

Six Frames for Information literacy Education: a conceptual framework for interpreting the relationships between theory and practice.

Christine Bruce, Sylvia Edwards, Mandy Lupton

Abstract

Information literacy educators are daily challenged by an environment in which colleagues and students bring very different perspectives to curriculum design, teaching and learning, and by the need to apply theories of learning to information literacy education in coherent ways. The purpose of this paper is to propose a model, Six Frames for Information Literacy Education, as a tool for analysing, interpreting and understanding these challenges; and to explain the relational frame in more detail. In the first part of this paper we provide an overview of the different ways in which teaching, learning, and information literacy may be approached. We also introduce the Six Frames for information literacy education. In the second part, we explore some challenges and techniques of applying the relational frame for information literacy education in more detail. Finally, we suggest some ways in which using the six frames may assist practice.

Keywords

Information literacy, learning, relational model, six frames of information literacy education, variation theory.

People see information literacy, learning and teaching differently

The purpose of this paper is to propose a model, Six Frames for Information Literacy Education, and to explain the relational frame in more detail. We contend that information literacy (IL) is not a theory of learning, but rather that peoples' approaches to IL and IL education are informed by the views of teaching, learning and IL which they adopt either implicitly or explicitly in different contexts. IL educators, including discipline-based academics and librarians are challenged daily by an environment in which administrators, teaching colleagues, students and others bring very different perspectives to the processes of IL education.

In this section we explore the idea that teaching, learning and IL are seen differently by participants in the teaching-learning context, and suggest ways in which IL education might be affected. Variation across these aspects of the IL education context inform the Six Frames for Information Literacy Education – which we introduce in this paper as tools to help us analyse and reflect on aspects of IL education and their contexts.

“People see teaching and learning differently” This is a deceptively simple proposition, supported by much research, which has a profound effect on our daily engagement with teaching and learning in its many forms. (Marton and Booth, 1997; Bowden and Marton, 1998; Prosser and Trigwell, 1999; Ramsden, 2003)

Figure 1 summarises different ways of seeing, or experiencing, teaching and learning; and invites you, the reader, to consider your view of learning and teaching, or that of your group. It is common for individuals to adopt different views of learning and teaching in different contexts, and it is also common for different group members to adopt varying views, particularly if these remain unarticulated. Such variation might be expected to influence information literacy politics, curriculum design, relationships between lecturers, librarians or students, and the out workings of curriculum in classrooms.



VARIATION IN WAYS OF SEEING TEACHING and LEARNING

<p>How do you see teaching and learning?</p> <p>In my/our view teaching is:</p> <p>In my/our view learning is:</p>	<p>Students may see learning as:</p> <p>An increase of knowledge Memorizing</p> <p>The acquisition of facts, procedures for us in practice Understanding what something means Interpreting the world to understand it Changing as a person (Saljo, 1979; Marton, et al 1993)</p>
<p>Teachers may see learning as:</p> <p>Acquiring knowledge Absorbing knowledge and being able to explain and apply it Developing thinking skills and the ability to reason Developing beginning professional competence Changing attitudes or behaviours A participative pedagogical experience (Bruce and Gerber, 1995)</p>	<p>Teachers may see teaching as:</p> <p>Presenting information Transmitting information (From teacher to student) Illustrating application of theory to practice Developing the capacity to be expert Supporting student learning Encouraging active learning Facilitating personal agency (control) Bringing about a better society (Dall'Alba 1991; Pratt, 1998; Samuelovicz and Bain, 1992)</p>

Figure 1: Variation in ways of seeing teaching and learning

“People also see information literacy differently” As there are different ways of seeing learning and teaching, there are also different ways of seeing IL (Bruce, 1997; Limberg, 2000; Lupton 2004; Maybee, in press). Further, Barrie (2003) reports a clear relationship between ways in which university teachers see teaching and learning and their approaches to teaching graduate capabilities of which IL is one. We may infer from this that our ways of seeing IL, and ways of seeing teaching and learning are likely influences on our approaches to, and experiences of, IL education.

Figure 2 summarises outcomes of some IL research and invites, you, the reader, to consider your views of IL, or those of your colleagues or students. You may also like to consider other ways of talking about IL emerging from recent research. For example, the idea that IL is ‘a way of engaging with and learning about subject matter’ (Bruce and Candy, 2000: 7); that IL is ‘a way of knowing’ (Lloyd, 2003: 88) or that it is an ‘approach to learning’ (Lupton, 2004: 89). The existence of variation in ways of seeing IL raises questions. For example: How do different views of IL influence approaches to learning and teaching? How do different views of IL influence interest in IL in different parts of institutions? and the level of curriculum integration? or the ways in which we choose to assess?

Such variation invites us to consider further questions. What are the challenges of environments where teaching and learning and IL are seen differently? Or how can we use an appreciation of different ways of seeing to progress the practice of IL education?



VARIATION IN WAYS OF SEEING IL

<p>How is information literacy seen in your context?</p> <p>I/we see information literacy as:</p> <p>My/our organization sees information literacy as:</p> <p>My/our colleagues see information literacy as:</p> <p>My/our students see information literacy as:</p>	<p>Information professionals or scholars may see IL as:</p> <p>Acquiring mental models of info systems A set of skills A combination of information and IT skills Learning skills; A process; A way of learning; The ability to learn Ways of interacting with the world of information Information behaviour Part of the literacy continuum (Bruce, 1997)</p>
<p>University teachers see IL as:</p> <p>Using IT for retrieval and communication Finding information Executing a process Controlling information Building up a knowledge base in a new area of interest Working with knowledge to gain new insights Using information wisely for the benefit of others (Bruce, 1997)</p>	<p>Students see information use as:</p> <p>Fact finding, finding the right answer Finding information to form a personal standpoint Critically analyzing information – trying to reveal values Finding information located in information sources Initiating a process Building a personal knowledge base for various purposes (Limberg, 2000, Maybee, in press)</p>

Figure 2: Variation in ways of seeing information literacy.

