

Making Thinking Visible: An Approach to Competency Based Education

by

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A Project Submitted in Partial Fulfillment of the  
Requirements for the Degree of

MASTERS OF EDUCATION

In the Area of Curriculum Leadership  
Department of Curriculum and Instruction

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**Abstract**

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As we continue working on global educational reform, educators are transitioning from a content based approach towards a more competency based approach to education. With these changes, necessitates shifts not only in educational approaches but in the methods used by teachers to enact these changes in the classroom. This Capstone project reviews literature that reflects changes in focus from content and knowledge towards understanding that connects and builds on ideas and concepts. This requires that educators, such as myself, focus on the thinking that students do in order to develop deep understanding. Ritchhart, R., Church, M., and Morrison, K. (2011) created a framework using thinking routines that assist students of all age groups to work through concepts and ideas in all disciplines in order to develop deep understanding. These routines also make visible the thinking students are doing as they collaboratively work towards understanding, allowing us to monitor and adjust to further meet our student's needs. The project also shares a proposed critical participatory action research plan to help educators inquire and reflect on the impact of using these routines in their practice as they strive to improve student learning in their classroom.

Key words: Competencies, thinking, understanding, competency based education, critical participatory action research, documentation

### **Dedication**

I would like to dedicate this capstone project to my immediate and extended family. Growing up, many family meals were followed by lively discussions and debates about a variety of ideas. Regardless of how young I was, I always felt that my thoughts and opinions were heard and considered when I contributed. This ignited my love of learning and continued pursuit of understanding concepts that I am passionate about. I hope to pass on this passion to my students as they develop as thinkers and learners in my classroom.

### **Acknowledgments**

I was not alone in working on this project as I had the support of family, friends and colleagues who helped to see this capstone project to completion. I would like to thank my parents Claude and Priscilla Lamoureux, and my siblings Colette, Lucien and Susanne for their continued support and encouragement. I would also like to give a special thanks to Mark Holcroft who read over all the chapters to assist with editing. As well, thank you to Dr. Chris Filler and Dr. Todd Milford who provided guidance and helpful feedback continuously during the process.

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## Chapter 1

### Introduction

*Any curriculum, good or bad, will sink or float on the culture of the classroom in which it is enacted.*

*~Ron Ritchhart (2015)*

The seed for this capstone project was planted in 2011 with two female students in my grade three math class (Student A and Student B). Both students had strong number sense and mathematical abilities. I used a problem based approach with Learning Mathematics through Context to develop understanding of mathematical concepts in class (Fosnot et al, 2007). When faced with a complex problem to solve with her partner, Student A began to tear up and claim “This is too hard and I’ll never finish” and consequently gave up, which required me to coach and encourage her to continue. Meanwhile, with the same situation, Student B was overheard saying “Hmmm this is a challenging problem! I think we should try a different approach” These two comments left me wondering the impact these statements have in successful problem solving. I reflected on what educators could do to help children like Student A develop more persistence to face and solve complex problems like Student B? Is this possible? How could educators help students to navigate complex problems?

Meanwhile our district and school embarked on incorporating inquiry learning as a pedagogical method to develop 21st Century skills in our students. In professional development sessions on a variety of subject disciplines, teachers were rallied to incorporate an inquiry approach to allow students to construct knowledge. It became important to provide ample authentic problems for students to work through to develop problem solving and critical thinking skills. These essential 21<sup>st</sup> Century skills included: problem solving, critical thinking, collaboration, and communication. As illustrated in the above example, merely providing

opportunities for inquiry does not always translate into competent problem solvers or successful use of these skills.

Intuitively, I thought more was required to enable students to be effective problem solvers and critical thinkers. I searched for various resources that might identify what I could do as an educator. I read books by Ron Ritchhart, *Making Thinking Visible* (2011) and *Intellectual Character* (2002) as well as Guy Claxton's *New Kinds of Smart: How Learnable Intelligence is changing Education* (2010). These resources discussed learning dispositions as a means to cultivate independence, engagement and understanding; and also how learning dispositions have an impact on student achievement and learning. I wondered how I could help develop these dispositions in my students.

In the 2013 to 2014 school year, my district launched the Transform Initiative which called for two lead teachers from schools to volunteer to undertake a pedagogical shift in our practice and share our learning with others. See figure 1 (Edmonton Catholic Schools, 2013) below:

TRANSFORM = 10 Pedagogical Shifts	
Traditional	Student-centered
Content-based	Competency-based
Student as Recipient	Student as Inquirer & Creator
Topic-driven	Cross-curricular Themes
Short-term Assignments	Project-based Learning
Memorization	Higher-level Thinking
Summative Assessment	Formative Assessment
Competitive	Collaborative Learning
Single Grades	Multi-grades
One-size-fits-all	Differentiated & Personalized
Print-based	Multimodal (print, visual, digital)

*Figure 1: Pedagogical Shifts in Transform Initiative in Edmonton Catholic Schools*

As one of the transform leaders, I chose to implement in my classroom the project based learning shift. I was keen to learn about the changes and shifts that we were experiencing in education. I attended the Buck Institute professional development session on project based learning. I became aware of essential understandings that students require after they complete a project that integrates a number of subjects. I noticed the students were engaged and seemed to be both learning and applying learning in an authentic context.

### Professional Motivation and Relevance

I was intrigued and wanted to learn more. I approached the Transform Manager of our district to learn more about the changes that are occurring in education, and asked her what graduate program she recommended. By the summer of 2013 I had entered the University of Victoria's graduate program in Leadership and Curriculum Instruction. This coincided with the announcement of the intended changes Alberta Education was making to the program of studies through curriculum redesign. See figure 2 below (Alberta Education, 2013). Both our district's and Alberta Education's shifts were intended to assist educators and schools to prepare for the changes to come.

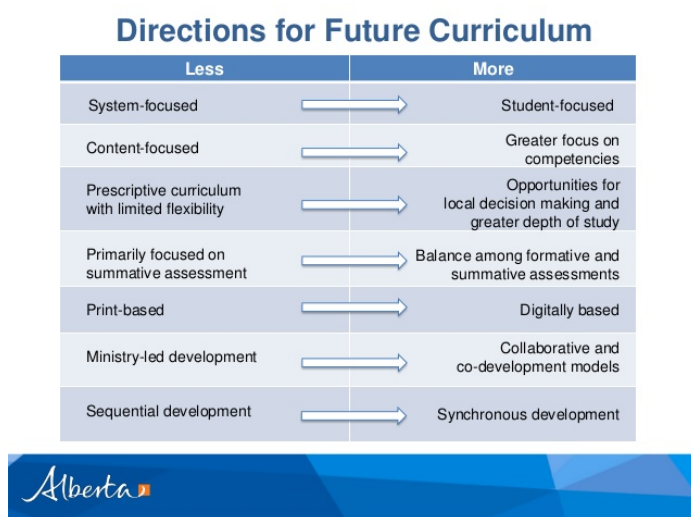


Figure 2: Directions for Future Curriculum in Alberta

The Ministerial Order (2013) identified competencies that education is required to cultivate in our schools to develop future Albertans who are engaged thinkers and ethical citizens with an entrepreneurial spirit (See Chapter 2 p. 17 for complete list of competencies).

Coinciding with this Ministerial Order was a call from our district for teachers to be Co-creators for the K - 3 program of studies. My district accepted me as a Teacher Co-Creator to develop and test the prototype of the new program of studies for the spring and fall of 2014. In the spring of 2014, I participated in developing the scope and sequence. Subsequently, with a small group of teachers, we developed draft outcomes for the K-3 social studies outcomes. I also assisted with writing the draft grade three math outcomes.

### **Problem Identified**

In the fall of 2014, we were asked to test and implement the prototype outcomes in our classroom. I felt confident with implementing the draft math outcomes as I had attended numerous professional development sessions and read many resources for using an inquiry approach to teaching and learning mathematics. I did not feel as confident with implementing the outcomes for social studies. I chose the following outcomes from the draft program of studies:

- 1) I can explain how traditions change over time
- 2) I can explain my personal traditions and cultures and the personal tradition and cultures of others to test in my classroom.

The text and teacher manuals did not relate to the concepts we were developing in social so I was left to find my own resources for the first term. I drew on my previous experience with project based learning and devised a “Heritage Days” project where the students would research and share their culture with others. I felt this would facilitate the students’ understanding of culture as they researched and presented to the class aspects of their own culture. However, the

coordinators gave me feedback that I was too focused on activities and not on deep understanding. I needed to rethink how I would implement these outcomes in my classroom.

Without having a manual to refer to, I was reminded of The Simpsons episode where Bart Simpson stole the teacher's manuals and the teachers walked around not knowing what to teach! I was disorientated and unsure where to turn. Although this was challenging and a little ego bruising from a professional perspective, I was forced to confront my beliefs about learning, teaching and what my students were capable of doing. My initial use of activities relates back to my own entrenched views of education or what Jardine (1998) refers to as the "fossilized residuals" (p.5) of education.

