Guided Inquiry in practice

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Scan journal values research as a process which:
- strengthens the theoretical basis for the practice of teacher librarianship
- informs practice through the application of findings, questioning assumptions and identification and analysis of practical problems
- is informed by practice as part of a cycle of professional evaluation.
In this article, Lee FitzGerald offers an overview of the context and concepts underlying inquiry learning. She also provides examples of scaffolds and teacher preparation for Guided Inquiry in practice in a Year 7 Geography classroom. Particular emphasis is given to the creation, delivery and assessment of inquiry tasks and the value of evidence gathering to ensure authentic student learning. Guidance is also given about how teacher librarians can use this evidence to meet the Australian professional standards for teachers (AITSL), which outline the requirements for teacher professional accreditation.

Introduction
Discussions about information literacy and inquiry learning frameworks are not new. As the information literacy landscape continues to evolve in an ever changing digital environment, it is timely to revisit the conversations, particularly in light of the recent implementation of the Australian Curriculum and its implementation in NSW syllabuses.

The NSW Geography K–10 syllabus, which many schools will begin to teach next year, emphasises the development of information skills and the formulation of creative questions through inquiry-based learning.

Overview of context and concepts underlying inquiry learning
Information literacy is at the heart of inquiry learning. There are many definitions of information literacy and schools must choose or develop a shared understanding of the concept to enable students to become information literate. Developing attitudes and skills associated with this kind of literacy will empower them as learners in a shifting information environment.

What is information literacy?

Information literacy is defined in the University of Sydney Library’s Information literacy policy as

… an understanding and a set of abilities enabling individuals to recognise when information is needed and have the capacity to locate, evaluate, and use effectively the needed information.

(Information Literacy Standards 2001, p.1.)

Langford’s seminal article (1998) explores changing notions of information literacy and asks the questions: Is it [information literacy] a concept or a process? … or is it a new literacy that has been transformed from existing literacies to complement the emerging technologies for which Information Age students must be skilled? (p.59)

These questions highlight the need for a revised view of information literacy to expand from a set of information skills into a more wide ranging concept that can be understood in the increasingly complex information landscape.

Debbie Abilock (2004) sees information literacy as a … a transformational process in which the learner needs to find, understand, evaluate and use information in various forms to create for personal, social or global purposes.

(Abilock 2004, p.1)

Information literacy is not a static concept. Definitions of information literacy will continue to be refined as the information landscape evolves. Judy O’Connell (2012) calls for educators to consider the characteristics of the skills needed to operate effectively in the digital environment, in particular:

• search strategies
• organising information in ways facilitated by technology, especially social media
• finding connections between texts
• finding patterns
• using organisational tools
• developing the skills of deep reading

Board of Studies, Teaching and Educational Standards NSW (BOSTES) 2015
O’Connell sees information literacy as

...a meta-literacy of information flow through fast information transactions and social channels of engagement. It is a recursive action that translates core information literacy skills into a pedagogy of digital participation.

(O’Connell 2012, p.6)

Carol Kuhlthau recognises the need for a

...holistic approach to information literacy that prepares students for the reflective thinking that leads to wise information seeking and use in the dynamic global information environment.

(Kuhlthau 2013, p.97)

These definitions of information literacy espouse the need to develop in students the attitudes and skills that empower them to be effective learners in a rapidly changing world. The onus is on schools to use or develop a framework or model to develop these skills and integrate information literacy and ICT across the curriculum.

Information literacy models

Definitions of information literacy, at least in the K–12 environment, generally include a process that can be taught, internalised and followed whenever a student has an information need. An information literacy model describes the steps that users take in their move from ignorance to understanding, when involved in an inquiry task. Use of an inquiry learning model allows teachers and students to use the steps of the model to break down the inquiry task into separate, though often overlapping, steps.

Mandy Lupton (2013) compares the information seeking and gathering models that are widely used in Australian schools in the following table (Figure 1).

Lupton comments that these models share similar steps and can be regarded as information literacy or information process models. When combined with questioning frameworks and an action research cycle, they become inquiry models.

(Lupton 2013, p.5)

The Information skills in the school: engaging learners in constructing knowledge (NSW Department of Education 2015) includes The Information Process (ISP) (p.9) and provides a framework for developing student skills to enhance information literacy and, when used in conjunction with the Department’s Quality Teaching model, it can inform professional judgments about explicit information skills teaching support for class units of work and cross curriculum priorities, such as literacy and integrating ICT. A guided inquiry approach, and reference to other information process models, may further enrich the development of information literacy skills.