Six Frames for Information Literacy Education

This section explains a series of Frames for Information Literacy Education through which many elements of IL education might be experienced. They were developed as a conceptual tool to help participants in the IL education arena reflect on, and analyse, the varying implicit or explicit theoretical influences on their contexts. These frames have been developed through bringing together thinking about variation in approach to teaching, learning and IL with thinking about approaches to curriculum design (Eisner and Vallance, 1974; Kemmis et al, 1983; Pratt et al, 1998; Toohey, 1999), and the idea of viewing problems through identifiable frames (see for example, Bolman and Deal, 1997). Altogether, six frames are presented:

- (1) The Content Frame
- (2) The Competency Frame
- (3) The Learning to Learn Frame
- (4) The Personal Relevance Frame
- (5) The Social Impact Frame and
- (6) The Relational Frame.

Each frame brings with it a particular view of IL, information, curriculum focus, learning and teaching, content, and assessment. Some elements of the frame apply to both the substantive content and to the IL component where these are taught together. In describing each frame we provide a brief example of some aspect of IL education that typically illustrates practice primarily implemented through that frame.

Users of the Content Frame (Figure 3) usually adopt a discipline orientation. Their focus is on what learners should know about IL. Assessment of IL typically quantifies how much has been learned. A typical example in relation to IL education might be teaching IL sessions within a discipline based subject and providing lectures on a key set of information tools and techniques. This might be followed by a test of recall.

CONTENT FRAME	
View of IL	IL is knowledge about the world of information
View of Information	Information exists apart from the user, can be transmitted
Curriculum focus	What should learners know about the subject, about IL?
View of learning and teaching	Teacher is an expert- transmits knowledge. Learning is a change in how much is known
View of content	What needs to be known has primacy. All relevant content must be covered
View of Assessment	Assessment is objective. Measures how much has been learned; ranks student via exams

Figure 3 The Content Frame

Users of the Competency Frame (Figure 4) usually adopt a behavioural or performance orientation. They ask what learners should be able to do, and at what level of competence? A program of instruction is usually followed to acquire the required competencies. Assessment of IL typically seeks to specify what level of skill has been achieved. A typical example in IL education might be the design of sequenced instruction to teach the use of an electronic tool; supplemented by testing to determine the level of skill that has been attained by the learner at specified points in the learning process.

COMPETENCY FRAME	
View of IL	IL is a set of competencies or skills
View of Information	Information contributes to the performance of the relevant capability
Curriculum focus	What should learners be able to do?
View of learning and teaching	Teachers analyse tasks into knowledge and skills; learners become competent by following predetermined pathways.
View of content	Content is derived from observation of skilful practitioners
View of assessment	Assessment determines what level of skill has been achieved

Figure 4: The Competency Frame

Users of the learning-to-learn frame (Figure 5) usually adopt a constructivist orientation. They ask what it means to think like an information literate professional, for example an architect, engineer, journalist or landscape designer. They are also interested in what will help learners construct knowledge appropriately, and develop learning processes that foster the development of professional thinking patterns. Assessment of IL seeks to determine how information processes have informed learning or learners approach to the problem at hand. A typical example might be setting a real life problem in which the need to access, evaluate and use information from a range of sources is central and appropriately supported.

LEARNING TO LEARN FRAME	
View of IL	IL is a way of learning
View of Information	Information is subjective – internalised and constructed by learners
Curriculum focus	What does it mean to think like an (IL) professional in the relevant field?
View of teaching and learning	Teachers facilitate collaborative learning; learners develop conceptual structure and ways of thinking and reasoning
View of content	Content is chosen for mastering important concepts and fostering reflective practice
View of assessment	Complex, contextual problems are proposed. Self or peer assessment is encouraged

Figure 5 The Learning to Learn Frame

PERSONAL RELEVANCE FRAME

View of IL	IL is learned in context and is different for different people/groups
View of Information	Valuable information is useful to the learners
Curriculum focus	What good is IL to me?
View of teaching and learning	Teaching focuses on helping learners find motivation. Learning is about finding personal relevance and meaning
View of content	Problems, cases, scenarios selected to reveal relevance and meaning
View of assessment	Typically portfolio based – learners self assess

Figure 6 The Personal Relevance Frame

Users of the Personal Relevance frame (Figure 6) usually adopt an experiential orientation. In relation to IL education they need learners to develop a sense of what IL can do for them. They are interested in the kinds of experiences that are required to enable learners to engage with the subject matter. Assessment is typically portfolio based and learners self-assess. A typical example might be participating in a community project that required engagement with relevant information services and providers; then subsequently reflecting on the experience and what was learned about both the subject and information use in that context.

SOCIAL IMPACT FRAME

View of IL	IL issues are important to society
View of Information	Information is viewed within social contexts
Curriculum focus	How does IL impact society?
View of teaching and learning	Teachers role is to challenge the status quo. Learning is about adopting perspectives that will encourage social change.
View of content	Reveals how IL can inform widespread or important social issues or problems
View of assessment	Designed to encourage experience of the impact of IL.