Ritchhart (2015) believes that creating cultures of thinking in the classroom and school provides teachers with viable method to break their entrenched beliefs and transform their practice. He believes that cultures of thinking assist teachers to promote deep understanding, engagement and independence for learners. The routines involved in cultures of thinking provide teachers with the resources and tools to focus on cultivating thinking and learning dispositions in students. In chapter two I will review literature around teaching thinking and the thinking routines as a method to assist educators by providing focus on what they should focus on to cultivate understanding. In chapter three I will propose a research project through critical participatory action research that will enable educators to test the thinking routines in their classroom as a viable method for transitioning towards competency based education. Ritchhart et al (2011) discuss the need to teach for understanding and further explains that understanding "isn't a type of thinking but a chief goal of thinking" (p.8). He also discussed the problematic nature of confusing activities with inquiry as I had done with my Heritage Days project. He states this problem in the following:

In the often misunderstood notion of experiential or inquiry-based learning, students are sometimes provided with lots of activities. Again, if designed well some of these can lead to understanding, but too often the thinking that is required to turn activity into learning is left to chance. Ritchhart et al (2011, p. 9)

This statement by Ritchhart et al (2011) reiterated that I needed to focus on understanding first then the thinking that would develop the understanding. I delved further into the resource and realized that cultivating students' learning and thinking dispositions provide residuals in education that coincide with the competencies Alberta Education deemed essential for future Albertans. To understand what was important, I needed to go beyond the outcomes to the concepts. As well, around this time, casual conversations in the staff room reflected some of the tensions involved in making the shifts. Statements about the shift in learning, "Inquiry is good and direct teaching is bad" or "It's all process not content" were voiced in staff meetings and professional development sessions. Other statements about our role as educators, "Not a sage on the stage but a guide on the side" were statements waved around in meetings by staff and administrators as though they would magically transform our practice.

These statements didn't change our practice but created tension for educators entrenched in a traditional paradigm of learning and pedagogy. Discussion and questions were whispered in casual staff room conversations amongst me and other colleagues, for fear we would appear outdated, traditional or worse, incompetent. Some of the staff's questions related to the changing role of constructing knowledge versus knowledge acquisition. Statements such as "I think they need to have basic knowledge of things first before giving them complex problems to solve" could be heard in the staff room. These entrenched views of knowledge, learning and pedagogy created obstacles for educators undertaking the shifts in education. Subsequent discussions with

colleagues further revealed these tensions around implementing inquiry or project based learning. In addition, many earnest teachers who wished to implement project based learning were able to devise an essential understanding and performance task but lacked the repertoire of skills and resources to develop the understanding from the beginning to the end.

### **Identified Tension**

As many countries and provinces such as Alberta transition towards including competencies in the curriculum, many educators require methods and resources to assist with this longer view of education. The paradigm shift is problematic for many educators who are entrenched in the traditional knowledge acquisition methods of content based approach to education-the understanding of something. The question remains: how can we help students to develop an understanding with something where students are able to make connections to other ideas? Meanwhile, how can we assist our students to cultivate competencies so that they are able to use them independently? My inquiry question for this capstone project is:

- What methods or tools will help educators transition from a content based approach towards a competency based approach in education?

### **My Objective**

In this Capstone project, I attempt to answer in chapter two the above question by reviewing literature related to the thinking required for knowledge and understanding and how we as educators need to develop thinking and learning dispositions in our students as we transition towards a competency based approach in education. Following the literature, I propose a research method of critical participatory action research that allows educators to test how thinking routines improve their practice and assist with transitioning towards a competency based approach. Finally, in chapter four I reflect on aspects of my professional experience that has changed as a result of my learning journey over the two years in the graduate program.

## **Chapter 2**

### **Introduction**

#### **Purpose of Education and the Role of the Educator in times of change**

The global educational reform movement calls for changes in the way we educate children in the 21st Century. With the immediate accessibility of information and knowledge, advent of new thinking tools to improve cognition and development of new mental models of learning, the need for an improved educational model is now more pressing than ever. (Trilling & Fadel, 2009). Bereiter (2002) asserts that we live in a knowledge age and need to be concerned with what it means to be a knowledge worker. Educators, such as myself, are feeling the demands of change in the way we approach learning and instruction in our classrooms. Navigating the shift from a content based approach which placed importance on the acquisition of content towards a competency based approach which places an emphasis on using skills to attain knowledge is challenging. The practical nature of our profession and the daily demands placed upon us, unfortunately do not afford us the luxury to take time to reflect on the changing role of our institution and profession. It is often assumed or taken for granted that all educators have the same goal and purpose in mind.

With the changes that are happening, this assumption should be questioned. For example, in professional development and staff room discussions, simplified statements are often espoused such as “It’s all process, not content” and “Inquiry is good, direct teaching is bad”. As well, there are assumptions about new role of teaching, “Not a sage on the stage but a guide on the side” These statements are examples of what Bereiter (2002) calls false dichotomies where two ideas are reduced and placed in opposition. Or an example of conflation, “hands on

activities is student centered learning”, which reduces two ideas and creates a relationship between them. According to Bereiter (2002) conflation and false dichotomies are regularly used in education today. In addition, Hunt and Ministrell, (1988) and Lampert (1988) as cited by Bereiter (2002) points out that constructivism is often taken to mean hands on activities, which ignores examples of constructivist education that depends on teacher led highly focused inquiry. This reduction of ideas to simplistic statements is problematic for teachers who are trying to understand their changing role as we undergo a shift in our educational direction.

These false dichotomies do not help educators understand what it means to construct knowledge and how we as teachers can help students. As Bereiter aptly points out “education is stuck. It doesn’t know where to move and it doesn’t have tools to move with” (p.4). Examining the purpose of education and the role of the educator is important as it provides the direction and focus for schools. The changes of including the development of competencies provides an excellent opportunity for all stakeholders involved in education to reflect on the goal and purpose. Claxton (2002; 2010) poses that the purpose of education is to prepare students to face an unknown future, which is a function of both cognitive and non-cognitive skills. Ritchhart (2002) asserts that we are teaching for the wrong reasons if we are not helping to develop intellectual character of our students. Harpaz (2014) asserts that “the goal of education is not to produce a student who knows a lot but a student who knows how to relate to and manipulate knowledge (p. 81). As we transition towards a competency based approach in education it is important that we know what goals are and consequently what our role as educators is. This project examines how creating a culture of thinking in the classroom may promote understanding and learning for all students, which might assist teachers to move forward in a competency based approach.

## **Background Theories**

### **Knowledge and Perception of the Mind**

When Bereiter (2002) points to education as being stuck, he refers to educational conceptual tools. Bereiter (2002) asserts that we need to examine “the most basic tools, conception of knowledge and the mind” (p.4). As educators the view of what knowledge is and the perceptions of how the mind works with knowledge influences to some degree how we approach teaching and learning. Although the purpose of this capstone is not to justify various theories, I feel it is important as educators that we examine the underlying concepts that influence our pedagogical approaches. As Jerome Bruner (1996) states “assumptions of the mind underlie attempts at teaching” (p.56). It is important to flesh out our assumptions in order to assist with cultivating learning in the classroom.

The philosophical perspective of realism traditionally views knowledge as a reflection of the world and is detached from human concerns (Harpaz, 2014). Knowledge in this approach is seen as an object outside of the mind and the mind was viewed as a container to be filled (Harpaz, 2014; Hattie, 2009; Ritchhart, 2011). The popular Bloom’s taxonomy views knowledge as analogous to a filing cabinet which can be pulled or accessed by other skills - the “higher order thinking skills” (Bereiter, 2002; Harpaz, 2014; Hattie, 2009). This view is predominant in the content based approach to education with the focus on students accumulating a lot of knowledge in the form of facts and the teacher covering copious amounts of concepts in the curriculum. As Bruner (1996) claims education, from this worldview, sees the children as learning from didactic acquisition of propositional knowledge” (p.53). Then the procedural knowledge (how to) will follow once a child acquires new knowledge from an external authority such as a teacher or text book. The appeal of this approach is its clearness and specificity of

what is to be learned and standards for how assessment is achieved (Bruner, 1996). According to Bruner (1996) failure of a student to achieve in is seen as a result of the student's shortcomings of abilities or IQ. However, Bruner (1996) asserts that damning the didactic approach is akin to beating a dead horse: there are contexts when knowledge can be treated as objective. The world is full of facts. According to Bereiter (2002) there is nothing wrong with this perception of knowledge, but it is incomplete or a "one dimensional" view that is not sufficient if we want students to be a part of the knowledge society.

Another theory of knowledge and the mind which is influencing education is constructivism. Although often mistaken for a pedagogical theory, it is not a theory of teaching but a theory of knowing and how one makes meaning (Hattie, 2009). Constructivism, which has its philosophical basis in relativism, knowledge is not seen as a replica of the world, but rather it is a construction of the world by means of categories that the human mind places on it (Harpaz, 2014). Knowledge is viewed as a structure to be built. The view of the mind is active as it constructs knowledge and makes meaning rather than absorbing knowledge. According to Bruner (1996) the perception of the child's mind perceives children as thinkers through the development of intersubjective interchange. The child is viewed as capable of reasoning to make sense their own beliefs on their own or in discussion with others. The role of teaching is to help the child understand better and less one-sided (Bruner, 1996). This understanding is developed through discussion and collaboration with the child and encourages meeting of the minds. Knowledge is shared through discourse with others in a textual community (Bruner, 1996). Harpaz (2014) equates theory (idea) with a story that works and knowledge as a constructed a story that works. The teacher's role is to encourage and enable knowledge building (Harpaz, 2014). The teacher minimizes didactic teaching as it impedes on student learning. The teacher

is seen as a facilitator who enables sharing of ideas with other learners with minimal corrective intervention (Bereiter, 2002; Harpaz, 2014; Hattie, 2009). Students self-regulate to construct meaning and develop understanding. Truths are perceived as product of evidence, argument and construction rather than authority, textual or pedagogical (Bruner, 1996). This approach is dialectic as it is more concerned with interpretation and understanding than achievement of facts (Bruner, 1996). The building of knowledge and understanding is viewed as critical in this approach as a means for the learner to make meaning.

