UNIVERSITY OF ALBERTA

HOW CAN INVOLVING STUDENTS IN THEIR LEARNING ASSESSMENTS

BE EMBEDDED INTO THE INQUIRY PROCESS?

Arlis Folkerts

This Capping Course Document is Submitted in Partial

Fulfillment of the Requirements for the Degree of

MASTER OF EDUCATION

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA

Winter, 2010

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: ARLIS FOLKERTS

TITLE: HOW CAN INVOLVING STUDENTS IN THEIR LEARNING ASSESSMENTS

BE EMBEDDED INTO THE INQUIRY PROCESS?

DEGREE: MASTER OF EDUCATION

YEAR THIS DEGREE GRANTED: 2010

Permission is hereby granted to the University of Alberta to reproduce single

copies of this document and to lend or sell such copies for private, scholarly or scientific

research purposes only.

The author reserves other publication rights, and neither the document nor extensive extract

from it may be printed or otherwise reproduced without the author's written permission.

_____

Arlis Folkerts
116 Fraser's Grove Road
Winnipeg, Manitoba, R2K 0E7
Canada

Date: April 15, 2010

UNIVERSITY OF ALBERTA

DEPARTMENT OF ELEMENTARY EDUCATION

The Undersigned Certify That They Have Read, and Accept The Document Entitled

"How can Involving Students in their Learning Assessments be embedded

Into the Inquiry Process?"

Submitted by: Arlis Folkerts

In Partial Fulfillment of the Requirements for the Degree of Master of Education

_____

Dr. Julia Ellis

Capping Course Instructor

April 15, 2010

Dedication

This paper is dedicated to the memory of my late husband, Gerald Folkerts

May 13, 1958 – May 30, 2009.

TABLE OF CONTENTS

INTRODUCTION

Teacher-librarians have the opportunity to develop and nurture critical skills and processes students need to become self-regulated learners in the 21st century. I am interested in learning more about making this statement a reality for students. As I take up the topic of my capping paper, involving students in inquiry assessment, the following are also questions that I care about. How do "we" equip our students to successfully navigate a world of digital information, ever evolving technologies and a global economy? Are students able to communicate what they know to others in effective ways? Are they able to work collaboratively as team members to problem-solve for solutions or answers?

I believe that involving students in assessment is important and needs to be purposefully interwoven into the fabric of the inquiry process. Students who are active partners in assessment and inquiry learning can develop a skill set that helps them engage in personal quests of inquiry as they seek to uncover and discover their world.

To provide context for these ideas, the introduction that follows relates my personal narrative of inquiry and learning as a child, learner, teacher, and a graduate student.

My Early Memories in Inquiry

I remember having an inquiring mind from an early age. When I was young, we did not have many books in our home, however, we did have a complete set of the *Children's Book of Knowledge*. On days when I did not have a book to read, I would read sections from this encyclopedia set. Growing up as a farm girl from Midwestern Iowa, my parents owned and operated a farm with corn growing in the fields and livestock of cattle and hogs. There were times when I wondered, *"Why do the cows in our pasture have two stomachs?"* or *"How come some corn needs to be de-tasseled and other corn keeps the tassel at the*

top?" I would usually ask my Dad, or turn to the encyclopedia set for answers. My inquiries usually led to extended readings until my thirst for answers was satisfied.

My Journey in Inquiry-Based Learning

Although school was a challenge for me as a student, childhood curiosities and a desire to learn nurtured my aspiration to become a teacher. I realized in my first year of college that I needed to develop strategies to help me understand and process facts and information, and then to apply this information in ways that made sense to me as a learner. I needed to see purposeful connections between what I already knew, the new material that was being taught and how it fit within the broader context of the curricular topic or unit. This was long before teachers or students talked about learning styles and multiple intelligences. I realized that my brain did not learn in the ways that many of my teachers were teaching me.

As I continued to struggle in response to traditional teaching methods, I began to wonder about my role as a teacher and the student's role as a learner. Early in college, I gravitated to library sciences studies which offered more opportunities for learning about inquiry processes.

While I enjoyed research and searching for answers in the library science program, I sometimes felt constricted by the lack of opportunity for individuality and creativity in the research process. To me, the research process is more than finding the answers to questions. I prefer open-ended questions which allow for personal, curricular based inquiries in the quest for answers, problems or solutions. This type of research process honours personal self interests, knowledge and talent in the development of a creative product.

Defining and Redefining the Role of Teacher-librarian

My questions about learning and inquiry helped shape my understanding of working in a school library. While taking my undergraduate coursework in library science, my comprehension of the roles and responsibilities of an American school library media specialist included collection development, supporting student research projects, and assisting teachers with appropriate information resources to support their teaching in the classroom and the library. In the research approach used at that time, students typically studied the same topic or question and used the library's resources to supplement information provided by the teacher or found in the textbook. Most of the students' research processes entailed answering closed questions, and preparing written reports, papers or essays. The media specialist's role involved supporting students in finding and using appropriate resources, and aiding the classroom teacher in locating resources and materials for the teaching of research.

Three school-based teaching practicums were part of my final year of college; a grade one classroom, an elementary school library, and a high school library placement. Student teaching in the library allowed me to observe the end of the research evaluation process for students. The teacher assessed the students' research and evaluated with a grade and a general comment such as, "Good work Jesse!", "Research project reflects lack of effort during class time", or perhaps "Brendan, your use of audio-visual resources gave you good information for the research topic." It seemed unlikely to me that this type of feedback or assessment contributed to student learning.

Finally Supporting Inquiry as a Teacher

I realized my dream to become a teacher when I was hired as a Kindergarten teacher following my college graduation. After teaching for ten years, being a classroom teacher

finally led to a position as our school's first teacher-librarian, and an opportunity to continue my interest in supporting inquiry. I was given the task of developing and implementing library programming and a significant start-up library budget for collection development and materials. I navigated my own problem-based inquiry of figuring out my role as a teacher-librarian, the operation a school library, collaboration between teachers and the teacher-librarian and teaching inquiry-based learning. It became apparent to me that the word "teacher" in teacher-librarian was critical in the conceptualization of my role.

An experienced teacher-librarian from another elementary school became my mentor, and through professional reading and reflective dialogue with other teacher-librarians, I soon realized that my earlier, American definitions of media-specialist and student research processes were quite different from what it meant to be a Canadian teacher-librarian who collaboratively planned, taught, and assessed inquiry-based learning.

I had many questions about Canadian literature, inquiry-based learning and the transformation of my role in the library to an interactive collaborative teaching partner. I was excited about the inquiry process and what it meant in regard to meeting students' information needs and interests. I felt compelled to find out more... I enrolled in an after-degree program from the University of Manitoba in school librarianship.

Becoming a Consultant Focuses the Assessment Question

My understanding of inquiry began to grow in a new direction when, in the fall of 1998, I was seconded to the Manitoba Department of Education as a regional consultant and team specialist in classroom-based assessment. Coming from a small independent school, I didn't feel like a specialist or a consultant. Transitioning from an independent school to the public system was a significant learning curve. My responsibilities included facilitating adult professional development and professional learning. I worked closely with

five public school divisions as their department liaison, facilitating professional

development locally and in Northern communities and reserves. The professional

development supported reflective learning focused on differentiation, curriculum

implementation and assessment. This professional learning provided a broader experience-

base to serve as an anchor for my new understandings about differentiated instruction,

multiple intelligences and involving students in assessment. This was a beginning of a new

personal inquiry: How could I find better ways to engage students in learning and meet

their individual learning needs?

My Graduate Studies with Inquiry-Based Learning

The farm girl from Iowa never believed she was smart enough to pursue a graduate

degree. However, the assimilation of my experiences as a teacher-librarian and my

professional role as a divisional consultant for student assessment inspired me to learn more

about the effects of involving students in their own assessments through inquiry-based

learning experiences. I recognized my desire for further learning could be realized and

decided to pursue my Master of Education degree from the University of Alberta.

The conceptualization of the topic for my capping paper has been percolating in my

mind throughout my graduate coursework. In the context of decisions related to research

topics for papers, dialogue with classmates and the educational research course I completed

last summer, I refined my interests into a question about involving students in assessment

of their inquiry projects.

In my capping paper, I consider the student's role of assessment during inquiry,

specifically the inquiry process from *Focus on Inquiry: A Teacher's Guide to Implementing

Inquiry-based Learning* (Alberta Learning, 2004). Throughout many of my courses, this

document was either a primary or secondary source of information to guide my learning. I

currently use this support document as I work with new teacher-librarians in my school division, but I have concerns that it stops short of being all it could be. Reflection is core to inquiry learning, however when I consider this inquiry model as a teacher-librarian I can hear students groaning at the thought of reflecting, yet again. This leads me to investigate students taking an active role in their inquiry learning, where reflection is one strategy in a repertoire of strategies accessed by self-regulated learners.

Assessment for Learning

As I learned about involving students in their assessments and strategies that support inquiry learning, I realized I wanted to intensify my studies of related literature to learn more. My personal beliefs and practices about student learning are continuously being redefined, based on new experiences as a teacher, graduate student and a consultant.

Many educators are on a journey of implementing changes in assessment processes in their classrooms and libraries. *Assessment for learning* is the process of seeking and interpreting evidence during learning for use by students and their teachers in timely and meaningful ways (Davies, 2007). In assessment for learning, collecting assessment evidence is a shared responsibility, by the teacher and the student, rather than being held solely by the teacher. Assessment for learning research and theory can serve as a foundation to transform the student's role as a learner and my role as a teacher. Supporting students with strategies for making meaning and personal problem-solving processes gives them skills they need to become independent, self-reliant learners. To this effect, Costa and Kallack (1992) have stated

> we must constantly remind ourselves that the ultimate purpose of evaluation is to have students become self-evaluators. If students graduate from school still

dependent on others to tell them when they are adequate, good or excellent, then we

have missed the whole point of what education is about. (p. 280)

Through this capping paper, my goal is to reflect, rethink and refine my personal

assessment pedagogy and to explore processes and strategies that can support diverse

learners in the assessment process of inquiry learning. "When an old culture is dying, the

new culture is born from a few people who are not afraid to be insecure," (Bahro, cited in

Brackett, May 2009, para. 4). This quote underscores the state of cognitive dissonance we

experience as we reconcile previously held beliefs, and reflect on how to use research to

inform our practice in teaching and guiding inquiry learning experiences. In this capping

paper I explore the question, *"How can involving students in their learning assessment be*

embedded into the inquiry process?"

