

Three decades of information literacy: redefining the parameters

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Abstract

The last three decades of information skills and information literacy research are surveyed, with particular reference to work conducted in schools that may enrich the development of information literacy work in HE. Attention is also drawn to pedagogic concepts that are already informing information literacy work in the schools sector. Five issues are identified where further research in the HE domain would be useful and where research evidence from other sectors could prove valuable. A student-focussed framework for information literacy (based on the foregoing research and pedagogic concepts) is then offered here for the first time as a step towards addressing the five issues.

The British Library and information skills research

Information literacy may be relatively new as a dominant term in the world of education libraries but it delineates what has been a fruitful area of research and practice for almost four decades. From 1979 onwards, the British Library funded a series of extensive research projects, sometimes over several years each, on aspects of information skills (the preferred term in schools and further education), and also gave this programme momentum through their working group report on *Information skills in the secondary curriculum*, which produced its recommendations in 1981 (Marland, 1981). This publication was notable for the identification of nine core information skills which have since been regularly recycled, modified, elaborated and re-presented in later information literacy models.

This cluster of research projects was mainly focussed on information skills development in secondary schools (Irving et al, 1979) primary schools (Griffin, 1981) or both primary and secondary (Tabberer, 1987), on difficulties in using information encountered by sixth formers (Ruddock et al, 1984) and on initiatives at age 16+ (Tabberer et al, 1983). They also engaged with such issues as cross-curriculum skills development, analysis of where information skills fitted into the curriculum (Howard, 1991) and how learners coped with these demands (Hopkins, 1987), encouraging collaborative enquiry (Ruddock et al, 1987), and what were termed 'information technology skills' (Carter et al, 1987). Other projects examined the extent to which new teachers were being introduced to 'skills for learning' (Best et al, 1990), and sought to ensure better take-up of the information skills research outcomes by teachers, librarians and others, by making suitable materials available to support this work (Brake, 1986) and through a national development project (Markless et al, 1990).

Overall, this work resulted in a shift of focus to learning by exploring the pedagogic principles underpinning information skills development. Not all of this research was school-focussed: a pioneering attempt to ground information skills work with students in specific HE curriculum areas (biology, mechanical engineering and social welfare) was made through the *Travelling Workshops Experiment* (Harris et al, 1978) and attention was also given to information skills in further education (Markless et al, 1992). Other research conducted under the rubric of 'user education' in the wider F and HE domains (Cowley et al, 1987) emphasised the need to embed this into the work of librarians, although this appeared to have only qualified success (Noon, 1994).

Recent work on information skills/literacy in UK schools

With hindsight it can be seen that the withdrawal of the British Library from its leading role in library research has led to a marked decline in information skills/literacy research since the early 1990s, apart from one major study of *The impact of the school library resource centre on learning* (Williams et al, 2001) funded by the Library and Information Commission, which briefly took over the core research funding role for the UK LIS research.

Despite this setback, the UK schools sector is continuing to show interest in information literacy, partly as an accompaniment to the government-led drive towards enhancing literacy in schools. However, a recent school inspectorate (Ofsted) review concludes that teaching of information

literacy is rarely effective or coherent and identifies provision of a coherent programme for teaching information literacy across the school as one of the areas for development, thus setting the agenda for the next five years (Ofsted, 2006).

Where school librarians are getting seriously involved in teaching information literacy skills in a coherent programme they tend to work with one of three research-based models, all developed during the 1990s:

- *The Big Six Skills Approach*, described in the next section.
- John Herring's *Plus Model* (Herring, 1996) which has the merit of being relatively simple to apply and remember, centred as it is on the four themes of purpose, location, use and self-evaluation. These concepts are expanded into a total of fourteen sub-headings.
- David Wray's *Exit Model* (Wray et al, 1997) which offers ten process stages to support reading and writing of non-fiction in schools, from activation of previous knowledge through to communicating information. Uptake of this model in English schools was heavily boosted when it was referred to approvingly in the Key Stage Three *Literacy across the curriculum guidance*¹ (DfES, 2002).

Other relevant research

More recent research conducted in the USA, Australasia and latterly in Europe has established strong links between school libraries, information literacy work and student achievement, as well as clarifying what makes this work most effective. Notable here are the cluster of State-wide studies conducted in various US States and involving thousands of schools, to establish the impact of the school library on student attainment (Lance et al, 2005).

The powerful US schools-focussed model based on foregoing research is *The Big Six Skills Approach*, which was developed in the USA by Michael Eisenberg and Robert Berkowitz (Eisenberg et al, 1990) and has since been exported widely (it is, for example, the dominant model amongst international schools in Hong Kong). The Big Six is a sequential model based on task definition, information seeking strategies, location and access, use of information, synthesis and evaluation, thus providing a relatively straightforward and logical set of steps for the librarian to use with students. (In common with most other models, the *Big Six* tends to promote a more logical and sequential approach to information seeking and exploitation than even the most accomplished information users actually exhibit).

