

Information literacy and informed learning: conceptual innovations for IL research and practice futures.

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Abstract

Our paper draws together conceptual innovations emerging from the work of a group of researchers focussed on the relational approach to information literacy (IL), more recently labelled 'informed learning'. Team members have been working together in various configurations for periods ranging from seven to seventeen years. Our collaborative approach continues to yield new concepts and constructs which we believe to be of value to ongoing research and practice. Some of the ideas discussed have been previously published, while others are being put forward for the first time. All are significant in that they together form new constructs that have emerged from a focus on the relational approach to IL. In this paper, Christine Bruce introduces the background to this work and the contributing researchers, as well as providing concluding comments. Then the individual authors present the key directions which they have developed and are leading, typically working with one or more of the wider network. The key ideas presented are: The Expressive window for IL (Mandy Lupton); information experience design (Elham Sayyad Abdi); cross-contextuality and experienced identity (Andrew Demasson); informed learning design (Clarence Maybee); spaces for inclusive informed learning (Hilary Hughes); and Informed Systems (Mary Somerville and Anita Mirijamdotter). In each section, the respective authors reflect on what the idea is about, where it came from and what it might mean for research and practice.

Keywords

cross contextuality; experienced identity; expressive window; GEST windows; GESTE windows; information experience design; informed learning; informed learning design; informed spaces; informed systems; relational information literacy; Australia; Sweden; US

1. Introduction (Christine Bruce)

The cornerstone for this paper is the relational approach to information literacy (IL), and a team of researchers that have developed theoretical innovations based on their use of, or close association with, that approach.

The relational approach to IL (Bruce, 1997) comprises ways of thinking about IL, IL research and IL education that are grounded in understanding variation in people's experience of that phenomenon. As that approach gained traction, and a range of studies presented phenomenographically inspired insights into people's IL experience in different contexts, the relational approach came to be represented as 'informed learning' (Bruce 2008). Since then, ongoing interest in phenomenographic perspectives on learning and IL has inspired the range of conceptual innovations associated with research and practice that are reported here. A key conceptual innovation which has influenced some of these directions, also emerging from members of this group, is the idea of 'information experience' (Bruce et al., 2014). For this team, the idea of 'information experience' is inseparably intertwined with 'learning experience' as core elements of the experience of IL (Bruce, 2013).

The researchers responsible for the ideas in this paper are located in Australia, the US and Sweden and have worked together in many ways over periods spanning seven to seventeen years. Christine Bruce, Hilary Hughes and Mandy Lupton have the longest-standing intellectual partnerships around IL in the team. Mary Somerville and Anita Mirijamdotter have collaborated extensively with each other and with Bruce and Hughes; Lupton and Hughes were doctoral peers, as were Elham Sayyad Abdi, Andrew Demasson and Clarence Maybee. The connections between Somerville, Mirijamdotter and I, we believe, have been strengthened through our similar intellectual roots in Swedish thought. As academic peers, we all have been, or are, co-supervisors of students, collaborating authors, collaborating grant applicants; some of us have been visiting researchers or consultants at each others' institutions. We are always conscious of the grey area between collective and individual ownership of many of the ideas presented here. Informed learning itself would not have been possible without the collective underpinning research and accompanying conversations. At the same time, each idea is identifiably the brainchild of the authors listed. Moreover, we are all conscious of the extensive influence of other research peers in our network, especially Sylvia Edwards, Helen Partridge and Ian Stoodley with whom we have worked closely for many years.

The conceptual innovations reported here range from those which have been developed over many years – inclusive informed learning, informed systems, and the expressive window - to others which are somewhat newer - spaces for informed learning, information experience design, informed learning design, cross-contextuality and experienced identity. Some of the ideas have been previously published; others have more detailed manuscripts still under development. While all the ideas that follow have emerged from an interest in the relational perspective, not all necessarily remain closely linked to that perspective. The latter three ideas are strongly related to informed learning; the former have emerged from investigations adopting the relational approach to IL, but are less closely tied to it in their evolution.

1.1. Informed learning

To assist the reader, an initial overview of informed learning is provided here, following the pattern used in the rest of the paper.

1.1.1 What this idea is about

Informed learning (Bruce, 2008) is a way of framing the relational approach to IL for educators engaged across academic, workplace and community contexts. It also translates the relational model of IL (Bruce 1997) into learning practice, offering a pedagogic framework for enabling students to use information to learn, fostering critical, creative, ethical and reflective engagement (Bruce, 2008; Bruce & Hughes, 2010). Information is understood to be anything that informs in a particular context, as research suggests that there appear to be no limits to what we might experience as information (Bruce, 1997, pp.53, 102-103). It includes, for instance, many aspects of personal and professional experience, facts, theory, research findings and models, drawings, recipes, interviews, body language, sounds, archival material, the elements of the natural world as well as the virtual world. Through being aware of information use when learning, learners can become more aware of how they may use information in future academic, personal, and workplace learning situations.