Figure 7 The Social Impact Frame

Users of this Social Impact frame (Figure 7) usually adopt a social reform orientation. Their interest is in how IL impacts society, in how it may help communities inform significant problems. A typical example might involve focussing learners' attention on various issues and values associated with problems surrounding the Digital Divide, and proposing tasks related to policy, technology or training designed to assist in bridging that divide. Learners would be assessed in terms of their understanding of how IL could influence the social problem.

RELATIONAL FRAME

View of IL	IL is a complex of different ways of interacting with information
View of Information	Information may be experienced as objective, subjective or transformational
Curriculum focus	Bringing about awareness of the critical ways of seeing or experiencing
View of teaching and learning	Teachers bring about particular ways of seeing specific phenomena; learning is coming to see the world differently
View of content	Examples selected to help students discover new ways of seeing. Critical phenomena for learning must be identified.
Assessment	Designed to reveal ways of experiencing

Figure 8 The Relational Frame

Users of the Relational frame (Figure 8) are oriented towards the ways in which learners are aware of IL or specific relevant phenomena associated with IL. They are interested in designing experiences that help learners discern more powerful ways of seeing the phenomena in question. Assessment is designed to identify which ways of seeing IL, or other relevant phenomenon, students have learned to discern. Reflection is one strategy to encourage students to discern more complex forms of the phenomenon. A typical example might involve helping students learn to search the internet by designing experiences that focus their attention on previously undiscerned aspects of the experience (See Case A examined later on in this paper).

The first five frames are more likely to be recognisable to readers; we have made brief comments about each of these. Toohey (1999), or Ramsden (2003) would serve as useful texts for further exploration of ideas underlying these frames. The relational frame (see for example, Ramsden, 2003; Prosser and Trigwell; 1999; Bruce, 1997; Edwards and Bruce, 2004; Lupton, 2004), is explained here in more detail as it likely to be less familiar. It is also the primary frame through which the applications described below have been developed.

Of particular interest is the status of the relational frame as one through which the content, learning to learn, and experiential frames are mediated, or brought together. Users of the relational frame are

interested in both content (phenomena); and how that content is seen or experienced. Learning in this frame is understood as coming to discern things in new or more complex ways. This view of learning has been more recently formalised and labelled 'variation theory' (Marton and Tsui, 2004; Pang and Marton, 2003).

Variation theory proposes that learning occurs when variation in ways of understanding or experiencing are discerned. For example, music is learned when different sounds are discerned, reading is learned when the relationship between written words and spoken sounds is discerned, IL is learned when different ways of experiencing it are discerned, information searching is learned when different ways of experiencing that are discerned. In the latter example, a person must discern the difference in searching based on knowing that a database is structured, and searching without understanding the structure, to appreciate the powerful influence of structure on searching. Bringing about learning through widening experience, and thus revealing variation, is the underlying principle.

Implementing the relational frame

The basis of a relational frame is that students experience information literacy in a range of ways that are more or less complex or powerful. Learning is seen as being able to adopt these more complex and powerful ways of experiencing. Therefore, teaching and learning activities should be designed to enable students to develop more complex understandings.

It should be noted that a relational frame does not see the student and information literacy as separate entities; rather, it sees the relationship between the student and information as one entity. Therefore, information literacy is not a set of skills, competencies and characteristics. It is a complex of different ways of interacting with information which might also include:

- knowledge about the world of information (content frame)
- a set of competencies or skills (competency frame)
- a way of learning (learning to learn frame)
- contextual and situated social practices (personal relevance frame)
- power relationships in society and social responsibility (social impact frame).

Bruce (1997: 60, 174) adapts a number of Ramsden's (1988: 26-27) relational principles of learning (in bold) and relates them to information literacy education:

- **Learning is about changes in conception** – teachers need to assist students in developing new and more complex ways of experiencing information literacy
- **Learning always has a content as well as a process** – students need to learn about discipline content as they seek and use information
- **Learning is about relations between the learner and the subject matter** – the focus is not on the student or the teacher or the information, but on the relation between these elements
- **Improving learning is about understanding the learner's perspective** – teachers need to understand the variation in students' conceptions of information literacy.

Case A: Helping students learn to search the Internet or bringing about more complex experiences of Internet searching

In this section we discuss some challenges of applying the relational approach to IL education and describe ROSS (a Reflective Online Searching System) which has been designed based on the outcomes of an investigation into how university students experience Internet searching. In doing so we provide examples of how learning environments can be designed to bring about awareness of more complex ways of experiencing Internet searching.

Recent research by Edwards (in press) identified a relational model of four categories that capture students' different ways of searching and learning to search for Internet information. The four categories are:

1. Information searching is seen as looking for a needle in a haystack.
2. Information searching is seen as finding a way through a maze.
3. Information searching is seen as using the tools as a filter.
4. Information searching is seen as panning for gold.

While these categories are interrelated, each one is associated with different meanings being assigned to the search experience. Each is also associated with different awareness structures, different approaches to learning, and different search outcomes. The awareness structures are differentiated in terms of different foci, and also in different ways of seeing the information environment, the information tool structure, and searchers' awareness of information quality (see Edwards 2005; Edwards & Bruce, in press for more details).

