From Learning to Read to Reading to Learn: School Libraries, Literacy and Guided Inquiry

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"We are made wise not by the recollection of our past, but by the responsibility of our future"
George Bernard Shaw
(http://quotations.about.com/cs/inspirationquotes/a/Destiny4htm)

School libraries are about the future. They are about the development of knowledgeable and knowing young people; young people who have the ability to read the word and the world, and who can live their lives as thinking, informed, knowledgeable and productive citizens of an increasingly inter-connected world. They are about young people who have the knowledge, skills, attitudes and values to invest wisely in confidently shaping their own futures and their lives as family, community and workplace members. Reading, Knowing and Doing are the multiple faces of the future global citizens that we nurture in our schools. Reading, Knowing, Doing, as the multiple faces of literacy, are the multiple faces of quality school libraries. And Reading, Knowing and Doing are at the heart of informed, in-tune, and in-touch school librarians committed to providing the best opportunities for our students to learn to use their minds well.

In Reading, Knowing and Doing, we have a very important and noble work to do. School libraries as powerful and engaging places in the lives of students do not happen by chance or force. They are achieved through wise and deliberate decisions and actions and instructional interventions on our part; actions, interventions and productive learning partnerships that enable us to work in transformative ways in our schools. In this paper, I will briefly address each of the dimensions of Reading, Knowing and Doing as the literacy-knowledge-learning foundations of school libraries. As the school library research builds, we see strong and compelling evidence that school libraries are engaging places in the lives of our students, and at the same time we see challenges ahead where much needs to be done. These challenges take us beyond traditional notions of reading, writing, and numeracy, as well as long standing conceptions of information literacy. They focus our thinking on the building blocks of a knowledge-based society, and the knowings and doings that will enable our students to get there. They challenge us to embrace a powerful vision of knowledge centeredness rather than information centeredness, and to align our leadership, pedagogy and resources to create that vision.

Reading

I have read several studies in recent months that show the important challenges ahead of us, as well as celebrating the power of effective school libraries. The findings of the 2004 USA study "Reading at Risk" (NEA ARTS, 2004) undertaken by the independent US federal agency The National Endowment for the Arts point to considerable challenges. Participants in this study were asked if, during the past twelve months, they had read any novels or short stories, plays, or poetry. A positive response to any of those three categories was counted as reading literature, including popular genres such as mysteries, as well as contemporary and classic literary fiction. No distinctions were drawn on the quality of literary works. Ten findings emerged:

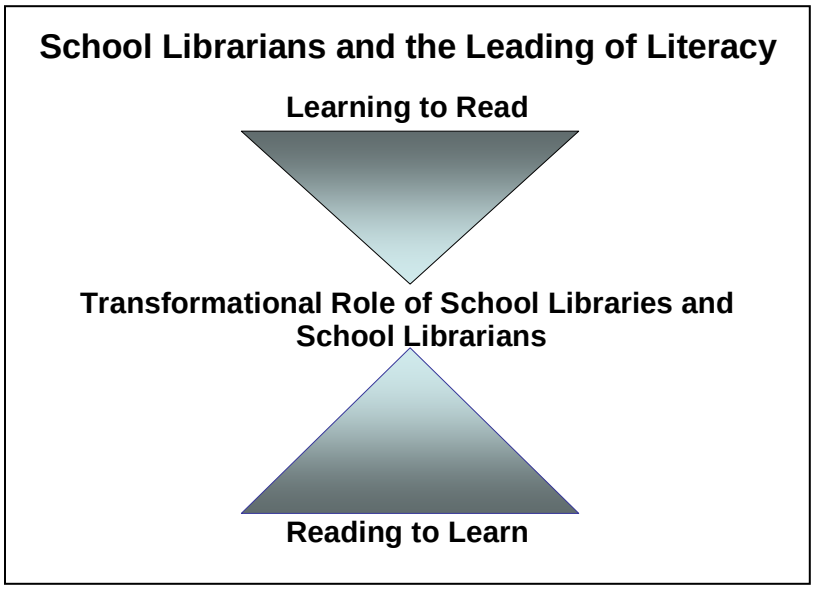
1. The percentage of adult Americans reading literature has dropped dramatically over the past 20 years.
2. The decline in literary reading parallels a decline in total book reading.
3. The rate of decline in literary reading is accelerating.
4. Women read more literature than men do, but literary reading by both groups is declining at significant rates.
5. Literary reading is declining among whites, African Americans, and Hispanics.
6. Literary reading is declining among all education levels.
7. Literary reading is declining among all age groups.
8. The steepest decline in literary reading is in the youngest age groups.
9. The decline in literary reading foreshadows an erosion in cultural and civic participation.
10. The decline in reading is due to increased participation in a variety of electronic media, including the Internet, video games, and portable digital devices.

In commenting on these findings The NEA Chairman Dana Gioia claimed “The decline in reading among every segment of the adult population reflects a general collapse in advanced literacy. To lose this human capacity—and all the diverse benefits it fosters—impoverishes both cultural and civic life.” She was particularly concerned about the trend among younger adults, and has suggested that unless timely solutions were developed, then literary culture, and literacy in general, would continue to worsen. In this regard, the study found that the rate of decline for the youngest adults, those aged 18 to 24, was 55% greater than that of the total adult population. She predicted that at the current rate of loss, literary reading as a leisure activity would virtually disappear in 50 years. As educators, these concerns must be our concerns. Schools play a fundamental role in the ongoing development of literacy, together with the active involvement of parents, families and caregivers before formal schooling begins. As school librarians, where literacy is the foundation of learning, we must invest in the solutions (NEA ARTS, 2004, p. 1).

