Guided Inquiry: School Libraries in the 21st Century

Carol Collier Kuhlthau
School of Communication and Information, Rutgers The State University of New Jersey, USA

Global interconnectedness enabled by information technology calls for new skills, knowledge and ways of learning to prepare students for living and working in the 21st century. Guided Inquiry equips students with abilities and competencies to address the challenges of an uncertain, changing world. School librarians are vital partners in creating schools that enable students to learn through vast resources and multiple communication channels. School libraries are dynamic learning centers in information age schools with school librarians as primary agents for designing schools for 21st century learners.

Call for 21st Century Skills

The 21st century calls for new skills, knowledge and ways of learning to prepare students with abilities and competencies to address the challenges of an uncertain, changing world. Some think that an Internet connection in the classroom is all that is needed to transform a 20th century school into a 21st century learning space. If only it were that simple. Some have assumed that the Internet makes school libraries obsolete. Research shows that this is definitely not the case. A new way of learning is needed that prepares students for living and working in a complex information environment. Our research shows that school libraries are an essential component of information age schools. School librarians are vital partners in creating schools that enable students to learn through vast resources and multiple communication channels. Teachers cannot do this alone. School librarians are primary agents in schools for 21st century learners. School libraries are dynamic learning centers in information age schools.

Information Technology – The Easy Part and the Hard Part

Consider some of the attributes of emerging information and communication technologies that change the way we live. Internet connection provides direct access to vast information resources. Mobile devices provide instantaneous communication any time and any place. Multifunctional hand-held devices are ubiquitous around the world from cosmopolitan urban centers to remote rural outposts. Web 2.0 tools help us interact, connect and collaborate in new ways. Technological tools that have become part of our everyday life have great benefit for people across the world. However, there are potential dangers as well.

There is an upside and a downside to these fantastic devices. For instance, information technology is instantaneous and mobile providing equality of voice, access and communication in real time. Everyone has a voice but this also produces an abundance of misinformation and misunderstandings, intended or not. Questions arise of what is accurate, reliable, important and wise. There is confusion between what is enduring and what is ephemeral in online information. What is intended to be ephemeral keeps cropping up and reappearing as a digital footprint, frequently at awkward times, such as personal photos on Facebook that become part of a prospective employer's consideration for hiring a candidate. What is intended to be enduring and long lasting disappears and is hard to track when most needed. For example, that interesting website you found last week is no longer accessible today. Personal communities expand with like-minded people on blogs and wikis while disengagement with the here and now in the physical present is prevalent. Questions arise about who are our friends and what is our relationship with others.

Information technology has an impact on education, the economy, and politics in phenomenal ways that change the way we learn, work and are governed. New skills, new knowledge and new ways of learning are essential to function and thrive in this vibrant environment. Students who are unprepared are headed on an exceedingly slippery slope leading to disappointment, confusion and possible disaster. We need to move beyond teaching how to use technology tools to teaching technology in use for creativity and meaning.

Inquiry as a Way of Learning

Educators around the world are seeking ways to prepare students for living and working in the changing information environment of the 21st century. There is an innovative movement in education that advocates acquiring essential skills and knowledge through an inquiry approach to teaching and learning. It is obvious that teaching the latest technology is not productive, as technology changes continuously. We are constantly being introduced to the next new thing and adopting the latest innovation. Young people pick up these new technologies easily and learn the functions with little or no formal instruction. Learning all of the bells and whistles of a new device isn't the hard part of information technology use. The hard part is learning to use the technologies for creativity and enlightenment. We need to be alert to what may get us into trouble. For instance, learning how to make a PowerPoint presentation is the easy part. Learning how to express complex ideas through a series of visuals is the more difficult but more valuable competency and the more interesting and creative as well.

Inquiry is a way of learning new skills and knowledge for understanding and creating in the midst of rapid technological change. Inquiry is the foundation of the information age school. I am aware that the English term "inquiry" may not translate easily into all languages. The underlying concept is considering a question or problem that prompts extensive investigation on the part of the student. In this sense, it is a research approach to learning. This approach is becoming increasingly common across all subject areas of the curriculum. Inquiry that is guided by an instructional team to enable students to gain a depth of understanding and a personal perspective through a wide range of sources of information is called Guided Inquiry (Kuhlthau, Maniotes & Caspari, 2007). Guided Inquiry equips students with abilities and competencies to meet the challenges of an uncertain, changing world. Teachers cannot do this alone.