(NSW DoE 2015, p.5)

There are strong reasons at present to employ an effective information literacy model to scaffold student information process. Christine Bruce (1997) sees the ultimate face of information literacy as the application of wisdom to information in order to use it for the benefit of others. Todd (2000) suggests that the end point of the information gathering, project based approach is merely a celebration...
He applauds the shift that sees students using and applying relevant information. This change of approach expects students to still find and comprehend relevant information, and to then build understanding and use or apply it in some way. Through that application they will build understanding. Todd suggests that the goal of this approach is a celebration of the understood.

Information skills development is essential for information literacy in the contemporary environment. This includes skills concerned with locating information and skills concerned with understanding and using information. It is not a linear process but is based on a generative question framework (Wiggins 2007; Wiggins and McTighe 2005) and research cycle. Lupton (2014) and Kuhlthau (2013, p. 97) favour holistic inquiry models which incorporate a questioning framework, information literacy/information search process and an action research cycle (Lupton 2014, p.6).

Inquiry learning and the Australian Curriculum

Lupton asserts that the Australian Curriculum (AC) lacks an across-the-curriculum approach to inquiry learning and sees that this as inconsistent with a wholeschool inquiry approach that many Australian schools have implemented (Lupton 2014). School educators need to investigate the extent of inquiry skills embedded in the AC and align them. Lupton suggests that at the school level, teacher librarians, as specialist teachers with a bird’s-eye view of the curriculum should be used as curriculum consultants, particularly in relation to inquiry learning pedagogy (Lupton 2014, p. 8).

Fortunately for schools, much of this investigation and analysis is occurring. Karen Bonanno’s analysis of the curriculum identifies core essential inquiry skills in the AC and applies the Guided Inquiry (GI) process to these skills to create an F–10 inquiry skills scope and sequence (Bonanno 2015). As a taster, the first page of this scope and sequence follows (Figure 2).

How will schools set up a curriculum linked, holistic inquiry learning framework to meet the needs of developing information literate students?

The Information Search Process (ISP) lies at the heart of Guided Inquiry (GI). Because it is supported by evidence, from studies carried out by Kuhlthau (2007, p.21), Todd and others (Kuhlthau et. al. 2008), this model of information seeking and using behaviour is very telling. Since 2012, and the publication of Guided inquiry design: a framework for inquiry in your school (Kuhlthau, Maniotes and Caspari 2012), a second process has been added to GI. This is the Guided Inquiry Design Process (GID). A pedagogy is emerging around GI, which is very timely in this country because of the Australian Curriculum’s emphasis on inquiry learning.

Concepts in Guided Inquiry: The two processes – ISP and GID

This diagram (Figure 3) shows the two GI processes. To the left is the ISP, which generally includes as its last stage, Assessment. There are two critical points about the ISP:

- There is at least one stage of confusion, frustration and doubt that arises in the research process.
- It is essential to allow students time to develop their own take on the curriculum topic, in order for them to engage with it, (from Initiation to Formulation). If a student does not engage with a topic, it is possible to move from Initiation to Collection. This is when the copy and paste syndrome tends to occur, which is so wasteful of student and teacher time.
To the right of the diagram (Figure 3) is the GID process. This is intended to be used by teaching teams to create, schedule, implement, and assess the inquiry unit. It also describes what the inquiry community (the class) is doing at any given point, while giving students simple verbs to describe their process. The ISP and GID processes combined underlie GI, and can be written as ISP/GID.

The ISP is what any individual will do when researching, (it is what each student does in an inquiry) and GID process is what the class, teachers and teacher librarians do in the creation and process of a GI.

### Why use the ISP/GID process?

The most important reason why a school might choose the ISP/GID process is because it covers the steps the individual researcher takes (ISP), and the creation and delivery of inquiry tasks (GID). Inquiry tasks for students are proliferating and it is of the utmost importance that students internalise an information process to apply across the curriculum. Teachers and teacher librarians are being asked to design, resource and deliver inquiry tasks. The ISP/GID caters for the design and implementation of inquiry units, while GI can be aligned with the General Capabilities of the Australian Curriculum and technological imperatives.

