as semantic Web and cloud computing. Noncomputing technologies might include books, physical resources, instruments, or other tools and artifacts. All learning requires the use of some form of technology. The relationships between informed learning and ICTs, however, are complex. This complexity increases as we bring the principles and ideas associated with informed learning to social networking spaces, especially the interactive Web environment. As we continue to experience the influence of new technologies, the role of technology becomes increasingly complex, partly by creating further influence on the information literacy experience, and evolving new contexts in which that experience might play out. Some of the existing interrelations are considered in this section.

Sometimes Technology Contributes Vitally to the Informed Learning Experience and Transforms It

People use information in an increasingly information rich and chaotic environment that is regularly transformed by new technologies. Communication takes place via e-mail and the Web; journals are contributed to, and read, online; conferences are attended virtually, or in the form of unconferences; evidence for professional and personal decisions is sought from a wide array of sources including online hosts; brokers and other information professionals, especially librarians, play a vital role in ensuring the flow of reliable or high quality information; professional meetings are conducted via chat groups. Producers and consumers become *prosumers*, blending inextricably their producer-consumer roles (Bruns, 2008).

In social networking spaces, phenomena such as blogs, wikis, Second Life, YouTube and Myspace, Facebook, Flickr, and Twitter continue to change the ways in which we experience our world. While many of these online landscapes were initially used by private individuals, organizations, and educational institutions, libraries and other cultural agencies are increasingly embracing them for the benefit of employees and clients. In some cases individuals within organizations bring the benefits of their

personal skills to the organization through informal channels (Andretta, 2009). Overall the experience of using information in innovative digital spaces is blurring boundaries between private, professional, and academic domains.

Sometimes Technology Makes It Harder for People to Be Informed Learners
While ICTs are important and influential sources of information, they often represent barriers for those struggling to use the technologies due to limited capabilities or access. Today's digital/virtual environments make it harder for people to be information literate (Lorenzo & Dziuban, 2006). The sheer volume of content and software available makes successful and creative use of what is available an ongoing challenge. A British report shows that while people may use technology extensively, they do not have the capabilities required to make the most of their information environments, due to limitations in their information literacy (Rowlands & Nicholas, 2008). Extensive access to informal information environments make it difficult for the uninitiated to discern authoritative and unauthoritative information or to determine when information may be considered authoritative in some contexts but not in others.

High levels of technology without informed learning or information skills of the conceptual kind may mean that we become poor learners. Greenfield (2009) warns of risks that ongoing users of social networking sites may find that the manner in which their brains interact with information will change; and Wilson (2008) records Greenfield's comment that:

> modern generations may be very good at processing information but not acquiring knowledge. . . . In order to find something out you have to know what you want to ask. You don't want to be in an answer rich, question poor environment any more than you want to be in an answer poor, question rich environment. (p. 19)

Technology Is Unlikely to Be Empowering Unless in the Hands of an Informed Learner
Many information experiences are now inextricably entwined with technology; while the conceptual skills involved transcend technology, the basic practices remain. The more complex forms of informed learning are not dependent on technology, and these experiences must be emphasized to ensure that when technology is available it can be used to maximum advantage. For example, a writer must seek history, context, inspiration, collaboration, and review with or without technology. While technology may simplify or make the process more complex, it may also act as a barrier or may add new facets to the experience. Scientists must understand how knowledge has developed in their field, who has contributed, what they have contributed, the potential nature of a contribution, what constitutes scientifically acceptable knowledge and acceptable approaches to generating that knowledge; a decision maker or problem solver must have

the required heuristics to engage in those processes if technology is going to facilitate or enhance their experience. Again technology may make a range of contributions. Scientific information practices have evolved from scientific letter writing to the possibilities of e-research. Nevertheless, technology itself is unlikely to be empowering unless in the hands of an informed learner.

Sometimes Technology Is Simply Not Available
Informed learning is essentially inclusive and celebrates multiple forms and uses of information across socially and culturally diverse communities. Although advanced information technology may not be within the reach of all individuals and groups, people are able to be creative, reflective, and ethical information users in both ICT rich and poor contexts. Lack of access to new technologies need not inhibit informed learning. Thus, it is generally inappropriate to impose the norms of information and ICT use that have evolved in more developed contexts to less developed contexts. Information professionals and other stakeholders, including researchers, can refocus attention on the character of information that is considered important in different cultural contexts, including within relevant discipline, professional, community, and other contexts. Those of us committed to supporting lifelong learning must bring the information experiences within different kinds of communities, including technology users and nonusers, to the fore. We must learn to understand and facilitate the informed learning experiences of people of all genders, ages, cultures, regions, faiths, and ethnicity.