My review of related scholarly and professional literature addresses how:

- Assessment reflects the complexity of learning

- Students are learning partners in inquiry

- Students become self-regulated learners

In conclusion, the third section will synthesize implications and recommendations for

educators and teacher-librarians. It will also provide practical assessment strategies that

students and teachers can use on their journey of inquiry learning.

LITERATURE REVIEW

The first section in the literature review, "Assessment Reflects the Complexity of

Learning", provides some background information on assessment within the context of

inquiry. It looks specifically at assessment terminology, shifts in student assessment, what

assessment for learning looks like in classrooms and libraries, and finally, how teachers can scaffold inquiry for students.

Assessment Reflects the Complexity of Learning

Assessment is interwoven into the fabric of student learning. In a dynamic and fluid learning environment, inquiry is not a locked procedure with definitive step-by-step stages which students' progress through simultaneously. Rather, inquiry is an integrated whole and recursive in nature, allowing students to go back and forth between the phases of inquiry, working independently or with each other to refine their thinking and learning (Alberta Learning, 2004). Teachers can draw from a repertoire of assessment strategies to maximize student engagement and learning, reflecting the complexity of the learning process.

What do the Assessment Terms Mean?

A shift in assessment language from formative and summative assessment to "assessment for learning" and "assessment of learning" reflects "jargon-free" language which promotes student understanding when we talk to them about their learning (Black & Wiliam, 1998a, p. 7). While some of the literature and research articles embrace the new language of assessment, other authors use the older terminology with the new meanings. This incongruence of terminology and meaning can be an impediment for teachers who are reconstructing their understanding of the role students have in the learning process.

To clarify the purposes of assessment for learning and assessment of learning, *Refocus: Looking at Assessment for Learning* (Alberta Assessment Consortium, 2005) uses the following chart (see Table 1) to help teachers understand how "emphasizing quality assessment for learning leads to improved assessment of learning" (p. 4).

Table 1: Assessment Purposes

Assessment for Learning (formative assessment evidence)	Assessment of Learning (summative assessment evidence)
• Actively involves the student as a partner in the learning.	• May be teacher directed, however students may be involved.
• Checks learning to determine where the student is now in relation to his/her learning goal and what the student needs next.	• Checks and evaluates learning to date.
• Happens during the learning process.	• Happens at the end of a learning experience, chapter or curricular unit.
• Provides information to students and teachers to improve learning.	• Provides a snapshot of student knowledge, skills and understandings at that time for students, parents, teachers and other stakeholders.
• Ongoing, timely, specific and descriptive feedback is given to students.	• A performance scale or percentage mark represents the student's learning. This could include comments about student mastery of the outcomes.
• Student improvement and support is the focus, and compares a student's current level of performance with the identified outcomes.	• Student achievement is measured. There may be opportunities for second submissions to provide missing assessment evidence.
• Emphasis on next steps, and is not used for grades or marks.	• Emphasis on most recent evidence, and is used for grades or marks.

-adapted from *Refocus: Looking at Assessment for Learning,* Alberta Assessment Consortium, 2005, p. 4.

For this paper, I will use the terminology "assessment for learning" as defined and commonly used in many current professional resources in North America. Assessment for learning communicates growth and progress to students and teachers and helps students monitor their learning over time, what they need to do next, and how best to do this (Alberta Assessment Consortium, 2005; Black, McCormick, James, & Pedder, 2006; Black & Wiliam, 1998a, 1998b; Coatney, 2003; Davies, 2007; Harada, 2005; Kuhlthau, Maniotes & Caspari, 2007; Ruiz-Primo, & Furtak, 2007; Shepard, 2000; Wormeli, 2006).

Why a Shift in the Assessment Focus?

The work of Black and Wiliam (1998a, 1998b) from King's College, University of London, and the Assessment Reform Group in England reflects a significant shift of emphasis in student assessment literature and academic research. Their seminal research turns attention from summative assessment evidence, such as test formats and end of unit evaluations, to formative assessments which happen during the learning experiences with an emphasis on feedback, growth and improvement.

Black and Wiliam (1998a, 1998b) synthesized results from international research studies on classroom assessment with a primary focus on the interactions between assessment and classroom learning by teachers in school or college environments. Two purposes for this review of the literature were identified: evidence of correlations between improvement of classroom assessment and improvement of student learning, and identification of theoretical and practical assessment issues gleaned from the diverse studies.

This meta-analysis of 250 core reviewed publications spanned nine years. Research studies were labelled according to conditions for student success in the classroom, a total of 47 labels represented areas of assessment focus. Only studies with a control group where students were tested before and after the trial were included, allowing for levels of attainment to be measured and compared.

In their summary of findings, Black and Wiliam (1998a) noted that "the role of students in assessment is an important aspect, hidden because it is taken for granted in some reports, but explicit in others, particularly where self and peer assessments by and between students are an important feature" (p. 17). Implications for policy from this large

scale study indicate that improving formative assessment practices increases student achievement, especially for less successful students. Teachers require significant modifications in their classroom assessment practices which embed feedback for student learning. Black and Wiliam recommend this teacher transformation should not be prescriptive, but should personally evolve for teachers as practice is refined (p. 62).

What does Assessment for Learning Look Like?

Assessment for learning happens during the learning process. As teachers, we should be cognizant of curricular outcomes, inquiry pedagogy, and the interplay between the cognitive (knowledge and understanding) and affective (attitudes and feelings) domains (Kuhlthau, 2003). Kuhlthau et al., (2007) suggest that assessment "is the means by which the instructional team knows how to guide students through the inquiry process" (p. 9).

Based on the professional and research literature that I examined, the following are some of the most commonly identified characteristics of "assessment for learning" that should be considered when designing inquiry learning experiences:

- Students monitor their progress, set goals and determine next steps in the learning process (Alberta Assessment Consortium, 2005; Beishuizen, 2008; Black & Wiliam, 1998a, 1998b; Brownlie & Schnellert, 2009; Davies, 2007; Harada, 2005; Harada, & Yoshina, 2005; Kuhlthau et al., 2007; Shepard, 2000; Wormeli, 2006);

- Students are involved in constructing criteria that is used to assess their learning (Beishuizen, 2008; Branch & Solowan, 2003; Brownlie & Schnellert, 2009; Davies, 2007; Gregory, Cameron & Davies, 1997; Harada, & Yoshina, 2005; Shepard, 2000; Wormeli, 2006);

- Students are actively engaged in their learning (Alberta Assessment Consortium, 2005; Black & Wiliam, 1998a, 1998b; Brownlie & Schnellert, 2009; Buehl, 2009; Davies, 2007; Harada, & Yoshina, 2005; Kuhlthau et al., 2007; Ruiz-Primo & Furtak, 2007; Shepard, 2000; Stiggins, 2001; Stripling & Hughes-Hassell, 2003; Tomlinson, 2005; Toth, Suthers, & Lesgold, 2002);

- Student specific feedback is based on readiness level, criteria elements and/or the inquiry phase of learning (Alberta Assessment Consortium, 2005; Black & Wiliam, 1998a, 1998b; Branch, 2003; Brookhart, 2007; Brookhart, Moss, & Long, 2008; Davies, 2007; Harada, & Yoshina, 2005; Higgins, Hartley, & Skelton, 2002; Kuhlthau et al., 2007; Shepard, 2000; Stiggins, 2001);

- The teacher's role is to demonstrate, model, guide and coach students based on their learning needs (Alberta Assessment Consortium, 2005; Black & Wiliam, 1998a, 1998b; Brownlie & Schnellert, 2009; Davies, 2007; Kuhlthau et al., 2007; Shepard, 2000; Wormeli, 2006);

- Student specific interventions relate to next steps, gaps or expectations about student learning (Black & Wiliam, 1998a, 1998b; Brownlie & Schnellert, 2009; Harada, & Yoshina, 2005; Kuhlthau et al., 2007; Shepard, 2000; Wormeli, 2006);

- Student assessment information *during* the learning drives and informs classroom instruction and assessment (Alberta Assessment Consortium, 2005; Black & Wiliam, 1998a, 1998b; Black, McCormick, James, & Pedder, 2006; Brownlie & Schnellert, 2009; Harada, & Yoshina, 2005; Stripling & Hughes-Hassell, 2003; Tomlinson, 2005; Wormeli, 2006).

These assessment elements can overlap and/or be recursive in nature. While students are actively engaged in learning, the assessment information can be drawn from multiple elements, which are determined by the curricular focus and outcomes.

How do Teachers Assess for Student Learning in Inquiry?

Teachers are seeing, hearing and watching students engage in inquiry and use these observations as ongoing assessments for instructional planning (Harada & Yoshina 2005). Helping students understand what they are learning, what they still need to learn, and where they need to go next embeds assessment for learning into inquiry experiences. Kuhlthau et al., (2007) indicate assessments should continually "provide students with prompt feedback and timely intervention during the inquiry learning" (p. 112). Assessment should reflect differentiation, based on what the students need to move forward in their inquiry, and include "conferences, observation, and student journals, [to] indicate what has been learned and what hasn't. The information gathered in these settings indicates what intervention is necessary and timely for each student at the various stages of the inquiry process" (p. 112).

Alberta Learning (2004) identifies reflection as a strategy for assessing inquiry learning that is embedded into each phase of inquiry. As shown in Figure 1, *Focus on Inquiry: A Teacher's Guide to Implementing Inquiry-based Learning* (p. 7), uses a circular puzzle representation to illustrate the cyclical and inter-related nature of the inquiry process, with reflection as a core process strategy.