### General Capabilities: skills for 21C

Even though the 21st century is well and truly underway, here is an overview of the much defined and debated 21st century skills from the Australian Institute for Teaching and School Leadership (AITSL).

#### ATC21S

<table>
<thead>
<tr>
<th>Ways of thinking</th>
<th>Australian Curriculum</th>
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<tr>
<td>Creativity and innovation</td>
<td>Critical and creative thinking</td>
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<td>Critical thinking, problem solving &amp; decision making</td>
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<td>Learning to learn and metacognition</td>
<td>Personal capability</td>
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#### Ways of working

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<th>Communication</th>
<th>Literacy</th>
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<td>Collaboration and teamwork</td>
<td>Social capability</td>
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#### Tools for working

<table>
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<th>Information literacy</th>
<th>ICT capability</th>
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<td>ICT literacy</td>
<td>Numeracy</td>
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#### Living in the world

| Citizenship - global and local | Intercultural understanding |
| Life and career              | Ethical understanding |
| Personal and social responsibility | Personal and social capability |

The closest General Capability to GI is **Critical and creative thinking**. Refer to the [linked table](#) to see the alignment of the Critical and creative thinking capability with the ISP/GID.
The ubiquity of technological change

The Information and communication technology capability features in the Australian Curriculum across all learning areas. Currently, there is a move to student-centred learning in a context of developments in technology which favour learning as student-driven. The New Media Consortium (NMC) Horizon report – 2015 K–12 edition shows a shift to deeper learning processes and identifies inquiry based learning as an effective pedagogical approach to deeper understanding of curriculum (p. 33). The report recommends that school leaders encourage professional development of teachers’ own inquiry skills, so that they develop a classroom community of inquiry... to show students how to respect the opinion of others, and integrate technological resources to engage in new forms of communication and expression (p. 34).

The report also states that the adoption of Bring Your Own Device (BYOD) will occur within one year. Of note is the implication that BYOD can connect in the third space for students as it creates a classroom culture that gives students the opportunity to connect their learning in the classroom with their personal lives (NMC, p. 37). Figure 5 shows some of the technological developments forecast by the Horizon report. This is the present and future of technology for schools.

Technology feeds inquiry learning at every stage, from its planning, to its execution, to its product. Analysis of developments in technology in the NMC: Horizon report—2015 libraries edition is organised in the same way as the K–12 edition, but focuses more on the challenges and trends in librarianship, rather than in schools.

Where does GI fit in the curriculum?

The GI Community, set up by Alinda Sheerman and Lee Fitzgerald a few years ago, is a place where teachers and teacher librarians can share GI resources. It brings together many templates and scaffolds for each stage of the GI process. The GI Community has more than 600 subscribers and is available to join. It contains theory and practice of GI, in the form of presentations, GI units (for Year 3 – Year 11), as shown in Figure 6, and scaffolds for every stage of the ISP/GID.

Figure 5 Technological developments forecast by Horizon report (NMC Horizon p.33)

Jason Zagami (2015) sees technology developments as particularly relevant to school libraries. His presentation at ASLA 2015 highlights interesting challenges for teacher librarians with competition from alternative avenues of discovery, such as information visualisation, Google search and ways of searching that library catalogues need to develop. The accessibility of MOOCs and teacher and student created content are developments needing management, but it is very exciting to look at the Blended library of the near future. Indeed, students featured in the following video could well be working in an inquiry circle carrying out a guided inquiry on Ancient Rome. Their inquiry circle centres on Caesar and the Rubicon. The possibilities presented in this video for inquiry circles’ work is very exciting indeed.

Figure 6 Examples of GI units for primary and secondary at the GI Community
Exploring the world in Year 7 Geography

Dr Kasey Garrison and I are conducting research at Loreto Kirribilli, Sydney on students’ use of the GI process, and how they can apply the process from one curriculum area to another. Students have now done a very similar GI in History on Ancient Egypt and in Geography on Exploring the world. Data is being analysed from the students’ process booklets and from focus group interviews. Analysis from this project should be available at the beginning of 2016. The following discussion of GI in practice refers to the Year 7 Exploring the world GI.