However, Bruner (1996) notes there are critics of this approach, which is deemed to tolerate an unacceptable level of relativity that is taken for knowledge. Bruner (1996) posits that knowledge is justified belief and therefore claims about truth must be justified. He asserts that it is “foolish postmodernism to accept that all knowledge can be justified in an interpretive community that agrees” (Bruner, 1996, p. 59). More is required to obtain knowledge than the sharing of our beliefs with others. Bruner (1996) asserts that the “more” is the justification of one’s own beliefs. He claims this justification is a result of logical reasoning that resists disproof and disbelief. Despite the inevitably subjective component of knowledge not all theories are equally good or bad. As Bereiter (2002) cautions, when the knowledge constructed is trivial or fantastical, the learning activity is just an activity not knowledge building. These beliefs must be held against agreed upon standards and openly tested (Bruner, 1996). Bruner (1996) uses the example of saying today is Tuesday as a truth not because it is Tuesday, but because of the agreed upon approach to naming of the week. The agreed upon notion of what Popper (1978) claimed was objective knowledge of the third world. This is a movement away from what Popper (1978) calls the human subjective experiential world (world 2) towards the objectification of ideas and content in the third world.

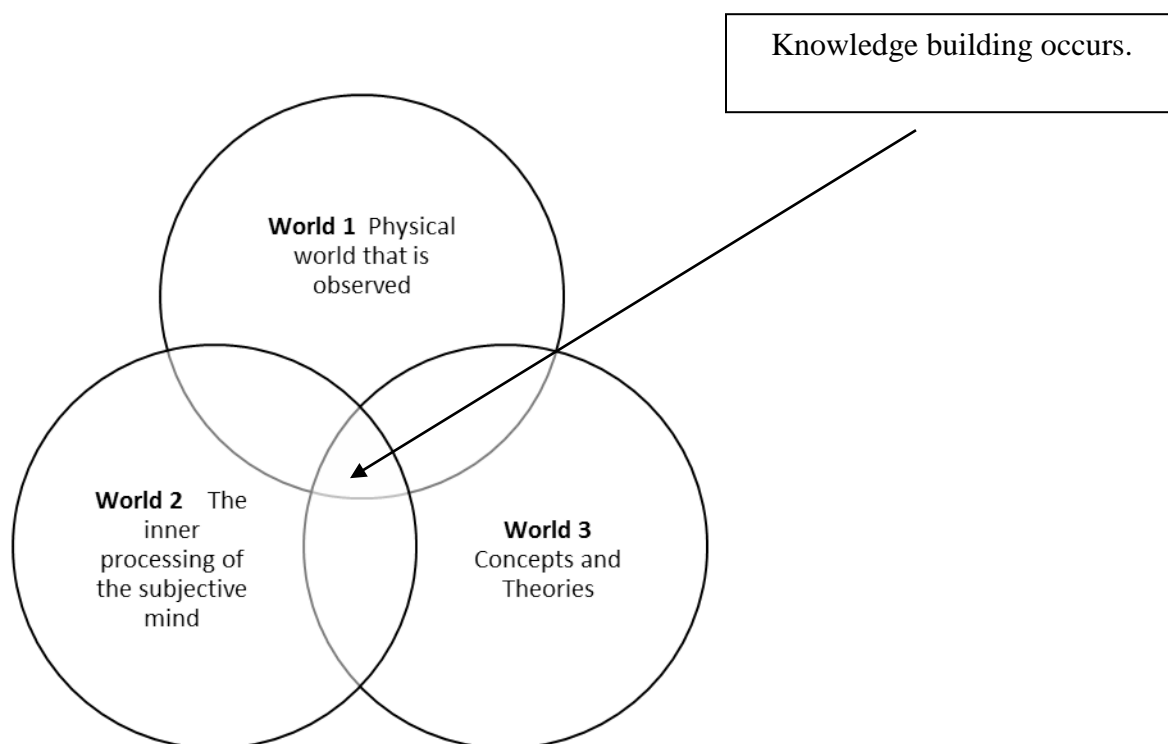
### **Popper's Three Worlds**

It is Popper's three models of the world that Bereiter (2002) bases his theory of knowledge building as a third model for education. Popper (1978) discusses three models of reality referred to as worlds. World 1 is comprised of the physical world. World 2 is the human subjective experiences of thought process and emotions and World 3 is thought contents and ideas (concepts). Bereiter (2002) uses conceptual artifacts to describe the abstract ideas and content in the third world. The term conceptual refers to discussable ideas, ranging from theories, designs and plans down to concepts. Artifacts reveal the human creation of these concepts. The content of conceptual artifacts are human creations. As the content of these artifacts are from human creations they are fallible. Not all ideas are equally good when they can be fallible. Therefore knowledge can be improved upon. Bereiter (2002) uses these worlds in relation to teaching with knowledge and provides the example of using a science textbook in the three worlds. World 1 is the physical world and how it really works. With a science textbook, this would be seen as how the world really is. In addition, hands on work with physical properties such as experiments. World 2 the subjective, is content for the teacher - the mind of the student. The example Bereiter uses with the textbooks in this world might be what scientists believe. The question naturally arises why are those beliefs better than others?

Bereiter (2002) asserts that education mainly operates in the two dimensional worlds. However, it is the added dimension of the third world of conceptual artifacts that builds knowledge. It is important to clarify that these three worlds are not hierarchical, but relational. Bereiter (2002) points out there is a physical world comprised of living and nonliving things that we strive to understand. As well, the mental states of learner is of important consideration for teachers and students. Scientific knowledge is not relegated to the first two worlds but occupies knowledge in its own right (Bereiter, 2002). Bereiter (2002) asserts that the three worlds allow

for relationships between theory and observation, between personal belief and observation, and between personal belief and theory.

This coincides with Bruner's (1996) fourth view of the child's mind as knowledgeable with the ability to manage objective knowledge. Children are able to distinguish between what they and others know and what is known in a larger sense (Bruner, 1996). Harpaz (2014) expands on this notion to specify that the mind is an interpretive activity used to make meaning. Rogoff (1996) states that the promise in pedagogy is to manage the collective pursuit of meaning and understanding. However, Bruner cautions that too much focus on beliefs and the negotiation of beliefs through discourse risks overemphasizing social construction of knowledge. Bruner (1996) states this overemphasis may lead to diminishing the importance of knowledge accumulated in the past. As Bruner (1996) indicates it is generally agreed in this postmodern era that knowledge is revisable. He clarifies further that revising knowledge should not be confused with relativism where all beliefs are equally valid. This distinguishes personal hunches and beliefs in Popper's World 2 with objective knowledge of World 3. The objective knowledge stands up to sustained scrutiny over time. Through this clarification, Bruner (1996) also explains the role of the teacher is to help children grasp the distinction between personal knowledge and what is known through culture (Bruner, 1996). This role of education provides a balance for the adult and child's role. As the teacher encourages and guides students to interpret, process and invent knowledge that is organized around big ideas and essential concepts of subject matter, the student is better equipped to become knowledge builders as opposed to acquirers of knowledge. See figure 3 below.



*Figure 3: Relationship Between Popper's Three Worlds*

### **Knowledge and Understanding in Education**

It is the inclusion of powerful conceptual ideas in the curriculum, or what is termed “Big Ideas” or concepts in subject disciplines that connects the personal World 2 knowledge with the objective knowledge of World 3. As a result of this connection, meaning is made and understanding developed. Understanding describes knowledge and is connected to it (Bereiter, 2002). However defining understanding depends upon the perception of knowledge.

Traditionally, understanding in schools is demonstrated through memorization and recall of facts. According to Bereiter (2002), the notion of understanding and intelligence as means for accessing knowledge in the filing cabinets of our minds is still prominent in education today. Hattie (2009) cites Brown's (2002) research where seven hundred 15 year olds and 71 math and science teachers were investigated on their beliefs about learning. Students asserted that learning exhibited surface knowledge such as being able to reproduce material in order to perform well on

a test. Contrary to this, the teachers of the same students indicated they were teaching for deep learning outcomes. He further cites research (Gepps, 1994; Torrance & Pryor, 1998; Wade & Mojo, 2000) which indicates that many questions from teachers do not initiate deep thinking because students understand that the teachers already know the answers (Hattie, 2009). Like knowledge, understanding occupies the lower order thinking skills in Bloom's taxonomy (Bereiter, 2002; Hattie, 2009; Ritchhart, 2011). Bereiter (2002) asserts that one of the failings of the taxonomy is its lack of focus on depths of understanding. Although we aim for deep understanding the message is not always conveyed to students. Therefore it is important for us to first be clear on what understanding is so that we know what we aim for.