There are many definitions of literacy, and what it means to be considered "literate," varies from country to country and from educational system to educational system. A common assumption underpinning most definitions is that a person has to be able to cope with some reading and/or writing tasks. John Hertrich, of the Ofsted Inspectorate for children and learners in England takes this further, and claims that literacy is the capacity to recognize, reproduce and manipulate the conventions of text shared by a given community” (National Literacy Trust, 2006, p. 1). In other words, literacy goes beyond merely acquiring reading and writing techniques; rather, it is the transformation, communication and dissemination of text and the development of meaning and understanding.

Similarly, Paulo Freire (1973) claims: "To acquire literacy is more than to psychologically and mechanically dominate reading and writing techniques. It is to dominate those techniques in terms of consciousness; to understand what one reads and to write what one understands: it is to communicate graphically. Acquiring literacy does not involve memorising sentences, words or syllables - lifeless objects unconnected to an existential universe - but rather an attitude of creation and re-creation, a self-transformation producing a stance of intervention in one's context."

Against this backdrop, school libraries and school librarians are critical in the reading-literacy-knowledge life cycle, because they are the transformational link, the bridge between children learning to read, and children continuing to read, to know and to understand. They are a key to the education of children and the development of communities and cultures that highly value literacy.



The school library as a transformational bridge in the reading-literacy-knowledge life cycle is well documented. The important reading research undertaken by Krashen, as documented in Todd, Kuhlthau & Tepe (2004) explicate the contextual and instructional dimensions of reading development fostered by the school library. The school library and school librarian's role as a point of access, reading space, motivator and sustainer of reading, are shown to have a positive impact on reading comprehension, vocabulary, spelling ability, grammar usage and writing style; as well as higher reading achievement and overall higher student achievement.

My own research, and that of Lyn Hay in Australia, on how school libraries help students learn leaves me convinced, more than ever, of the central place of the school library as a transformational bridge in the reading-literacy-knowledge life cycle of students. The table below shows the findings from three studies: Student learning through Ohio School Libraries (Todd & Kuhlthau, 2005) which involved 13,123 students; Student learning through Australian School Libraries (Hay, 2005a, Hay, 2005b) which involved 6,718 students, and Student learning through Delaware School Libraries (Todd 2006) which involved 5,733 students.

How helpful the school library is to you with your general reading interests.	**Place**	**Most helpful**	**Quite helpful**	**Some help**	**A little help**	**No help /Does not Apply**
The school library has helped me find stories I like	Delaware	39.8	21.5	15.1	11.7	11.9
	Ohio	29.3	19.4	17.2	18.7	15.5
	Australia	36.4	24.3	15.5	12.8	10.9
The school library has helped me read more	Delaware	30.4	20.7	16.1	16.1	16.7
	Ohio	20.9	17.0	17.2	24.3	20.6

	Australia	29.2	21.8	17.0	17.1	15.0
The school library has helped me become a better reader	Delaware	29.4	19.5	16.2	16.2	18.8
	Ohio	18.2	15.2	15.8	25.2	25.6
	Australia	27.2	20.3	16.7	17.3	18.4
The school library has helped me enjoy reading more	Delaware	30.2	17.4	14.7	18.2	19.5
	Ohio	20.9	14.0	16.3	25.5	23.3
	Australia	27.6	19.0	16.8	18.4	18.1
The school library has helped me be a better writer	Delaware	22.3	20.8	17.9	17.7	21.3
	Ohio	15.5	16.9	17.9	24.7	25.1
	Australia	20.8	20.3	19.7	18.7	20.4

While these findings are encouraging, and show that school libraries do help students on a range of reading dimensions they also clearly suggest that there is work to be done. Students who see that the school library enriches their reading experience and fostering their passion for reading, see that it happens in a multitude of ways. One thing is common – it is not just creating the library as a stimulating and engaging place, it is interventions by the school librarian personalized and tailored to the individual needs of each child to be that transformational link. For example, in Ohio, it was found that the following actions contribute to sustaining reading: responsiveness to expressed need; availability of latest releases; personalized, targeted, proactive service; identifying interests and developing self-esteem; currency and relevance; linking from curriculum to personal interest; showing that academic success can be achieved through improving reading; and making links from reading to writing (Todd, Kuhlthau & Tepe, 2004).

It is of greatest importance that school libraries continue to work to develop and sustain a culture of reading. But I have some concerns. When I speak to school librarian about typical activities and interventions to enable this, I typically hear things like literature displays and book talks, promoting information resources, reading incentive programs, and to a lesser extent story telling, book clubs and author visits. These tend to be more pervasive in the elementary school, and typically decline in frequency through middle school and high school. If you reflect on these approaches, you see reading activities that are primarily passive activities. The challenge is to focus on reading activities that foster active student engagement, discussion and creative outputs: web blogs; book raps; interactive book reviews; online literature circles, reading pals online; create your own e-books; student-run school reading web pages, community reading initiatives. The list is as long as your imagination, your commitment and your passion.

Knowing

When reading is at risk, it is not just school libraries that are at risk; more critically, it is knowledge that is at risk. Alvin Toffler expressed it this way: “The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn” (Toffler, n.d., 6). And this brings me to focusing on the Knowing dimension of the Reading, Knowing, Doing theme of this conference. I have been fascinated for a long time now about how people develop new knowledge, and the whole theoretical and pedagogical arena of knowledge construction and representation is something that I believe all school librarians need to grasp. I have wondered, in the context of increasing calls for school librarians to demonstrate the impact of the school library on student learning outcomes, what exactly do students learn when they come into the school library to do yet again another pick-a-dinosaur-bird-country-planet-disease project. Do they learn anything? And in

the rich information context of schools, how can we maximize the learning through information resources?