Figure 1. The Alberta Learning Model for Inquiry
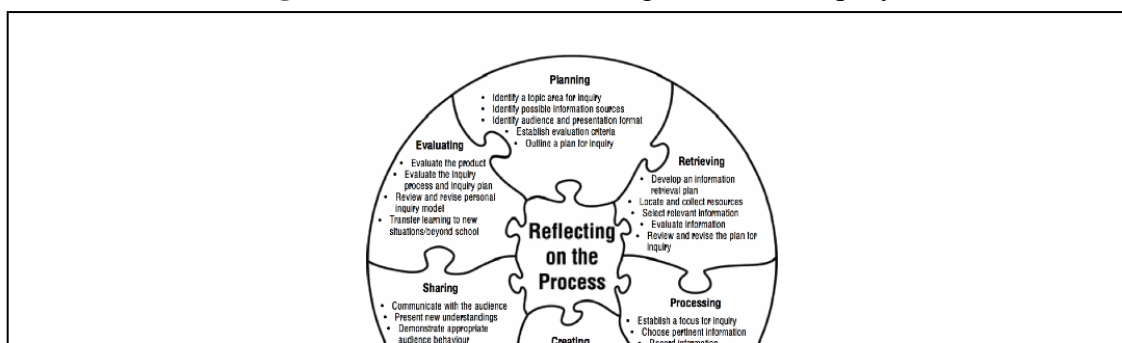
Reflective assessment draws on both the affective (attitudes and feelings) and cognitive

(knowledge and understanding) domains for student learning.

> The core purpose of the "reflecting on the process" component in the Inquiry Model
>
> is to involve students in their own learning by developing their metacognitive skills.
>
> This component is key in each and every phase of the inquiry process, is integral to
>
> the success of inquiry-based learning activities, and is actively practised throughout
>
> the inquiry process. Students are taught reflection skills and strategies so that inquiry
>
> becomes a natural process. (Alberta Learning, 2004, p. 41)

As students investigate, problem solve, seek answers, consolidate information, determine

relevance of resources and information, and synthesize to construct personal meaning, they

are managing the cognitive and affective aspects of the inquiry using reflection to self-

assess and construct new understandings (Branch, 2003; Branch & Solowan, 2003;

Kuhlthau, 2003; Toth, Suthers, & Lesgold, 2002).

Teachers use a variety of assessments during student learning, looking for

knowledge, skills and understanding related to the curricular outcomes. Canadian

assessment researcher and writer, Anne Davies (2000), suggests that using three sources of

assessment—collecting evidence of products, observations and conversations will provide

reliable and valid evidence (p. 35). Harada and Yoshina (2005) apply Davies' (2000)

assessment model as they identify and classify strategies for recording and analyzing

assessment information with information literacy standards:

a) Observation (checklists, rubrics, rating scales, anecdotal);

b) Personal communication (information conferences, formal conferences, logs, notes and letters);

c) Examination of student work (checklists, rubrics, graphic organizers, portfolios) (pp. 14 – 15).

Teachers are able to see shifts in student understanding related to cognitive and affective behaviours as they document assessment conversations, observations, products and processes that represent student learning (Branch, 2003; Branch, 2006; Davies, 2007; Harada & Yoshina 2005; Kuhlthau, 2003).

How do Teachers Scaffold Inquiry Learning for Students?

To scaffold student learning, teachers place supports which students can access for help, based on their learning needs. White and Frederiksen's (1998) research on student success in scientific inquiry recognized the importance of instructional approaches which fostered metacognitive skills through scaffolded inquiry, reflection and generalization (p. 3). In scaffolded inquiry instruction, self-assessment strategies can support students' diverse learning needs, especially for lower achieving students.

Researchers White and Frederiksen (1998) signify the importance of providing scaffolds for student learning by including scaffolded inquiry within their inquiry cycle. White and Frederiksen collaborated with three urban, public middle school teachers, with students in grades 7, 8 and 9, to create a computer enhanced inquiry cycle and "science curriculum that engages students in learning about and reflecting on the processes of scientific inquiry as they construct increasingly complex models of force and motion

phenomena" (p. 3). The inquiry cycle guided the students' research using curricular activities to develop inquiry expertise. The instructional approach included:

1. Scaffolded Inquiry: Scaffolded learning environments with computer simulations and analytic tools to make the inquiry process as easy and productive as possible, in scaffolds or levels, at each stage in the inquiry cycle.

2. Reflective Assessment: Students were introduced to reflective assessments in which they assessed their own and each other's research.

3. Generalized Inquiry and Reflection: The inquiry cycle is repeated with a new research question, and some of the scaffolds for learning are removed. This continues until students are independently able to progress through the inquiry cycle, generate their own inquiry questions, and refine their thinking through reflection (p. 12-13).

The researchers' processes can apply to inquiry learning, indicating that "reflective assessment provides an explicit classroom activity that brings metacognition into the social processes of the classroom, [enhancing] the acquisition of metacognitive knowledge and skills" (p. 79). Students can apply what they have learned about the topic studied or the inquiry process to new learning situations.

When scaffolds are used to support learning where students need it the most, students can become empowered to be independent users of strategies that compliment their preferred ways of learning (Tomlinson, 2005). Interwoven instruction and assessment can shift learning from isolated activities to strategic, effective instruction which legitimizes planning, teaching, and assessing differently (Wormeli, 2007). When teachers differentiate instruction and assessment they "provide scaffolding and support for some students but not for others who do not need it. [Teachers also] "ratchet" up or down the

challenge level of student tasks in order to meet instructional needs" (Wormeli, 2007, p. 195). Scaffolding student learning can be short-term or long-term, dependent on the type of help or strategy required for student growth or success.

The student's role in assessment is an integrated, recursive and complex process. Students, along with their teachers, can work together to monitor progress of learning.

Students are Learning Partners in Inquiry

Included in this section is research related to the significance of students as learning partners. Research on the effects of student self-assessment, setting inquiry criteria and being involved in a community of learners is reviewed.

Inquiry-based learning provides a framework for engaging students as learning partners so they know "what" they are doing and "why" they are doing it (Branch, 2006). Self-assessment and reflection are strategies for instruction and assessment supporting teachers and students in being purposeful and focused on the learning target or inquiry (Harada & Yoshina, 2004). Black and Wiliam's (1998b) formative assessment research indicates that students are the primary users of assessment information. When students have a clear picture of the targets they are meant to attain, they "become more committed and more effective as learners, their own assessments become an object of discussion with their teachers and with one another, and [therefore] reflection on one's own ideas is essential to good learning" (p. 145). Sharing with students the purpose of instruction and how they will be assessed helps them to contextualize the inquiry, and ask questions about what they do not understand related to the inquiry process and content expectations.

In order to encourage students to be engaged as learning partners, inquiry experiences should be customized to meet the needs of students. *The Role of Assessment in a Learning Culture,* (Shepard, 2000) analyses research related to the transformative role

students have in their learning and concentrates on assessment "that can be used as a part of instruction to support and enhance learning" (p. 4). From the research, shared principles of cognitive and constructivist learning theories, classroom assessment and a reformed vision of curriculum "characterize an emergent, constructivist paradigm" (p. 8). Shepard concentrates on assessment strategies that support social / motivational as well as cognitive / informational purposes which help students understand their role as learning partners.

When students understand their role in monitoring their learning, progress and growth, the classroom environment can be seen as a learning culture. A learning culture has the power to change previously held beliefs, ideas and perspectives about classroom assessment. The strategies of dynamic assessment, assessment of prior knowledge, the use of descriptive feedback, teaching for transfer of understanding, explicit criteria, and student self-assessment are methods tied to student learning steps and expectations about student learning (Shepard, 2000, pp. 10 – 12). Fundamentally important to the idea of transforming classroom cultures is the aim to "change our cultural practices so that students and teachers look to assessment as a source of insight" (p. 10). Shepard identifies the need for research projects "that would advance fundamental understandings and at the same time would work to solve practical problems in real-world settings . . . and lead to continuous improvement of [educational] practice" (p. 13). In the context of a learning culture, teachers need to develop "classroom assessment practices that can be [used] to help students take the next steps in learning" (p. 12) and can provide a reformed model of curriculum and classroom assessment.

In an effort to understand the impact of easy-to-use technologies, the dramatic growth of information and social networking tools in an educational context, teachers consider how students can be learning partners in a technology milieu. What we mean

when we talk about knowledge and literacy is changing and evolving (Asselin & Doiron, 2008). Asselin and Doiron present a transformative pedagogy "where students *un*cover the curriculum" (p. 13), proposing that learners and the process of learning have significantly changed. The transformations of the foundations of education—learners, literacy and knowledge alter key concepts in teaching and learning (Asselin & Doiron). Asselin and Doiron suggest that it is important to "set clear parameters for a task and let learners choose the ways and means to create personally meaningful products that will include what we expected for the assignment" (p. 12). Students who are partners in assessment are learning "how to learn" within a conceptual framework of new literacies and new knowledge, developing "competencies which they will need to live and learn throughout their lives" (p. 11).

What are Student Self-Assessment Tools in Inquiry?

According to constructivist theory, it helps students if self-assessment and thinking about their learning strategies are embedded in inquiry (Kuhlthau et al., 2007). If reflection and self-assessment strategies are incorporated as core processes in the cycle of inquiry learning, there is an authentic context for student *metacognition* – that is, students thinking about their own thinking (Alberta Learning, 2004).

Martinez (2006) expands the commonly used definition of metacognition, "thinking about thinking" to "the monitoring and control of thought" and provides practical ideas of how metacognition can be taught to students. In most of the research literature, metacognition is presented as a conscious cognitive behaviour. Martinez identifies metacognitive skills and habits that can be developed by students which include both conscious and automated processes that compliment each other in cognitive activity:

1. Students should know and understand why metacognition is important for their learning. Teachers should provide time for students to engage in metacognitive thinking, purposefully embedding metacognition into instruction and assessment;

2. Teachers should model metacognition through "Think Alouds" to exemplify higher level thinking, problem solving and critical thinking processes for students;

3. Social interaction and thinking together should be used to cultivate metacognitive capacity (p. 699).

In inquiry learning, when teachers plan for opportunities in which students engage in metacognitive thinking and talking, these self-assessments can stimulate deeper student conversations and insightful questions. To this effect, Brownlie and Schnellert (2009), Canadian teachers and authors, signify that "students need opportunities to monitor their use of thinking strategies in [guided practice] and to make links between how and why they are used in different tasks and settings" (p. 5). Students use metacognition as a self-assessment strategy as they think about, plan, adjust their learning and assess if their personal learning goals have been met (p. 115). Brownlie and Schnellert reiterate:

As students learn to use metacognition, they begin to make and monitor personalized plans for their growth. As teachers provide support and feedback to students, the students become greater agents of their own learning. This leads them to self-direct and to self-regulate, or monitor their own learning. (p. 5)

Inquiry is an approach to learning which "engages, interests, and challenges students to connect their world with the curriculum" (Kuhlthau et al., 2007, p. 2). Such a dynamic and multifaceted learning experience can be enhanced by assessments which

reflect students' understanding related to the inquiry and social interactions that make the process of inquiry relevant (Harada & Yoshina, 2005). Underscoring the integrated and recursive nature of inquiry, Kuhlthau et al., (2007) state: "The longitudinal aspect of inquiry learning offers the prospect for designing an instrument to collect data on student learning at several points in the inquiry process" (p. 126). In addition, "assessment is complicated because there are different kinds of learning going on at the same time. Students are learning about sources, content, process and comprehension and articulation abilities and social skills" (p. 130). Purposeful selection of assessment methods can capture the complexity of inquiry and provide detailed information about the students as they progress through the phases of learning.