### **Understanding**

Understanding is not easily defined however many definitions are put forward. Carr and Claxton (2002) indicate that understanding is the carrying out of actions that show's ones grasp of a topic and being able to take knowledge and use it in a new way. Perkins (1994) definition expands further by viewing understanding as a performance, being able to do a variety of thought provoking things with a topic such as explaining, finding evidence and examples, generalizing, applying, analyzing and representing a topic in a new way. Learning is the process and understanding is the product. Bereiter (2002) views understanding as "relationship between the knower and object of knowledge. Teaching for understanding should then cultivate the learner's relationship to the objects of knowledge thereby supporting intelligent action (Bereiter, 2002 p.100). Ritchhart (2011) critiques of Bloom's placement of understanding as a type of thinking. Ritchhart (2011) indicates that understanding is not a type of thinking but a result of it. He further asserts that instead of focusing on the levels of different types of thinking we would do better to focus on levels or quality within a single type of thinking. He illustrates that one can

test something to see if it fails or fully test the limits and conditions of that failure. In addition, analysis can be deep and penetrating or deal with some of the apparent features.

Hattie's (2009) explanation of surface, deep and constructed understanding expands on the cognitive processes involved in developing understanding. Surface learning involves understanding ideas and facts. He then contrasts the two other deep processes as being relational which results in complex cognitive processes. Hattie (2009) clarifies that the relational responses of the deeper processes requires an integration of two separate pieces of given knowledge, information, facts or ideas as he states:

Relational questions require learners impose a pattern on given material.

Elaborative or extended abstract responses require students to go beyond general rule or proof to all cases. In these cases the learner must then go beyond the given and bring in related prior knowledge or facts or information to create an answer, hypothesis or prediction that extends to a wider range of situations. (Hattie, 2009 Chapter 3 Section 6 Paragraph 7)

It is through the relational processes of deep thinking that the student demonstrates understanding. Hattie (2009) clarifies that the dichotomized view surface learning is good or that deep understanding is good is not correct. It is the balance of both surface and deep understanding that is required without the over reliance of one over the other. Ritchhart et al (2011) further exemplify the complexities involved in understanding when they cite research by Wiske (1997) at Harvard's Project zero which demonstrated that understanding is not a precursor to application, evaluating and creating but a result of it. Thinking is the relational understanding process involved in knowledge building and understanding.

### **Thinking involved in Understanding**

When the goal in education is to equip students to relate to and manipulate knowledge on a knowledge building society, it would make sense to turn our attention to the thinking involved in understanding. Both Bereiter (2002) and Ritchhart (2011) and Perkins (1994) discuss the importance of students being engaged in kinds of thinking that promote disciplinary understanding. Curriculum that would support this approach should be focused around big ideas or concepts (Harpaz, 2014; Perkins, 1994). Many students learn about a subject, but are not learning to do the subject (Ritchhart et al, 2011). Learning to do the subject requires students to be authentically involved with the subject matter as is demanded of the discipline through problem solving, making decision and developing new understanding through the methods and tools of the discipline. Ritchhart et al. (2011) asserts that educators should then be aware of the kinds of thinking that are important in these disciplines. The following are kinds of thinking the authors claims are necessary to build disciplinary understanding in some areas:

Scientists (make and test hypothesis, observing closely, building explanations ...)

Mathematicians (looking for patterns, making conjectures forming generalizations, constructing arguments...)

Readers (making interpretations, connections, predictions...)

Historians (considering different perspectives, reasoning with evidence, billing explanations...) (Ritchhart, 2011, p. 11)

It is important to note that the disciplinary thinking identified above connects back with Hattie's (2009) explanation of deep learning which connects knowledge, information, facts and ideas. For example, based on close observation, a scientist makes a hypothesis which is tested and

results observed then an explanation of the results is provided. Connecting Popper's three worlds in order to build new understanding and ideas.

From the disciplinary thinking identified Ritchhart et al (2011) then identified a short list of thinking moves that are essential in aiding our understanding across disciplines. It is important to point out that both lists are not exhaustive in the thinking involved in understanding but help orientate educators towards perspective. Other disciplinary thinking for understanding can be identified and added to the list. The thinking involved in understanding across disciplines was distilled below:

1. Observing closely and describing what's there
2. Building explanations and interpretations
3. Reasoning with evidence
4. Making connections
5. Considering different viewpoints and perspectives
6. Capturing the heart and forming conclusions
7. Wondering and asking questions
8. Uncovering complexity and going below the surface of things

(Ritchhart et al., 2009, p.14)

Ritchhart et al (2011) state that the above list is important when cultivating understanding of new ideas. When the thinking moves involved in understanding are made explicit, it assists educators to design learning around the big ideas that promote student engagement with concepts to develop understanding instead of leaving it to chance.

### **Why should we consider teaching and learning of thinking in schools?**

The above literature and research demonstrate how thinking is involved in understanding. Teaching for understanding has been a major movement in education with frameworks such as

Wiggins & McTighe (1998) Understanding by Design and Blythe et al (1998) Teaching for Understanding are promoted as planning tools in many schools (Ritchhart et al, 2011). However, Ritchhart et al. (2011) point out that making teaching for understanding remains a difficult goal to focus on external forces such as schools steeped in the tradition of transmitting knowledge and skills alongside high stakes testing continue. I concur with Ritchhart et al (2011) statement “Although lip service may be paid to the idea of teaching for understanding, there are pressures that work against it (p.9). Grade three is a testing year which previously had summative standardized testing, which placed constraints on my pedagogical practice as I pushed through the curriculum to prepare them. However, our province piloted the new Student Learner Assessments which are standardized benchmark assessment at the beginning of the year. My grade three colleagues and I lamented at the amount of time to conduct and mark the testing, which put us further behind and took time away from developing and implementing quality lessons.

However, it is important that we remain focused on the goal of cultivating understanding in the classroom during times of fast paced changes. The accessibility and complexity of knowledge make teaching thinking a priority (Resnick, 1987). In *5 Minds for the Future*, Gardner (2008) discusses the importance of the synthesizing mind and its ability to weave together information from different sources into a coherent whole. He shares a letter he received from a navy captain that underlines the importance of synthesizing in leadership, “I have been through this wringer. Synthesizing massive amounts of data, slants, opinions, tact while trying to maintain a big picture “... [It’s] challenging to be sure, but if you practice it, you develop a good tool for the leadership toolbox” (Gardner, 2008, p. 46-47). We cannot ignore that teaching

thinking should be an important tool as we help students relate to and manipulate knowledge. This thinking needs to be cultivated in the classroom.

Our way of making sense of the world can, at times, stand in the way of good thinking. Perkins and Ritchhart (2005) point out that narrowness of vision and insight can lock us into rigid patterns of thinking. We tend to dismiss challenges rather than rethink our understanding. They cite research from Gilman (1995) regarding how our emotional responses have a tendency to override our reason and cite Janis (1972) discovery of the phenomena of group think where the dominant views of the group lead to limited ways of thinking. Perkins and Ritchhart (2005) assert that even when our thinking tendencies are not faulty, the child's natural curiosity for discovering and making sense of the world does not always lend itself towards curiosity for ideas, knowledge and problem solving. It is for all of these reasons that Perkins and Ritchhart (2005) assert that teaching thinking for understanding in school is important.

### **Competency Based Education**

The four powerful forces identified by Trilling and Fadel (2009) demonstrate new approaches to learning for life and knowledge work in the 21<sup>st</sup> Century. The four forces are: 1) knowledge work 2) learning research 3) digital lifestyles, and 4) thinking tools. Consequently, the 21<sup>st</sup> Century saw the dawn of the competency based learning approach, which places importance on developing competencies beyond acquisition of subject matter. Although there are many discussions on the definition of competencies, Parsons and Beauchamp (2012) note that there is an international consensus that views competencies as “the knowledge, skills, attitudes and values that allow a person to participate meaningfully in society” (p.82).

Trier (2002) report to De Soco project for the Organization for Economic Cooperation and Development (OECD) which examined of a wide range of international curriculum documents from 12 countries (Denmark, Finland, France, Germany, the Netherlands, New

Zealand, Norway Sweden, Switzerland, and United States) where competencies were mentioned and the importance given to them. Trier (2002) distilled the competencies common to all countries as the following: 1) Lifelong learning, 2) Literacy in Mother tongue, 3) Social competencies/cooperation/teamwork, 4) Communication, 5) Information/ Problem solving/IT Media competencies, 6) Numeracy/Mathematical Literacy, 7) Value education/ ethics, 8) Autonomy/Self-management/action orientation (p. 33). Binkley et al (2012) created the KSAVE model of assessment that was created from 12 relevant frameworks drawn from a variety countries and organizations (European Union, OECD, Japan, Australia, Scotland, England and Northern Ireland). The KSAVE model of assessing 21st Century skills, organizes 10 skills and 4 groupings that are common in these countries frameworks around the following competencies:

### **Ways of Thinking**

Creativity and innovation

Critical thinking, problem solving and decision making

Learning to learn, metacognition

### **Ways of Working**

Communication

Collaboration

### **Tools for Working**

Information Literacy

ICT Literacy

### **Living in the World**

Citizenship - local and global

Life and career

Personal and social responsibility (Brinkley et al, 2012)

Brinkley et al. (2012) further identify the complexity in ways of thinking as they discuss critical thinking, problem solving and decision making. They use the Philosophic Association's published Delphi Report (Facione, 1990) clarifying six cognitive thinking skills involved in critical thinking: interpretation, analysis, evaluation, inference, explanation and self-regulation. Brinkley et al. (2012) further extend this list with by adding attitudes and values such as open mindedness, fairness and honesty.