Too often I have heard school librarians lamenting the fact that they see many meaningless forms of library research assignments, projects and reports, where students seem to undertake low-level learning activities that do not give much evidence of learning new knowledge, and where students seems to be engaged in the "transport" of text (Limberg, 1999). The transport of text is shown not only in cutting and pasting of text, but also in the stockpiling of facts without imposing any organizational or reflective structure on them, or without constructing both local and global coherence to ideas. And amid this lament, there is often blame ascribed. While it might be seen as a failure on the part of teachers, it is also a challenge for the school librarian to position herself / himself as the information learning specialist – one who brings specialist knowledge of learning through information, and who is empowered to lead the school community in developing effective instructional interventions that guide students meaningfully through their information inquiries to develop deep knowledge and deep understanding of their topics. School libraries and school librarians as transformational agents are about enabling students to transform information into new knowledge, and this is a complex, carefully designed and guided process.

It is my belief that if the school library is to be integral to the reading-literacy-knowledge life cycle of our students, then primary focus has to move from "finding stuff", from finding and stockpiling facts, to a focus on the construction of on deep knowledge and deep understanding. This means moving from low-level learning activities focusing on the transport of text to high-level activities focusing on the transformation of text. This challenges us to rethink our instructional involvement in information literacy. Our primary instructional focus I believe has to move beyond finding and evaluating information sources, to guiding and empowering students to take found information and critically reflect on it, impose personal organizational frameworks on it, establish and identify interrelationships, and to develop personal viewpoints and positions. The focus is not the found information, but actively searching for meaning and understanding of the found information, and through it, encountering alternative perspectives and conflicting ideas and learning how to integrate this into existing knowledge and create new knowledge for themselves. A personal mantra of every school librarian should be: Celebrate the understood, not the found".

The question: Do they learning anything? is central to the future of school libraries, and it is one that school librarians must be able to answer easily and thoughtfully. Think of the last time you worked with a class in your school library. What did your students really learn? What deep knowledge and deep understanding of their curriculum topic did they come way with through this library experience, and through your instructional interventions? And how do you know this? And how would you explain it to your school community?

"Impact of School Libraries on Student Learning" project

I want to share with you some of the findings of one of the recent research projects that Professor Carol Kuhlthau and I have been involved in at CISSL, the Center for International Scholarship in School Libraries at Rutgers University. The project titled "Impact of School Libraries on Student Learning" was funded by the US federal agency, the Institute for Museum and Library Services (IMLS). (For more information about this research, consult the CISSL website at: http://cissl.scils.rutgers.edu/imls/) It was born out of a number of environmental realities -

standards-based education, accountability, performance excellence and school improvement - and with these aspects, increasing pressures for school librarians to more clearly and precisely demonstrate the link between school libraries and student learning outcomes. This posed some significant questions to us which underpinned the project. Given that students typically do spent a lot of time in the library doing research projects and resource-based assignments, do they actually learn anything? And if they do, what does this learning look like, in terms of new knowledge about a curriculum topic? How can this learning of a curriculum topic be measured? How can we enable school librarians to demonstrate and document the learning that takes place? Accordingly, the project sought to provide sustained empirical evidence of the impact of school libraries on student learning, and in doing so, provide a methodology that is replicable in school libraries identifying the impact.

The project made certain assumptions about learning in order to operationalize it. For the purposes of this research, learning was perceived as a process of personal and social construction where people are actively involved in making sense of information they interact with, rather than passively receiving it. It is a cumulative and developmental process involving the whole person thinking, acting, reflecting, discovering and linking ideas, making connections, and transforming prior knowledge, skills, attitudes, values into new knowledge and understandings. Learning was also conceived as encompassing feelings and motivations, and understanding the changing nature of these affective dimensions was seen to be important in the knowledge construction process (Kuhlthau, 2004).

Research Questions

Central to this study was understanding how a person's knowledge changes. In order to identify knowledge-based outcomes, the following research questions were investigated through quantitative and qualitative data collection approaches:

- What changes, if any, are evident in students' knowledge of a curriculum related topic, as they proceed through the stages of a collaborative inquiry project?
- What changes, if any, are shown in the students' feelings as they proceed through the stages of a collaborative inquiry project?
- How does the students' study approach influence knowledge construction of a curriculum topic in collaborative inquiry projects?
- What interactions exist between knowledge construction, feelings, and study approach, and what are some of the explanations for these interactions?

Sample

The research involved 10 New Jersey public schools chosen through a nominations process and selected by a New Jersey Expert Panel**.** The 10 schools meet the project criteria of having an effective school library instructional program, where the school librarian works collaboratively with classroom teachers to foster effective inquiry through the school library. The schools chosen could be characterized in terms of: experienced and expert school librarians; diverse schools (public schools with diverse student body and community); 10 teacher-school librarian teams; 10 school librarians working on curriculum projects with 17 classroom teachers; and 574 students in Grades 6 – 12. Topics studied were based on New Jersey curriculum standards, and across disciplinary areas. The teams were trained in implementation protocols, including the nature of inquiry-based projects,

and Kuhlthau's Information Search Process. Data were collected over a four week period during the Spring term of 2004.