Having identified this model of Internet information searching, the challenge of applying it to educational practice began. Edwards' research identified that that the four experiences of searching are inclusive. We can expect, therefore, that for each of the more complex categories, the previous category experience has been built upon as the student's searching experience progresses.

Importantly, however, the less complex categories are not a misconception of the searching process or experience. Nor do the more complex categories reflect expert versus novice searching approaches. The four categories are a repertoire of the ways of experiencing web-based information searching (Limberg, 2000). Individual searchers decide which lens is the most appropriate to use in each context. The variety of lenses is necessary in order to be a powerful searcher. If an individual does not have all of the available four lenses with which to view searching (Figure 9), then the awareness structures of each category suggest how we might encourage students to learn to use the other available lenses.

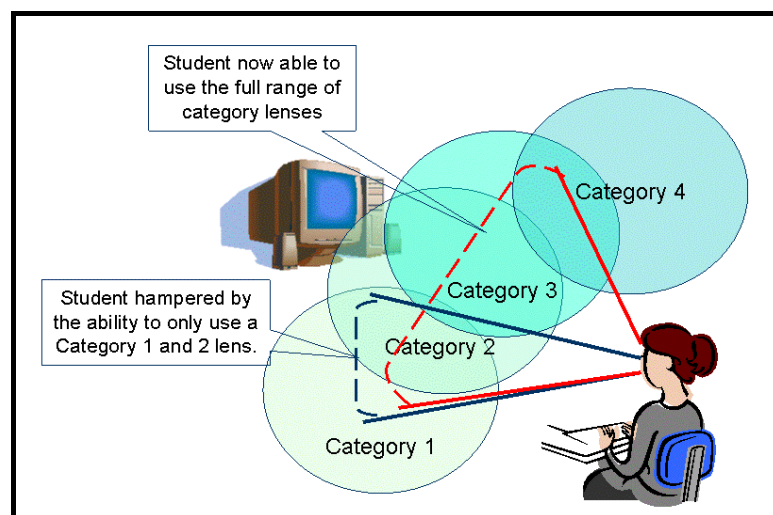


Figure 9: Ability to use the range of category lenses when searching

The relational model revealed two key aspects of the searching experience; reflection and planning of the search process (Figure 10). For example, when using only Category 1 and 2 lenses, the students lack of reflection and planning hampers their ability to search. The relational model identified that, in the more advanced categories, students actively plan and reflect, and this influences the quality of their search performance. If we want to encourage the development and use of higher order lenses, then these aspects, search planning and active searching reflection, need to be built into the learning environment. Furthermore, the myriad of individual aspects, or dimensions of variation, which people are barely aware of in the earlier category levels also need to be built into the learning environment (Edwards, 2005). A Flash animation explaining each of these individual aspects is available at the website <http://sky.fit.qut.edu.au/~edwardss/WebSearching/hintro.html>. These individual aspects include a focus on the individual searching features of the various database tools used in the online environment (eg: the search control features of search engine and/or library databases, such as Boolean operators, truncation, synonym use, etc.) and the engagement, or lack of it, of the student in reading their screens for instructions. Library IL programs have always referred to these matters, and they are often ignored by students because they are spoken about in abstract terms without providing the student with the opportunity to use them and reflect on their use while they are searching. According to the relational frame, the key is to design the learning environment to ensure students experience all of these aspects and reflect upon their use.

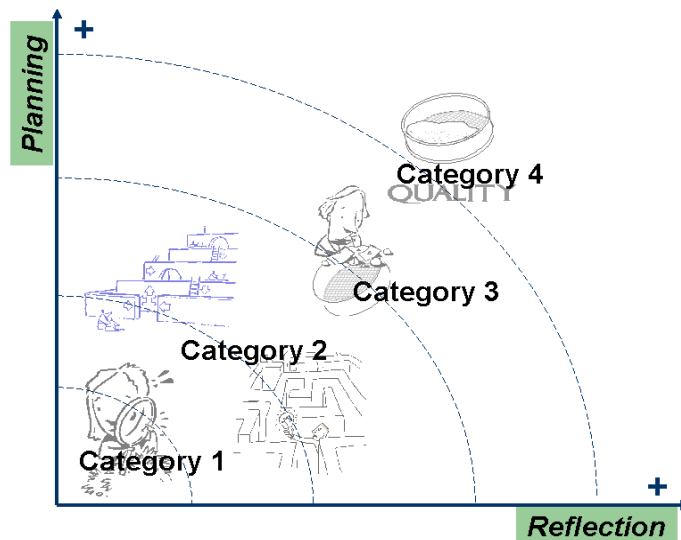


Figure 10 Critical Differences of reflection and planning

Using the relational model to develop the ROSS environment

The Reflective Online Searching Skills (ROSS) environment (Figure 11) was specifically developed to be integrated into the face-to-face delivery of any subject (unit or course), and it focuses on opening up to students all of the possible variation in searching experiences.



Figure 11: ROSS (Beta Version 2005) Welcome Screen

ROSS goes where existing IL tools have not. It uses the relational model to create a learning environment that reflects each of the four categories. It allows students to reflect on their IL, where information literacy is embedded into the assessment tasks of units, enabling the assessment and the reflection to drive the learning. Existing tools usually provide only one way to learn (Kasowitz-Scheer & Pasqualoni, 2002; Kent State University, no date; QUT Library, 2003; Rensselaer Research Library, 2002). ROSS provides multiple learning methods, and includes the use of a sandpit site approach, the Reflective Workspace, and/or a combination of both approaches. The site can also provide timed release of resources, an environment that adapts to and is contingent on student (inter)actions (eg: using a “submit before continue” device), is media rich (including Flash animation, videos, and animated gifs), and gives to learners opportunities for reflection and feedback.