Informed learning promotes pedagogical approaches that reflect twelve characteristics and incorporates three key principles (Hughes & Bruce 2012). Informed learning is: expansive, grounded, active, reflective, creative, eclectic, balanced, contextualised, inclusive, socially responsible, collaborative and transformative. It:

1. takes into account learners' existing experiences of informed learning, using reflection to enhance awareness
2. promotes simultaneous learning about disciplinary content and the information using process
3. brings about changes in learners' experience of information use and of the subject being learned

These principles and characteristics highlight the aim of informed learning to enhance awareness of new ways of experiencing and using information to learn.

1.1.2 Where this idea comes from

Informed learning emerged from IL research at the Queensland University of Technology, in particular my own phenomenographic work (Bruce, 1997) and Mandy Lupton (2008), as well as the wide research base cited in Bruce (2008). Conceptually, informed learning builds upon the understanding that using information to learn is a complex and varied experience. Informed learning theory aligns with the relational model of the 'seven faces of information literacy' (Bruce, 1997).

1.1.3 What it might mean for research and practice

In drawing on learners' experiences of using information to learn, informed learning provides a conceptual framework for both formal and informal learning contexts across academic, workplace and community settings (Bruce & Hughes, 2010; Bruce, Hughes & Somerville, 2012). In higher education (HE), it supports curriculum design and pedagogy for transformative learning outcomes through reflective inquiry and discovery. Beyond the interdisciplinary imperatives of contemporary HE, informed learning contributes to the socio-economic wellbeing of the wider community.

2. Expressive window for IL (Mandy Lupton)

2.1 What this idea is about

The Expressive window for information literacy is part of the GeSTE windows model. The GeSTE windows is a way of seeing information literacy through four perspectives: Generic, Situated, Transformative and Expressive (Lupton 2008). The GeSTE windows form a hierarchy of increasing complexity with the Generic window at the base (i.e. simplistic) and the Transformative and Expressive windows as a parallel top level (i.e. complex).

The Generic window sees IL as a set of generic skills and processes where information is codified and tangible. The Situated window has a contextual, socio-cultural orientation. In this window, IL involves engaging in authentic information practices. Information can be internal, subjective, embodied and sensory. The transformative window takes a critical theory approach. It involves critiquing power structures and knowledge generation in society, with the aim of taking social action.

In contrast with the other windows, the Expressive window is deeply personal. The aim of the expressive window is to build identity, and to express and understand oneself. Information is internal, subjective and transformative. In this window, information is viewed as 'that which informs'. As such, anything can be perceived as information (Bateson, 1972; Buckland, 1991). Information sources could include thoughts, ideas, opinions, beliefs, feelings, imaginings, intuitions, life experiences and sensory experiences.

The Expressive window has two dimensions: creating information and responding to information. Creating information involves the ways we produce information that is an expression of ourselves. It is a way that we can express our identity. Responding to information involves an aesthetic and emotional response. It is the way that information engages our hearts and minds. In contemporary online environments, the Expressive window can be seen in the shift from consumption to creation, and in the ways that people create digital identities as expressions of their different personas.

2.2 Where this idea comes from

The GeSTE windows model was constructed from theories of literacy and IL (Lupton and Bruce, 2010b) and research into musicians' and dancers' experiences of using information (Lupton, 2008; 2014). It emerged from research that valued 'sensory information by looking at the use of information through the eyes of those who use their senses to create, communicate and express information as an art form' (Lupton 2014, p.71). However, the Expressive window encompasses more than the creative arts. It can also be seen in the ways we decide which information is worthy of our attention.

I have coined the phrase 'information nourishment' to explain the attention focus of the Expressive window. Information nourishment is a way of critically analysing how we spend our time and attention. For instance, in my daily life I make a number of choices: I choose food that is nourishing; to spend time with people who enhance my sense of wellbeing and belonging; experiences that are inspiring, relaxing, fun, playful, joyful, insightful and challenging. I seek natural environments that are calming. I seek urban environments that are exciting. I choose work projects that are interesting and motivating and that give me a sense of purpose. This principle is underpinned by concept of 'essentialism' (McKeown, 2014) and 'infotention' (Rhiengold, 2012).

2.3 What it might mean for research and practice

For research, the Expressive window opens up a number of previously undeveloped conceptions of IL. For instance, my research into musicians' and dancers' use of information revealed an expansive view of information that is not generally present in IL research (Lupton, 2008; 2014; Lupton and Bruce, 2010a).

For practice, an application of the Expressive window is in its potential for highlighting creation of information as an expression of oneself. For instance, in contemporary education, this potential can be seen in the ways that students create web-based artefacts such as music, video, podcasts, images, blogs, websites, portfolios and curated collections. It is seen in the ways that students represent themselves in social media communities, and how they contribute to networked learning.