School Librarians' Role in Inquiry Learning

School libraries are essential source of lots of information pertinent to the curriculum and good books to read. They need to become dynamic learning centers with school librarians as primary agents for designing new ways of learning. School libraries are about more than information literacy. Information literacy is important but there is more to education for the 21st century. The latest AASL (2007) standards expand information literacy to incorporate inquiry. The evolution of the role of school libraries follows the evolution of changes in the charge of education for the information age. Callison and Preddy (2006) have laid out a comprehensive account of these changes in their hefty, valuable text, *The Blue Book: On Information Age Inquiry: Instruction and Literacy*. Briefly, school librarianship has evolved from emphasis on library skills to information skills in the 1980s, to information literacy in the 1990s, to inquiry as a way of learning in the first decade of the 21st century.

School librarians are vital agents in creating schools that enable students to learn through vast resources and multiple communication channels. Librarians have the training and expertise in how to locate, evaluate and use information. They are resource specialists with broad knowledge of the extensive resources in the library, on the Internet and in the community as well. Without this expertise teachers can only minimally accomplish the information literacy requirement of 21st century learning standards. Collaborations with teachers in a team can create the necessary climate for students to inquire, participate, create and learn in an information environment. Teachers cannot do this alone.

Teachers feel pressed to meet curriculum standards and to prepare students to pass skills tests. You commonly hear, "I'd really like to take an inquiry approach but first I have to drill for the test and meet all of these subject area standards. We'll do an inquiry project after we get done with the required instruction." This is a misunderstanding of 21st century education. Inquiry learning is more than an occasional, optional research project. Guided Inquiry is a way of learning that accomplishes the objectives of 21st century schools. It is the way to meet the many requirements of the curriculum through engaging, motivating and challenging learning. Teachers and librarians work together to guide students thinking and learning through inquiry. Harada and Yoshina (2004) explain how this works in their insightful book, *Inquiry Learning through Librarian Teacher Partnerships*.

What does Research Tell Us?

Our research clearly shows that inquiry sparks learning in students and that inquiry learning calls on the collaborative expertise of librarians and teachers. One of the largest initiatives to improve learning through school libraries in urban communities across the U.S. was the Library Power Project funded by The De Witt Wallace Foundation. An evaluation study showed the emergence of an inquiry approach in the school library for improving opportunities for student learning (Hopkins & Zweizeg, 1999). Case studies of Library Power librarians revealed that collaboration with classroom teachers increased where librarians focused on student learning and inquiry (Donham, Bishop, Kuhlthau & Oberg, 2001). Studies of high school students in Sweden found that for the most part students stopped at fact finding with few going on to analyze and synthesize their understanding of facts (Limberg & Alexandrsson, 2003). At Rutgers University Center for International Scholarship in School Libraries (CISSL) Professors

Ross Todd, Carol Gordon and Ya-Ling Lu conduct ongoing studies of learning in school libraries. The study, "The Impact of School Libraries on Student Learning" (Todd, Kuhlthau & Heinstrom, 2008; Todd, 2006), investigated inquiry learning in ten school libraries in New Jersey and found that where teams of librarians and teachers guided students through the stages of the inquiry process, students went beyond merely fact finding to personal understanding.

Guided Inquiry - What Is It?

Guided Inquiry is planned, targeted, supervised intervention throughout the inquiry process. The principles and foundation of Guided Inquiry presented in *Guided Inquiry: Learning in the 21st Century* by Kuhlthau, Maniotes and Caspari (2007) are based on solid research findings grounded in a constructivist approach to learning. The Information Search Process (ISP), founded in over two decades of research, (Kuhlthau, 2004) provides insight into how to guide students in the inquiry process that underlies Guided Inquiry (Figure 1). The model of the ISP describes thoughts, actions and feelings in six stages of inquiry: initiation, selection, exploration, formulation, collection, and presentation.