Researchers in the schools domain are now turning to other information literacy challenges. Some core assumptions about information literacy work are being questioned, including the idea of collaboration between teachers and librarians and how this works; the thorny issue of assessing skills acquisition currently being addressed by Ross Todd in the USA and the Learning Resources Action Group (2006) in the UK; and, crucially, the misguided notion of information literacy as a 'separate curriculum'.

Significant HE-focussed information literacy research has recently been undertaken in Australia and Europe, notably by Christine Bruce (2002) and Alan Bundy (2005) in Australia focused on 'sense-making', creating new understandings, and the iterative and emotional aspects of information-seeking (work in this area, but largely focussed on schools, was also conducted by Carol Kuhlthau in the USA). They have helped to advance thinking about the importance of transforming information (by imposing new structures, refining and reinterpreting, and constructing new knowledge).² Meanwhile, Jannica Heinström in Finland has identified three types of student information-seeking behaviour in relation to Internet searching (described more fully below) and Louise Limberg (2005) in Sweden has undertaken interesting phenomenographic work on patterns of variation in student information-seeking and use which goes away from and beyond the limited behaviourist approach.

¹ See especially module 10 'Using the library/learning centre'. Available at: http://www.standards.dfes.gov.uk/keystage3/downloads/lit_xc2_023501mod10library.pdf (Accessed 20 December 2006).

² Notably Ross J Todd 'Evidence-based practice: overview, rationale and changes' in David V Loertscher with Ross J Todd *We boost achievement: evidence-based practice for school library media specialists* Salt Lake City, Utah, USA: Hi Willow Research and Publishing 2003.

An outstanding example of an HE-focussed information literacy development project building on sound information literacy research and pedagogic principles is the SWIM Project³, based at Aalborg University Library, with collaboration from the Aarhus School of Business Library, The Royal Library and Roskilde University. SWIM aims to support students in acquiring information literacy skills, particularly when using web-based information resources supported by Denmark's Electronic Research Library. The SWIM group has used established learning principles, notably scaffolding, problem-solving and linking reflection with action, to develop a web-based multimedia programme as a contextually relevant, interactive tutorial.

The SWIM modules are based on streaming-server technology, which gives the user direct, quick access to video-sequences, as well as other multimedia elements, via the Internet.

More models

As in the schools arena, several models or frameworks for developing information literacy have been generated in the higher education domain. There is not room here to review all of the main models, but mention must be made of:

Christine Bruce's influential *Seven Faces of Information Literacy in Higher Education* (1997), which offered a relational model as part of a fresh approach to information literacy, challenging the traditional behaviourist model still cherished by many librarians. These relationships are focussed on 'structures of awareness' experienced in the information technology conception and further conceptions focussed on information sources, information process, information control, knowledge construction, knowledge extension (intuitive information use) and wisdom conception.

The SCONUL *Information skills* model which was originally published in 1999, but re-presented as the *Seven Pillars of Information Literacy* model in 2004⁴, reflecting its increasing use in university libraries during this period. The model attempted to build some progression into the process of becoming information-literate. It also referred to the iterative nature of finding and using information, but the model itself did not show where and how this might occur.

The *Big Blue* framework for information skills was developed as part of an initiative funded by the UK Universities' Joint Information Systems Committee (JISC) between 2001 and 2002. The Big Blue model focuses on the changes sought in the behaviour of information literate students. The main headings are:

- Recognises an Information Need
- Addresses the Information Need
- Retrieves Information
- Evaluates Information Critically
- Adapts Information
- Organises Information
- Communicates Information
- Makes use of Information
- Reviews the Process (Big Blue, 2002)

Like the *Seven Pillars*, the *Big Blue* model implies that finding and using information is a sequence of steps.

There have also been moves in the USA⁵, Australia and New Zealand⁶ to formulate standards for information literacy in higher education. These have been very influential in raising the profile of

³ SWIM Streaming web-based information modules. Available at: http://www.ceris.cnr.it/Basili/EnIL/gateway/denmark/web_based_swim.htm (Accessed 20 December 2006).

⁴ SCONUL Society of College, National and University Libraries. The Seven Pillars of Information Literacy model. Available at: http://www.sconul.ac.uk/groups/information_literacy/sp/model.html (Accessed 20 December 2006).

⁵ Available at: www.ala.org/acrl/ilcomstan.html (Accessed 20 December 2006).

⁶ Available at: <http://www.anziil.org/resources/Info%20lit%202nd%20edition.pdf> (Accessed 20 December 2006).

information literacy in those countries; developing practice, providing widely-accepted frameworks to support information literacy teaching and assessment across institutions. (See Andretta, 2005, for an overview and critique of these Standards). Some UK universities have already adopted one or other of these Standards to underpin their work. The question for UK HE librarians is whether a library-focussed, outcomes-based Standards approach offers an effective way forward for information literacy practice.