Data Collection and Analysis

Five data collection instruments were used to collect the data from the students:

1. Writing Task 1 (at initiation of inquiry unit)
2. Writing Task 2 (at the focus/formulation stage of inquiry unit)
3. Writing Task 3 (at conclusion of inquiry unit)
4. My Research Style
5. Search Journal Log

Writing Tasks 1 and 2 consisted of the following questions:

1. Write the title that best describes your research project at this time.
2. Take some time to think about your research topic. Now write down what you know about this topic.
3. What interests you about this topic?
4. How much do you know about this topic? Check (✓) one box that best matches how much you know. Nothing, Not much, Some, Quite a bit and A great deal
5. Write down what you think is EASY about researching your topic.
6. Write down what you think is DIFFICULT about researching your topic.
7. Write down how you are FEELING now about your project. Check (✓) only the boxes that apply to you. Confident, Disappointed, Relieved, Frustrated, Confused, Optimistic, Uncertain, Satisfied, Anxious or Other.

Additional questions at Writing Task 3 were:

1. What did you learn in doing this research project? (This might be about your topic, or new things you can do, or learn about yourself)
2. How did the SCHOOL LIBRARIAN help you?
3. How did the TEACHER help you?

Given that the focus of this research was identifying and measuring changes in knowledge, and to understand interactions related to this knowledge construction process, the data collection instruments involved 5 approaches to measuring changes in knowledge. These are elaborated here as they provide examples of strategies for school librarians and classroom teachers to gather data on learning outcomes as part of an evidence-based approach to professional practice.

1. Substance of knowledge. This was based on an analysis of changes in the relational nature of statements by which students described their topical knowledge. To do this, we employed a statements classification typology based on nature of relationships between concepts and developed by Graesser & Clark (1985). This typology is based on the nature of the relationships between concepts as expressed in the statement, and can be used to describe the set of statements in terms of the content regardless of the disciplinary field and accuracy of the statements. The framework is shown here:

Statement type	Definition	Example
Property	statements describing characteristics	The color of Valentine's day is red

Manner	statements describing processes, styles, actions	People drive aggressively in USA
Reason	statements of explanations of how and why	The wall was constructed to block invaders
Outcome	statements providing end result	(People eat too much) As a result, people got very sick
Causality	statements showing some event causally leads to another	Too much alcohol can lead to liver failure
Set Membership	statements about class inclusion	Michelangelo created works such as statue of David, Cistine Chapel and the famous Pieta
Implication	statements showing predictive relations, inference, implied meaning	He was suspected of poisoning him
Value Judgment	statements presenting personal position or viewpoint	That's not right

Using this typology, we coded and counted every statement, as well as counted the number of individual terms / headings provided that were not embedded into conceptual relationships at all of the three stages of the data collection process. In addition to this process of coding the statements, we also imposed a meta-structure on this. This meta-structure consisted of three levels:
1. Statements which focus on facts: Included in this category were statements that presented characteristics, traits or qualities, as well as statements that described processes, styles and actions, and which gave illustrative examples. These related to Bloom's Taxonomy of Educational Objectives: "remember".
2. Statements which focus on explanations and results: These statements focused on reasons, explanations, causes and consequences. Included this category were statements that expressed *how* and *why*, as well as statements that described results, follow-ons. These related to Bloom's Taxonomy of Educational Objectives: "understand", "apply", "analyze".
*3. Synthesis statements***:** These were statements that went beyond explaining and stating of outcomes, consequences, but took these ideas to another level, including the development of a conclusion, or expressing opinions or positions. These statements showed personal reflection, evaluation, and implication. These related to Bloom's Taxonomy of Educational Objectives: "evaluate" and "create"

Amount of knowledge. This was measured by a numerical count of number of statements students used to describe their topical knowledge, as well as isolated concepts and terms. Numerical counts were charted at each of the stages of the research process and analysis undertaken to identify patterns in the changes of amount of statements.

Structure of knowledge. This measurement focused on the nature of the structure, if any, shown in the students' representations. These were coded in terms of levels of coherence and structural centrality, that is, the organization and sequencing of ideas, and the extent to which the statements overall are interlinked in ways that provide a clear meaningful set of relationships.

Estimate of knowledge. The students were asked to give a personal estimate of extent of their topical knowledge at each stage of the inquiry process, using the categories: Nothing, Not much, Some, Quite a bit and A great deal.

Labeling of knowledge. The students were asked to give a title for their inquiry, which was considered to reflect the degree of focus/specification of topical knowledge. We assumed that a general title merely reflecting the overall assignment often shows that the student has not been able to form a focus for the inquiry, while a specific title often indicates ability to do so.

Affective dimensions of knowledge construction

A constructivist view of knowledge change posits feelings as an important aspect of information seeking and sustained integrated learning. Based on the multiple research studies undertaken by Kuhlthau (2004), we identified nine feelings that we tracked through the three stages of data collection. These were: confidence, disappointment, relief, frustration, confusion, optimism, uncertainty, satisfaction, and anxiety. These were measured by asking the students to indicate how they experienced a particular feeling on a 4-point scale from: very, fairly, a little to not at all.

Approaches to study and knowledge construction

As part of understanding the knowledge construction process, we collected data on students' approach to study. Research has shown that students typically conceptualize their learning in three ways – surface, deep and strategic (Entwistle & Tait, 1996; Heinström, 2000). These approaches to studying were examined using a version of the Approaches and Study Skills Inventory for Students (ASSIST) developed by Tait, Entwistle, & McCune (1998). This involved 18 statements about study approaches measured on a five-point scale.

Search Logs

The students were asked to maintain a pre-prepared search log, and to make an entry each time they read some information that they have found related to their topic. The search log asked them to record: date, where they looked for information, search terms used to look for information and details of sources. These enabled us to look at the nature of information resources students used, and to get a picture of their approach to information searching.