Canada also joined the competency based approach. Although education falls under provincial jurisdiction, many provinces are working towards including competencies in their curriculum. In 2004, Quebec was one of the first provinces to include competencies in their curriculum. According to Parsons and Beauchamp (2012) "by 2010, as can best be ascertained by a review of the government's website, the cross-curricular competencies were disaggregated into separate subject area/discipline competencies" (p. 84). Alberta is also working towards including competencies as of 2014 in the prototyping phase of developing a new program of studies that includes competencies. The Ministerial Order of Education by Alberta's Minister of Education (2013) states that "competencies are interrelated sets of attitudes, skills and knowledge that are drawn upon and applied to a particular context for successful learning and living, are developed over time and through a set of related learner outcomes." The key competencies identified in the Ministerial Order (2013), that a future Albertan would require in order to live a fully and successfully:

(4) Discover, develop and apply competencies across subject and discipline areas for learning, work and life to enable students to:

- (A) Know how to learn: to gain knowledge, understanding or skills through experience, study, and interaction with others;
- (b) Think critically: conceptualize, apply, analyze, synthesize, and evaluate to construct knowledge;
- (c) Identify and solve complex problems;
- (d) Manage information: access, interpret, evaluate and use information effectively, efficiently, and ethically;
- (e) Innovate: create, generate and apply new ideas or concepts;
- (f) Create opportunities through play, imagination, reflection, negotiation, and competition, with an entrepreneurial spirit;
- (g) Apply multiple literacies: reading, writing, mathematics, technology, languages, media, and personal finance;
- (h) Demonstrate good communication skills and the ability to work cooperatively with others;
- (i) Demonstrate global and cultural understanding, considering the economy and sustainable development; and
- (j) Identify and apply career and life skills through personal growth and well-being.

(Alberta Education Ministerial Order, 2013)

The pursuit of learning to understand in education, our own fallible thinking tendencies and the international educational movement towards competency based education, make it evident that teaching and learning thinking in schools is now essential.

## **Can thinking be taught in schools?**

### **Framework for evaluating thinking programs**

The last thirty years has seen an increase in teaching thinking for the reasons listed above. Harpaz (2014) discusses that many thinking approaches are skills based. This approach imparts skills with terms such as strategies, heuristics, algorithms, scaffolds etc. These skills are meant to be used quickly and efficiently. With the rise of thinking programs available for schools it is important to review the programs to consider which program to implement (Harpaz, 2014; Perkins & Ritchhart, 2005 ;) According to Dewey and Bento (2009) “no comparative study exists between the different thinking skills approaches; the existing research base appears to suggest that thinking skills instruction can have a positive impact on the child and staff (p. 332).

Grotzer and Perkins (2000) framework to judge the success of thinking programs in three different areas (cited by Perkins & Ritchhart, 2005). The first area is magnitude of the results, which is the impact the program has on the learners thinking. Secondly the persistence of a program’s results or how long it lingers after instruction is completed. Finally, the ability of the program to transfer into other domains, which will be discussed in more detail later. Three approaches to thinking will be examined by their theories, methods and research results.

### **Approaches to teaching thinking**

Some view the concept of thinking as what Paul (1984) identifies as “micro-logical”. This approach views thinking as extrinsic to the character or the person and is tacked on to other learning. What Dewey and Bento (2009) refer to as “Bolt on” thinking skills added in addition to the curriculum. One such program that has been discussed at length in a variety of literature with well over thirty year’s duration is the *Instrumental Enrichment* program designed by Dr. Reuven Feurstein. This program is based on the theory of cognitive modifiability, which stems from the belief that intelligence is learnable and requires a mediator to instruct the thinking skills

(Dewey & Bento, 2009; Perkins & Ritchhart, 2005; Sternberg, 1984). The program's goal is to develop autonomous learners whose deficits can be changed through a series of specific lessons (Perkins & Ritchhart, 2005; Sternberg, 1984). The skills developed in this approach through direct mediation are classification, comparisons, orientation in space, logical reasoning, inductive and deductive reasoning and synthesis. Students perform tasks that are abstract and decontextualized such as the ones found on psychometric tests where instructors bridge abstract and relate it to the real world (Perkins & Ritchhart, 2005). These 12 to 15 tasks are to be completed in one hour sessions three times a week.

Empirical studies reveal moderate success. Perkins and Ritchhart (2005) cite research from (Feurstein et al 1981; Rand, Tanenbaum, and Feurstein, 1979) in which the study matched low functioning, low socio economic status twelve to fifteen year olds who participated in Instrumental Enrichment program or a General Enrichment program where students were tutored in subject areas of math, science, language arts. Pre and post-test reveal gains in the area of interpersonal manner, self-sufficiency and adaptation to work. Results showed that students of the Instrumental Enrichment program scored slightly above normal and significantly better than the general enrichment students by about a third of a deviation on a follow up Army intelligence test (Perkins & Ritchhart, 2005). According to Perkins and Ritchhart (2005) these findings demonstrate magnitude and persistence. Instrumental Enrichment program are similar to intelligence tests (Perkins & Ritchhart, 2005; Sternberg, 1984).

### **Macro-logical Programs**

Other approaches to teaching thinking in schools can be deemed macro-logical in nature. These skills are integrated and intrinsic to a person's character and insight into their own cognitive and affective processes (Paul, 1984). Philosophy for Children developed by Mathew Lipman, aimed to teach reasoning and logic through the use of stories and discourse to children

in grades five to eight (Lipman, 1976). Through discourse, a community of inquiry is built around problem formation, identifying underlying assumptions, empirical studies indicate significant gains in reading and reasoning (Perkins & Ritchhart, 2005; Sternberg, 1984) which indicates magnitude. In addition, transfer across domains are built into the stories are infused into different subject areas of social, science, art and language arts (Perkins & Ritchhart, 2005; Sternberg, 1984).

CASE developed by Adey and Shayer (1993) is another approach to teaching thinking in science. This approach is based on Piaget's theory of cognitive development and Vygotsky's social construction of knowledge. The aim of this approach is to generate cognitive conflict through a series of lessons to stimulate complex thinking and accelerate children's cognition towards the next developmental phase (Dewey & Bento, 2009; Perkins & Ritchhart, 2005). Adey and Shayer (1993) as cited in Perkins and Ritchhart (2005) state the results of 12 year old boys and 11 year old girls indicate, immediate and after one and two years later, gains on post standardized tests in science. Adey and Shayer indicate that (as cited by Dewey & Bento, 2009, p. 332) later research with younger children also indicated significant immediate effect on cognitive domain. According to Adey and Shayer (as cited by Perkins & Ritchhart, 2005) the program not only taught thinking skills but also explicitly developed metacognitive skills and transfer of knowledge between strategies and context. According to Perkins and Ritchhart (2015) these results indicate magnitude, persistence and transfer.

When Perkins and Ritchhart (2005) considered the question about which thinking program has the best approach they asserted that "the matter is too complex to declare a winner" (p. 784). These programs address different needs of various groups: children with special cognitive needs, and students challenged by conceptual understandings of controlled variables in

science. (Perkins & Ritchhart, 2005). Despite their differences Perkins and Ritchhart (2015) indicate these programs provide challenging thinking tasks that stretch students beyond what they normally undertake. The programs place importance on focused attention and metacognitive self-regulation. Perkins and Ritchhart (2015) postulate that the cognitive demands of the programs are the factors that influenced the various approaches success as their methods overlap more than their theories. The notion that these programs extend students beyond what they normally do indicates that thinking has occurred.

What is important in reviewing these programs is that thinking can be taught (Perkins & Ritchhart, 2005). Perkins and Ritchhart (2015) reveal the limitations of these programs is that they demonstrate what is good thinking when students are in the process of thinking, which is an important criteria. However, they are left with two questions: “What if you don’t feel moved to think about the matter at hand? What if you don’t notice that a situation invites thinking?” (Perkins & Ritchhart, 2005). These questions lead to the role dispositions play in thinking and learning.