Model of the Information Search Process

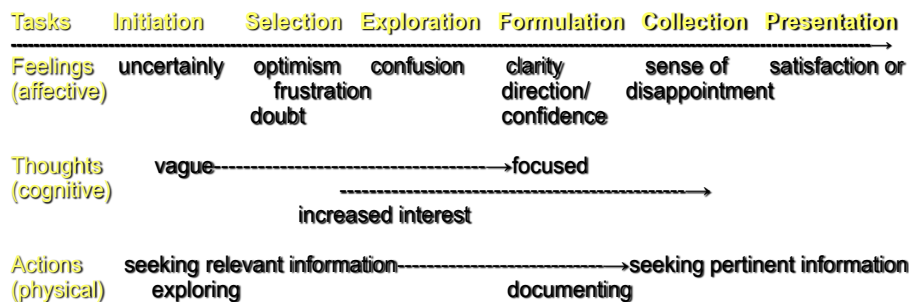| Tasks	Initiation	Selection	Exploration	Formulation	Collection	Presentation
Feelings (affective)	uncertainly	optimism	confusion frustration doubt	clarity direction/ confidence	sense of disappointment	satisfaction or
Thoughts (cognitive)	vague----------------------------------→focused --→ increased interest					
Actions (physical)	seeking relevant information--------------------------------→seeking pertinent information exploring documenting					

Figure 1: The Information Search Process

These studies found that students need considerable guidance and intervention throughout the process to enable a depth of learning and personal understanding. Without guidance, students often approach the process as a simple collecting and presenting assignment that leads to copying and pasting with little real learning. With guidance, students are able to concentrate on constructing new knowledge in the stages of the inquiry process to gain personal understanding and transferable skills. Students' feelings play an important part in the constructive process of inquiry that indicates a zone of intervention for teachers and librarians. For example, students get frustrated in the exploration stage of inquiry and need encouragement to take time to read and reflect and guidance in making sense of information

that doesn't fit together smoothly. Guided Inquiry provides essential intervention at critical points in the inquiry process that fosters deep personal learning.

Another important research-based fundamental of Guided Inquiry is the necessity of connecting to the students' world. Maniotes' (2005) research describes the importance of creating a learning environment called third space (Figure 2).
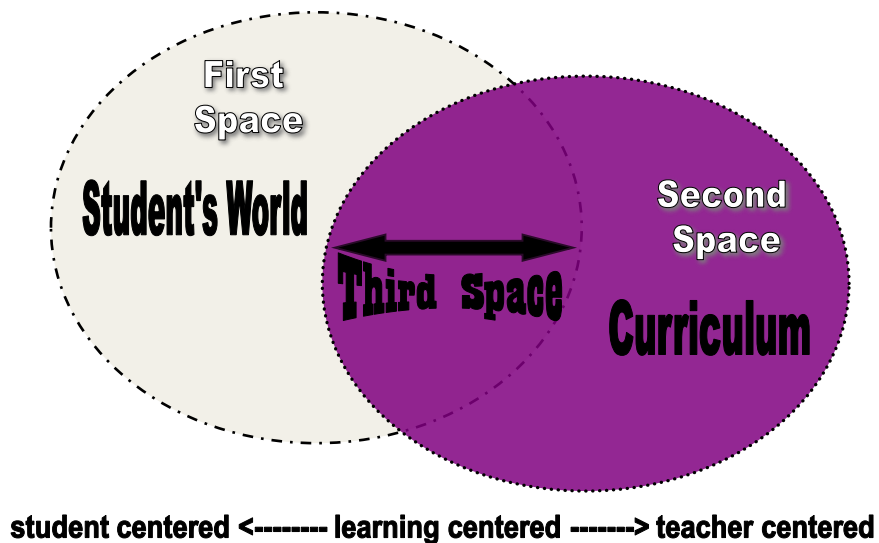

student centered <-------- learning centered -------> teacher centered

Figure 2: Third Space

If we think of the student's world outside of school and the student's cumulative knowledge and experience as first space and we think of the curriculum as second space, the question arises of how to make these two very separate spaces intersect. When first space and second space overlap third space is created. Third space is where the most meaningful, lasting learning takes place.