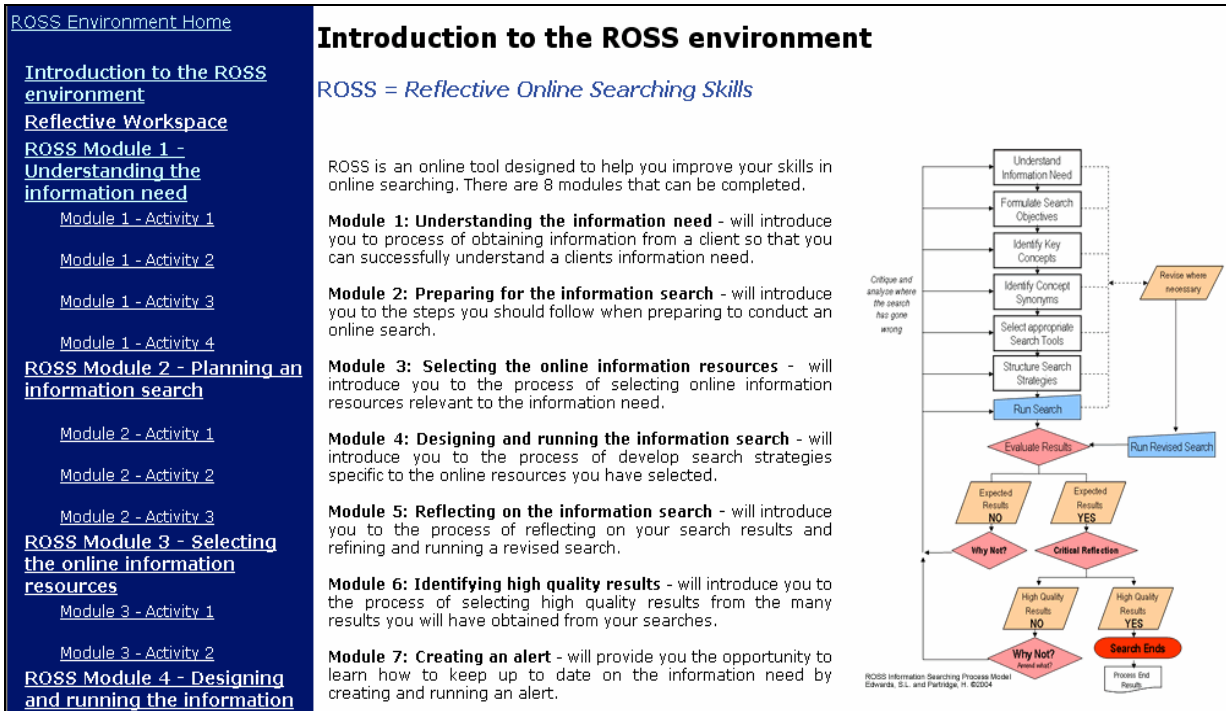


Figure 12 ROSS (Beta Version 2005) Introduction, showing the Modules and the Searching Model

ROSS works to showcase examples of web-based information searching to the students; examples that are based on the experiences identified in the category descriptions. It is interactive in that the student's learning experience is conducted in real-time between the user and the ROSS environment, allowing students to search online and have the opportunity to perceive a variation from their previous experiences.

The Reflective Online Searching Model (as seen on the right-hand side of Figure 12) guides the student through this process in a step-by-step approach. Each of these steps aligns with the identified individual aspects of variation identified in Edwards' study (2005); such as identification of synonyms, search planning and search reflection. Edwards' study also produced the action research model (Figure 13) for Reflective Internet Searching (Edwards & Bruce 2002). This model is a much simpler depiction of the online searching process; a model that shows the emphasis of online searching should be an action research cycle of continuous planning, acting, recording and reflecting.

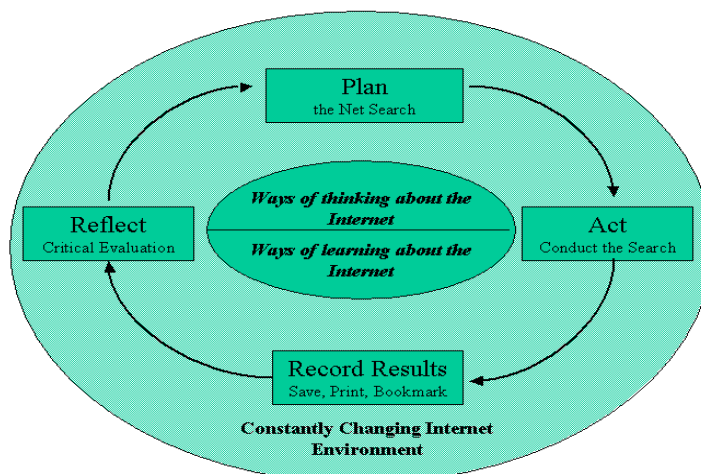


Figure 13 Edwards & Bruce (2002) An action research model for Reflective Internet Searching

These two models form the basis for the ROSS environment. One ensures the students see the importance of the individual steps in the searching process, and coupled with the learning environment of ROSS, also ensures the student experiences the full range of variation in the online searching process. The other model reduces the overall approach to online searching into a simpler and easy to remember cycle of continuous planning and reflection.