Research Findings

This section provides a brief overview of some of the key findings of the study. Two predominant patterns of knowledge construction were evident. The common starting point was listing topical facts of a rather superficial kind, and in a generalist, broad manner. The first, an *integrative pattern* to knowledge construction, was characterized by movement from descriptive statements (typically property, manner and set membership statements) in Writing Task 1, through explanatory statements (typically reason, outcome and causality statements) in Writing Task 2, to interpretational synthesized replies in Writing Task 3. At the second stage, the students started to present more specific facts within broader hierarchical conceptual structures, and to look for how and why things happen. At Writing Task 3, some students articulated conclusions, viewpoints and interpreted the information they have encountered through the inquiry process. Some also provide more conceptual statements to encompass a myriad of set membership details elaborated in Writing Task 2.

The second pattern was an *additive pattern* to knowledge construction. Knowledge development seemed to be characterized by the progressive addition of facts, and it remained on a descriptive level throughout. The addition of new facts was typically a listing of property statements of a generic, superficial kind. At Writing Task 2, students showed that they continued to add property

and manner statements, and to a lesser extent, set membership statements. Students typically found more facts at each stage of the research process, and added these to their stockpile of facts, even though these added facts were sorted, organized and grouped to some extent into thematic units by Writing Task 3.

The students' representations of their knowledge showed a movement towards more structured replies over time. Initial structures were typically disparate, unstructured and random listing of facts (properties, manner and set member lists), but there was development to higher levels of structural centrality and conceptual coherence, where endpoint representations typically showed organization of facts into thematic groupings, with some students linking the thematic groupings into larger more coherent and more conceptual units.

On average the students own estimated knowledge developed from "not much" (mean = 1.26, SD =.91) at Writing Task 1, to "some" or "quite a bit" (mean = 2.6, SD =.83) at Writing Task 2. At Writing Task 3, most students found they knew at least "quite a bit" (mean = 3.2, SD =.76) about their topics. In a qualitative analysis of the statements, five predominant patterns of perceptions of knowledge gained emerged. These were: Not much more; Know "heaps" more**;** Know lots more, and surprised at breadth and depth of knowledge**;** Know lots more, but still could learn more**;** Know lots, but dissatisfaction about not knowing enough.

While there were individual patterns of variation in relation to feelings, it seemed that the students overall felt increasingly confident, relieved and satisfied as the inquiry process proceeded. Their feelings of frustration, confusion and uncertainty decreased through the project. Disappointment and anxiety appeared to be sustained during the projects, particularly at Writing Task 2 when the students were at the formulation / focus stage of their inquiry. This stage of an inquiry project tends to be the most challenging, and was shown in the level of feelings. There was also a clear connection between feelings and learning. The more the students had learned about the topic (WT3), the more confident (r=.39, p=.000), relieved (r=.19, p=.000), satisfied (r=.34, p=.000) and optimistic they felt (r=.28, p=.000). The students who did not estimate their knowledge as particularly high tended to feel disappointed (r=.28, p=.000), frustrated (r=.33, p=.000), confused (r=.30, p=.000), and uncertain (r=.33, p=.000).

There was an interaction between the cognitive, affective and motivational dimensions. Students who were motivated in their learning tended to develop a rich in-depth understanding of their topics, accompanied by positive emotions at project completion. Students who lacked motivation for their projects tended to learn less about it and overall expressed a less rewarding project experience.

The students' general approach to their studies also influenced their engagement in the inquiry process. This was expressed both in knowledge construction, emotional experience and in information seeking style. Students with a deep study approach tended to learn substantially. They experienced the inquiry process as emotionally rewarding, and seemed to be particularly aware of information quality aspects. Deep students typically presented themselves as knowledgeable about their topics at Writing Task 3, typically developed knowledge through an integrative approach, and had dominant feelings of confidence and optimism throughout the process. They also had a specific interest for their topics, and interest was a key to learning more about the topic. They also acknowledged their own eagerness to learn, but in doing so, ran the risk of becoming particularly

vulnerable to information overload. Furthermore, they indicated strong awareness of information quality, and appeared driven to explore a wide variety of material for their inquiry project and encounter material of various quality.

While strategic learners were similar to deep learners in terms of their knowledge development, particularly distinctive of strategic learners was their ability to organize and structure their inquiry. Their goal for the inquiry tended to focus strictly on achievement, as opposed to the deep students' inherent interest to learn more about the topic. When asked to state what they had learned through their inquiry, they described their topics, rather than reflecting on them as the deep learners did, and they also focused on how they developed their skills in organizing their work, and managing their time. They felt confident throughout the inquiry process and expressed satisfaction and relief at completing it.

Students who were characterized as having a surface approach tended to experience difficulties in the inquiry process. They tend to learn through rote learning and memorization, an approach which is problematic in inquiry projects which require independent information seeking, and knowledge construction. Students with the most surface study approach typically showed that their knowledge seemed to remain on a rather factual level throughout their projects. Their estimates of knowledge, which were low, changed little from beginning to end, and the content analysis showed little growth of their topical knowledge. The aspect of the search process that these students predominantly mentioned as easy was availability of information. They showed low levels of interest and engagement, and seemed particularly relieved when the projects ended.

At Writing Task 3, students were asked to state what they had learned in doing this research project. We found seven predominant expressions of outcomes. These were: increase in knowledge about a topic; development of research skills, especially "combining" information; skills in using specific online sources (online databases, Internet, OPACs); widened information horizon and changed conceptions of information seeking, in particular the recognition of beneficial information sources beyond Google (we called this feature "The Transformed Googlians"); more realistic conceptions of efficient information seeking; heightened awareness of quality aspects of information, and increased ability to deal with information conflict.