The teacher's main challenge is to create third space as often as possible. Inquiry provides the opportunity to create third space and Guided Inquiry enables students to make their own connections within the inquiry process that motivates learning and builds ownership and expertise.

Guided Inquiry Team

A flexible team approach to teaching is essential for Guided Inquiry. The main purpose for teaming is to take full advantage of the expertise in the school and community. A flexible approach facilitates constructivist learning where the curriculum meets the students' world in

dynamic, interactive ways. Flexible teams of teachers and librarians with varied expertise are formed and adapted according to curriculum requirements and students' needs.

Guided Inquiry recommends a three member core team that plans and supervises the inquiry with an extended team of other experts joining in when most needed. Although two member collaborations between a school librarian and a teacher are common, three member teams provide a synergy of ideas for developing inquiry learning. Three member teams also provide the additional professional guidance and ongoing support student inquiry requires. The third member joining the librarian and the subject area teacher may be second classroom or subject area teacher or any of the other specialists in the school, such as a teacher specializing in reading, technology, music, art, or drama.

Build your team thoughtfully with full knowledge of the curriculum standards to be met and the abilities of your students. Three member core teams provide synergy for guiding student learning. However, more is not necessarily better on the Guided Inquiry team. Larger teams tend to be cumbersome with too much going on and are not as effective for guiding student learning. Too many subject areas with diverse objectives may merely clutter and confuse the inquiry, actually obstructing rather than enhancing learning. The extended team may incorporate community members from the public library, museums, and a range of other experts to expand resources and generate authentic experiences.

Guided Inquiry Assessment

Assessment is an active process throughout Guided Inquiry for both students and instructors. Continual reflection and assessment throughout the inquiry process reveals what students have learned, when students need intervention and what intervention is required. Some assessment methods applied are observation records, student performance, conferences, portfolios, products, rubrics. The SLIM Student Learning Inquiry Measure (http://cissl.scils.rutgers.edu/) provides assessment throughout the stages of the inquiry process. Team members plan assessment of inquiry collaboratively working to assess the different aspects of the process. They work individually and together to assess the various types of learning that occur through inquiry.

Five Kinds of Learning Accomplished through Inquiry

An important advantage of an inquiry approach is the variety of different competencies and knowledge that students develop while engaged in Guided Inquiry. Five kinds of learning are accomplished through inquiry: information literacy, learning how to learn, curriculum content, literacy competence and social skills (Kuhlthau, Maniotes & Caspari, 2007, p. 9). An inquiry approach is a most efficient way to learn in the 21st century.

Information Literacy

This year, the ALA President's Committee on Information Literacy is celebrating the 20th anniversary of publication of its fundamental statement on information literacy. The basic definition of information literacy that emerged from this statement, "the ability to locate, evaluate, and use information" has been adopted and expanded by associations, institutions and educators around the world (ALA, 1999).

Guided Inquiry takes a concepts approach to teaching and learning information literacy (Kuhlthau, Maniotes, & Caspari, 2007). Students learn the underlying concepts of locating, evaluating and using information that are transferable to a wide range of situations of information seeking and use. For example, the fundamental concept of locating information is that vast and various sources of information are organized to enable a person to locate information on a specific subject and to access a particular source. Guided Inquiry encourages students to think of inquiry as a journey and to find trails and pathways through information to develop search strategies that they can apply in many information quests. The fundamental concept of evaluating information is to select what is most useful for accomplishing the task at hand. Guided Inquiry introduces students to criteria to apply for selecting useful sources to help them make intelligent choices. Five criteria for evaluating information--expertise, accuracy, currency, perspective, and quality--are applied for making good choices in inquiry learning. The fundamental concept of using information is to find meaning and gain a deep understanding. Guided inquiry enables students to determine importance, form a focus, decide what is enough, manage inquiry, interpret facts and organize ideas, and share their learning with others.