What UK academic libraries can learn from the research

Relatively little corresponding development of research-fuelled understanding of information literacy has so far occurred in the UK higher education field (an interesting exception is Sheila Webber and Bill Johnston's research on academics' conceptions of information literacy⁷). However, the e-Lib (Electronic Libraries) Programme funded by the UK Universities Joint Information Systems Committee in the late 1990s onwards supported a number of development activities in this area. A scan of the literature appears to show a gradual shift in academic libraries in the 1990s away from library-centred conceptions of 'user education', 'bibliographic instruction' and 'library skills training' towards a new focus on enhancing student information skills. Although coined much earlier, the term information literacy fairly rapidly took over as the preferred HE term as part of a wider borrowing (which included various information literacy models) from the USA and Australia. Interestingly, the Society of College, National and University Libraries (SCONUL) only retreated from their earlier position of rejecting the term information literacy in favour of information skills very recently, setting up a *Working Group for Information Literacy* in 2005.⁸

What legacy can the cache of research from other sectors and other countries offer to UK higher education? There are at least five main issues that are already being addressed elsewhere which deserve greater attention from the UK academic community – and not just university libraries.

Information literacy in HE: five issues from the research and related pedagogical work

1. Basis in learning, not in libraries

There is a tendency in some UK university applications of information literacy to advance this work as an 'alternative curriculum' or as the 'unique selling point' that the library can offer students. This is only a small advance on the traditional stance of expecting everyone to change their behaviour to conform to requirements of the library systems. A clear message from the research is that information literacy skills will only be taken seriously if they are seen by students and lecturers as an integral part of learning, or even more powerfully if the ideas offered under the guise of information literacy are seen as being critical to enabling learning. In this context, the constructivist approach to learning⁹, linked to the experiential learning cycle, has been found to be the most productive approach. In particular:

- We know from the research that most students need *information literacy scaffolds* if they are to move on from their established routines, abandon their comfort zones and engage in deep learning and the building of new knowledge. These scaffolds encompass not only knowledge, skills and strategies, but also the attitudes and values that enable students to engage more effectively with their academic work. Scaffolds are applied at the point of need to achieve academic success, not introduced as a 'separate curriculum'.
- Choosing the right level at which to intervene (the *zone of proximal intervention*,⁹ Vygotsky, 1962) is crucial for successful intervention: it is important to capitalize upon what students already know and can do rather than patronize the student by 'starting with a clean slate' and adopting a 'This is how to ...' approach, which is only likely to work if they have nothing relevant to bring to bear (and this rarely occurs even with six-year olds!). An important precept of experiential learning is that it is important to engage the learner in doing something that makes

⁷ <http://dis.shef.ac.uk/literacy/ahrb.htm> (Accessed 20 December 2006)

⁸ SCONUL Society of College, National and University Libraries website:

http://www.sconul.ac.uk/groups/information_literacy/About_us.html (Accessed 19 December 2006)

⁹ See, for example: Race, P. (2005) *Making learning happen: a guide for post-compulsory education* London: Sage.

their existing processes and strategies visible. Good information literacy material, based on experiential learning principles, was generated in the schools domain in the 1980s (Brake, 1986; Tabberer, 1987). These materials bring together experience in a compelling subject context, reflection on that experience and consideration of how to use new approaches in different contexts.

- Schools that take information literacy seriously usually link this to other pedagogic developments such as active learning and problem-solving. In this context, emphasis is placed on people's *preferred learning styles* being taken into account when planning and delivering sessions or learning programmes. Most students who reach university are probably capable of learning in a variety of environments, whether these are ideal for activists, reflectors, pragmatists or theorists (to use one common set of designations, Kolb, 1984) but they will still prosper better if they are allowed to learn in their own way, at least some of the time. Our sweeping generalisation, based on running workshops for 'librarians as teachers', as well as observation of and feedback on numerous sessions organised and delivered by academic library staff, is that most people recognise the need for flexibility - in theory. In practice, many still rely heavily on traditional didactic or heavily structured and systematic approaches. Enhancing information literacy requires that we engage with learners, which may require us to teach differently, using a broader repertoire of teaching methods.
- In an intriguing variation on the relationship between personality types and information-seeking behaviour, Heinström characterised three dominant approaches to *Internet information-seeking* as 'fast surfers', 'broad scanners' and 'deep divers' (Heinström, 2003). The fast surfers take minimum time and effort to search, rate ease of access over quality of information and encounter problems in critically evaluating material. The broad scanners access a wide range of sources, are flexible browsers, tend to acquire information by chance and are open to experiences. The deep divers offer a stereotype for the ideal information-seeker or strategic learner, being highly motivated to search, systematic in approach, willing to apply much effort, driven by intellectual curiosity and interested in only gathering high quality information. Too often, information literacy programmes aspire to create a universe of deep divers. This research suggests that it is more important to be sufficiently flexible in approach to allow all three types of searchers to enhance and develop their skills.
- With greater HE emphasis on widening participation, combined with enhanced access to a confusing plethora of information sources, the notion of the confident university student no longer holds – if it ever did. Carol Kuhlthau, in particular, has drawn attention to the *emotional aspects of information literacy* (Kuhlthau, 1993). She emphasised the importance of engaging with students about their changing emotions when seeking and using information and acknowledging that uncertainty and confusion are normal. Again, the idea that students should make gains in confidence and self-esteem as well as in competence and knowledge may receive ritual acknowledgement amongst HE librarians, but is this being seriously addressed in practice? How do we know whether students feel less threatened by learning situations or feel more assured when conducting a complex search unless we gather evidence about this?