The Expressive window is particularly powerful when critically evaluating information by considering feelings, aesthetics, expression, and identity. For instance, I can consider affect by asking: How does this source make me feel? What sort of emotions does it evoke? Does this source nourish, enrich, excite and inspire me? Does it challenge me to think, or to re-think? Is this source worthy of my attention? Aesthetics can be considered by asking: Does the source have style, beauty, elegance, flair, originality, quirkiness, humour, wit, vibrancy, liveliness? Does the creator have a distinctive voice? (Sword, 2012) In creating a source I might ask: Is this creation an expression of me? Is my voice distinctive? Will people know this is me? In constructing my digital identity I might ask: Is my contribution to social media valuable in contributing to the crowd/collective intelligence? How might I develop a positive digital footprint? How is my digital identity expressed in different social media?

The GeSTE windows model was originally developed for use in formal education environments; however, it can also be used in a range of personal and professional contexts. The Expressive window offers a unique, personal perspective which values experience and affect, and empowers us to live more nourishing lives.

3. Information experience design (Elham Sayyad Abdi)

3.1 What this idea is about

Information experience design is a new development in the field of information literacy. It is an enabler of information literacy, both in classrooms or library environments, and also in peoples' everyday lives and workplaces.

Information experience design is about broadening peoples' experience of information in specific contexts to its fullest extent. It is about developing and implementing interventions that allow individuals and groups to experience information and the information environment surrounding it in a range of increasingly complex ways which offers them a richer, broader and more effective information engagement experience.

Information experience design starts with an investigation into people's information experiences. This involves looking into a whole experience of a phenomenon and foregrounding the information component of that experience. The outcome of such an investigation would be a description of how, in different ways, people engage or disengage with information in a specific context.

In the second phase of information experience design, suitable interventions, based on the resulting understanding in each specific context, are developed and implemented in order to enhance and improve people's engagement with information in that context. These interventions could include products, tools, services, technologies, strategies or programs. The developed interventions are intended to assist individuals to make the required shift across

different ways of experiencing information until they are aware of all possible ways of experiencing the phenomenon in the new environment. These interventions enable people to obtain richer, more fruitful and more comprehensive information experiences that allow them to navigate the new environment more confidently and effectively. The interventions will also enable people to familiarise themselves more effectively with information environments and information experiences that are new to them, and with which they expectedly or unexpectedly become engaged. In this sense, information experience design is a method for translating the theory of IL into practice. People helped with enhanced information experiences are likely to make more informed decisions or practice more informedly; so they become “information literate” in the sense of being able to use information in a range of different ways (Bruce, 1997).

3.2 Where this idea comes from

The idea of information experience design emerged from my interest in translating the theoretical understanding of IL into practice. The idea emerged from reflections on my doctoral study (Sayyad Abdi, 2014; Sayyad Abdi et al., 2016) which took a relational view of IL. From a relational perspective, a phenomenon is seen as the logically structured complex of the different ways of experiencing an object, for example information (Marton, 2014). IL, therefore, is described as being able to use information in a range of ways. An information literate person from that perspective is someone who can confidently adapt particular ways of experiencing to the situation they are in and navigate effectively through the information environment. The outcome of such a study is a set of significantly varying ways that constitute the studied group's experience of IL.

Reflecting on theoretical and practical implications of my research, and considering the theoretical outcome of similar studies (e.g. Demasson et al., 2016; Maybee et al., in press; Yates, 2015), I started to wonder how the theoretical understanding of relationally viewed IL research could be translated into practice. This inspired the development of the idea of information experience design.

3.3 What it might mean for research and practice

Still in its early days, information experience design is an emerging concept that merits further research.

In addition to being a specific phenomenon to be researched, information experience design also has the capacity to become a field of research. Such a field could extend the IL domain, and link it to areas such as user experience (UX) design, human-computer interaction and human-information interaction, through which a multidisciplinary field might be created. Being tightly grounded in the new area of information experience research, information experience design research will concurrently develop our theoretical understanding of information experience.

With a strong focus on enabling the application of IL research outcomes, information experience design has also significant contribution in practice. As an enabler of IL, information experience design contributes to IL education beyond the classroom and the library. In this regard, information experience design can be used as a means to educate people for information literacy in new contexts within their everyday life or workplaces environments. Such an approach assists IL stakeholders such as librarians, IL instructors and other information professionals to enable the transferability of IL beyond library and university walls to everyday life and workplace settings. In this regard, information experience design informs the teaching of IL for non-traditional contexts. It allows design and development of IL-enabling products, tools, services, technologies, strategies or programmes for non-classroom, non-library environments.

This will, in addition, create collaboration among IL stakeholders and practitioners from beyond the information profession.

Information experience design can address questions around the implications for practice of the idea of information experience (Bruce et al., 2014). It has the potential to yield insights into how people's information experience could be enhanced in different contexts, specifically in workplaces and everyday life contexts; and it brings the theory and the practice of IL together, engaging both researchers and practitioners of the information domain and beyond in the process.