Inquiry circles

Students can work in inquiry circles in a GI and did in Exploring the world. Shown in the following video, Above and beyond, (Fable Vision & The Partnership for 21st Century Skills, 2011) is a story about what is possible when communication, collaboration, critical thinking and creativity take centre stage in schools and transform learning opportunities for all students. There are examples of the ways in which students can work together at various stages of the GID in the GI Community. For example, Question focus formulation is an excellent exercise that helps students understand what a higher order question is and works well in inquiry circles (Rothstein and Santana, p. 28).

A way of weaving inquiry circles into a GI unit is suggested below in Year 7 Geography Exploring the world. Essentially, the inquiry community (class and teachers and teacher librarians) are finding out about World Heritage Sites together. There is an overarching inquiry question, Why is it important to know about and cherish World Heritage Sites (WHS)? The following overview of steps in the task shows that the process is to:

- search broadly on WHS
- join an inquiry circle interested in the same continent
- explore together to find WHS of interest
- explore further
- share the work of notetaking and recording bibliography
- create an inquiry question relating to the chosen WHS
- create a mind map of the answer to the inquiry circle’s inquiry question.

Next the inquiry circle splits up, and each member joins a jigsaw group, to tell the group about their particular WHS, and to listen while members of other inquiry circles share their information about their WHS. Lastly, all students answer the overarching question, Why is it important to know about and cherish WHS?, in an essay, for which they have prepared, using a PEEL scaffold (Point, Evidence, Explanation, Link).

The following scaffold, Overview of process for Exploring the world Guided Inquiry, provides each student with an overview of their steps in the Exploring the world unit (Figure 9). It shows how inquiry circles and jigsaw groups can be used in a GI unit which shares the exploration of WHS as an inquiry community.

Students record their findings in their process booklets.

Figure 7 shows a page from the GI, where inquiry circles carry out the question focus formulation, (Rothstein and Santana, p. 28) to identify the inquiry question they will answer together.
### OVERVIEW OF PROCESS FOR EXPLORING THE WORLD GUIDED INQUIRY. YOU WILL USE YOUR INQUIRY JOURNAL FOR ALL THE WORK OF THIS GUIDED INQUIRY!

| Two lessons: to Page 4 | Step 1: Your teachers will introduce you to World Heritage sites  
Your inquiry community is going to piece together an answer to the **Big Question**: Why is it important to know about, and cherish, World Heritage sites?  
For now, you will jot down some thoughts, do a glossary and get some basic facts. |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| One lesson: to Page 6   | Step 2: Develop some background knowledge in class time  
Discover interesting world heritage sites. |
| Two lessons: to Page 8  | Step 3: The Year 7 Inquiry community will pull apart the jigsaw of World Heritage. Choose a continent! Europe, Africa, Asia, Australia, South America and North America. Join your inquiry circle.  
Each inquiry circle is a piece of the jigsaw that you will bring together to answer the Big Question.  
Step 4: Working alone, explore the ideas you think are interesting. Browse and jot some interesting ideas, while you visit at least TWO World Heritage sites in your continent. |
| Two lessons: to page 11 | Step 5: Share what you’ve learnt in your inquiry circle.  
Work together to choose ONE World Heritage site for your inquiry circle.  
**Develop an inquiry question using Question focus formulation activity.**  
Work together to decide how to find the answers to your inquiry questions and share the work of gathering information.  
Step 6: Reflect on your process so far. |
| Two lessons: to page 14 | Step 7: Gather important information - **Go deep.** Take FOUR separate notes, using the format on p12 of your booklet.  
Step 8: Gather at least FOUR images of your site, for the **Tripline** presentation. The pictures must help you answer your inquiry question.  
Take notes about the pictures in your booklet. |
| Five lessons: to page 20 | Step 9: Share with your inquiry circle. **Mind map** your answer to your inquiry question.  
Step 10: Each inquiry circle will create and share a **Tripline presentation** which answers the inquiry question relating to the World heritage site you’ve chosen.  
Step 11: **Jig saw of Tripline presentations:** Take notes while you are listening to help you plan your written response to the Big Question  
Step 12: **Bibliography** – gather together at least four sources, using the APA format. |
| One lessons: to page 26 | Step 14: Evaluate achievement of learning goals  
Step 15: Reflect on your process - final reflection |

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**Figure 9** Overview of process for *Exploring the world* Guided Inquiry
Students reflect on their learning at two stages of this GI. Figure 8 on p. 22 shows the final reflection step.