The team who developed the SWIM material (mentioned earlier) reported that they spent twice as long getting to grips with theories of learning and pedagogic principles than in building the appropriate e-materials. In our view, it is the embedding of these principles in the materials that makes them so effective.

2. Transfer of information literacy skills and strategies

The concept of 'transferable skills' is heavily used by UK higher education librarians, but the problematic nature of the transfer of skills (Perkins et al, 1992) has received little or no research attention. Since fostering transferable information skills is at the heart of most conceptualisations of information literacy, academic librarians would do well to give this issue more attention.

Research conducted on critical thinking skills in schools in the 1980s and early 90s (Beyer, 1997) established effective transfer as a key part of information literacy, but also made clear that "the most serious problem with teaching thinking skills is that transfer is not automatic" (Nisbet et al, 1989) and that "even when students are able to demonstrate mastery of certain skills, they are unlikely to transfer these skills to new areas of learning on their own." (Grotzer, 2005). With the large-scale

shift towards e-learning in HE it is more important than ever to focus on how to work for transfer, but skills transfer is still seen as largely unproblematic in this area.

How can we be more effective in supporting student transfer of information literacy skills and strategies? The research tells us that:

- Both far and near transfer are problematic: students frequently fail to recognise that skills developed in one subject area are also applicable to disparate learning situations – unless they are encouraged to think about this. But this is not just a problem in making distant connections – researchers frequently report surprise at how similar problems can be without learners realising that two situations require the same type of solution.
- Students should be encouraged to think about their skills and how to apply them (adopting a metacognitive approach). They should be encouraged to plan activities to meet goals, anticipate obstacles, monitor their own progress, approach information critically, evaluate information during the problem-solving process and by these means to develop a personal information style.
- Work with students should focus on situated learning/cognition (Seely Brown et al, 1989) - where what the student learns is learnt in relation to specific contexts and is not offered as 'inherently general.' At a recent information literacy research symposium (CISSL-IMLS, 2005), Louise Limberg said that her research had led her to believe that we must stop thinking about teaching students particular skills and focus instead on helping them to look at each learning situation from a variety of perspectives, and to consider alternative approaches.

Attention should be given to *how* information literacy skills are taught and especially to:

- the conditions of transfer: students should be offered extensive practice in a variety of contexts and the skills employed should be explicitly abstracted. Students should be encouraged to engage in active self-monitoring and to actively engage in their own learning; and to
- the mechanisms of transfer: too often this entails what has been called **Low road transfer** (reflexive, with automatic triggering and little active thought), when the aspiration should be to encourage **High road transfer** (mindful, conscious, deliberate, entailing a search for connections, Perkins and Salomon, 1992).

As Perkins and Salomon observed, "Unfortunately, many learning situations do not encourage a high level of mental investment. Therefore, transfer does not occur as often as we want (ibid).

Specifically, teaching to encourage and support transfer should

- make overt connections
- provide links to specific applications
- focus on the purpose of strategies
- consider how strategies might be adapted
- provide opportunities to practice, apply, re-apply and re-teach
- include time for student reflection
- provide feedback to students.

Planning to encourage and support transfer should encompass

- continued availability of contexts for using strategies
- time for reflection and discussion
- support for self-monitoring and self-regulation

The e-learning environment in which HE librarians now operate presents difficulties when trying to achieve transfer. On-line information literacy tutorials/worksheets/self-assessment questionnaires do not tend to foster the depth of reflection and critical analysis needed to encourage transfer.

3. The sequential approach in existing models

Although advocates of particular information literacy models make reference to the need for flexibility in their application and some refer to recursive construction of knowledge, most models on offer in the HE world are presented in a way that invites interpretation in sequential and mono-directional terms and discourages adaptation by the student. The implicit assumption underlying some models is that skills and strategies are relatively simple and unproblematic processes that can

and should readily be used in a particular sequence by all students. By breaking these processes down into 'bite-sized chunks' they encourage fragmentation of cognitive and meta-cognitive processes, although as we have seen in the earlier discussion of learning styles, multiple intelligences and internet information seeking, many people think and operate in other ways.

Adopting such models as the basis for information literacy work may have attractions for librarians because their task becomes easy to plan and manage. They can convey the preferred version of the staged approach to the students and then assess the students' ability to work through the steps. This approach tends to create the impression that knowledge is inert and broadly equates to information (in much the same way that advocates of knowledge management see the challenge of gaining access to other people's tacit knowledge as simply a matter of communicating it as information, when Polanyi's view (1958) in advancing the concept was that tacit knowledge is that which cannot be made explicit, expressed in his phrase "We know more than we can tell").¹⁰

Further, the sequential approach also seems to offer a straightforward way of describing to students and academic staff the complex structures of information literacy expertise that librarians possess. Unfortunately, this ignores the interplay between the subject content, the learning context and the strategies required to succeed.