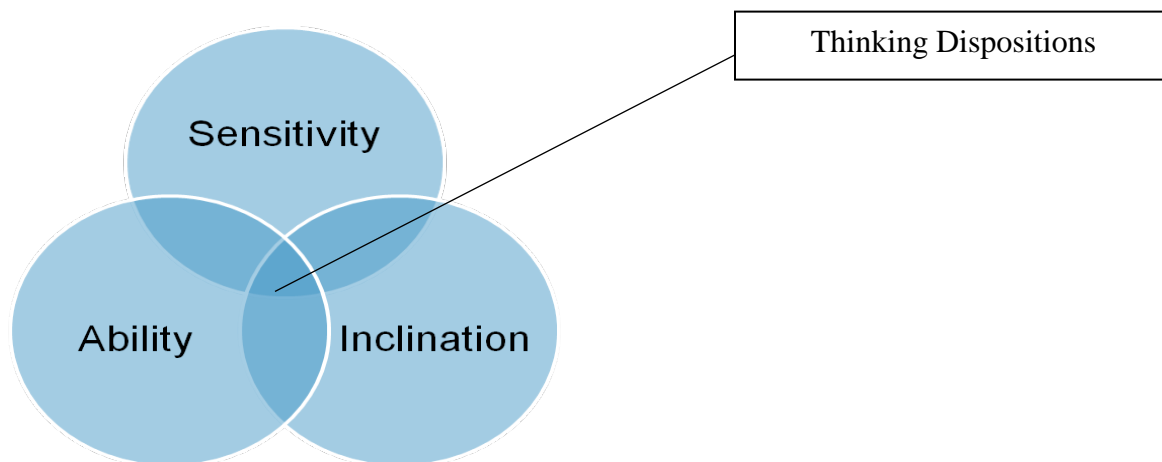
### **Case for Dispositions**

*Knowledge of methods alone will not suffice: there must be the desire and will to employ them ~*

*Dewey (1933 p.30)*

The above quote by Dewey links dispositions to the heart of what provides the impetus to relate to and manipulate knowledge - desire and motivation. Claxton & Carr (2004) further expands this notion of dispositions as an active process when he states “dispositions are a verb, not a noun” (p.88). According to Deakin-Crick and Buckingham-Shum (2012) dispositions are a tendency to behave in a certain way in new situations. Tishman, Jay and Perkins (1992) purport that a triad of abilities, sensitivities and inclinations are required to create the disposition the *abilities* are the capabilities and skills required to carry through on the behavior. The

*sensitivities* are the alertness to notice an appropriate occasion to act on the behavior and the *inclination* or tendency to behave in a certain way. All three are required for an individual to act on a disposition. Without feeling inclined to think critically an individual will not be disposed to that behavior. If an individual does not notice or is not sensitive to an occasion to think critically the disposition will not come to fruition. See Figure 4 (Perkins, Jay & Tishman, 1993).



*Figure 4: The Triadic Model of Thinking Dispositions*

The intersection of all three abilities, sensitivities and inclination are required to create a disposition. There is further discussion later around the empirical research supporting this construct of dispositional thinking.

### **Thinking as Dispositional**

Ability alone does not ensure performance and having certain thinking skills does not mean one will use them. Ritchhart (2002) defines thinking dispositions as characteristics that animate, motivate and direct our abilities towards good and productive thinking. Ritchhart's (2002) analyzed some of the dispositional lists from a philosophical perspective (Ennis, 1991; Facione & Sanchez, 1991; Paul, 1991, 1993) and educational practice perspective (Costa and Kallick, 2000; Marzano, 1992; Perkins, Jay & Tishman, 1993). He noticed many commonalities resulting in a synthesized of six broad categories

1. Creative thinking- open minded and curious
2. Reflective thinking: looking within - Metacognitive
3. Critical thinking: looking at, through and within and in between - seeking truth and understanding, skeptical, strategic (Ritchhart, 2002)

Ritchhart's (2002) purpose in integrating the list was not to create a list of perfect dispositions but rather to identify the ones he termed "Intellectual Character". These intellectual dispositions or character traits provide the impetus for thinking and understanding and should be nurtured in classrooms and schools.

### **Empirical Research on Thinking Dispositions**

The above discussion defines dispositions and lays the theoretical basis for considering the impetus to allow one to become involved in good and productive thinking. Further to that, researchers have investigated a variety of dispositional constructs that provide evidence of their influence on thinking, trait like characteristics and uniqueness from abilities.

### **Need for Cognition**

The Need for Cognition (NFC) construct looks at a person's tendency to seek, engage in and enjoy challenging activities. When personal involvement is high, rational processing of the content tends to be predominant (Cacioppo & Petty, 1982). The factors involved in the need for cognition will determine when and to what extent they will engage in thinking. Fleischhaur et al (2010) investigated the relationship between NFC and the fluid and crystallized aspects of intelligence. Fluid intelligence (gf) refers to the general efficiency of mental capacities or adaptive problem solving abilities. Crystallized intelligence (gc) refers to acquired knowledge. NFC scale was completed by one hundred and fifty two undergraduate students who performed the comprehensive German intelligence test which examines both gf and gc. Findings indicate a positive correlation between NFC and intelligence and they also observed a positive correlation

of NFC between both *gf* and *gc*. They noted that all associations between NFC and intelligence were modest. However, they discussed the magnitude of association as engaging and enjoying challenging cognitive tasks might be underestimated in a testing situation. As they state “people’s thinking disposition, that is, their sensitivity to intellectual occasions and their inclination to use these opportunities, may be more pronounced in everyday life compared to controlled test situations” (p.12). Furthermore, Fleischhaur et al. (2010) indicate the findings underline the emerging view that intelligence cannot be understood without considering cognitive motivations. This provides more consideration for the notion that dispositions play in the cognitive role of our students.

### **Triadic Model of Dispositional Thinking**

The dispositional side of thinking was investigated by Perkins, Tishman, Ritchhart, Donis and Andrade (2000). They examined two separate components (sensitivities and inclination) to measure its contribution towards intelligence. In a series of 4 different studies, with 318 students ranging from grades five to eight, were given stories with thinking shortfalls woven into them. These shortfalls had deficits in the area of problem solving, decision making, not examining the other side of a case or going for obvious options. Results showed that students detected about 10% of the thinking problems. Students had the ability which was evident by the problems they were able to generate after reading the stories and brainstorming other possibilities the characters could have done differently and argued other sides of the case after they still had difficulty detecting the thinking problems. This demonstrates the important role that sensitivities or the noticing of an opportunity plays in good thinking. According to Perkins and Ritchhart (2005), inclination plays an intermediate role in engagement in thinking. Findings also indicated the important role sensitivity to a situation played in developing thinking dispositions. In their final study they did a test-retest reliability on sensitivity scores. They administered the test two times

over six weeks and noticed high correlation .8 for eighth grade and .6 for fifth grade students indicating that sensitivity is very important when inspecting the sorts of thinking shortfalls presented in the stories. According to Perkins et al (2000) and Perkins and Tishman (2001) several studies investigated correlations between their dispositional measure and various measures of cognitive ability with a range from no to moderate correlation but lower correlation within ability measures as cited by Perkins and Ritchhart (2005). According to Perkins and Richhart (2005) this solidified the notion that dispositions are not “reflections of cognition as previously considered” but are aspects of thinking (p.787). The significance of this from an educational standpoint is that we need to consider how to facilitate situations that assist with developing the sensitivities and inclinations of our students when thinking to understand.

### **Entity and Incremental Perspectives of Intelligence**

Dweck's (2000) well known research theories of self, demonstrates the impact of student's views of intelligence on performance. The entity view perceives intelligence as fixed and unchangeable, whereas, an incremental perspective views intelligence as changeable. Students with fixed perspectives give up quickly in the face of difficult challenges, however, students with an incremental perspective persisted to extend beyond abilities through effort. Subsequent research, by Duckworth and Seligman (2005) examines why students with the same IQ scores performed differently in school. The amount of self-control each student had was tested, including self-rating, parents and teachers. The students who rated highly as self-disciplined, outperformed other students with the same IQ in a number of ways: achievement in school, less absences and completion of homework. This indicates the very important role motivation plays on ability.

### **Perceptions of Intelligence and Impact on Self Identities**

The concept of dispositions as the tendency to behave in a certain way is well established. However, the question remains: what is the mechanism that orientates a student to be disposed in a certain direction? Sfard and Prusak (2005) work on identity conveys the important role of identity as a mechanism for engaging in behaviour. They define identity as “a collection of stories about a person that are reifying and endorsable” (p.15). Deakin-Crick and Goldspink (2014) assert that self-identity plays an integral role in the direction of the disposition one leans towards. The qualitative research of Goldspink and Forests (2013, 2014) involved 23 primary schools with 245 teachers and 4,500 students from year’s three to seven over a three year period. They examined whether a student held an entity view of intelligence or an incremental view of intelligence. Results of the research indicated that the more a person aligns themselves as resilient, the less likely they would hold an entity view of intelligence and consequently have a stronger disposition towards being open to learning. Deakin-Crick et al. (2010, 2011) qualitative research in the Future for Learning schools links learning dispositions with identity and agency. Analysis of students who used rich language to describe themselves as a learner also viewed themselves as confident in their ability to take responsibility for their learning achievements. Contrasted to this, students whose learning profiles were low used negative language to describe themselves as learners. In addition, dispositional descriptions of passive, dependent learners and disengaged were used to describe them.