4. Cross contextuality (Andrew Demasson)

4.1 What this idea is about

To date, when IL studies have been conducted, they have typically fallen into one of three contexts - educational, professional or community-based IL. While some studies have had the potential to display overlap between contexts, no explicit attempt has been made by researchers to engage with that possibility. However, my recent work (Demasson, 2014; Demasson et al., 2016) has identified a critical area of engagement, leisure, where an individual's IL experience can be seen to connect with and cross over more than one context simultaneously. That overlap, which I have termed 'cross-contextuality', provides a new contribution to the field of IL and represents both a unique finding and a new set of possibilities for IL research.

4.2 Where this idea comes from

This idea originates from my study into the IL experience of serious leisure participants (Demasson, 2014; Demasson et al., 2016). While the study from which this idea emerged adopted a relational approach to IL research, the idea is applicable across the IL research and practice landscape.

4.3 What it might mean for research and practice

Cross-contextuality provides a new way of approaching the context of research studies, and alerts researchers to the possibility that their work may be contextually more complex than they had originally thought. In doing so it shows IL to have greater value and reach as well as more significant implications than had previously been imagined. That being the case, future research programmes, aware of the cross-contextual possibilities of IL, can leverage their research (for example, to those agencies which fund research projects) as having the potential to examine and influence multiple dimensions of society.

The idea of 'cross-contextuality' also broadens researchers' understanding of the ways in which IL can be understood. When future studies are undertaken, researchers may consider the possibility that, while their focus may be on IL within a specific context, there may be contextual overlap and that could be taken into account. As a result, they will have the opportunity to examine whether or not contextual overlap does occur. Similarly, the potential for cross-contextuality will influence the way in which researchers consider their participants. Rather than considering that their IL experience occurs only within one context, they are now able to see them as being potentially influenced by multiple contexts. That means, the way in which IL functions or is experienced within one context may be directly related to and influenced by the way in which it is experienced within another context (or contexts).

In regard to IL, an important task for future research might be to examine and test the notion of cross-contextuality. It is not being claimed that IL is always cross-contextual in nature; however, the question needs to be asked, when is it cross-contextual and what are the implications of that

occurrence? To that end, further research should be conducted which locates those sites or situations in which IL can be seen to entail more than one context simultaneously and to detail the impact that has on the individual's IL experience and engagement.

There is also potential for impact on the design and delivery of IL programmes. When those programmes are being developed, the designers would need to be aware of both the potential their environment holds for cross-contextuality (including its ability to attract people operating in a variety of contexts) and the impact that potential has for the programmes they want to deliver. In a narrowly focussed environment, in which the group is all working towards the same or similar aim/s, that potential is likely to be limited; but in a more diverse environment, such as a library, the potential for cross-contextuality would be significantly higher. That does not have to be a limitation or a barrier to delivery of IL programmes. Instead, it might provide a way in which to more deeply engage with the organisation's (or industry's) various patrons. In being aware that the audience may not all be operating within the same context, educators will be more able to develop an IL environment that accommodates the needs of people operating in and across multiple contexts.

5. Experienced identity (Andrew Demasson)

5.1 What this idea is about

Experienced identity is proposed as a way in which to represent, especially within studies that adopt a relational perspective, the authentic experience people have with information and the potentially fluid nature of their information identity. Experienced identity refers to a way of seeing oneself and being seen by others in relation to a particular context or set of circumstances. The idea of experienced identity emerges from the experience an individual has of a particular phenomenon. The identity that emerges is not alien to the individual but is organically representative of their experience of the phenomenon in question. In using the word 'organic', I mean natural, and not consciously adopted in order to experience or understand the phenomenon within certain parameters (for example, a way required or expected of a particular person or group). In that regard, the person does not consciously adopt the role of 'teacher' or 'student' prior to engagement with the phenomenon. Instead, they can be seen to display those characteristics they emerge through, and as a result of, engagement with the activity, not prior to the activity being engaged with.

5.2 Where this idea comes from

In 2014, I submitted a thesis (Demasson, 2014) outlining my research into the IL experience of people engaged with a serious leisure activity. One of its key observations was the way in which the identity experienced by the participants appeared to change as they moved from one engagement with information to another. Where previous studies (Harding, 2011; Yates, 2015) refer to 'role shifts', that language did not appear to fit the experience of the serious leisure participants and did not accurately represent the phenomenon being observed in my own study. At no time did the participants talk about adopting a particular way of engaging with information. They didn't see themselves as adopting a particular role (learner, teacher, parent, lawmaker, etc) or categorise their information experience in any particular way. Instead the identity that emerged and changed throughout their information experience - whether as leader, teacher, student, expert, creator, consumer, or parent - was a natural (organic) outgrowth of their experience with information and of a particular phenomenon. Consequently, the term experienced identity was coined.