Why is Setting Inquiry Criteria with Students Important?

When we involve students in setting criteria for inquiry learning, we invite them to help determine what is important in the assessment. Creating criteria for assessment with students helps them clearly understand the teacher's expectations of learning. *Criteria* are the "standards by which something can be judged" (Gregory, Cameron & Davies, 1997, p. 7), providing clarity of purpose and the specific details as teachers assess student learning. "Teachers can set criteria for their students, teachers can set criteria with their students or students can negotiate their own criteria" (Gregory, et al., p. 7). The criteria are developed by students and teachers to determine the focus of inquiry assessment, and can draw from the students' previous assessment experiences.

As a community of learners, constructing criteria for determining "what counts" in learning is a strategy that helps students de-mystify rubrics and what the teacher is looking for in the assessment. Marking papers or projects with a grade or percentage mark encourages students to focus on the score, "not at the criteria and the learning these

represented" (Gregory, et al., p. 28). "Building criteria with your students gives them ownership of the criteria and increases their understanding of the purpose" (Brownlie & Schnellert, 2009, p. 104) and helps to focus on the quality of the student work. Students can incorporate assessment language in meaningful assessment conversations when they reflect on their inquiry processes because the identified criteria, phrased in their own words, are easy to understand.

When students have opportunities to build criteria that describe the qualities of inquiry learning, the students work to meet the same criteria successfully, with the work they do reflecting their own styles and understanding related to their inquiry question (Brownlie & Schnellert, 2009). Setting assessment criteria with students can promote student engagement, understanding and ownership through a four step process that follows (Gregory, et al., 1997). The first step is for students to make a brainstormed list. The teacher can pose a questions such as, "What counts in inquiry self-assessments?" or "What do we look for assessing your inquiry project?" The teacher records all the student's ideas, phrases and words on strips of paper, use sticky notes or chart paper. Teachers contribute ideas as well, ensuring that curricular outcomes are reflected in the criteria. The second step is for students to sort and categorize the list, reviewing the list of criteria and grouping similar criteria or ideas together. Coloured markers or pocket charts can be used to sort and categorize the written criteria. For criteria that are similar ideas grouped together, determine a label or group of words can describe this category. Make and post a t-chart is the third step in setting assessment criteria. A t-chart which reflects the criteria (what counts) and the specific details (what the teacher or student assessor will be looking for) is either posted or typed up for easy reference. Teachers and students use, revisit and revise the criteria.

Developing criteria continues to evolve and be revised as the inquiry progresses. These criteria can be refined the next class period, or for the next inquiry (p. 8 – 14).

Engaging students in self-assessment and using criteria to guide their learning helps students question, contemplate, revise, and determine the quality of their own work (Harada & Yoshina, 2005; Kuhlthau, et. al., 2007).

By being partners in assessment, [students] critically examine the process and products of their efforts. They become more aware of the strengths and needed improvements in their work and determine the quality . . . Assessment in this context is not "assessing learning" but it truly becomes "assessing for learning". (Harada & Yoshina, pp. 101-102)

Assessment for learning can provide students with a deeper understanding of their role as a learning partner and why the development of self-assessment strategies is important. Setting criteria with students contributes to,

clarity of purpose allowing all students the opportunity to succeed. Building the criteria with your students gives them the ownership of the criteria and increases their understanding of their purpose, they cannot then say, "I didn't know I had to do THAT" or "What am I supposed to do here anyway?". (Brownlie & Schnellert 2009, p. 104)

When criteria are posted and/or typed as a reference point from which students monitor their learning, the learning destination, and identified curricular outcomes can become identifiable and comprehensible. It helps teachers and students describe what quality inquiry can look like, sound like, and feel like (Alberta Assessment Consortium, 2005; Branch, 2006; Brownlie & Schnellert, 2009; Davies, 2007; Gregory, et al., 1997; Kuhlthau et. al., 2007; Moss, & Long, 2008; Ruiz-Primo & Furtak, 2007).

What is the Student's Role in a Community of Learners?

When students become learning partners in inquiry, talking about what they are reading or viewing with peers helps them to make connections, process information, synthesize and apply what they have learned (Branch, 2003; Branch, 2006; Branch & Solowan, 2003). Branch (2003), Canadian researcher and University of Alberta professor in teacher-librarianship, examined information seeking processes used by Canadian male and female adolescent populations, ranging in age from 11 to 15 years in Inuvik, Northwest Territories and Beaumont, Alberta. Verbal report methods of "Think Alouds", "Think Afters" and "Think Togethers" were used as strategies for students to employ when peer tutoring and to learn about their own learning styles. Branch suggests that using verbal report methods "supports the idea of a community of inquirers and provides opportunities for students to talk about their thinking" (p. 59). Both studies identified that students valued time to talk together and discuss their own cognitive and affective processes and that explicit inquiry instruction helped them move ahead using skills and strategies for their searching and learning.

Research conducted in the Netherlands shows that students are serious partners in the process of building inquiry knowledge. In Beishuizen's (2008) research, both sample populations of community of learners within Bachelor and Master's programmes, demonstrated that students benefit from explicit instruction, modeling, peer interaction, and feedback as they internalize assessment information related to their learning. Research findings that membership in a community of learners is an ideal learning environment can be generalized for elementary and high school educational environments:

It is the teacher, acting as a model, expert and coach, who shows students in a

community of learners how to carry out complex cognitive tasks, how to apply

methods for [inquiry] research, collaboration and scientific communication . . . Reflection is the basis for establishing the individual and collective identity of [a learning community]. (p. 186)

Active involvement in learning and making meaning during the inquiry process allows students individually and together to make connections between what they already know in relation to their inquiry question and the new information they are uncovering (White & Frederiksen, 1998). Retired teacher and writer, David Buehl (2009), recognizes the power of students learning from each other as they think and talk about what they have heard, seen, or read:

Metacognitive conversations are a natural fit for classroom discussions about learning. These critical discussions need to assume a permanent and organic role in classroom routines. Students become privileged to the inner workings of effective minds at work, allowing them to experiment with their own thinking as learners. In addition, students become increasingly comfortable using one another as learning resources, as discussions center less on "tell me the right answer" to "tell me how you decided that was the right answer". (p. 11)

Teachers purposefully connect content with strategic instruction to guide and support students as they find, process, discard, interpret and use information in unique and personal ways (Branch, 2006).

Engaging students within a community of learners places the emphasis on "active learning that plays a critical role in developing information-literate learners" (Alberta Learning, 2004, p. 73). Assessment in a learning community involves the teacher and students working together in a partnership with shared responsibilities. Students who view

themselves as learning partners cultivate self-regulation strategies which can support them as they determine what they need as a learner.

Students Become Self-Regulated Learners

There are many ways which teachers work to support students in the development of becoming life-long learners. The research review in this section investigates the student's role as a self-regulated learner and highlights student specific feedback, the significance of metacognitive aids and reflective learning.

Students who are self-regulated learners are strategic learners who can use the skills and strategies necessary to navigate their learning, recognizing their own learning strengths and interests (Beishuizen, 2008). According to Brownlie and Schnellert (2009), for students to become self-regulated learners with a collection of processing strategies for making meaning from information and content knowledge, they need:

> . . . opportunities to work both alone and in collaboration with others. Strategies that enable students to read together and construct understandings of the text help move students beyond the limits of their own experience. Effective paired and group structures help students link their learning with others, pose questions, and dig more deeply as they socially construct their knowledge and understandings. (p. 6)

When students are supported as they explore ideas, develop possible understandings, share works in progress, and get feedback, they are learning how to become self-regulated learners (Beishuizen, 2008).

Why is Feedback Important?

The type of feedback students receive during the learning process is important. Davies (2007) signifies that feedback helps students when and where they need it, "the more specific, descriptive feedback students receive while they are learning, the more

learning is possible. Teachers, who want all students to succeed, arrange ways for students to give themselves feedback or receive feedback from others" (p. 58). Susan Brookhart (2007), an educational consultant and senior research associate, outlines effective ways to deliver feedback to students. The relationship between the cognitive and motivational components of assessment provides effective student feedback which is personalized. Brookhart provides a context for when to give students feedback:

> If a student is studying facts or simple concepts – like basic math – he or she needs immediate information about whether the answer is right or wrong – such as the kind of feedback flash cards give. For learning targets that develop over time, like writing, problem solving, [or inquiry], wait until you have observed patterns in student work that provide insights into how they are doing the work, which will help you make suggestions about next steps. (p. 54)

Students can take ownership of their learning as they understand where they are in their learning, what is missing, and what is needed to be successful. "Make as many opportunities as you can to talk with your students about their work. As you do, you will develop a repertoire of feedback strategies that work" (Brookhart, p. 59).

The research by Higgins, et al., (2002) provides initial findings from a three year project examining the meaning and influence of assessment feedback for students. Adopting Black and Wiliam's (1998a, 1998b) theoretical framework for formative assessment, Higgins et al., investigates reasons why students do not use feedback to improve their learning. Semi-structured interviews and questionnaires, providing qualitative and quantitative data, were administered to the study participants. The target populations comprised of nineteen students from a diversity of backgrounds, age, gender, and studying different content areas at two different universities.

Barriers affecting students using the feedback given include the timing, quality, quantity and language of the feedback (Higgins, et al., 2002, p. 53). From this research, it indicates that the students "wanted feedback to provide them with a grade, [and] also desire feedback which focuses on generic, deep skills" (p. 60 - 61), such as critical analysis. The data suggests most of the students in the study, to some degree, are "intrinsically motivated, and [therefore], value feedback comments which focus on skills relating to a deep approach to learning" (p. 61). Despite factors which limit students using the feedback, the results indicate that feedback can improve student learning (p. 62). Higgins, et al. note their findings provide starting points related to the meaning and impact of assessment feedback for students:

1. Timely feedback is critical, comments should be given to students as soon as possible after the assignment is submitted;

2. Errors or misconceptions need to be explained, not simply noted, and improvements for future work included;

3. Peer assessment may help students become familiar with the elements of the criteria upon which the work is assessed (p. 62).