Perhaps more seriously, learning how to seek and use information through a sequence of steps creates a false sense of security for the student. In her work in New Zealand primary schools, Penny Moore (1995) clearly delineates what happens when a step in the process doesn't produce the expected outcome and the process breaks down. Similarly, in their work with science students, Kinchin and Hay (2000) show how students who are using a sequential approach (or in their terms, a chain structure) may have difficulty in assimilating new knowledge that does not readily fit into the sequence. At best this may cause confusion and at worst may lead to the new knowledge being rejected.

4. Achievement and impact – showing the difference

The next major area in which information literacy work in other domains has something to offer HE libraries is in evaluating the impact of this work. Writing in 2002 and commenting on impact assessment in libraries and adjacent fields, Wavell and her colleagues recognised that HE librarians have, comparatively some way to go, judging that they "at present, are at the stage of attempting to find appropriate indicators and data collection techniques".¹¹

There has been some progress since then, with, for example, the Library and Information Research Group and SCONUL-funded *Impact Implementation initiative*.¹² Seven of the ten university library teams working through year one of the programme chose to focus their innovative activity and linked impact evaluation on information literacy interventions in their universities. SCONUL is now seeking to maintain the momentum by ensuring that the approach adopted can be accessed more widely and that appropriate support materials are made available.

There has also been a gradual cumulation of case studies based on information literacy initiatives in specific institutions, notably Andretta's work at London Metropolitan University (2005) and the work of Johnston and Webber (2003).

As outlined at the beginning of this chapter, information literacy work in schools has frequently gone hand-in-hand with related research, which has in turn shifted its focus over time from the processes involved to their impact, particularly their impact on learners. This work has culminated in a number of major large-scale studies in the USA involving thousands of schools.

¹⁰ For a fuller discussion of this issue, see: Wilson, T.D. The nonsense of 'knowledge management' *Information Research* 8 (1) October 2002 [Online] <http://informationr.net/ir/8-1/paper144.html> (Accessed 19 December 2006).

¹¹ Wavell et al (2002) *Impact evaluation of museums, archives and libraries: available evidence project*. Available at: <http://www.rgu.ac.uk/files/imreport.pdf> (Accessed 19 December 2006).

¹² Payne, P. and Conyers, A. Measuring the impact of higher education libraries: the LIRG/SCONUL Impact Implementation Initiative. *Library and Information Research* 29 (91) Spring 2005. The whole issue is devoted to the Initiative.

Project Achievement (Loertscher and Todd, 2003) reviewed the research to: identify the areas in which the school library can make a difference; and formulate indicators that could be used to drive the collection of evidence. They specified:

- Developing skilled and avid readers
- Making learners information-literate
- Building high quality learning experiences for learners through collaboration with teachers
- Building an information-rich environment and enhancing teaching and learning through ICT

These large-scale studies are increasingly being complemented by a self-help approach for library managers, as part of a more general thrust towards schools self-evaluation. A notable lead in this area was given by the School Libraries Working Group of the Department for Education and Skills (England) which commissioned self-evaluation processes for primary (Markless et al, 2004) and secondary school libraries (Streatfield et al, 2004). These 'toolkits', published in July 2004, gave school librarians the means to evaluate, *inter alia*, the library contribution to pupils' research and study skills, pupil reading and pupil progress in library-based work, as well as the librarian's contribution to information literacy.

5. The nature of collaboration

The integration of information literacy into subjects/disciplines has been promoted since its inception. There have been exhortations to school librarians to 'collaborate with teachers' in order to make real progress. In higher education the push has been towards embedding information literacy into the various curricula. In addition the ACRL and ANZIL Standards talk of adopting institution-wide approaches to complement packages and workshops that are part of the curriculum. However, full integration and broad collaboration have been elusive. Research in schools and Further Education has focussed on the nature of collaboration, pursuing a variety of questions, such as:

- What models of collaboration exist?
- What roles can the librarian adopt when collaborating with teachers?
- What should be the content of collaboration?
- Are some approaches more effective than others?¹³

These and related themes are being picked up in current research in the USA, Australia and the UK. The role of the subject librarian in higher education has been widely debated; perhaps the debate could be informed by research into models of collaboration. The current interest in blended learning (combinations of face-to-face and e-learning) offers opportunities for extended collaboration.

Models and frameworks - again

Practical manifestations of information literacy in HE can be seen in the emergence of UK models, (notably the *Seven Pillars* and *Big Blue* models), their adoption by university libraries and, occasionally (for example at the University of Cardiff), institution-wide adoption (Jackson et al, 2005).