To clarify the distinction between the natural/organic experienced identity and the idea of 'role', consider the analogy of method acting. A method actor seeks to infuse their performance with an authenticity they believe cannot be found by merely performing a 'role'. Instead they strive to

produce an authentic representation of the natural, organically occurring experience their character would have. That is to say, they aim to present their character's experienced identity.

5.3 What it might mean for research and practice

The idea of experienced identity has implications for at least two distinct research areas: serious leisure and IL. Focussing on the latter, there are four interconnected questions that need to be addressed.

1. Is experienced identity constituted in the encounter which necessitates their engagement with IL OR
2. Is the experienced identity something pre-existing that is brought to the encounter?
3. Does the experienced identity change as a result of the encounter (is there a wholly new experienced identity that emerges)? AND
4. What are the implications of those answers?

Addressing those questions could provide an avenue through which to engage in longitudinal studies of the IL encounter.

We may also find that multiple experienced identities exist at different points within the IL experience. While identity may precede the information encounter, therefore, it would not be unaffected by it. Subsequently, when people engage with IL their engagement will be informed by the experienced identity they bring to bear on the encounter (established, perhaps, by a prior encounter) and the one that emerges as a result of that encounter.

IL and experienced identity would, therefore, be experienced as part of a dynamic, fluid and ongoing experience in which multiple experiences are connected by the individual. That, in turn, would require us examining not only the context in which the phenomenon is encountered but also the subtext that the individual brings to the IL encounter (the 'lens' through which they view the phenomenon). That relationship – between the subtext, context and text (defined by me as being anything that requires meaning to be ascribed to it and which can be physical, experiential, abstract, concrete, overt or tacit) - forms the basis for further IL research I am currently undertaking.

Figure 1: The relationship between text, context and subtext

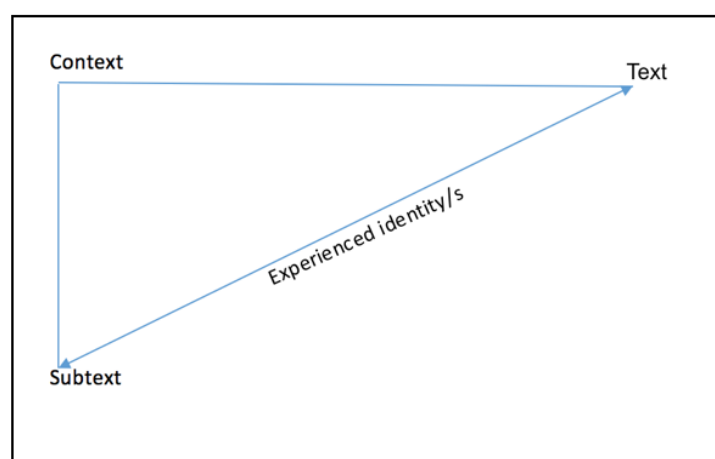


Figure 1 proposes what that relationship might look like, with a reciprocal bond between the subtext and the text. The subtext provides the lens through which the individual experiences the text (determined by the context in which it is encountered) while the text impacts upon the

individual to affect the experienced identity which emerges from the encounter they have with the phenomenon. 'Reading' (understanding) of the text is dependent on the context in which it is encountered and the subtext the person brings to the textual encounter.

An example is the famous *Uncle Sam* poster . The poster is a piece of text – visual and literal. In the context of 1942 United States after the bombing of Pearl Harbour, it might be have been interpreted through the subtext of a country at war and read as a symbol of patriotism . In the context of late 1960s United States, the text may have been interpreted through the subtexts of student unrest, feminism or black activism and read as a symbol of capitalism, the patriarchy or white oppression. While the text itself remains static (the image has not changed), the context in which it is enountered has changed along with the subtexts through which the text is interpreted. Subsequently, the experienced identity is a key element of the IL experience constituted in the interrelationship between the individual and the text.

Experienced identity fits with my concept of cross-contextuality in that both emphasise the dynamic, fluid potentiality of IL engagement and experience.

6. Informed learning design (Clarence Maybee)

6.1 What this idea is about

Informed learning design is a curriculum design process through which teachers can cultivate informed learning (Bruce 2008) in their classrooms. Informed learning is grounded in three principles:

1. building on learners' prior experiences
2. concentrating on both learning to use information and subject content
3. simultaneously focusing on subject content and using information.

Informed learning design also draws from the variation theory of learning, which suggests that learning involves becoming aware of critical aspects of an object of learning defined by a teacher's intentions, and introduced to students through lessons and assignments (Marton 2014; Marton & Tsui 2004). In an informed learning environment, students foster an awareness of critical aspects associated with both using information and subject content (Maybee, 2015; Maybee et al., in press).