ROSS consists of a series of modules (Figure 12). Its attention to conscious reflection on learning, and consistent planning of searching are paramount, because it is these factors which bring about the adoption of the more complex ways of searching.

Many of the module activities specifically require the students to recognise essential aspects identified in the relational model. For example, in Module 4 (Figure 14), the students are required to identify differences they have noted in search strategies, or the results they have retrieved, for each of the search tools they used. They are also asked to reflect on what they have observed. Thus ROSS stresses that reflection should be built into searching, and this necessary reflection is required in the more complex categories (Category 3 and 4).

Module 4 Activity 2

Run the searches you developed in Activity 1 for each of the two online resources. Use the notepads below to record your observations of each search. For example, note down:

- How many results you obtained – too many? too few?
- What type of results you obtained – are they too broad? too narrow?
- New key words or synonyms that you didn't include in your search
- Areas where the search didn't perform as expected
- The bibliographic details of results that meet the information need.

Or anything else you think is important to record and which may help you in modifying and refining your search later.

My notes on the search conducted in the Internet search engine.

My notes on the search conducted in the database

Figure 14 Module 4 Activity 2 example questions

In some of the modules the predict, observe, explain model (POE) is used (Kearney & Wright, 2002). Students are required to watch a video, or read through a storyboarded script, predict what they expect to happen and then compare what they have predicted with the actual results by observation. They are then expected to submit their explanation of what they have seen. This POE model allows students to engage more fully with the searching experience, encouraging them to reflect more about what they are attempting, their searching strategies, and the quality of the resources they have found. This approach is intended to foster a more reflective search process, encouraging students to see the variation in the searching experience that is possible.

Whatever learning method is used, each module is interactive, requiring the students to answer questions, make observations and complete exercises. A separate reflective searching space, provided for them to work on their actual assignments, is also always available and allows the students to keep a permanent and ongoing record of their thoughts, decisions, and reflections throughout their assignment searching and preparation periods. After each module students are reminded of what they have been experiencing in the module, and to continue these searching techniques in their current and future assignments.

Throughout the entire set of modules, ROSS encourages students to read their screens and absorb instructions; something we know from the research findings that a Category 1 searcher does not do. From the start then, the intention to allow students to see the entire range of searching experiences is introduced, and this drive to display the variation in the experience is maintained consistently throughout the site.

Although the evaluation and analysis are continuing, early indicators are that both staff and students have responded positively to ROSS. Clearly ROSS contributes to the development of curriculum strategies designed to both strengthen and evaluate students' web-searching experience. It also strengthens student experiences of web searching which, in turn, will strengthen their capability to learn in an online environment in any unit of study. The ROSS environment provides immediate and ongoing resources for both students and for staff development with a focus on the conceptual change required for learning from a relational perspective.

Assessment is another important aspect to consider when applying these findings in practice. Based on the findings, the assessment items in the unit were also mapped against the categories of description to identify how well the assignments were designed to encourage learning. The principles upon which the analysis, and later redesign, of the assessment for the subject undertaken included the relational frame assumption that learning the generic capability of information searching means coming to experience that capability differently; that there has been a new discernment in the worldview of the student (Edwards and Bruce, 2004; Runesson, 1999). In this case, when assessing Internet searching, we must be able to determine the character of the learning outcomes achieved by the student. Thus, the assignments need to make it possible for the assessor and the student to discern the different ways of experiencing information searching.

Case B: Helping students become more information literate or Bringing about more complex experiences of information literacy.

This section reports Lupton's study of students' ways of experiencing information literacy when researching an essay in a first year environmental studies course (see Lupton, 2004 for a full account), as well as the implications of that study. The key outcome of her investigation was a description of the variation in students' ways of experiencing information literacy when researching an essay. Variation encompassed three categories illustrating increasingly complex ways of experiencing information literacy.

Category 1 - Seeking evidence

Information literacy is experienced when researching an essay as *seeking evidence to backup an existing argument*.

- Subcategory a) Seeking statistics
- Subcategory b) Seeking opinions and ideas
- Subcategory c) Seeking contrasting perspectives

Students searched for information as evidence to backup an existing argument. Their argument was synonymous with their own viewpoint. Evidence took the form of statistics, opinions, ideas and perspectives that students used to cite to support their argument. Students limited their search to sources that they could use as evidence. Students judged the trustworthiness of information by surface signs including the presence of statistics and references, author, origin and 'look and feel' of the source. Students' focus was primarily on the essay task while their secondary focus was on the information. They experienced the essay as a product. Information was external to the person, it was out there ready to be found, and when found it was used for the essay task.

Category 2 - Developing an argument

Information literacy is experienced when researching an essay as *using background information to develop an argument*

- Subcategory a) Learning about the topic
- Subcategory b) Setting the topic in a context
- Subcategory c) Rethinking the argument

Students searched for background information to 'fill in the gaps'. Some already had a knowledge base that they were broadening, while others were building a knowledge base and learning about the topic. Background information was important to set the essay topic in a context, to learn about the topic and to 'get the big picture'. Students did a number of rounds of searching and developed an argument as they searched. They asked themselves questions about the topic and issues as they searched. Students used a wide variety of sources and pursued information for their own interest. They internalised and

personalised information by incorporating it into their knowledge base and developing an understanding of the topic.

Category 3 - Learning as a social responsibility

Information literacy is experienced when researching an essay as *applying learning to help solve environmental problems*.