Further investigation is suggested in regard to "how" students use feedback, with some students "adhering closely to every comment, while others reflect in a less conscious manner on a small selection of points which they have stored in the back of their mind" (Higgins, et al., p. 61). The language of feedback and the effects of student motivation are areas that could be further examined.

Higgins, et al., (2002) research results can be generalized to school environments in the following ways:

1. If comments are too general they are of little value and students will simply ignore them.

2. Teaching students how to use feedback specificity can help students rethink, go back or refine what is missing their learning.

Feedback is important because descriptive comments can guide students through the phases of inquiry, helping them clarify their processes and what is missing in the work they have done to date. Questions such as, "What did you notice about the relationship between your feelings and the phase of inquiry?" or "I see you used AutoSummarize to reduce the amount of informational text. How did it help you?" can extend students' thinking, and help them know what they need to do next, who they need to talk to, or where to go for additional information.

How Do We Use Metacognitive Aids for Assessment?

Using reflective talk, mind maps, graphic organizers and metacognitive aids within inquiry differentiates ways for students to monitor their inquiry learning and growth (Kuhlthau et al., 2007; Toth, et al., 2002; Wormeli, 2006). Strategies for processing information can become metacognitive aids to provide practical pathways which can aid students in synthesizing information, determining importance, transferring information into the student's own words, or analyzing and synthesizing the application of what do next in the inquiry.

Toth, et al., (2002) researched the effects of representational guidance during scientific inquiry. Using a 2 x 2 research design, one dimension uses external representation (evidence mapping or prose writing) and the other dimension notes the presence or absence of reflective assessment while using the external representations. Students in the mapping condition used a software tool, and students in the prose writing condition used a template

to record data and hypotheses. This study design measured "how effective students were in transforming information from the web-based hypertext materials to two forms of representation: evidence map or prose" (p. 270). The positive effects of representational guidance by evidence mapping and explicit reflection using criteria in the form of rubrics during the inquiry learning are the primary findings from this study. In addition, the results indicate that "explicit reflection on one's activity may be most effective when the accompanying response format to record one's thinking is matched to the goal of instruction" (p. 283). Toth, et al., indicate that representational guidance can influence student learning in inquiry in two ways:

1. Making information noticeable or striking;

2. Focusing student processes/learning during inquiry (p. 281).

Another important factor in this research is the combination of representational guidance and reflective assessment. Together, representational guidance and reflective assessment supports the "viability of this instructional methodology to help students overcome reasoning difficulties in complex, authentic environments" (p. 283). These conclusions validate students using processing tools such as concept frames and visual organizers as supports during inquiry learning. Working with text and information in alternate ways can enable students to make connections and meaning from the information they find in a variety of formats (see Appendices A – G).

What is Reflective Learning?

Reflection is an essential self-regulation strategy that is embedded through all the inquiry phases (Alberta Learning, 2004). Based on Black and Wiliam's review of professional literature (1998a), their article, *Inside the Black Box: Raising Standards Through Classroom Assessment* (1998b), identifies present educational policy treating

"classrooms" as a black box of inputs and outputs for student learning. The paper focuses on "inside" the black box and the proposition that teaching and learning have to be interactive (p. 139).

With the goal of finding research-based, practical means to improve formative assessment, and thereby, improve student learning; three recommendations evolve from their literature review:

1. Self esteem of students: Giving feedback to students supports individual students and focuses on ways for students to improve and should avoid comparisons with other students. Teachers believing that all students can learn and achieve cultivates the students' self esteem as a learner.

2. Self-assessment and reflection by students: Self reflection is an essential ingredient in formative assessment that students use as they engage in self and peer assessments. How to self-assess and reflect needs to be modelled so that students understand "how" to self assess or reflect, the purpose of the learning, and understand what they need to do to be successful.

3. The evolution of effective teaching: Assessment for learning is more than adding new strategies into assessment practices. All components of the student's learning experience consolidates instruction and assessment, with the focus on improving the students' work (pp. 144-146).

Identifying the importance of ongoing reflective talk in which students think, form an opinion, or draw conclusions, Black and Wiliam (1998b) suggest that dialogue, "between pupils and a teacher should be thoughtful, reflective, focused to evoke and explore understanding, and constructed so that all pupils have an opportunity to think and

express their ideas" (p. 146). Providing an environment where students talk about their understanding through an interactive discourse can support student learning.

While reflective dialogue is an important element of student self-assessment, the strategies used to elicit reflective thinking should vary. Listening to and observing student's interactions and conversations can provide insight and direction into student learning needs and evidence of understanding. Table 2 (Folkerts, 2009) identifies ways in which students can construct and connect the layers of reflective thinking and understanding that make up the inquiry process.

Figure 2.
Meaningful, Authentic and Purposeful Inquiry Learning Experiences
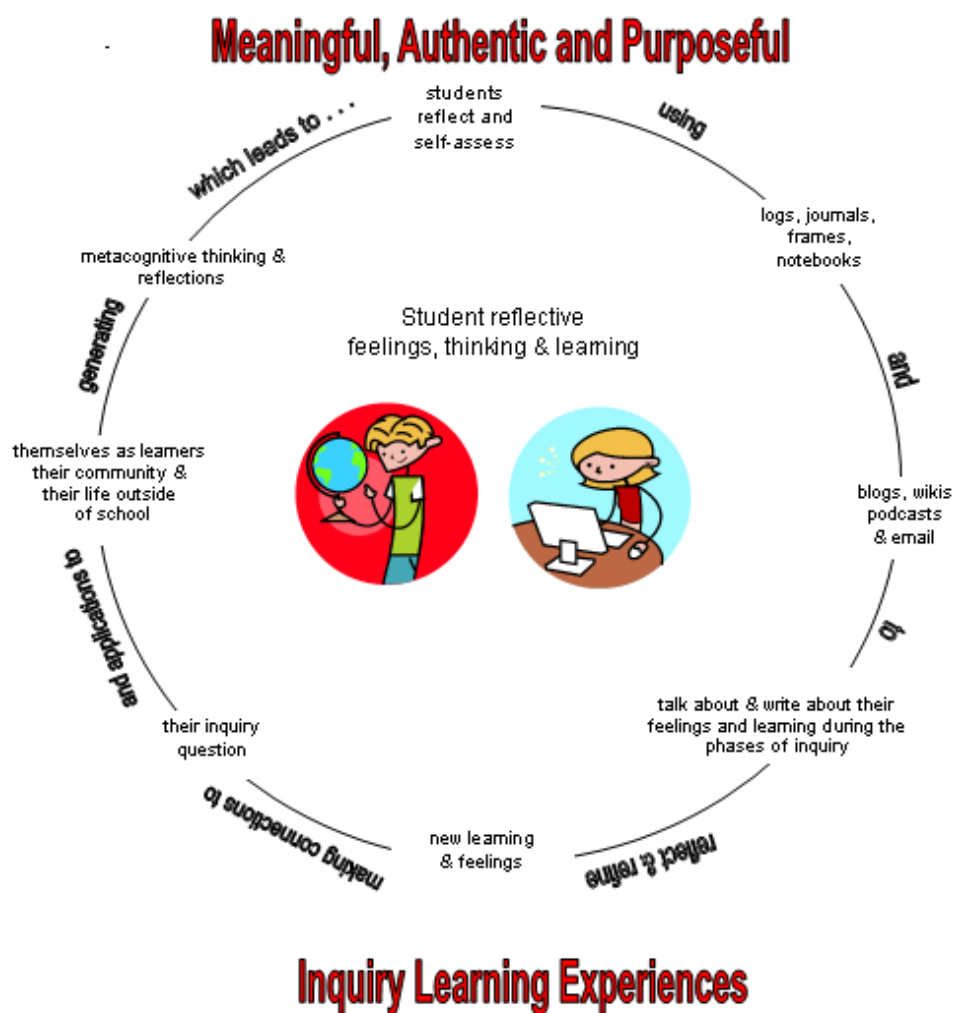
Figure 2. A visual representation of reflective learning strategies that illustrate students becoming self-regulated learners, by A. Folkerts, 2009, *Literacies, Learning & Libraries*, *2*, p. 26. Copyright 2009 by the Alberta Teachers Association.

Students should have learning experiences which use inquiry processes for the development of skills and strategies in different content areas a few times each school year. "It is the repetition and reflecting on the process over time that provides students with the opportunities to learn and grow into lifelong learners" (Branch & Solowan, 2003, p. 12). Branch and Solowan suggest that inquiry assessment can include process and/or, content and/or product, depending on the purpose of the assessment:

> [Assessment] need not be summative. Some of the worst abuses of research as a learning experience grow out of an emphasis on creating the final product rather than reflecting on the process. Students who are mentored in metacognitive awareness have been shown how to exhibit growth in both content knowledge and search strategies. The inquiry process is the kind of active and/or problem-based learning that plays a critical role in developing information literate learners. (p. 12)

Through guided practice in inquiry, students can engage in deeper and richer learning experiences by understanding what cognition is, how to access it in multiple ways, and develop self-regulated strategies that help them to self-assess and think critically about what they need as a learner (Alberta Learning, 2004; Branch, 2006; Branch & Solowan, 2003; Harada & Yoshina, 2004, 2005; Kuhlthau, et al., 2007).

REFLECTIONS AND CONSIDERATIONS

Assessment for learning can be interwoven into the fabric of student learning. Educators and teacher-librarians have important roles as we consider ways students can be learning partners in inquiry assessment. Involving students in assessment for learning

provides a foundation of skills and strategies which support them in their quest to become lifelong learners in the 21st century.

Why Involve Students in Inquiry Assessment?

Involving students in inquiry assessment promotes teaching and assessing in ways that make sense to the learner. Teachers need to use a variety of strategic approaches which include reflection, feedback on learning and metacognitive aids. Children learn best when they make personal connections to the topic being discussed or researched. These connections enrich classroom conversations and give students a voice and a role in their personal learning as they inquire together and share knowledge. As teachers, we can invite students to be co-creators of their own learning.