In summary, narratives orientate a student to be disposed to act in a certain way. Self-identity is the impetus of dispositions, therefore it is imperative that we consider the narrative history that our students bring to our classroom. In addition, research supports the notion that dispositions impact cognition and sensitivity is highlighted as an important player in the triadic



This fluctuation between how students view themselves as learners and the competency they display demonstrates the importance of nurturing and cultivating students' self-identities and dispositions. The identity is not a fixed story that cannot be changed but is “words that are taken seriously and shape into action” (Sfard & Prusak, 2005, p. 19). Education needs to focus itself in this direction, as Sfard and Prusak (2005) state, “learning can be thought of as closing the gap between the actual identity and designated identity” (p.19) through stories. As educators we need to become aware of the stories students bring with them and help shape the stories to reach their designated identity. As Deakin-Crick and Goldspink (2014) assert, “pedagogical design should account for a student’s learning identity and dispositions in order to stimulate ownership and agency” (p.30). As we transition to a competency based approach in education it is essential that we as educators cultivate these identities and dispositions towards good and productive ways of thinking. This must be done in a place that promotes healthy skepticism and challenges students to ask questions and probe assumptions (Ritchhart, 2015).

### **Creating Cultures of Thinking in Schools**

*Children grow into the intellectual life around them.*

*~Vygotsky (1978)*

If the identity of the learner is a narrative then school culture is the co-author. Schools are comprised of many individuals who shape and impact the identity of students. According to Deakin- Crick and Goldspink (2014), “learning dispositions are the site for the development of identity and agency precisely because our learning dispositions are uniquely personal yet socially situated, shaping the stories we tell about ourselves as well as framing our future learning trajectories” (p. 30). Due to the socially situated nature of dispositions, they are influenced by the learner’s culture. According to Ritchhart (2015) “culture is a group of people enacting a story. Everyone is a player in this story in a way that reinforces the story” (p.7). I would extend the

definition to include a group of people coming together whose stories interact to enact a story. The stories of the learners' identities interact with each other and the identity of the institution of school. Schools also have their own stories from a historically based identity that does not acknowledge the identity of the learner. As educators, we need to be aware of the stories we are telling. As Taylor (1995) states as cited by Ritchhart (2015) "culture management is message management. If you find enough of the sources of these messages you will change the culture" (p. 7). As we transition towards a competency based approach in education we need to be aware of the messages we send in education through the learning environment we create. When we look at assisting students to construct narratives of themselves as thinkers and learners, we must provide the space for them to do so. Schools need to be a place where thinking is valued, visible and promoted (Ritchhart et al., 2011). When we place the learner and their story at the center of the educational system "our role as a teacher shifts from delivery of information to fostering students' engagement with ideas" (Ritchhart et al., 2011, p. 26). When we are focused on engaging students with ideas (knowledge) we are asking our students to think.

### **Making Thinking Visible**

Thinking is invisible to educators and making it visible helps to provide a window into understanding and enables us to support them on their process to understand (Ritchhart, 2011). Part of creating the culture of thinking entails making thinking visible. By making thinking visible we demystify the thinking and learning process for the students and provide examples of how to engage with ideas to think and teach (Ritchhart et al., 2011). This demystification can help add to the narrative of the student and thus assist in shaping their identity as a learner. In addition, to cultivate thinking as a disposition we must create a sensitivity to it. As educators we need to be cognizant of what thinking is and the types of thinking that we seek in order to notice and highlight it as it occurs (Ritchhart et al. 2011). This promotes the sensitivity that is an

essential component of dispositions. Keene and Zimmermann state (as cited by Ritchhart et al, 2011) “until students can name a process they cannot control it” (p. 29). This ability to be sensitive then cultivates independence as students gain control over the process. According to Ritchhart et al. (2011) it is important for teachers to also gain control of their own process and become aware of the types of thinking they want in the classroom so that they can notice and name it as it happens in the class.

### **Thinking Routines in a Culture of Thinking**

One way to make thinking visible in the classroom is by establishing thinking routines. Ritchhart et al. (2006) developed, refined and implemented thinking routines in the Innovating with Intelligence project at a charter school in Sweden. In addition, countries such as the Netherlands, Belgium, and the Artful Thinking program in Traverse City, Michigan Public Schools participated in the research. The core site in Lemgashi Akedmi in Amsterdam was a pre K - 12 school with 900 students representing 45 different nationalities where 60% of the school population native language was other than English. The intent of the research was to inform educational practice around the teaching and thinking of thoughtful classrooms. Thinking routines were designed and developed to provide a concrete intervention of thinking while indirectly touching on other cultural forces in the classroom (Ritchhart et al., 2006). Ritchhart’s (2002) research examined schools where thinking was valued and promoted. Through analysis of the classrooms, Ritchhart (2002) extrapolated what he termed the eight cultural forces that create cultures of thinking and learning in schools. Routines were identified as one of the culture builders (Ritchhart, 2002). Routines are a natural part of the classroom and many managerial routines. The use of the word routine is different than strategy as it is intended for purposeful, repeated use. Ritchhart et al. (2006) compares between managerial routines of a classroom as

ones that help students get ready to learn. However they point out that “learning routines guide the actual learning and thinking as students engage in content” (Ritchhart et al., 2006, p. 6).

There are four structural features of a thinking routine: 1) explicit in nature, 2) few steps - easy to teach, learn and remember, 3) serve a purpose or goal - to scaffold and support particular set of thinking not just activities and 4) be an individual and group process. These structures were created to be flexible so that teachers could adapt and modify to meet their needs (Ritchhart et al., 2006).

In addition to the structure of the routine and cultural influence, these routines are based in epistemological beliefs related to learning. Ritchhart et al. (2006) developed these routines as “epistemic moves and messages” (p.14). Epistemic moves are the processes or steps a student goes through in the learning experience which are scaffold by the thinking routines. An epistemic message is the cognitive behaviors that are ideal in a classroom. These are demonstrated in the understanding that is developed in the subject matter. The student also becomes aware of the learning process itself, as it is made visible.

The messages Ritchhart et al. (2006) outlines about learning that are cultivated in these routines is that learning is doing. In the transmission model students “get” knowledge as it is handed to them. In this method knowledge is constructed actively. Another message related to the constructing of knowledge is learning starts with your own ideas. Many of these routines are entry level points when learning a new concept. Starting with students’ ideas builds a foundation for them to become engaged as they are personally invested and they build new knowledge based on existing knowledge. Ritchhart et al. (2006) caution that while they are building new knowledge, they are not unreflectively piling new knowledge on top of old. Routines connect to their prior knowledge, which encourage students to “probe, challenge, and revise existing

knowledge” (p.17). An example provided was the claim/support/ justify routine that enables students to go “through a justificatory reasoning that ends with an invitation to challenge the initial claim” (p.17). Students’ justification of their ideas provides teachers with a method to do so. See Table 1 for examples. As indicated in my earlier discussion, teachers’ misunderstanding of constructivism with the false dichotomies between knowledge acquisition and constructing or building knowledge leaves uncertainty about how students are building knowledge and understanding. My own experience with devising inquiry or project based learning in my classroom started with the essential understandings (big ideas) however, I was not sure if students were building understanding as I resorted to activities. In discussion with a few colleagues of mine about this problem one stated, “Yeah exactly, after the big question what happens next? I don’t really know what should happen next other than have them start the project”. Having routines such as these ensures purposeful thinking about concepts and that knowledge building is happening rather than being left to chance. Teachers also build their own knowledge and awareness of thinking and understanding through the use of these routines.

Table 1 below describes some of the routines and the epistemic moves from Ritchhart et al (2011) alongside the epistemic messages that using these routines relay (Ritchhart et al, 2006).

**Table 1: Examples of some thinking routines with their epistemic moves and messages.**

<b>Routine with brief description</b>	<b>Epistemic Moves:</b> The kinds of “cognitive behaviours we would see in the classroom with the use of routines.	<b>Epistemic Messages:</b> Another kind of conceptual learning that might occur which aligns with meta-learning –the nature of learning and knowledge itself.
<b>See-Think-Wonder</b> – Good to use with visual stimuli	Describe, interpret and wonder	<ul style="list-style-type: none"> <li>• Learning requires personal involvement – when we are asked to share an opinion we are more engaged.</li> <li>• Learning is doing</li> </ul>
<b>Think –Puzzle –Explore</b> –good at beginning of unit to direct personal or group	Activates prior knowledge, wonder and planning.	

<p>inquiry and uncover students' understandings and misconceptions.</p> <p><b>Claim – Support – Question</b></p> <p>Routine to “Dig Deeper” into ideas. Can be used with text or as a basic structure for mathematical and scientific thinking.</p>	<p>Identifying generalizations and theories, reasoning with evidence, making counter arguments</p>	<p>(active learning) – learners demonstrate as well as construct understanding.</p> <ul style="list-style-type: none"> <li>• Questions are engines and outcomes. Questions drive inquiry and fuels search for answers. Questions are also generated at the end of routines.</li> <li>• Learning starts with learner's own ideas. They can recollect prior knowledge or construct in the moment – emphasis on probing, challenging and revising existing knowledge – the relationship between Popper's three worlds.</li> <li>• Learning involves uncovering complexity. Multiple participant bring multiple perspectives which also contributes to complexity.</li> <li>• Learning is a result of reflecting on our thinking (metacognition)</li> <li>• Learning can be a group process and group outcome. One student's ideas sparks another's questions or search for evidence.</li> </ul>
<p><b>The 4 C's</b> – Routine for synthesizing. A text based routine that helps identifies key points of complex text for discussion, demands a rich text or book</p>	<p>Connection making, identifying key concept, raising questions and considering implications</p>	
<p><b>Generate –Sort-Connect</b></p> <p>Highlights the thinking steps of making an effective concept map that both organizes and reveals one's thinking</p>	<p>Uncovering and organizing prior knowledge to identify connections</p>	
<p><b>3-2-1 Bridge</b> Works well when students have prior knowledge but instruction will move it in a new direction; can be done over extended period of time.</p>	<p>Activating prior knowledge, questioning, distilling and connection making through metaphor</p>	
<p><b>I used to think... but now I think....</b></p>	<p>Reflection and metacognition</p>	
<p><b>Sentence-Phrase- Word</b></p> <p>Text based protocol aimed at eliciting what a reader found important or worthwhile; used with discussion to look at themes and implications.</p>	<p>Summarizing and distilling</p>	

Adapted from Ritchhart et al (2011, p.51-52) and Ritchhart et al (2006, p. 16-18)

By sharing their thoughts and ideas, students experience that learning is personal. This personal sharing increases their engagement as they have invested their own thoughts and opinions.