Doing: Guided Inquiry

In this study, the knowledge construction process did not proceed evenly across the schools, and there was some evidence in the qualitative responses that suggests that this uneven development reflects the influence of contextual factors on the learning process. Some students did not just see the research exercise as one of gathering facts at each stage, rather they manipulated these facts in a number of ways: seeking explanations, synthesizing facts (and consequently reducing the number of statements in their representations) into more abstract groupings, organizing facts in more coherent ways; reflecting on these facts to draw out conclusions and build positional or predictive statements. Their research took an integrative and synthetic approach to knowledge construction, with the knowledge outcome being interlinked, conceptual and reflective. For some students, learning however seemed to remain on a more descriptive level throughout the inquiry. Their topical understanding developed through a path of quantitative addition of new detail through finding more facts at each stage of the research process, and adding these to their "stockpile" of facts, even though these added facts were sometimes sorted, organized and grouped into thematic units.

These patterns did not happen by chance, and there was some indication in the study that the nature of the task set, the extent of choices involved, interest and motivation, and the nature of the instructional interventions played a role in shaping these different patterns of knowledge acquisition and outcomes. This raises some critical questions for all school librarians: What is the nature of knowledge that you expect your students to develop through school library use? What is the level of intellectual quality that your instructional interventions target? What constitutes deep knowledge and deep understanding of a curriculum topic? How do your instructional interventions foster this?

I believe that it is important for our profession to reflectively and critically examine the nature of the learning climate we foster through our school libraries, and particularly the nature and dynamics of our instructional interventions. It is not about "doing information literacy", nor is it about implementing rigid scope-and-sequence literacy programs. It is not about "if it is Grade 9 Term 2, then they must learn to search complex databases". Rather it is about school librarians and classroom teachers working as partner-leaders to guide students through curriculum based inquiry units that build deep knowledge and deep understanding of a curriculum topic, and gradually lead towards independent learning. Even with 15 years of information literacy standards and frameworks behind us, there is evidence emerging that we have yet to move beyond "finding information" as the dominant focus of our information literacy instruction (Todd, 2005). In a broader educational climate where inquiry and constructivist learning are emphasized, it is increasingly important that we focus our attention on knowledge construction, and grounding our instructional interventions in constructivist rather than transmissive approaches to enable students to move beyond transporting found information to transforming it into deep knowledge.

Guided Inquiry (Kuhlthau & Todd, 2006) is mutually negotiated, carefully planned, closely supervised, targeted interventions of an instructional team of school librarians and teachers that are clearly tied to specific academic content standards and which guide, support and enable students to develop deep knowledge and deep understanding through using diverse, complex and multi-format resources, and becoming competent researchers and information seekers and users. The focus is knowledge: guiding students in the process of constructing knowledge of their topics. Guided Inquiry is founded on the belief that learning is a guided process of personal and social construction, a view developed by influential 20th century educational thinkers such as John Dewey (1859-1952), George Kelly **(**1905-1967**),** Jerome Brunner (1915 -), and Lev Vygotsky (1896-1934).

Guided Inquiry gives emphasis to an active search for meaning and understanding by learners. Learners construct deep knowledge and deep understanding rather than passively acquiring and repackaging found information. Learners are directly involved and engaged in the discovery of new knowledge; they encounter alternative perspectives and conflicting ideas so that they are able to transform prior knowledge and experience into deep understandings, and able to transfer new knowledge and skills to new circumstances; and they take ownership and responsibility for their ongoing learning and mastery of curriculum content and skills. The instructional interventions that shape guided inquiry are thus needs driven, knowledge driven, owner driven, rather than based on some prescribed information literacy plan or prescribed sequence.

Guided Inquiry, as a learning approach, thus involves the whole person thinking, acting, and reflecting, discovering and linking ideas, making connections, and developing and transforming

prior knowledge, skills, attitudes and values through encountering information sources. These are the hallmarks of its instructional interventions. Guided Inquiry is built on three fundamental principles of construction, and each of these is elaborated here. These beliefs form the foundational principles around which Guided Inquiry instructional interventions are planned, designed and implemented.

1. Students learn by being actively engaged and reflecting on the experience. (Dewey, 1933, 1944).
Dewey described learning as an active individual process, not something done to someone but rather something that a person does. Learning takes place through a combination of acting and reflecting on the experience and its consequences, what Dewey called reflective experience or reflective thinking. This is highly personal and individual. He believed that education must engage with and enlarge experience, enlist natural curiosity, be directed towards the investigation of matters of interest, and which fulfill and enrich the current lives of students as well as prepare them for work, citizenship and living in a free and democratic society. Like Dewey, Jerome Bruner's research and writing (1975) focus on learners being actively involved in making sense of the world rather than passive receivers of information. Bruner believes that it is not enough to merely gather information; rather, learning involves going beyond the information given to creating products of the mind.

2. Students learn by building on what they already know.
Past experience and prior understandings form the basis for constructing new knowledge (Kelly, 1963; Ausubel, 1968). The central concept is that connections with a student's present knowledge are essential for constructing new understandings. Ausubel, for example, contended that "the most important single factor influencing learning is what the learner already knows" (Ausubel, 1968). According to him, a primary process in learning is subsumption in which new material is related to relevant ideas in the existing cognitive structures. Ausubel proposed the use of advance organizers as an instructional approach which act as a "subsuming bridge" between new learning material and existing related ideas.

3. Students develop higher order thinking through guidance and instructional intervention at critical points in the learning process. (Vygotsky, 1978)
Higher order thinking entails deep processing that leads to understanding. Deep processing requires engagement and motivation at critical points fostered by authentic questions about a topic that are drawn from the student's own experience and curiosity, and sense of life relevance. Vygotsky refers to these as zones of proximal development. Deep processing also requires the development of intellectual skills that go beyond the locating and gathering of facts. These are the skills of critical analysis, argumentation, learning to deal with conflicting knowledges, learning to formulate, hypothesize, predict, and infer: the intellectual skills that lead to deep knowledge and understanding, rather than shallow processing in response to simple or superficial questions with prescribed answers.