All models and frameworks tend towards the simplistic and therefore create problems when applied. This is particularly true when dealing with the complexities inherent in learning. Specifically, most models of information literacy are:

- not linked to the learning process as we currently understand it, ignoring or underplaying reflection, iteration, trial-and-error, and different learning styles and strategies
- grounded in a technical view of information literacy (depending on mechanistic processes such as citation and keyword searching), with far too little emphasis on the cognitive and meta-cognitive elements
- ignore peer interaction and the collaborative nature of much enquiry (Limberg, 2005)
- use a language that does not resonate with academic staff and students, does not reflect the language of the disciplines and, therefore, keeps information literacy separate and harder to embed in the curriculum. This poses yet another challenge for students who are likely to be overwhelmed by the plethora of 'new languages' especially at the start of their university experience.

¹³ See, for example: Markless, S. and Streatfield, D. R. *The really effective college library* Library and Information Commission Research Report 51, Twickenham, Middx. IMA for the LIC 2000; Harada, V. H. (YOP?) 'Librarians and teachers as research partners: reshaping practices based on assessment and reflection' *School Libraries Worldwide* 11 (2) 49-74.

Most of the models examined cover similar ground. The main differences are in emphasis on particular elements of information literacy, the order of the skills (hierarchy and sequence) and the language used. Therefore, when choosing a model, the issue usually becomes one of minimizing the problems in application in a particular institution. These can largely be overcome by ensuring that information literacy is embedded in the curriculum rather than treated as a separate subject, and by using pedagogically-sound principles when designing information literacy materials, activities and sessions. The model itself should contribute to the learning process by:

- being flexible
- using language that reflects aspects of learning
- being capable of supporting a wide range of different learning outcomes
- enabling the inclusion of students with different approaches to learning

Another issue to consider is the 'reach' of any model. How far should librarians venture into areas such as critical and creative thinking, structured reflection and active construction of new knowledge? Existing models can be adapted to fit the 'language of the curriculum' more closely, to merge categories so that the process appears less fragmented and frozen. However, most models remain as frameworks to be *taught* and assessed.

As part of a recent project conducted with the University of Hertfordshire we reviewed all the main information literacy models and the published critiques of these models. For example, when comparing three widely known information literacy models, Susie Andretta commented

"The main difference (between the Frameworks) rests on the emphasis placed by ANZIIL and ACRL on the recursive knowledge construction approach which provides a coherent framework for learning. SCOUNL's interpretation of the knowledge creation process is too linear to reflect fully the learner's experience as it is based on a sequential progression..." (Andretta, 2005: 53).

Case studies of UK university libraries show that they usually adopt the SCOUNL, ACRL or Big Blue frameworks. Some universities have lightly adapted the chosen model; others base their programmes more loosely on a particular framework. Staff then formulate appropriate learning outcomes. In some universities, these are related to different disciplines, courses and levels of students; in others they operate at a more generic level. There are very few examples of Universities using progressive standards as the basis for a comprehensive programme.

A new information literacy framework for students

In the event, the University of Hertfordshire decided to opt for a new model which was developed by Sharon Markless following a series of interviews with key staff of the university conducted by David Streatfield to establish where the university had reached in relation to information literacy and i-skills (the preferred term in Hertfordshire). The model was introduced to key university library staff in a day-long workshop; they then generated four online tutorials in key areas of need identified during the consultation, which were piloted with a range of students. The framework is currently being applied and field-tested in Hertfordshire.

The framework published here for the first time offers a more radical student-focussed approach to supporting information literacy development based on a fusion of two research-based published models, a non-linear model of information-seeking behaviour¹⁴ devised by Allen Foster (2004) and a model of information and critical literacies offered by Ross Todd.¹⁵ It is essentially a framework to support student choice in learning rather than information skills teaching.

This new framework is presented below: as a series of figures (accompanied by sets of lists to unpack some of the concepts). The figures are intended to drive the process and are envisaged as being used in an electronic environment. The framework is designed to take advantage of technological developments that allow individuals to make choices, navigate between options and then save their search paths.

¹⁴ Although Foster describes his model as non-linear, it may be more helpful to regard it as a non-sequential model

¹⁵ Todd, Ross Transitions for preferred futures of school libraries. *Keynote paper to International Association of School Libraries (IASL) Conference, Auckland, Symposium 2001*. Available at: <http://www.iasl-slo.org/virtualpaper2001.html> (Accessed 20 December 2006). [since developed by Professor Todd in various conference papers and presentations].

The drivers behind the models are student choice and reflection to support effective learning. During three key stages (which do tend towards the sequential) students **choose** which strategy to adopt at different points in their research. Help and guidance is available for each of the key elements. Importantly, if one avenue fails they can go back to the big picture and choose another. The framework is designed for students to construct their own problem-solving approaches to finding and using information. The impact of context on learning should lead students to make different choices depending upon the nature of the task they are addressing.