The Inquiry Model and Reflection

"Reflecting on the Process" is the core component of the "Inquiry Model" (see Figure 1) from Alberta Education (2004) and is interwoven into the phases of inquiry learning. "Planning for assessment requires that teachers consider the purposes for assessment in the inquiry activity" (p. 30) . . . and are encouraged to "include multiple sources of evidence" (p. 31) in their assessment practices. However, using reflection as an essential processing strategy repeatedly, risks that students become desensitized to reflection due to overuse. While reflective learning is important, students should have the opportunity to provide evidence of understanding in multiple ways as they process cognitive and affective learning dimensions in inquiry.

Harada and Yoshina (2004) describe inquiry-focused learning as a process that "provokes deeper thinking and investigation and greater student motivation to learn" (p. 22). Through the recursive cycle of inquiry, "assessment is done continuously, not just at the end of a project, and both students and instructors engage in this crucial aspect of

learning" (p. 23). Black and Wiliam (1998a, 1998b), Davies (2007), Kuhlthau et al., (2007) and other authors/researchers indicate that teachers should use a variety of assessment strategies for students to show what they know, understand, and can do. Teacher librarians have a unique role in assisting students in developing skills and strategies to help them manage their learning. Reflective learning should be one component of assessment for learning which students can use to communicate and demonstrate learning evidence.

Feedback for learning

Assessment feedback nurtures student learning and growth. Through assessment for learning, students work to "improve" their learning, as they provide learning evidence related to curricular outcomes. As Brookhart (2007) and Higgins, et al. (2002) point out, continuous and descriptive feedback can enhance the student's role as a learning partner, reflective thinker and a self-regulated learner. Assessment feedback involves thinking about thinking, planning for learning, and how we can get better.

When providing feedback, general or non-specific statements give little indication of what is good or what needs improvement. The student may already be trying as hard as possible and asking "can you" questions elicit "yes" or "no" responses. Comment starters (see Table 2) can improve the quality of feedback teachers give to students related to their learning:

Table 2. Quality Feedback for Student Learning

Don't say...	To encourage learning say...
Good work!	What will happen if...
Needs improvement...	How do you know?
Satisfactory effort...	What does this mean to you as a learner?
Try harder...	What might ... this mean?
Work does not reflect inquiry criteria.	Turn and talk to your partner about what you just

Can you...?	read, heard or seen...
The mark reflects lack of effort.	How do you explain...?
The ... is missing.	Where else might you find information?
Where is your ...?	What other ways might you...
	What is the purpose of...?
	Why did you use this strategy? How does it help you as a learner?
	Does your learning create new questions?
	What do you need next? Who can you talk to?
	What is another way to solve this?
	This is an interesting idea... what do you think about it?

Teachers have the power to transform their feedback into "effective feedback" which students will read, reflect on and actually use. Higgins et al., (2002) and others identify important considerations that affect students' use of feedback:

1. Quality: The quality of teacher feedback reflects a shift from, "This is worth 25% of your grade" to "Use the specifics of my feedback to improve your learning" (Beishuizen, 2008; Black & Wiliam, 1998b; Brookhart 2007; Brookhart, Moss, & Long, 2008; Brownlie & Schnellert, 2009; Davies, 2007; Higgins, et al., 2002);

2. Time: Feedback is most effective if done immediately so it can be used during the learning. Increased time between work and feedback causes students to lose interest (Beishuizen, 2008; Black & Wiliam, 1998b; Brookhart 2007; Davies, 2007; Higgins, et al., 2002);

3. Specificity: Relate errors and poor strategies to the task rather than the student. Assessment feedback provides specific steps to improve student performance, and builds on the student's previous best performance (Alberta Assessment Consortium, 2005; Brownlie & Schnellert, 2009; Davies, 2007; Higgins, et al., 2002);

4. Differentiated: Students receive as much or as little feedback as they need.
Scaffolded feedback enables students to complete the next step in their
learning and concentrates on progress and growth (Beishuizen, 2008;
Brookhart 2007; Brownlie & Schnellert, 2009; Higgins, et al., 2002;
Tomlinson, 2005; Wormeli, 2006).

Replacing general comments about student work with more timely, specific comments can
stimulate correction of errors through reflective thinking which helps students improve.

Black and Wiliam (1998a, 1998b) indicate that attention must be brought towards
developing learning environments which benefit all students, with teachers being
purposeful in planning and assessing student learning. Black and Wiliam (1998b) suggest,

When classroom culture focuses on rewards, gold stars, grades, or class ranking,
then students look for ways to obtain the best marks rather than to improve learning.
One reported consequence is that when they have any choice; students avoid
difficult tasks [looking at ways to do a minimal amount of work to get the grade]. (p.
144)

One way the teacher librarians can incorporate assessment for learning into inquiry
is through student specific feedback. This is authentically done throughout the learning
experience, providing support and/or interventions to students, giving them specificity
regarding "what," "how" and "what's next." Effective feedback should come from teachers,
peers, and the students themselves. Students, who understand assessment, know how to
self-assess and use teacher feedback to improve their learning.

Strategic Assessment

A foundation premise of building a community of learners (Beishuizen, 2008) in
our classrooms, libraries and schools is for teachers to use metacognitive aids, reflective

thinking and talking in meaningful and purposeful ways. It is easy to have students work together in pairs or small groups, "But so what?" Teachers need to consider the purpose of talking together, explain to students what is expected when they engage in conversations, and model what "reflective talk" sounds like and looks like within inquiry instruction and assessment.

Strategy lessons illuminate features or strategies for learning, and students learn the value of the skill or strategy by exploring its use within their personal inquiry. Student-involved assessment is a shared partnership and a shared responsibility. It allows teachers and teacher-librarians to hear and see what students need in relation to their learning, where they are in the inquiry process, and how to respond appropriately (Alberta Assessment Consortium, 2005). Teachers can function as "inquiry guides" who promote open-ended inquiry, and encourage students to work together and learn from each other. Kuhlthau, et al., (2007) identified that assessment provides insight for the instructional team as they guide students through the inquiry process (p. 9).

> Inquiry work with students is an active interchange ... [which is] is supportive, discursive, adaptive, interactive and reflective. Teachers suggest how students can move forward, see things from new perspectives, make connections between previous and new knowledge, and see the patterns of their learning. (Alberta Learning, 2004, p. 41)

Many of the strategies that learners use during the instructional and learning phases can also be used in assessing student progress and growth. This provides an authentic context for showing students how to get their needs met, no matter what or where they are as a learner. As "inquiry guides," educators must provide modelling and explicit instruction in the use of strategies for learning. This goes beyond using strategies with students; it

entails purposeful guidance and practice for students with the goal of independent use of the strategy in new contexts. It is about crafting inquiry learning experiences that provide multiple points of entry for students, allowing their learning to go from there (see Appendix A – F).

Educators who are strategic in instruction and assessment provide a powerful model for students to be strategic in their learning. Jackson (2010) encourages teachers to empower students, "It's not about making students work. It's about inviting students to be co-creators of their own learning and then giving them the space, tools and support to do so". Involving students in inquiry assessment enables students to construct an image of themselves as independent and self-regulated learners who skilfully use strategies that can be applied successfully in school and outside the school environment.

Metacognitive Aids

When students are partners in inquiry assessment, they can be empowered to become users of strategies that compliment their preferred ways of learning. Metacognitive aids are representational processing strategies that enable students to break down large amounts of information and record it in ways that compliment their personal learning styles.

From action research conducted by Toth, et al., (2002) benefits for students result when, in the context of inquiry-based learning, reflective assessment and representational guidance (content frames, visual aids, and graphic organizers or webs) are combined to support students' as they process and make meaning of information. While this helps students who are visual learners, it promotes all students interacting with facts and information in different ways, which solidifies the content and deepens understanding. Appendices G – M provide examples of reflective assessment which bridges the phases of

inquiry with metacognitive thinking. Student assessments can include visual frames or strategies which the students are familiar with to show what they know related to their inquiry, increasing the opportunity for students to be successful.

Assignments that focus on synthesizing knowledge or information can be improved by adding visual frames and organizers to meet student readiness levels and support students in organizing information in meaningful ways to them as a learner (see Appendices A – F). This also addresses concerns of students lifting information (sentences and key ideas) directly from resources or copying off the Internet because students must rework the text into their own words and phrases as they transfer their understanding to the metacognitive aids.

Teacher librarians who view their role as an "inquiry guide" incorporate coaching, modeling, mentoring, differentiation and feedback as necessary components in inquiry-based learning. Teacher-librarians have a leadership role to model this framework as they support other teachers on their continuum of learning in implementing differentiated instruction, or if they see instruction and assessment as separate entities. Educators can use the findings from the Toth, et al., (2002) research as a basis for incorporating representational guidance within inquiry learning. This in turn, supports students in their effective use of managing ideas and information.

Implications for Educators and Teacher Librarians

Teachers are learning partners in inquiry. In a dynamic learning environment there may be 27 students, however, there are 28 or more learners. Applying assessment for learning pedagogy into inquiry instruction and assessment will take time as teachers personalize and refine strategies that work for them in their teaching.

Teachers as Learners

 Black and Wiliam (1998a) recognize that flexible measures are needed if the goal is for teachers to put into practice assessment strategies which can support student learning and achievement. Black and Wiliam (1998b) also found that as we strive to improve effective assessment for learning practices, instruction and assessment become indivisible (p. 145). They suggest teachers start by asking the question, "Do I really know enough about the understanding of my [students] to be able to help each of them" (p. 146)? Improving teaching and assessment practices to benefit student learning is a complex process, without easy to implement action plans. Within an assessment for learning framework, teachers need to try, reflect, refine, apply, get feedback, and try again...