These principles, drawn from educational research are the heart of Guided Inquiry. They characterize Guided Inquiry as an instructional approach, and provide a framework for planning and implementing it in schools, particularly in terms of thinking about and providing the range of instructional interventions which develop students' competencies and skills with accessing and using information sources effectively to build new knowledge. Students construct their own understandings of these experiences by building on what they already know to form a personal

perspective of the world. Underpinning the inquiry process is a thinking process that requires extensive interrogation and exploration of ideas and formulation of thoughts before moving on to collecting, organizing and presenting ideas in ways which demonstrate personal understanding and ownership.

Guided Inquiry takes students out of the predigested format of the textbook and rote memorization into the process of learning from a variety of sources to construct their own understandings. They are guided through a process of intellectual construction to help them to build on what they already know and to come to a deeper understanding of the concepts and problems underlying the subject. Mediation and intervention are key mechanisms in this process, where school librarians and classroom teachers actively "become involved in the constructive process of another person … in information seeking and use" (Kuhlthau, 2004, p. 127). Kuhlthau's research shows that most library interventions tend to be based on sources, that is, matching a student's query with the organized collection, and often with little attention given to, or active involvement in, the holistic experience of students in the process of constructing new understandings and meanings. In a Guided Inquiry framework, students are not abandoned in the knowledge building process; they are not left to do it themselves under some (misguided) notion that this is "independent learning". Borrowing from Vygotsky's concept of a zone of proximal development and Kuhlthau's zone of intervention, guidance is explicitly developed around critical zones of intervention in the constructive process, "in which a student can do with advice and assistance what he or she cannot do alone or can do only with great difficulty" (Kuhlthau, 2004).

I believe strongly that Kuhlthau's Information Search Process, as our field's only empirically generated and tested model of people's engagement in the search process, provides a useful framework for understanding students' journey of information seeking and use, and understanding the thoughts, actions and feelings commonly experienced by students in each stage of the inquiry process as they build personal knowledge and understanding. The Information Search Process forms a validated basis for developing a program of inquiry-based learning, and for guiding students in their inquiry. It provides a mechanism for teachers and school librarians to recognize those critical moments when intervention and instruction is essential, and then to tailor interventions to enable students to achieve successful outcomes in their inquiry.

When the Information Search Process is used as a framework for developing and guiding inquiry, students are encouraged to move away from simply collecting information and putting it together to please the teacher; rather, right from task initiation they are engaged and guided in a thinking process that requires extensive exploration of ideas to build background knowledge, and to help them formulate their thoughts, shape their focus and engage their interest, before moving on to the later stages of identify and collecting pertinent information, and engaging with that information in more complex and critical ways. Thus they avoid missing the critical stages of learning by allowing time for reflecting and formulating while they are exploring and collecting information. Working diagnostically rather than prescriptively, specific instructional interventions are determined by the stage of the search process, the affective, cognitive and behavioral needs of the learners, and the curriculum standards and goals to be achieved.

For school librarians and classroom teachers, some important questions to ask in the planning process of Guided Inquiry are: How do I guide students in their inquiry? When do I intervene?

What is the nature of the intervention in terms of intellectual and affective scaffolds for enabling inquiry? How do I enable students to stay focused and not be detracted from the learning task at hand? How do I motivate and engage students who may perceive task of searching as primarily one of gathering information to a task of forming a focused perspective from the information encountered? How do I know what learning has taken place? How do I foster ongoing learning?

Learning environments and instructional interventions that focus on Guided Inquiry will typically show many of the following attributes (Kuhlthau, 2004; Gore, Griffiths, & Ladwig, 2002; Callison, 2003; Callison, McGregor, & Small, 1998). These are presented here in bullet point and represent a checklist of key dimensions to incorporate into the planning and delivery of Guided Inquiry:

- Guided Inquiry is initiated though compelling situations, and questions which meaningfully engage students in wanting to know, and which provide challenge and opportunity
- instructional activities put emphasis on meaningful, authentic activities that help the learner develop skills relevant to problem solving and to construct understandings
- students are more motivated to engage in their inquiry when they are able to exercise some choice over the specific questions they want to answer and how to present their new understandings
- an attempt is made to connect with students' background knowledge
- instructional activities involve the students in thinking, acting, and reflecting, discovering and linking ideas, making connections, developing and transforming prior knowledge, skills, attitudes and values - higher order thinking and critical analysis occurs throughout
- instructional activities enable students to develop deep knowledge, deep understanding
- students see that inquiry learning is developmental, an iterative process of advancing, consolidating, reinforcing, and involving whole person; opportunities for students to provide their understanding of concepts or ideas, and opportunities for sustained dialogue between students, and between teachers / school librarian and students
- learning activities closely resemble the ways that students will be expected to use their knowledge and skills in the real world, and to equip them for work and living in a democratic society: assigned work has resemblance or connection to real life contexts and a focus on identifying and solving intellectual and/or real-world problems
- structured interventions are informed by the Information Search Process enable students to have the information seeking and use skills to engage in an active search for meaning and understanding; they provide students with the knowledge and skills to work competently and responsibly with information, and to represent their new understanding in appropriate ways
- students know how to engage with diverse information sources to build background knowledge, formulate a focus and collect pertinent information – the focus is constructing mew knowledge, not just a source orientation
- students encounter deep knowledge and build deep understanding of the curriculum content
- students demonstrate a personal process of construction through the products they create that show their new understandings
- students have opportunity to communicate and share their new understandings
- the inquiry learning environment is one where academic and personal success and intellectual inquiry are valued and acknowledged, and one where students feel connected, cared for and trusted