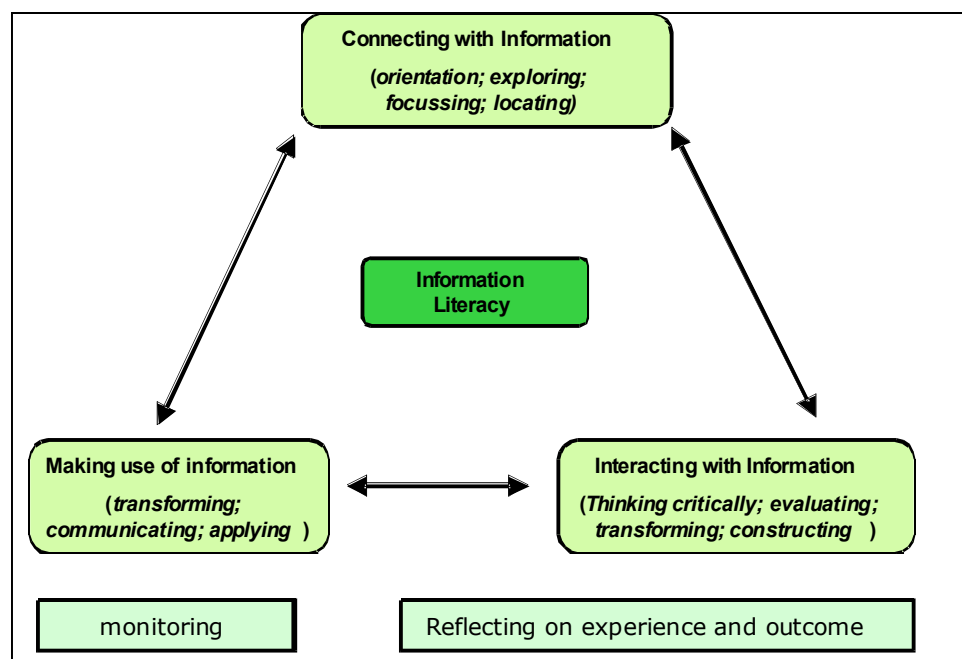
Two points should be kept in mind when considering this framework:

- the heavy emphasis on transformation and construction of knowledge is designed to encourage students to stop seeing research/assignments as a process of collecting information and instead to see in terms of forming their own perspectives and creating new insights. In HE, courses proclaim their desire to create critical and independent learners. Information literacy should enable students to discover and present their own authentic voices.
- The framework can be populated by exercises, problems or advice - both from librarians and other academic staff. To this end, the professional jargon of librarians has been assiduously avoided.

There are three elements to the new framework (see figure 1 below):

- Connecting with information
- Interacting with information
- Making use of information

Figure 1: Information and Critical Literacies

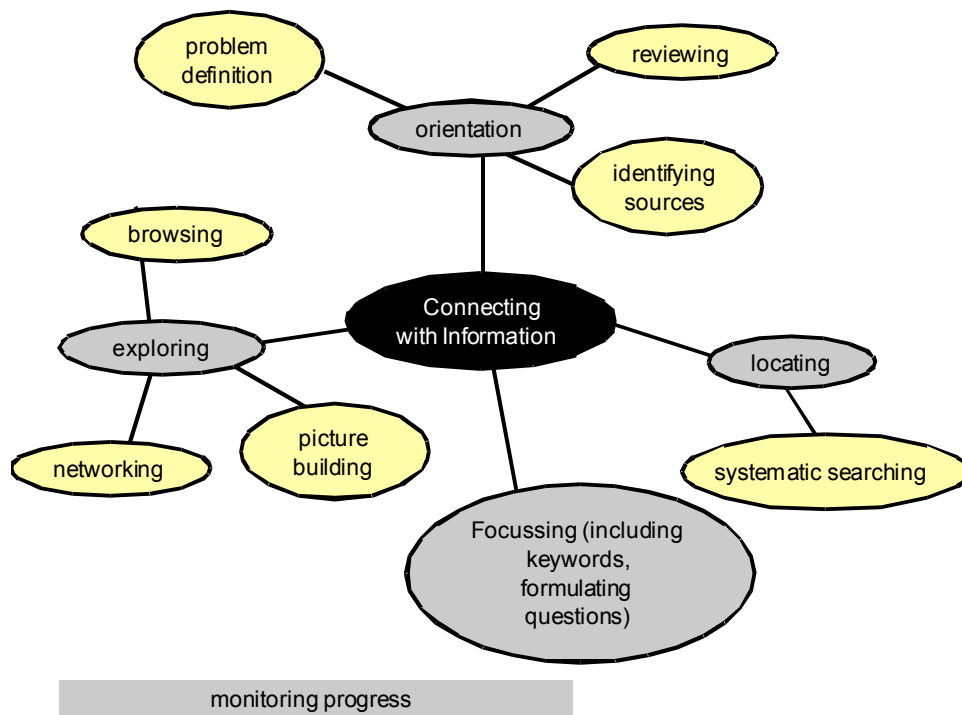


Each of these elements is unpacked below.