> Teachers modify their practice not by sweeping change but step by step, in
>
> small ways, as they reflect on their practice and will themselves to grow.
>
> Perhaps educators are not so different from their students – learners who
>
> have their own starting points, and who need to measure their success
>
> according to essential goals, persistent effort, and progress toward their goals.
>
> (Tomlinson, 2005, p. 269)

 Assessment for learning necessitates changes in instruction and assessment. We need to start with a clear focus on learning and learners. Teachers are more effective as they become strategic and skilled in the planning, implementing and assessment of inquiry, which leads to improved student learning. Holt (cited in Guskey, 2000) underscores the need for teachers to manifest what students know and learn in ways in which they can learn:

Since we can't know what knowledge will be most needed in the future, it is

senseless to try to teach it in advance. Instead, we should try to turn out

people who love learning so much and learn so well that they will be able to

learn whatever needs to be learned. (p. 226)

Teaching is changing because our world and students are changing. I used to think that teacher attitudes and beliefs needed to change before teachers modified their teaching practices. I realize now that experience shapes attitudes and beliefs (Guskey, 2000). Teachers need to use assessment strategies for student learning, which can and should be assessed in a variety of ways. When teachers see that strategic assessment makes a difference for their students, **then** attitudes and beliefs about involving students in inquiry assessment are transformed. Teaching is defined by what our students have learned, and as we ask, "What can I do differently?" we will change teaching and assessing practices because through our own experiential learning, we have seen that students are more successful.

As teachers enhance the learning environments for students, they embody the characteristics of reflective learning in their professional practice. In this context, students are provided with an example of "reflective learning in action" as they develop the skills they need to become independent, self-regulated learners.

Conclusion

Teacher-librarians have the opportunity to develop and nurture critical skills and processes students need to become self-regulated learners in the 21st century. Teacher librarians assist students in developing assessment skills and strategies that promote learning relationships, reflective talk, using feedback to improve their learning and selecting metacognitive aids that they need to process and consolidate information. It is

important that teacher-librarians are seen as assessment leaders who are dedicated to equipping their students with the ability to work collaboratively as a team member and problem-solve for solutions or answers. Involving students in inquiry assessment provides a framework of skills and strategies that supports them in becoming lifelong learners.

As a farm girl from Iowa, I realized there had to be a better way to learn. Insights as a learner helped me understand how learning and assessment can be scaffolded to support students where they need support, and bridge learning to the next phase of inquiry. I realize is not just about "what" I teach, but "how" I teach and engage students in learning. In inquiry, it is the difference between knowing "that" and knowing "why" and also "what's next".

REFERENCES

Alberta Assessment Consortium (2005). *Refocus: Looking at assessment for learning* (2nd edition). Edmonton,AB: Alberta Assessment Consortium.

Alberta Learning. (2004). *Focus on inquiry: A teacher's guide to implementing inquiry-based learning*. Edmonton, AB: Alberta Learning

Asselin, M., & Doiron, R. (2008). Towards a transformative pedagogy for school libraries 2.0. *School Libraries Worldwide, 14*(2), 1-18. Retrieved from http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=0&did=1567446521&SrchMode=1&sid=1&Fmt=3&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1269480157&clientId=12301

Bahro, R. (see What would it take for you to feel safe enough to…?, 2007-2009, para. 4*). Wycliff College Institute of Evangelism.* Retrieved February 2, 2010, from http://institute.wycliffecollege.ca/?p=984

Beishuizen, J. (2008). Does a community of learners foster self-regulated learning? *Technology, Pedagogy and Education*, *17*, 183-193. doi:10.1080/14759390802383769

Black, P., McCormick, R., James, M., & Pedder, D. (2006). Learning how to learn and assessment for learning: A theoretical inquiry. *Research Papers in Education, 21,* 119-132. doi:10.1080/02671520600615612

Black, P., & Wiliam, D. (1998a). Assessment and classroom learning. *Assessment in Education: Principles, Policy, and Practice 5*(1), 7-74. Retrieved from http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=7&sid=5&srchmode=1&vinst=PROD&fmt=3&startpage=-1&vname=PQD&did=30132745&scaling=FULL&pmid=34444&vtype=PQD&filei

nfoindex=%2Fshare4%2Fpqimage%2Fpqirs103%2F20100324213718602%2F2986

7%2Fout.pdf&rqt=309&source=%24source&TS=1269481040&clientId=12301

Black, P. & Wiliam, D. (1998b). Inside the black box. *Phi Delta Kappan, 80*(2), 139-148.

Retrieved from

http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=1&did=34

989021&SrchMode=1&sid=8&Fmt=3&VInst=PROD&VType=PQD&RQT=309&

VName=PQD&TS=1269481209&clientId=12301

Branch, J. L. (2003). Instructional intervention is the key: Supporting adolescent

information seeking. *School Libraries Worldwide, 9*(2), 47-61. Retrieved from

http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=0&sid=17

&srchmode=2&vinst=PROD&fmt=6&startpage=-

1&clientid=12301&vname=PQD&RQT=309&did=642087081&scaling=FULL&ts

=1256924577&vtype=PQD&rqt=309&TS=1256924582&clientId=12301

Branch, J. L. (2006). Using think alouds, think afters, and think togethers to research

adolescents' inquiry experiences. *Alberta Journal of Educational Research*, *52*, 148-

159. Retrieved from

http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=0&did=11

75257551&SrchMode=2&sid=18&Fmt=3&VInst=PROD&VType=PQD&RQT=30

9&VName=PQD&TS=1269481681&clientId=12301

Branch, J. L., & Solowan, D. G. (2003). Inquiry-based learning: The key to student

success. *School Libraries in Canada, 22*(4), 6-12. Retrieved from

http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=0&did=35

6953131&SrchMode=2&sid=20&Fmt=4&VInst=PROD&VType=PQD&RQT=309

&VName=PQD&TS=1269481790&clientId=12301

Brookhart, S. M. (2007). Feedback that fits. *Educational Leadership, 65*(4), 54-59.

    Retrieved from

    http://login.ezproxy.library.ualberta.ca/login?url=http://search.ebscohost.com/login.

    aspx?direct=true&db=tfh&AN=27984947&loginpage=Login.asp&site=ehost-

    live&scope=site

Brookhart, S., Moss, C., & Long, B. (2008). Formative assessment that

    empowers. *Educational Leadership, 66*(3), 52-57. Retrieved from

    http://web.ebscohost.com.login.ezproxy.library.ualberta.ca/ehost/pdf?vid=2&hid=9

    &sid=6bfd8119-83d4-47b4-bbac-4f8b45c173c5%40sessionmgr13

Brownlie, F., & Schnellert, L. (2009). *It's all about thinking: Collaborating to support all*

    learners. Winnipeg, MB: Portage & Main.

Buehl, D. (2009). *Classroom strategies for interactive learning* (3rd edition). Newark, DE

    International Reading Association.

Coatney, S. (2003). Assessment for learning. In B. K. Stripling & S. Hughes-Hassell (Eds.),

    Curriculum connections through the library (pp. 157-168). Westport, CT:

    Libraries Unlimited.

Costa, A. L., & Kallick, B. (1992). Reassessing assessment. In A. L. Costa, J. A.

    Bellanca, & R. Fogarty, (Eds.), *If minds matter: A forward to the future, Volume II*

    (pp. 275-280). Palantine, IL: IRI/Skylight Publishing.

Davies, A. (2000). *Making classroom assessment work*. Merville, BC: Connections

    Publishing.

Davies, A. (2007). *Making classroom assessment work* (2nd edition). Courtenay, BC:

    Connections Publishing.

Folkerts, A. (2009). Reflections on Kuhlthau's "From information to meaning:

Confronting challenges to the twenty-first century". *Literacies, Learning &*

Libraries, 2(1), 25-29.

Gregory K., Cameron, C., & Davies, A. (1997). *Setting and using criteria*. Merville, BC:

Connections Publishing.

Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks: CA: Corwin

Press.

Harada, V. (2005). Working smarter: Being strategic about assessment and accountability.

In E. Rosenfeld & D. V. Loertscher (Eds.), *Toward a 21st century*

school library media program (pp. 87-97). Toronto, ON: Scarecrow.

Harada, V. H. & Yoshina, J. M. (2004). Moving from rote to inquiry: Creating learning that

counts. *Library Media Connection, 23*(2), 22-24. Retrieved from

http://web.ebscohost.com.login.ezproxy.library.ualberta.ca/ehost/pdf?vid=2&hid=9

&sid=438dcaac-b697-49b1-b779-68d8b5348bd1%40sessionmgr14

Harada, V. H., & Yoshina, J. M. (2005). *Assessing learning: Librarians and teachers as*

partners. Westport, CT: Libraries Unlimited.

Higgins, R. Hartley, P. & Skelton, A. (2002). The conscientious consumer: Reconsidering

the role of assessment feedback in student learning. *Studies in Higher*

Educaton, 27, 53-64.   doi:10.1080/03075070120099368

Jackson, R. (2010, March 7). *Never work harder than your students*. [Lecture]. Association

of Supervision and Curriculum Development International Conference. San

Antonio, TX.

Kuhlthau, C. (2003). Rethinking libraries for the information age school: Vital roles in

inquiry learning. *School Libraries in Canada, 22*(4), 3-5. Retrieved from

http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=0&did=35

6953041&SrchMode=2&sid=25&Fmt=4&VInst=PROD&VType=PQD&RQT=309
&VName=PQD&TS=1269482287&clientId=12301

Kuhlthau, C. C., Moniotes, L. K., & Caspari, A. K. (2007). *Guided inquiry: Learning in the 21st century.* Westport, CT: Libraries Unlimited.

Martinez, M. E. (2006). What is metacognition? *Phi Delta Kappan, 87*(9), 696-699. Retrieved from http://proquest.umi.com.login.ezproxy.library.ualberta.ca/pqdweb?index=9&did=10 36316101&SrchMode=2&sid=27&Fmt=3&VInst=PROD&VType=PQD&RQT=30 9&VName=PQD&TS=1269482385&clientId=12301

Ruiz-Primo, M., & Furtak, E. (2007). Exploring teachers' informal formative assessment practices and students' understanding in the context of scientific inquiry. *Journal of Research in Science Teaching*, *44*, 57-84. doi:10.1002/tea.20163

Shepard, L. A. (2000) The role of assessment in a learning culture. *Educational Researcher, 29 (7),* 4-14. doi:10.3102/0013189X029007004

Stiggins, R. J. (2001). The unfulfilled promise of classroom assessment. *Educational Measurement: Issues and Practice*, *20*(3), 5-15. doi:10.1111/j.1745-3992.2001.tb00065.x

Stripling, B., & Hughes-Hassell, S. (2003). *Curriculum connections through the library.* Westport, CT: Libraries Unlimited.

Tomlinson, C. A. (Summer, 2005). Grading and differentiation: Paradox or good practice? *Theory into Practice.* 44(3), 262-269.