- students are given feedback throughout their inquiry process that advances and nourishes their learning and continues to motivate them
- students are given opportunity to practice their new skills to sustain and support their learning beyond the formal classroom and school library experience
- inquiry learning is responsive to students' personal, social and cultural worlds, valuing differences and cultivating an inclusive community

Designing learning for a knowledge-based society is complex. At its heart is the challenge for school librarians to embrace a powerful vision of knowledge centeredness rather than information centeredness, and to align our leadership, pedagogy and resources to create that vision. A focus on constructing knowledge brings with it a challenge of reconstructing school libraries as knowledge spaces. We must ask deeper questions about how our school libraries contribute to the development of knowledge, and how our instructional interventions enable this. A focus on knowledge construction collides with many of our traditional practices, and we must have the courage to listen and to learn. We have a significant and powerful call to understand who we are and what our goals are, to be informed by the research that surrounds us, and to take action. In the spirit of this IASL conference, this is our challenge expressed so eloquently and simply in the conference theme: Reading, Knowing, and Doing: The Multiple Faces of Literacy.

Bibliography

Ausubel, D. (1968). *Educational psychology: A cognitive view*. New York: Holt, Rinehart and Winston, Inc.

Brunner , J. (1975). *Toward a theory of instruction*. Cambridge: Harvard University Press.

Callison, D. (2003). Key Words, Concepts and Methods for Information Age Instruction: Methods for Teaching Information Inquiry. Baltimore: LMS Associates.

Callison, D., McGregor, J. & Small, R. (1998). Instructional Interventions for Information Use. Salt Lake City: Hi Willow Research and Publishing.

Dewey, J. (1933). *How we think*. Lexington, MA: Heath.

Dewey, J. (1944). *Democracy and education*. New York: Macmillan.

Entwistle, N & Tait, H (1996). *Approaches and study skills inventory for students*. Centre for Research on Learning and Instruction. Edinburgh: University of Edinburgh.

Freire, P. (1976). *Education as the practice of freedom*. London: Writers and Readers Publishing Cooperative. Quote available at: (http://www.literacytrust.org.uk/Database/quote.html)

Gore, J., Griffiths, T., & Ladwig, J. (2002). *Exploring 'productive pedagogy' as a framework for teacher learning*, Paper prepared for presentation at the Annual Meeting of the Australian Association for Research in Education, Brisbane, December 2-5, 2002. Retrieved November 4, 2004, from: http://www.aare.edu.au/02pap/gor02267.htm

Graesser, A. & Clark, L. (1985). *Structures and procedures of implicit knowledge*. Norwood, N.J.: Ablex.

Hay, L. (2005a), Student learning through Australian school libraries. Part 1: a statistical analysis of student perceptions', *Synergy*, 3 (2), 17-30.
Available at: http://www.slav.schools.net.au/synergy/vol3num2/hay.pdf

Hay, L. (2005b). *Student Findings: Student Learning Through Australian School Libraries.* Unpublished manuscript, created 28 June 2005, modified 5 May 2006.

Heinström, Jannica (2000) The impact of personality and approaches to learning on information behaviour. *Information Research*, **5**(3) Available at: http://informationr.net/ir/5-3/paper78.html

Kelly, G. (1963). *A theory of personality: the psychology of personal constructs*. New York: Norton.

Kuhlthau, C. C. (2004). *Seeking meaning: a process approach to library and information services*. (2nd edition). Westport, CT: Libraries Unlimited.

Kuhlthau, C. & Todd, R. (2006). *Guided Inquiry: A framework for learning through school libraries in 21st century schools*. CISSL. Available at:
http://www.cissl.scils.rutgers.edu/guidedInquiry/guidedInquiry.htm

Limberg, L. (1999). Experiencing information seeking and learning: a study of the interaction between two phenomenon. *Information Research*, 5(1). Available at: http://informationr.net/ir/5-1/paper68.html

National Literacy Trust (2006). *Definitions of literacy*.
Available at: http://www.literacytrust.org.uk/Database/quote.html

NEA ARTS (2004). *Reading at risk*.
Available at: http://www.arts.gov/about/NEARTS/ReadingAtRisk2.html

Tait, H., Entwistle, N., & McCune, V. (1998). *ASSIST: A reconceptualisation of the Approaches to Studying Inventory*. In Chris Rust (Ed.), *Improving students learning: Improving students as learner*. Oxford: Oxford Brookes University, The Oxford Centre for Staff and Learning Development

Toffler, A. (n.d.) cited in : *A report and mile guide for 21st century skills*.
Available at: http://www.21stcenturyskills.org/downloads/P21_Report.pdf P. 6

Todd, R. (2005). *Report of the Delaware school library study.* New Brunswick, NJ.: Center for International Scholarship in School Libraries.

Todd, R. & Kuhlthau, C. (2005). Student learning through Ohio school libraries, Part 1: How effective school libraries help students. *School Libraries Worldwide*, 11(1), 89-110.

Todd, R., Kuhlthau, C., & Tepe, A. (2004). 13,000 students tell their story: "Yeah, the school library rocks". In: P. Moore et al (eds.) *From Aesop to e-book: The story goes on….* Selected papers from the 33rd Annual conference of the International Association of School Librarianship and the 8th International Forum on Research in School Librarianship. Erie, PA: IASL, 94-108.

Vygotsky, L. (1978). *Mind and society: The development of higher mental processes*. Cambridge, MA: Harvard University Press.

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