Learning How to Learn
Guided Inquiry enables students to learn how to learn by becoming aware of their learning process. Each time they work through the stages of the Information Search Process (ISP)--initiating, selecting, exploring, focusing, collecting and presenting--they learn the process of inquiry as well as how they personally interact within that process. Guidance is provided at critical intervention points to teach strategies for learning from a variety of sources of information. Inquiry is a fundamental way of learning in the information environment of the "real world" where everyday tasks require learning from information. Through guidance students personalize the inquiry process recognizing that "this is my process, this is the way I learn." They prepare to apply their learning process for understanding and creating in an abundance of information in their daily life.

The latest AASL standards center on the student as learner, depicting the range of skills, dispositions, responsibilities, and self assessment strategies that encompass learning how to learn. These Standards apply information literacy through inquiry to prepare students for learning, living and working in the 21st century.

Curriculum Content
An important kind of learning fostered by Guided Inquiry is the content of subject areas across the curriculum. The content of inquiry is drawn from many areas of the curriculum. The major fields of curriculum are in agreement that students learn best by connecting new knowledge to what they already know and by motivating students through active learning. Four common themes in subject area standards are fundamental to Guided Inquiry: constructivist approach to teaching and learning; information explosion–too much to learn it all; focus on broad themes and big ideas; and meaningful instruction through integration and problem solving (Kuhlthau, Maniotes & Caspari, 2007). All of these may be best accomplished through an inquiry approach to learning. Each of the curriculum area standards has high expectations of achievement.

Students are expected to go beyond simple fact finding to meaningful interpretation and deep understanding. Guided Inquiry motivates students to learn subject area content and habits of mind through strategic interventions that enable them to make the learning their own (Kuhlthau, Maniotes & Caspari, 2007).

Literacy Competence

High levels of literacy are required of the 21st century learner. Students need to go beyond learning to read, to reading to learn. They need to be able to comprehend informational texts as well as understand stories in fiction. Determining importance in informational texts is an essential skill in the information environment in which they live and learn. The basic skills of literacy, reading, writing, speaking, listening, viewing, and presenting are enhanced through inquiry learning. The best way to become proficient in each of the literacy competencies is to practice, practice, practice. Krashen (2009) stresses the importance of immersion in reading gleaned from his extensive research on improving reading ability.

Only one method of improving reading ability really works: engaging in a great deal of interesting (better yet, compelling) comprehensible reading. Massive evidence supports this view, both in first and second language research. Briefly, studies show that those who read more, read better. They also write better, spell better, have larger vocabularies, and have better control of complex grammatical constructions (Krashen, 2004).

CISSL researchers, Lu and Gordon (2008), also noted the importance of immersion in reading ability. They studied the effects of free choice on student learning in a study of summer reading. They found that students reading increased when they were free to choose what they read. This was especially true for low achieving students who professed to "hate to read except when I read what I like. "

Inquiry requires students not only to read to learn but to write, speak, listen, view and present to learn. Practice and choice are two essential elements of inquiry learning. Guided Inquiry provides students with strategic interventions in application of literacy competencies while they are engaged in the inquiry process.

Social Skills

Social skills are developed in inquiry learning by establishing a community of learners (Kuhlthau, Maniotes & Caspari, 2007). Students gain the ability to interact with others in situations that require cooperating and collaborating. Organizing small work groups is a strategy applied in Guided Inquiry called inquiry circles (Kuhlthau, Maniotes & Caspari, 2007). Adapted from Daniels' (1994) literature circles, inquiry circles are structured work groups with each student assigned a different job. Jobs are rotated to give students an opportunity to practice each task independently. In Guided Inquiry each task represents one aspect of inquiry that students need to learn. Eight jobs essential to inquiry recommended in Guided Inquiry are: word hunter (finds key words and definitions); evaluator (evaluates the source); messenger (summarizes big ideas and main points); quiz kid (raises questions); connector (makes connections between self, texts and the world; note taker (takes specific notes on content); image maker (creates visual scheme of ideas); and interpreter (asks, "What does it mean?" and "Why is it important?") Each member of the circle has a specific job to do prior to meeting with the

group. Each member is dependent on the others and each is responsible to the others. Inquiry circles can be adapted to all age students from early elementary through high school. Students are interacting, cooperating and collaborating in the inquiry process under the guidance of the instructional team.

What Does Guided Inquiry Look Like?