Subcategory a) Helping the community
Subcategory b) Effecting social and political change

Students were interested in applying their learning to solving environmental problems. They felt a social responsibility to help the community and to effect social and political change. They looked beyond the topic to the field and discipline and made connections with other disciplines. They regarded the essay as a way of communicating about the issues. They internalised information in looking for information for their personal interest and developed their essay argument as they searched. Information was experienced as transformational, as it was being used to change people and society.

How can we help students explore variation?

Bowden and Marton (1998: 154) argue that not only do students need to experience variation in order to learn, but they also must explore variation by comparing and analysing their experiences. Based on the research results above, how can we help students explore variation?

First, students need to be actively engaged in discussion and reflection about finding and using information in order to uncover variation in conception within the group. Asking students to reflect on and discuss in class the strategies they use and why they use them will elicit a range of qualitatively different strategies and intentions. Strategies and intentions form the basis of a learning approach. The research results show that the intentions of students are in many ways more important and illuminating than their strategies. It should be noted that adopting an approach that uncovers variation will inevitably require more class time.

Second, students need to confront variation in their own experience and in the experience of others. The idea is to make explicit a range of experience so that students can discern what was previously undiscerned. It is not enough for us as teachers to simply *present* variation, as students need to *experience* variation. As Ramsden (1988: 21-22) argues, teachers need to “arrange situations where students must confront the discrepancies between their present way of thinking about the subject matter and the new way desired by the teacher, and where students can come to realize the personal value of the new way”. As in the previous case A, reflection is crucial to achieving this.

Third, in designing information literacy learning activities we need to make fundamental aspects explicit. For example, searching for evidence to support an argument forms the basis of students' experience when researching an essay. We cannot assume that students understand what we mean by an 'argument' and how to present and build an argument. We also cannot assume that students understand what is meant by 'evidence' and how to present evidence. These aspects will also have disciplinary variation (Neumann 2003: 237; Moore 2004), and we must make this variation explicit.

Students in all categories spoke of using contrasting perspectives as evidence to support their argument. However, there was contrast between students' strategies (to find contrasting perspectives as evidence) and their intentions (why they wanted to find contrasting perspectives and how they wanted to use them).

The following figure illustrates limited versus complex views:



LIMITED vs COMPLEX WAYS OF EXPERIENCING EVIDENCE & ARGUMENT

Limited	Complex
I need to search for contrasting perspectives provide balance for my argument.	I need to search for contrasting perspectives to understand the big picture.
The essay argument is my personal viewpoint.	I need to understand the issues in order to <i>develop</i> an argument. My personal viewpoint is included in my argument but it is not the same as my argument.
My argument/viewpoint stays the same.	I rethink my argument as I find more information.
I restrict my searching and reading as I already know what I want to say.	I need to read extensively in order to create and develop an argument. I continuously search for information.

Figure 15: Limited versus complex ways of experiencing evidence and argument

A tutorial activity addressing argument would canvas students' views on what an argument *is*. For instance, in a recent class with third year business students Lupton asked students to reflect upon what they meant by an 'argument'. Responses ranged from 'a point of view', 'an opinion', a belief' to 'a point of view supported by evidence'. Clearly the latter promotes a more complex understanding. From a teachers' perspective, one might describe an argument as 'a line of reasoning supported by evidence'. This understanding incorporates the view that the author *builds* their argument. Students could analyse various forms of information (e.g. popular and scholarly websites, journal articles, newspaper articles) in order to identify the authors' argument and to analyse how the author builds their argument. They could discuss their personal viewpoint and beliefs on an issue, and then be asked to create an argument for that viewpoint and against that viewpoint.

How can we help students be discriminating web users?

Most of us have concerns about the indiscriminate use of web resources by students. In Lupton's study, it is of significance that the most limited experience of using information was confined to an evaluation of surface signs of the quality of websites in terms of author, date, provenance, look and feel and the presence of statistics. It is of significance that many of these elements are present in website evaluation checklists. However, a more complex experience was that it was important to use a variety of sources for different purposes and that the quality of written communication was important. Therefore, we need to go beyond website evaluation checklists.

We need to make explicit the ways that particular sources could be used for background information and as evidence to support an argument. For example, students in this study used:

- government documents for reports, policy and legislation
- books for general, broad information and ideas
- journal articles for specific information and scientific information

- websites for biased information and different perspectives
- encyclopaedias and dictionaries for definitions
- television, radio, newspapers and textbooks for background information
- other subjects to provide connections between disciplines and fields
- lectures for a framework upon which to build a knowledge base and approach.

A tutorial activity might be to have students discuss the reasons that determine the use of different sources for assignments. Evaluation of sources would need to include not only the surface signs of authority, but also the ideas, opinions and perspectives apparent in the source and the quality, style and tone of the writing. Students could write a reflection on the sources they used which is discussed in class.

How can we help students learn through assessment?

Another important aspect was the way that students saw the significance of the essay task. A limited view was that the essay task was used to complete course requirements, while a more complex view was to use the essay task as a vehicle with which to learn about the topic and communicate the topic in relation to the field and discipline. Tutorial activities aimed at moving students to a more complex view would include discussing how students might apply their learning in a particular assignment and how they see the links between the topic, field and other disciplines.