Informed learning design consists of three stages:

1. Identifying critical aspects of intended learning which include both using information and subject content.
2. Defining assessment methods for gauging students' increased awareness of critical aspects associated with using information and subject content.
3. Determining activities that enable students to learn about critical aspects associated with subject content by intentionally using information.

During stage one, the designer of an informed learning environment examines past teaching interactions or initial evaluations to identify students' current experiences, and uses the conclusions to determine intended changes in students' awareness of using information and subject content to be focused on in the course. In stage two, methods for assessing the changes in students' awareness throughout the course are selected. The learning activities determined in stage three help students to foster the new awareness and ability to use information to learn as defined in stage one.

6.2 Where this idea comes from

The development of informed learning design began with, and continues to evolve from, a study (Maybee, 2015; Maybee et al., in press) that used the variation theory of learning (Marton, 2014; Marton and Tsui, 2004) to examine informed learning in an HE classroom. Informed learning and variation theory are both underpinned by a relational perspective, which views human experience as an interrelationship between people and phenomena. Beyond simply introducing students to disciplinary concepts, variation theory suggests that an object of learning focuses on making students aware of aspects critical to experiencing a phenomenon in a new way (Pang & Ki, 2016). The focus of informed learning is for students to experience critical aspects associated with using information and subject content. The informed learning design process borrows from the structure of backward design (Wiggins & McTighe, 2005), which utilises a three-stage process to create course curricula in which goals for learning must be identified before assessment strategies and learning activities. In the three stages of informed learning design, the focus is on enabling and evaluating students' increasing awareness of critical aspects related to using information and subject content.

6.3 What it might mean for research and practice

Informed learning design may be used by teachers to develop courses and by librarians and instructional developers working to integrate IL into disciplinary curricula. Few studies have examined informed learning environments in educational settings (but see Hughes & Bruce, 2012; Maybee 2015; Maybee et al., in press; Smeaton et al., 2016). Although seasoned teachers may be able to recognise critical aspects through interactions with students, research on informed learning environments is necessary to extend our knowledge of critical aspects related to using information and subject content. A research approach called "learning study," that uses variation theory to enable teachers to design instruction fostering intended changes in student awareness (Pang & Ling, 2012) has great potential for the exploration of learning environments created using informed learning design. Conducting this type of research in various educational settings, such as different subject areas (such as biology or history), or modes of instruction (such as online or flipped) will further illuminate the role that using information plays in teaching and learning.

7. Spaces for inclusive informed learning (Hilary Hughes)

7.1 What this idea is about

The idea of spaces for inclusive informed learning responds to learner diversity in higher education. It seeks to support learning approaches and environments that enable students to participate to their full potential irrespective of socio-cultural background. This idea connects elements of my interdisciplinary research related to informed learning, international student experience and learning space design. The linking thread is inclusivity. Extending beyond tokenistic nods to cultural or social differences, inclusive informed learning embraces the diverse knowledge, experience and practices that learners bring. It also acknowledges the influence of environment on students' learning experience and outcomes.

The principles and characteristics of informed learning contribute to the design of inclusive learning approaches and spaces that enable using information to learn in culturally diverse contexts. (Hughes, 2013; Hughes & Bruce, 2012). Inclusive informed learning approaches encourage students to draw upon their previous learning, varied strengths and challenges, thoughts and feelings, and information using strategies. It supports the integration of IL across the curriculum, and addresses an identified IL imbalance between students' generally confident use of digital devices and their less-developed approach to using information.

Spaces conducive to inclusive informed learning can be physical and virtual. They may exist within classrooms, public places (such as libraries), and online. These spaces offer a supportive environment for interaction between learners from diverse backgrounds where they can share information about, and with, each other. Here, learners may safely explore worldwide information sources, differing patterns of thinking and artistic expression. Educators encourage the sharing of trans-cultural perspectives in discussion and assessment pieces. In these ways, spaces for inclusive informed learning encourage participation and generate a common sense of belonging.

7.2 Where this idea comes from

My doctoral study revealed the complexity of international students' experience of using online information to learn at their host university. In addition, it identified the need for IL responses that support their transition to life and study in an often unfamiliar educational environment (Hughes, 2010; 2013). Based on these findings, I proposed an inclusive informed learning approach.

Inclusive informed learning builds upon the work of Bruce (1997; 2008) and Lupton (2008) and the understanding that using information and learning are inextricably linked. It incorporates the key principles and characteristics of informed learning outlined above, placing particular emphasis on inclusivity (Hughes & Bruce, 2012; 2013). Thus, it contrasts with more common deficit-focussed IL instruction that generalises international students' needs in the light of assumed problems and differences.

My more recent research explores relationships between learning environment and learning experience in school and university libraries (Bland et al., 2013; Hughes et al., 2015). It highlights the benefit of including learners and educators in a participatory designing process. To this end, in 2016 I invited academic librarians to share their ideas for creating international student-friendly library spaces, collaboratively in workshops and individually through an online survey (Hughes, work in progress).