Here are some examples of accomplishing multiple learning objectives with information technology embedded through Guided Inquiry.

In a primary school, the classroom teacher teams with the librarian and reading or learning specialist to meet the science curriculum content objective, to learn different animal traits. The three member core team develops students' information search strategies for finding images and facts, their reading and writing ability, and their social skills for collaborating and critiquing each other. The staff of the local zoo joins the extended team to provide a visit with particular attention to comparing animal groups. The final project is an animal report presented from the animal's perspective by applying a Web 2.0 tool, such as "blabberize.com" which provides an animated presentation of the animal giving the report. The technology teacher joins the extended team to assist with the Web 2.0 application. These young students are learning the first three stages of inquiry--initiating, selecting, and exploring--preparing them to engage in the full process in the upper grades.

In upper elementary and middle school, students are immersed in inquiry learning. To meet the social studies curriculum objective, to gain an understanding and appreciation of local history, the librarian joins the social studies teacher and the language arts teacher to form the core team. Students are guided through all of the stages of inquiry particularly concentrating on exploring for formulating a focused perspective. Staff from a local museum joins the extended team to plan for a visit to expand ideas and clarify questions with primary sources. Inquiry circles enable students to work together in each stage, building on the foundation laid in primary school. As a culminating activity they present "I was there" accounts personalizing their understandings, publishing their work using Web 2.0 tools to share their learning with the school and community. The technology teacher joins the extended team when needed. Five kinds of learning are actively in play throughout the inquiry process expertly guided by the core team.

Harrington's (2006) book, *Guided Research in Middle School: Mystery in the Media Center*, has many excellent techniques for implementing an inquiry approach with upper elementary and middle school students that build on the foundation laid in primary school. Students take on the role of information detectives as they work through all of the stages of the inquiry process under the guidance of the librarian and teachers. After extensive research they present their findings in a number of creative ways.

In secondary school, students employ the full inquiry process in their daily studies to meet standards in subjects across the curriculum and to engage in all five types of learning. In life science, investigations center on real world scientific questions that are important to students. For instance, to meet the objective of learning about organisms in the environment and dangers of global spread of disease such as an influenza pandemic, the librarian joins the science teacher and writing teacher to form the core team. An expert from the local hospital

joins the extended team to tell about experiences related to contagious disease. Students are guided in conversing, charting, and composing throughout the stages of the inquiry process. A technology expert may join the extended team if needed. Students create presentations in Web 2.0 formats and discuss their findings on class wikis' discussion threads to open the conversation to others on blogs. Additional experts may be consulted online and brought in as speakers to add authenticity to the inquiry. The history teacher joins the team in a follow-up inquiry on the history of pandemics.

Schmidt, Smyth and Kowalski (2009) provide a comprehensive plan for developing literature reviews on science topics in the book, *Lessons for a Scientific Literature Review: Guiding the Inquiry*. They detail strategies they use with their high school students in all areas of the science curriculum: physical science, life sciences, earth and space science, and science and technology.

Getting Started and Sustaining Change

How do we get started and sustain change? There are three ways to get started in your school. First, you need to gain systemic support. You will need the support of your fellow teachers, if not all of them, certainly several of the most creative, competent and concerned of your colleagues. You will need to gain the commitment of the head of school and other administrators and decision makers in your school. Second, you need to develop an implementation plan. You will need a plan with a timeline for implementing an inquiry approach. You can begin by organizing one three member team to collaborate on an inquiry project with one group of students as an example of how it works. This can form the basis for implementing a flexible team approach in your school. Third, you will need to create a network for sharing stories of success and problems you encounter. This network of librarians and teachers will help each other and learn from each other while building an inquiry approach for 21st century learning in your school.

New Ways of Thinking about Education

The theme of the IASL 2009 Conference in Padua, Italy was "School Libraries in the Picture: Preparing Pupils for the Future." We need new ways of thinking about education to prepare pupils for the future. Teachers cannot do this alone. School libraries are definitely in the picture. School librarians are vital partners in creating schools that enable students to learn through vast resources and multiple communication channels. School libraries are dynamic learning centers in information age schools with school librarians as primary agents for designing schools for 21st century learners.

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