Assessment
The marking criteria for this project are twofold, one for process and one for content. Teacher librarians are responsible for the process marking of this project, as well as providing feedback during the process of the project. The culmination conversation is a technique for teaching team evaluation at the end of a GI (Kuhlthau, Maniotes & Caspari, 2012). It can also be used as a further assessment of students to gauge whether or not deep learning can be transferred from the inquiry question studied to the broad topic area. Students are given three minutes to think of an answer to a higher order question relating to, but not the same as, their inquiry question, and then speak for 3 minutes. This has been carried out with success at the end of GI units at Loreto Kirribilli.

How can teacher librarians gather evidence for AITSL accreditation?
Firstly, two recently released ASLA publications (Figure 10) assist teacher librarians in the accreditation process with AITSL. They link with the Australian Teaching standards to allow teacher librarians to consider how they will meet accreditation standards at the various levels. Each standard is listed, with an explanation, then some examples of evidence that teacher librarians might bring to bear upon achieving this level. The examples of evidence are not prescriptive, and are intended to be added to, and revised.

Designing, scheduling, implementing and assessing of GI units
The chart, Planning for and implementing a Guided Inquiry unit is adapted from the work of Karen Bonanno, with permission. It is based on Bonanno’s, F-10 Inquiry skills scope and sequence and F-10 core skills and tools document (2015) The chart contains information to design, schedule, implement, assess and reflect on a GI unit. It also shows what teachers, teacher librarians and students do at each stage of the GI process.

The rest of this article looks at Standard 5: Assess, provide feedback and report on student learning, in the light of evidence that might be garnered from GI. The evidence guides show examples of evidence that teacher librarians might produce to show that they provide feedback to students on their learning.

Standard 5 is broken down into
5.1 Assess student learning
5.2 Provide feedback to students on their learning
5.3 Make consistent and comparable judgements
5.4 Interpret student data
5.5 Report on student achievement.
In each case, the evidence guide expands on the standard to place it in a teacher librarian context, as well
as providing examples of evidence that might be gathered to show achievement of that standard. Evidence from GI of meeting Standard 5.2 – Feedback on learning is evident in the emphasis on process in GI, and on the role of the teacher librarian in providing support and feedback for process throughout the inquiry. This can take the form of feedback on a wiki, Edmodo, in process booklets, and in person. Figure 11 is feedback from the teacher librarians and teachers in a GI on the Ancient History investigation.

Evidence from GI of meeting Standard 5.3: Make consistent and comparable judgements is very clear in the marking of the process elements of a GI, as is evident in the content and process marking criteria of the Year 11 Ancient History investigation (Figure 12). Teachers mark the content and teacher librarians mark the process.

Evidence from GI of meeting Standard 5.4: Interpret student data can be gathered from using the SLIM (School Library Impact Measure) toolkit, (Todd, Kuhlthau & Heinstrom 2005), part of which appears in Figure 14. This is administered to students at Open, Explore and Assess of the GID, and can be the mechanism for feedback to and from students as well.
The graph (Figure 15) is an example of analysis of data from Question 1 of the SLIM toolkit. It shows students’ growth from facts, through explanations to conclusions in the course of their inquiry, as an indication of the growth of knowledge.

The graph (Figure 16) is an example of analysis of data gathered from Question 2 of the SLIM toolkit, showing students’ level of interest through their inquiry.

The graph (Figure 17) is an example of analysis of data gathered from Question 5 of the SLIM toolkit, showing students’ difficulties in their inquiries.

Conclusion
It is a time of great promise for teacher librarians. Kuhlthau and Maniotes suggest that now is the time to make the shift from traditional research assignments to Guided Inquiry learning (2014). The context is right. The combination of General Capabilities combined with the explicit emphasis of the Australian Curriculum on inquiry skills enable an information literacy model’s use in inquiry learning in every school. Add to that the driving force of technology, which can meet every stage of the inquiry community’s needs, and now is indeed the moment for inquiry learning.

References and further reading
Bonanno, K 2015, F-10 Inquiry skills scope and sequence and F-10 core skills and tools, Zillmere, Qld: Eduwebinar Pty Ltd, accessed 07 September 2015.


Challenge Based Learning 2015, Challenge based learning, accessed 9 November 2015.


McGaw, B 2013, Resourcing and supporting the Australian Curriculum, accessed 9 November 2015.