In addition, I have developed and evaluated the use of charrettes (collaborative designing workshops) to foster postgraduate students' awareness and capabilities as designers of their learning spaces (Hughes & Bruce, 2012). Through this research, I have discovered that a charrette supports both the process of inclusive informed learning and the design of spaces that enable it. Informed learning principles are evident in charrettes where students simultaneously use design information to learn about and create innovative learning spaces, through practical experience and reflection. Moreover, charrettes and informed learning share similar characteristics, both being active, grounded, collaborative, creative, contextualised and inclusive. Both also promote socially responsible and transformative outcomes.

7.3 What it might mean for research and practice

While my initial research focussed on international students (Hughes, 2010; 2013), the reach of this continuing work is much wider. University populations as a whole are culturally and socially diverse and transition to an unfamiliar academic environment is a commonly recurring challenge for international and domestic students alike. Therefore, purposefully designed inclusive informed learning approaches and spaces have the potential to support social learning and the development of cross-cultural fluency across the university.

The idea of spaces for inclusive informed learning aligns with contemporary pedagogy and increasing attention to learning environments (Ellis & Goodyear, 2016). Spatial awareness is relatively new dimension of IL theory and practice that deserves further attention. As informed learning is essentially a social process, it resonates with the notion that spaces are socially

produced by those who frequent them (Lefebvre 1991). This indicates the need to consider spatial elements in the design of inclusive informed learning.

Principles of informed learning and learning space design could be integrated into a framework for designing IL pedagogy that takes advantage of student diversity. As an educationally inclusive approach, the proposed framework could be applied to different disciplines and academic needs. While supporting learning about a curriculum-relevant topic, it would emphasise inquiry and scholarly practices rather than discrete skills. As part of the whole process, it would enable the development of context-appropriate expression, responsible use of digital technologies, academic integrity, and intellectual processes (such as critical analysis). It would also scaffold collaborative teaching by educators, information specialists and peer learners across disciplines. As a culturally inclusive approach, learning activities and assessment would seamlessly integrate global perspectives. This would encourage students and educators to draw on their varied cultural knowledge and linguistic fluency when using information to learn.

The multiplicity of languages and ethnicities in HE call for the creation of inclusive informed learning spaces that welcome everyone. For example, a group of Denver librarians envisaged an 'international tea house' within the library as a space where inclusive informed learning could occur continuously in many ways. They proposed that tea would be a unifying focus as it is enjoyed in many countries around the world and is often associated with relaxation, celebration and social connection. The tea house would be a circular space to symbolise globality and minimise boundaries and alienating corners. Here students would find a safe, informal space for informed learning related to their study and to life in general. They might gather in this space to share ideas, news, music, and movies from their home countries. Inclusivity might be generated through digital displays of students' artwork or multilingual messages. Educators and librarians could participate socially whilst offering pop-up informed learning support as needed. The space would be flexibly furnished to allow for changing interests and uses. To be truly inclusive, the space would be developed through an ongoing participatory designing process with students.

As a recent concept, spaces for inclusive informed learning still requires further elaboration. There is scope for further research that not only seeks understanding about the nature of this experience (using phenomenography or qualitative case study, for example) but that also develops truly inclusive IL pedagogy (such as through action research).

8. Informed Systems (Mary Somerville and Anita Mirijamdotter)

8.1 What this idea is about

Informed Systems invites co-workers to co-design workplace information systems that advance informed learning, information experience, and learning conditions. Participatory design methods evolve information-focused and action-oriented systems, relationships, and practices that inform decisions to be made and actions to be taken. This organisational learning approach offers enabling processes and supportive infrastructure for nimble adaption and knowledge creation, using information to learn, amidst dynamically changing circumstances (Somerville 2015a).

8.2 Where this idea comes from

Informed Systems evolved from recognising that to foster the creation of agile workplace responsiveness, organisation members must reinvent how they learn, fortified by appropriate structures and activity systems. It follows that building and sustaining a learning culture requires a change in how leaders think and what co-workers think about. In response, complementary learning- and information-intensive theories and methods catalyse re-consideration of organisational purposes and re-invention of workplace outcomes through (re)design of

workplace systems, relationships, and practices - all aimed at supporting operational efficacy within the larger context of an interdependent whole (Walker, 1998).

The genesis of the informed systems approach is the meeting of informed learning (Bruce, 2008) and soft systems (Checkland and Holwell, 1998). Both schools of thought are information-focused and learning-centered. In combining these approaches, informed systems promotes information exchange and knowledge creation (informed learning) within 'viable' workplace systems for organising, designing, and coordinating (soft systems) (Mirijamdotter, 2010).

To begin, systems co-design activities stimulate participants' appreciation of the potential for using information to learn. Then co-designed socio-cultural practices continue informed learning, through focus on information and learning experiences. The organization is therefore conceptualised as a knowledge ecosystem consisting of complex interactions among people, process, technology, and content wherein knowledge emerges through individuals' exchange of resources, ideas, and experiences (Nonaka, 1994).