Finally, the crucial aspect of actually experiencing variation would be to design assessment where students are required to:

- present different viewpoints
- pose questions to research throughout the information seeking and use process
- reflect on and demonstrate the development of their own viewpoint
- reflect on and demonstrate the development of the line of reasoning in their essay argument
- analyse bias and the use of statistics
- use a variety of sources for different purposes
- set their topic in an historical, social, cultural and political context
- reflect upon how they have learned about the topic through the process of their research
- make links between the topic, the course, other courses and disciplines
- reflect on how learning about the topic may help contribute to social responsibility.

The aim of the relational frame is to encourage students to adopt more complex strategies and intentions as outlined above. Being encouraged to experience information literacy in a range of increasingly complex ways will mean that students have a broader repertoire upon which to draw with each situation where they are learning through finding and using information.

How can the Six Frames be used in practice?

In this paper we have described the six frames and provided two detailed examples to explain the relational frame. Here we also consider further how the frames may be used to assist the practice of information literacy education.

Users of the frames may be discipline academics, librarians, academic developers, instructional designers, individuals or teams. They may be curriculum designers or implementers or learners. Individuals and teams are likely to consciously or unconsciously bring more than one frame to any aspect of IL education, and this is a natural part of applying theory, whether implicit or explicit, to practice.

While not intending to categorise or classify specific programs (indeed most programs would blend two of more of the suggested approaches), individuals or groups of educators, the resultant framework (see Appendix 1) provides a conceptual tool for thinking about the kinds of IL education that might be fostered within each frame, as well as for thinking about how different frames might work together in particular contexts. The frames may serve as an analytical tool for understanding the discourses and differences in opinion about how IL education might be best progressed.

Challenges which may be understood or tackled using the frames as lenses, include challenges associated with 1) consistent and coherent design or implementation within one or more frames, 2)

members of teaching teams consciously or unconsciously working with different frames, 3) teachers and students working with different frames in the same context or 4) frames adopted by teachers or teams conflicting with the frames that underpin institutional values, policy or direction.

For example, concern for measurement of IL capability in assessment may reflect the primacy of the content or competency frame for an individual or institution. This may conflict with the assessment interests of those who prefer the learning-to-learn or social reform frames. Tensions may also appear when interest in group processes reflect an orientation towards a learning-to-learn or social reform frame; such interests in groups may conflict with orientations of those focussed on individual learning, which usually reflects the adoption of a content, or competency frame.

All the frames are available to actors in the IL arena, and evidence of more than one frame will usually be found in any IL context. We believe that the greatest value of the frames lies in their power to challenge each of us to identify our primary frame(s) and to inquire into how our professional practice might develop if we were willing to adopt a different frame or a wider range of frames.

Biographies



Christine Bruce is Associate Professor and Director of Teaching and Learning in the Faculty of Information Technology at QUT, Brisbane, Australia. She developed the relational model for information literacy education, and has extensive interests in higher education teaching and learning.



Sylvia Laretta Edwards is a Senior Lecturer in the Faculty of Information Technology at QUT. Sylvia has received nine teaching awards. Her research interests include higher education, information literacy and information searching. She has co-developed the Reflective Internet Searching Model and developed a relational model of the experiences of students web-based information searching.



Mandy Lupton is a Lecturer in the Griffith Institute for Higher Education, Griffith University, Brisbane, Australia. She is currently undertaking a PhD investigating students' ways of experiencing the relationship between information literacy and learning.

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Content Frame	Competency Frame	Learning to Learn Frame	Personal Relevance Frame	Social Impact Frame	Relational Frame	Frame Orientation <i>Below: Characteristics</i>
Information exists apart from the user; can be transmitted	Information contributes to the performance of the relevant capability	Information is subjective – internalised and constructed by learners	Valuable information is useful to the learners	Information is viewed within social contexts	Information may be experienced as objective, subjective or transformational	View of Information
What should learners know about the subject and IL?	What should learners be able to do?	What does it mean to think like an (IL) professional in the relevant field?	What good is IL to me?	How does IL impact society?	What are the critical ways of seeing IL?	Curriculum Focus
Teacher is expert – transmits knowledge	Teachers analyse tasks into knowledge and skills	Teachers facilitate collaborative learning	Teaching focuses on helping learners find motivation	Teacher's role is to challenge the status quo	Teachers bring about particular ways of seeing specific phenomena	View of Teaching
Learning is a change in how much is known	Learners achieve competence by following predetermined pathways	Learners develop conceptual structure and ways of thinking and reasoning	Learning is about finding personal relevance and meaning	Learning is about adopting perspectives that will encourage social change	Learning is coming to see the world differently	View of Learning
What needs to be known has primacy. All relevant content must be covered	Content derived from observation of skilful practitioners	Content chosen for mastering important concepts and fostering reflective practice	Problems, cases, scenarios selected by learners to reveal relevance and meaning	Reveals how IL can inform widespread or important social issues or problems	Examples selected to help students discover new ways of seeing. Critical phenomena for learning must be identified	View of Content
Assessment is objective. Measures how much has been learned; ranks student via exams	Assessment determines what level of skill has been achieved	Complex, contextual problems are proposed. Self or peer assessment is encouraged	Typically portfolio based – learners self assess	Designed to encourage experience of the impact of IL	Designed to reveal ways of experiencing	View of Assessment
IL is knowledge about the world of information	IL is a set of competencies or skills	IL is a way of learning	IL is learned in context and different for different people/groups	IL issues are important to society	IL is a complex of different ways of interacting with information	View of IL

Appendix One – Six Frames for IL Education (adapted from Eisner and Valance, 1974; Kemmis et al, 1983; Pratt et al, 1998; Tooney 1999)