A Holistic Framework for Guiding Policy Direction in Different Contexts

Informed learning requires the active commitment of senior administrators and educators from a range of organizations, which include information, education, and other cultural agencies, as well as corporate, government, and not-for-profit institutions. To assist their leadership of the development and implementation process, we present a set of *informed learning policy principles.* These policy principles, which derive from the concepts of informed learning discussed previously, are applicable to a wide variety of scholarly, workplace, and community contexts. They build on the idea that informed learning emerges from an orientation toward understanding people and their experience of effective information use in various contexts, a direction complementary to imposing expectations about what they should or should not do. Consequently these policy principles direct attention toward the importance of considering aspects of information use as well as what is being learned in all learning communities. Using information to learn is an important part of all formal and informal learning environments, and is therefore a vital component of the lifelong learning agenda.

While the following nine policy principles may be interpreted and implemented in different ways according to context, the underlying assumptions about informed learning remain constant. Each policy principle is accompanied by a brief description of its practical application and associated underlying assumption about informed learning.

Informed Learning Policy Principle 1: Foster Informed Learning

> Informed leaders, educators, information professionals and agencies in all sectors promote and implement a holistic learning approach that simultaneously enables people to develop subject knowledge and information practices that extend beyond information skills.

> Underlying assumption: Informed learning involves learning with and about information.

Informed Learning Policy Principle 2: Promote Critical, Creative, and Reflective Information Use in Learning

> Informed leaders and educators promote and implement a holistic learning approach that enables people to develop deep and wide understandings about information and thoughtful information practices.

> Underlying assumption: Informed learning builds upon and extends beyond information skills.

Informed Learning Policy Principle 3: Recognize That the Experience of Information Literacy May Vary across Different Cultures and Communities

> Informed leaders and educators in all sectors understand that information literacy is not a homogenous set of skills, rather it reflects peoples' experience of using information, an experience that is likely to vary across cultural and contextual boundaries. They support people as they engage in the processes of informed learning in a variety of information and communication environments, both traditional and online.

> Underlying assumption: Informed learning fosters information practices that are relevant to the needs of particular user communities.

Informed Learning Policy Principle 4: Explore and Celebrate the Diversity of User Communities in Order to Support Their Information and Learning Needs

> Informed leaders and educators in all sectors understand the information and learning needs of those they serve and employ

and with whom they collaborate. This involves seeing through the eyes of many people, developing insights into the character of effective information use in specific cultures and contexts, both traditional and innovative, in order to understand and determine ways of advancing learning.

Underlying assumption: Informed learning requires inclusive interpretations of information use and learning approaches.

Informed Learning Policy Principle 5: Advocate for the Disadvantaged and Disempowered

Informed leaders and educators in all sectors support those who have limited access to ICTs, information, or education; or who experience barriers to using information to learn.

Underlying assumption: Informed learning enables individuals to achieve their rights regarding access to information and information use.

Informed Learning Policy Principle 6: Develop Informed Learning Environments for People of Diverse Generations, Learning Styles, and Cultural Heritages

Informed leaders and educators in all sectors enable people to explore and participate in social networking and collaborative communities, while accommodating varied personal preferences for accessing and using information and learning in more traditional ways.

Underlying assumption: Informed learning enables people to participate in a range of environments.

Informed Learning Policy Principle 7: Pursue the Potential of Technological Innovation and Learning Space Design for Informed Learning

Informed leaders and educators in all sectors engage with advancing information environments and technologies, changing information behaviors, and emerging art, text, sound, and language.

Underlying assumption: Informed learning enables people to keep abreast of and contribute to contemporary trends in education and communication.

Informed Learning Policy Principle 8: Collaborate to Support Informed Learning

Informed leaders and educators in all sectors encourage and provide means for specialists from varied disciplines and fields, including technologists, educators, and information profession-

als, to work together, to put in place learning programs and supporting environments.

Underlying assumption: Informed learning requires collaborative partnerships between all stakeholders.

Informed Learning Policy Principle 9: Broaden the Recognition of Educator to Include Information Professionals such as Academic and Public Librarians, Museum Curators, and Others

Informed leaders and educators in all sectors, including public libraries and other cultural agencies, formally recognize the *educator* roles of professional staff and support their involvement in the development and implementation of informed learning opportunities for clients.

Underlying assumption: Informed learning assumes that professionals who support information use (in any form) are educators.

CONCLUSION

In this article we have introduced the concept of informed learning as it applies to educational, workplace, and community settings. We have explored the experiences of informed learners, the ways in which such experiences might be supported in these three settings and the roles of technologies. Drawing together these essential aspects of informed learning, we have proposed nine principles to guide the development of policy around the informed use of information and technology. In closing we return to our initial point about why we have found the idea of informed learning to be a useful addition to the language we use around information literacy. Largely, the terms *information literacy* and *information literacy education* are interpreted as being about the development of skills: technological skills, library skills, and information skills. In contrast, informed learning represents a holistic approach that involves using information as we go about learning. While skills are important, there is a tendency among information literacy educators to focus more on the skills and less on how people use information to learn. It is important to move beyond skills to afford learners in education, the workplace and the community the rich potential that may be gained from broader attention to the different ways of experiencing information use in the disciplines, professions, and the society that are promoted by informed learning.

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