Over time and with practice, this approach simultaneously advances co-workers' capacity for creating workplace systems, activated by participatory design, amplified by systems thinking, and exercised by collective inquiry. Thus, the notion of 'working together' (Somerville, 2009) recognises the social nature of knowledge generation. 'Rethinking what we do and how we do it' (Somerville et al., 2005) then naturally occurs as colleagues with differing but complementary knowledge skills and work responsibilities advance social, relational, and interactive aspects of work life.

Learning the way to action also organically evolves through exercising informed learning capabilities during increasingly more complex information usage experiences within ever expanding social, procedural, and physical workplace information landscapes. Taking action to improve produces changes in co-workers' ways of seeing, being, and knowing, fortified by co-designed systems and associated practices. Co-workers then evolve to adopt and adapt, create and recreate, contextualise and re-contextualise through wider and wider circles of consultation, cooperation, and collaboration (Hager, 2004) .

Systems thinking furthers deep learning by revealing patterns, interconnections, and interrelationships that, over time and with practice, further organisational members' capacity to direct and adapt their learning processes (Rowley & Gibbs, 2008). Reactive and conservative impulses are transformed to proactive and generative responses, enabled by rich relational information experiences and social interaction opportunities that moves attention from transactions to transformations (Somerville & Bruce, 2017).

8.3 What it might mean for research and practice

The considerable benefits of informed learning prompt the question: "How do we activate sustainable workplace learning in a contemporary information or knowledge organization?" (Somerville, 2015b, p. 6) In response, Informed Systems design, activity, and process models guide creation of local conditions for learning that foster information exchange, sense making, and knowledge creation activities. Enabling systems and information practices serve to broaden, extend, and reframe understanding. Shared vision and common goals then advance overall organisational learning purpose, enabled by workplace systems, design thinking, information usage, and learning relationships.

Local customisation of the informed systems approach is necessary so organisational members experience systems design and knowledge creation in their own workplace. These experiences offer rich opportunities for reflection on experiences as well as formulation of concepts and generalisations. Then, in a cyclical action research fashion, co-workers test these ideas in other

situations, which lead to more experiences that initiate another cycle (Somerville and Mirijamdotter, 2014). Throughout, an action research orientation aims to both inform local practice and also inform purposeful action.

Informed learning serves as a theoretical construct which encourages exploration of learning-related and context-situated instances of using information, through which co-workers expand their information horizons as they engage in new information types and communication processes. This necessarily requires holistic appreciation of the interrelated elements of workplace information experience: its connection with informed learning and informed decisions, and its cultural and social dimensions. Such application of informed learning theory to critical and creative information use requires asking 'What information and learning experiences are vital to furthering our own professional work?' and 'What information ... experiences do we want to facilitate or make possible for others?' (Bruce, 2013).

Informed learning also provides a pedagogical framework which encourages expansion of co-workers' information-using and information-learning capabilities. It enables making increased sense of multiple information experiences through intentionally designed learning activities that sustain social interaction to activate knowledge creation. Such robust relationships encourage information, skill, expertise, and experience sharing to further repurposing, redirecting, reorganising, and relearning. In addition, co-designed communication systems and information practices –which determine how organisations function and change, as well as how they adapt and encourage inquiry, dialogue, and reflection – produce ever increasing variation and complexity in peoples' informed learning experience.

Within the research-to-practice space, further refinement of informed systems leadership and collaboration models, among others, could enhance their transferability. This necessarily involves systems thinking for placing information in larger contexts and considering it from multiple perspectives. Such contributions to informed systems model building would enrich both soft systems literature and informed learning scholarship.

Other research directions could extend workplace applications of informed learning theory and pedagogy. Possible projects include developing tangible activities, governing ideas, infrastructure innovations, management methods, and technology tools for changing the way that work is conducted. Based on results from earlier informed systems initiatives, colleagues engaged in such information-centred, action-oriented, and learning-focused projects will "continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together" (Senge, 1990, p. 3).

9. Conclusion (Christine Bruce)

In another reflective piece, I recently identified the existence of relevant research constructs as one of the possible signs of a maturing research field (Bruce, 2016). This reflective piece represents only a few of the constructs emerging in our IL field. Indeed, even within the team represented here, it has not been possible to identify and discuss all the relevant constructs. It is my belief that the possibility of working together in such teams, even relatively loose 'teams', makes for fertile research ground, and enhances the possibility of the emergence of ideas such as these. Further, I am left wondering whether the informed systems approach, information experience design and informed learning design may be emergent methodologies from the IL field, while at the same time being influenced by and influencing other fields. Each may be adopted with specific research intentions or to further evidence-based practice, informing practice initiatives. This team of authors looks forward to the many opportunities emerging for continuing to explore these ideas and generating new ones.

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