Connecting with information

- Reviewing existing knowledge and gaps
- Problem definition: focus and boundaries
- Picture building: exploring, mapping the scene and gaining an overview
- Browsing (purposeful and serendipity)
- Networking
- Identifying sources
- Locating sources and information
- Focusing (including identifying keywords and formulating questions)
- Systematic searching
- Monitoring progress

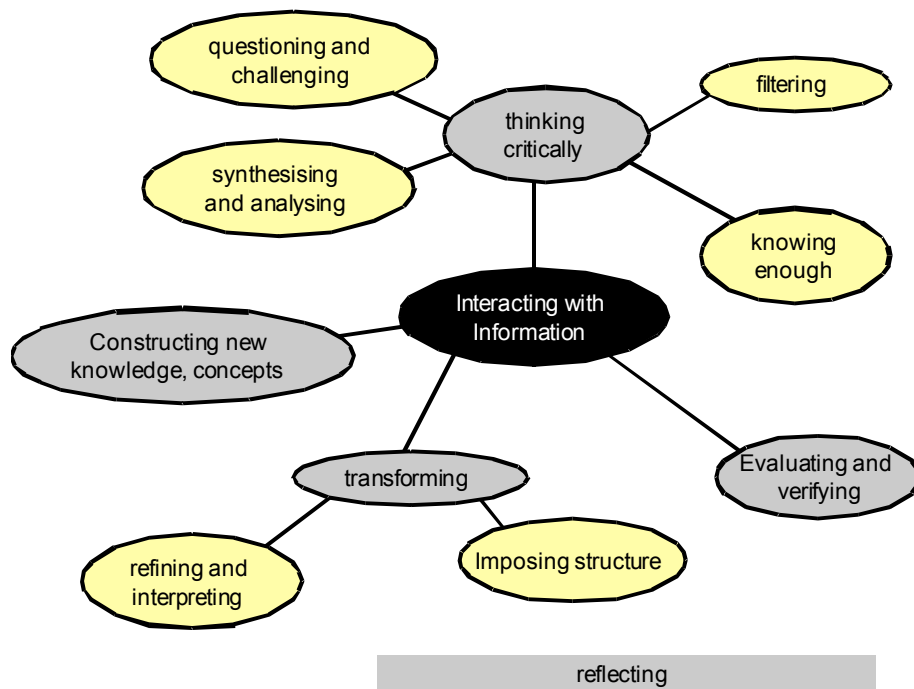
Figure 2: Connecting with information



Interacting with information (creating the personal or group perspective and position)

- Questioning and challenging the information
- Evaluating and verifying
- Filtering
- Refining and interpreting (fitness for purpose)
- Synthesising and analysing
- Constructing new concepts, knowledge, arguments
- 'Knowing enough' (is more information necessary?)
- Imposing structure to make sense of information
- Reflecting

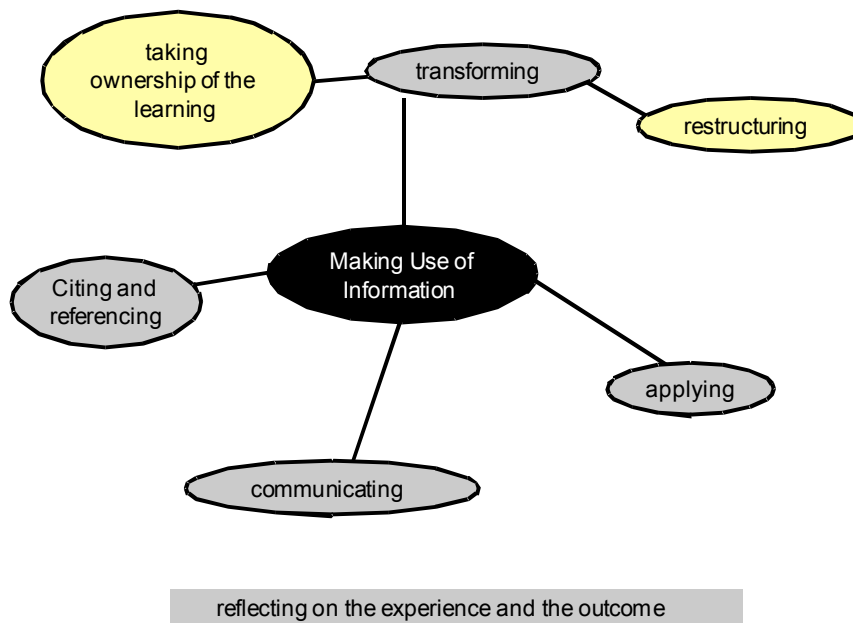
Figure 3: Interacting with information



Making use of information

- Taking ownership of what has been learnt by expressing its complexity and richness, using appropriate media
- Communicating in an appropriate variety of formats
- Citing and referencing appropriately
- Applying information when problem-solving, decision making and in critical thinking
- Restructuring information for different purposes (including transforming information into different media)
- Reflecting on the process and the product

Figure 4: Making use of information



We are now seeking to field-test and adapt this framework in a variety of HE settings, exploring some of the implications of recent information literacy research in practice, before a more developed version is offered.

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