Toth, E. E., Suthers, D. D., & Lesgold, A.M. (2002). "Mapping to know": The effects of representational guidance and reflective assessment on scientific inquiry. *Science Education*, *86*, 264-286. doi:10.1002/sce.10004

White, B. Y., & Frederiksen, J. R. (1998). Inquiry, modeling and metacognition: Making science accessible to all students. *Cognition and Instruction, 16,* 3-118. Retrieved from http://login.ezproxy.library.ualberta.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=7385487&loginpage=Login.asp&site=ehost-live&scope=site

Wormeli, R. (2006*). Fair isn't always equal: Assessing and grading in the differentiated classroom.* Portland, ME: Stenhouse.

APPENDICES

Appendix A
Making Meaning from Information 1

making meaning **M**aking **M**eaning

Use the guides on the side to help you **process** and **understand** information while you are reading.

Mark your page using these symbols…

| !	-Wow! -This is very good information. -This is interesting...
?	-I don't understand. -How? -Why? -I need to talk with Mrs. F. for help.
√	-I know this! -This is a connection to... -I wrote this as a **K** on my KWL.
+	-This is new information! -This adds to what I already know. -This makes me think of something else to look up...
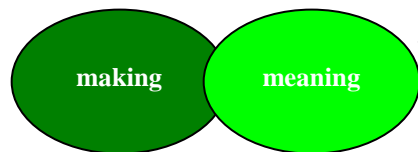
Appendix B
Making Meaning from Information 2
Making **M**eaning

making   meaning

Use the guides on the side to help you **process** and **understand**
facts & information while you are reading.

Mark the text using these symbols… Write your notes in your own words.

!	-I need to put this in my own words in my notes… -Good information! -These keywords will be good for my searching the Internet… -This information helps me answer my essential question!
?	-I don't understand… -What does it mean that… -Where do I go next in my searching for information?
√	-I already knew this! -These facts add to what I already knew. -From the K-W-L, what I **K**now, is correct!
(chain)	-How does this information connect to what you already know? -This confirms my thinking… -This ... connects to Winnipeg in this way...
(pencil)	-Notes to myself in the white spaces… -Underline or highlight important words or phrases… -Write why this is important to my reading…
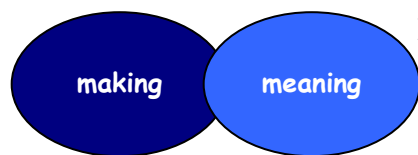
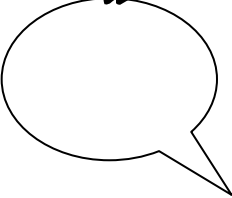**Appendix C**
**Making Meaning from Information 3**

Making **M**eaning

Use the guides on the side to help you **process** and **understand**
facts & information while you are reading.

Mark the text using these symbols… Use your own words when making notes.

!	-I need to write this in my own words in my notes… -Good information! -These keywords will be good for my searching the Internet or electronic databases… -This information helps me answer my essential question! -This helps me understand a cause for homelessness...
?	-I wonder… -I don't understand… -Why does… -What does it mean that… -Where do I go next in my searching for information?
√	-I already knew this! -This information fits with facts from other resources. -These facts add to what I already knew. -From the K-W-L, what I **K**now, is right, I just read it!
(chain)	-How does this information connect to what I already know? -For my inquiry question it means… -Invisible homelessness means..., so… -This confirms my thinking… -This connects to homelessness and poverty in Winnipeg in this way...
(pencil)	-Notes to myself in the white spaces… -Underline important words or phrases… -Write why this is important to my reading… -I need to investigate this further...
(speech bubble)	-Use speech bubbles to insert thoughts and feelings while Iam reading for information. -Bubbles can also be inserted on small sticky notes to the text I am reading. -I need to write my notes in my own words!

Appendix D
Making Meaning Frame 1

making   meaning
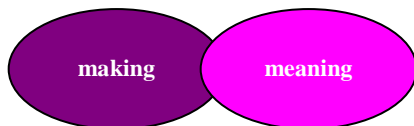
Name:

Where am I getting my information? What is the title?			

What type of information?

Book	Internet site	Print article
Podcast	Video / DVD	Other?

What pictures do you "see" as you read?	Write down important words or phrases:
What are 2 things you learned? 1. 2.	Can you connect this to what you already know?

What do you need to do next?

Appendix E
Making Meaning Frame 2

making   meaning

Name:

Information Source:

book	Internet	article	Video / DVD
podcast	blog	wiki	database

What type of information?

Draw pictures that come to mind when you read for information:

1 question I have...	1 Summary Sentence (in your own words)

Top 3 key words... 1. 2. 3.	How does this connect to your life and experiences?

What are your next steps?
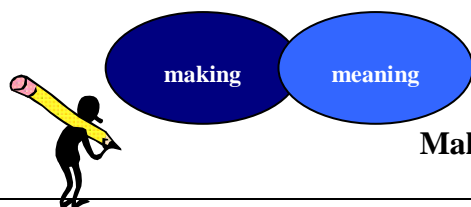
making   meaning

Appendix F
Making Meaning Frame 3

Name:

Information Source:

What type of information?

book	Internet	article	Video / DVD
podcast	blog	wiki	database

How did your new learning about homelessness and poverty connect to what you already knew?

Why is this information important?

What are 2-3 key words or vocabulary from your reading / viewing?

What is one new question from your reading / viewing?

List five important facts you learned in your reading or viewing.

1.

2.

3.

4.

5.

How does this connect to your life and experiences?

What do you still wonder?

Appendix G
Inquiry Assessment for Learning

Inquiry Assessment *for* Learning

& Reflect

	Student Self-Assessment
	Teacher Assessment

Criteria for Learning	Check & Reflect	Next Steps in My Learning…

Appendix H
Observing the Learning Process during Inquiry

Criteria for think tanks

Assessment FOR Learning
Observing the collaborative process during inquiry learning…

- What is your body telling me? (eye contact, turned to partner, writing notes…)
- Listen for differences, not agreement
- Ask for clarification, processes, not answers
- Are able to share your inquiry learning in your own words
- ¼ think match… one out of every four think tanks you can meet with someone who thinks like you do. (The other three think tanks are with classmates who have different smarts.)

Date	Jared	Janis	Jesse	Brendan	Dana

Appendix I
Assessment for Learning Think Tank

Write it!   Draw it!

Assessment *for* Learning
think tank x 4!

*Key words… Mind map…
Make a list…*

My thinking…

1 / 4 think match… one out of every four think tanks you can meet with someone who thinks like you do!

's thinking…	*'s thinking…*
's thinking…	*'s thinking…*

Appendix J
Assessment for Learning: Think, Feel, Write

Criteria for think tanks

Assessment FOR Learning
Think …Feel…Write…

Self-Assessment

- What is your body telling me? (eye contact, turned to partner, writing notes…)
- Listen for differences, not agreement
- Ask for clarification, processes, not answers
- Are able to share what your inquiry learning in your own words
- ¼ think match… one out of every four think tanks you can meet with someone who thinks like you do

Where are you now?   What inquiry phase(s) of the learning?

Planning ⇨ Retrieving ⇨ Processing ⇨ Sharing ⇨ Creating ⇨ Evaluating

Write down your thinking during this stage of learning…
What's working? What isn't working? Did you learn a strategy from the think tank that can help you?

What are your feelings at this time in the inquiry process?

uncertainty	optimism	confusion frustration doubt	clarity	sense of direction or confidence	satisfaction or disappointment	sense of accomplishment

Was your think tank partner feeling the same way you are?
Are you stuck? What do you need next? Who can help you? What is going well?

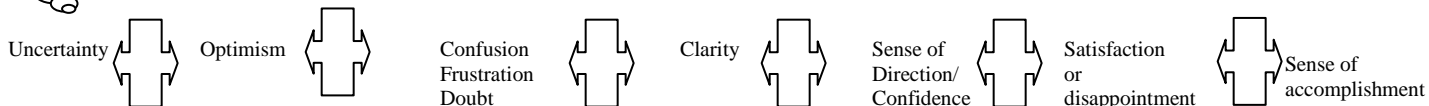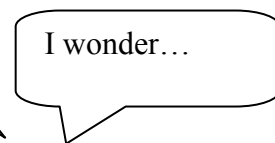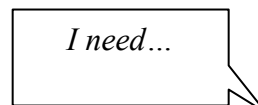**Appendix K**
Assessment for Learning: The Language of Inquiry

Assessment *for* Learning
Where are you now? The language of inquiry…

Phases of inquiry learning…

| Planning | ⇨ | Retrieving | ⇨ | Processing | ⇨ | Sharing | ⇨ | Creating | ⇨ | Evaluating |

What's next?

I feel…

I need…

I wonder…

Feelings during inquiry learning...

| Uncertainty | Optimism | Confusion Frustration Doubt | Clarity | Sense of Direction/ Confidence | Satisfaction or disappointment | Sense of accomplishment |

My thinking…	Other thinking…	Teacher thinking…
Date	Who?	
Date	Who?	
Date	Who?	
Date	Who?	

Appendix L
Reflective Talk

Assessment *FOR* Learning

Reflective talk… Connections to my inquiry… Next steps…
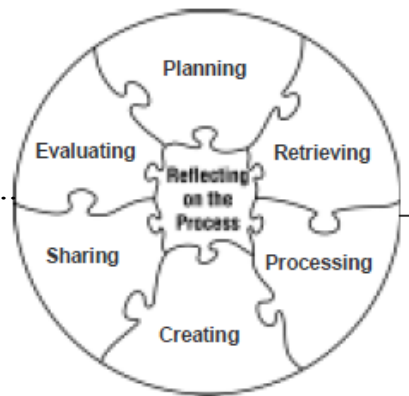
Who will I talk to? What are their learning strengths?

In your own words!

What? What have you learned?	*So What?* What does this mean for your inquiry question?	*OK… Now What?* What is your next step? What do you need? Who do you talk to?

Appendix M
Thinking About my Inquiry Learning

How do you connect what you already knew about your topic to the new information you have found?

What are 3 key words or vocabulary from your inquiry topic?

What is a new question you have based on your inquiry?

What have you learned so far from your inquiry research?

What do you still need to find out?

How does what you have learned, connect to your life outside of school?

... page 2

Draw a picture, diagram, mind map, or represent what you have learned so far in your inquiry.