### **Empirical Research on Thinking Routines**

In their work with the schools, Ritchhart et al. (2006) collected data through observations, conducted some in-depth interviews, collected samples of student work and surveyed teachers on the routines. In sharing their findings they did not “attempt to explicate the complete nature of their work but contextualize it by grounding it to exemplify (their) learning about how these routines” (p. 21) operate in practice and in the classroom. They provided a few cases to illustrate their findings. The illustrative examples highlight some indications for teachers to consider when implementing the routines. The routines are not designed to provide educators with the level of quality for each thinking move that comes from collaborative reflection and unpacking of what meaningful thinking looks like. Language was needed to help students unpack the meaning of the routine, and modelling the use of routine is required (Ritchhart et al., 2006). In addition, by making their thinking visible, teachers had more of an insight into students’ knowledge building by seeing conceptions and misconceptions (Ritchhart et al., 2006). These observations in turn informed instruction to further advance understanding. Ritchhart et al (2006) point out that although a teacher struggled with students making connections in his sixth grade mathematics class, the pedagogical issue of making meaningful connects applied to others in their practice as well. Therefore, it is important that educators incorporate time for them to collaborate and push their own understanding of the concepts in the routines forward. An example of such collaboration was devised at Baliak college in Australia where teachers met weekly in structured meeting using the Looking At Student Thinking (LAST) Protocol (Ritchhart et al., 2011). A type of action research where educators made understanding and progressing students thinking a goal for their practice.

**Conclusion**

The need for cognition motivation, research on the impact inclination, and sensitivity as well as theories of self, demonstrate there is more to cognition than ability. An impact of this research from an educational perspective is that educators need to consider the construction of the self-identities of their students as learners and thinkers in the classroom, which cultivates the learning and thinking dispositions. As Sfard and Prusak (2005) argue, “replacing the traditional discourse in schools with talk about construction of identity or longer term task of identity development” (p.15). Curriculum should in part be about assisting learners to access resources for learning such as tools and routines (Claxton & Carr, 2006). Beyond curriculum, it is educators that will enact this process through enculturation in the classroom as we play an integral role in the stories of our students as learners. This reminds us that we have an important responsibility to attend to the relationships of the learners as they narrate their own relationship with knowledge and understanding.

Based on the literature reviewed in this chapter, I propose a research plan in chapter three that will assist educators who plan to implement thinking routines school wide. The research methodology identified for the plan, provides educators with an opportunity to reflect on the effectiveness and impact these routines have on their own unique practice.

## Chapter 3

### Introduction

Changing schools and education to cultivate learner identities and dispositions necessitates a longer view of implementing education (Ritchhart, 2015). This change can be done by shifting the focus to a culture of thinking. Thinking routines provide a framework for educators to make thinking visible, helping to focus on developing dispositions and competencies while students pursue deep understanding. Culture is the values and beliefs that brought a group together and influences the activity carried out by the group. The behavioral norms become subconscious and remain even after the norm is no longer useful to the group. Culture is the messages sent through behaviors, symbols and systems (Ritchhart, 2010). Given this definition, it is imperative that we examine the culture of our schools and education systems. What messages are we sending about learning and thinking that are currently shaping our learners identities and dispositions?

Chapter two outlined that through the transmission mode of pedagogy, we currently send the message that the learner passively acquires knowledge through recall and memorization. This approach has a long and entrenched history with beliefs and assumptions handed down from this perspective shaping the message of learning and the learner for centuries. However, there is an international movement that is addressing these concerns about learning that looks at developing the competencies of students. The global movement to integrate a competency approach is a reflection of the need to become successful in a democratic knowledge building society (Bereiter, 2002). However, educators, such as myself, still use many traditional methods from entrenched belief of knowledge acquisition even though they are attempting to implement inquiry based approaches in their classrooms. Fossilized residuals (Jardine, 1990) leave beliefs

that are subconsciously held by educators despite the beliefs beginning to no longer serve a purpose. As educators move away from valuing an understanding of something (e.g., information on a test, names of places etc.) to an understanding with something (Perkins, 1992) (e.g. connecting ideas and thoughts), they require pedagogical methods to assist students' ability to relate to and manipulate knowledge.

Ritchhart (2015) asserts that a cultural shift is required to enable and develop these educational tools. By creating a culture of thinking, schools focus on learning that is a result of thinking. Among the eight cultural forces identified by Ritchhart (2015), the thinking routines reviewed in chapter two provide educators with an alternate method of enabling students to build knowledge and understanding. These routines make thinking visible for the students collectively and for the teacher who is then able to monitor and assist students with knowledge building. This culture shift communicates that schools are places where thinking is valued, visible and actively promoted (Ritchhart et al, 2011).

As I discussed in chapter one, inquiry and understanding by design provide a framework for the process, but the focus of understanding can often become knowledge acquisition with activities that fail to help students cultivate deep understanding of concepts. My colleagues echoed this when they expressed disconnect between the planned essential understanding and the implemented end product in inquiry based approaches. How could we develop a process where students construct and build knowledge in a purposeful and meaningful way? This led to my research question around what methods would assist educators to continue their transition from a content based to competency based curriculum?

In this chapter, I propose a research plan that explores the above question by investigating Ritchhart's (2011) thinking routines as a method to assist teachers as they transition

towards a competency based curriculum. I will discuss my worldview which will frame my intended research. In addition, I will define and provide a rationale for choosing the methodology critical participatory action research (CPAR) methodology. Finally, I will provide a plan of action to implement this research methodology to gather and reflect on evidence to answer my question.

### **Worldview**

A researcher's worldview impacts the methodology they use to design their research (Creswell, 2013). According to Creswell (2013), "A worldview is a set of beliefs that guide action" (p. 6). Worldviews or stances are perspectives that frame a researcher's questions, observations and interpretations of their data (Cochran-Smith & Lyttle, 2009). I ground my research in the critical participatory paradigm that looks at "inquiry as a critical habit of mind that informs instruction in all aspects" (Cochran-Smith & Lyttle, 2009, p. 120). This form of qualitative research explores the understanding of meaning that individuals or groups ascribe to a social or human problem (Creswell, 2013). Although my chosen research method aligns with the constructivist method of generating knowledge, it is not enough to only gain knowledge. It is important to also act on the knowledge gained. I believe that advocacy and action is required to help marginalized people. The action agenda for reform examines all aspects of practice that might have hidden forms of inequality, oppression, domination, suppression and alienation (Kemmis, 2009).

### **Critical Participatory Action Research Methodology**

The methodology of critical participatory action research (CPAR) fits with my worldview. CPAR is a collective inquiry that participants conduct to improve the rationality and justice of their own practice as well as generate an understanding of this practice (Kemmis et al, 2014). My colleagues and I will develop a critical stance with our practices to in the hopes to

build a culture of thinking that cultivate our students' identities as learners, which will consequently assist in the development of competent thinkers and learners. Since we are investigating our practices and their transformation, it is important to clearly define our 'practice.' I align my definition of practice with Kemmis et al (2014)

A practice is a socially established cooperative human activity in which characteristics arrangements of action and activities (doings) are comprehensible in terms of arrangements of relevant ideas in characteristic discourses (sayings) and when the people and objects involved are distributed in characteristic arrangements of relationships (relating) and when this complex of sayings, doings and relatings 'hang together' in a distinctive human social project. (p. 52)

The significance of this definition broadens all practice—and in my case specifically educational practice—to incorporate all facets that impact practice beyond the scope of instruction. In order to research and transform practice, all facets need to be examined (the sayings, doings and relating) so that educators understand their practice, how they conduct their practice and the conditions under which they practice. In actuality the facets of practice relate back to Ritchhart's (2011) view of culture as the messages we send. As practitioners engaged in CPAR, we will examine the messages we send to our students, each other and the community as a whole in order to improve. According to Carr (2006), action research also allows practitioners to test educational theories as it applies to their practice. Through the research process my colleagues and I will generate knowledge that will test the effect cultures of thinking have on our practice and the message we send to our students.

### **Validity of Critical Participatory Action Research**

Due to the fact that practitioners are generating knowledge about their own practice, it is contextualized and cannot be separated from practice (Somekh, 2006). Therefore it is required to validate this form of local knowledge generation. CPAR is grounded in practical philosophy (Carr, 2006; Cochran-Smith and Lyttle, 2009; Kidd & Kral, 2005). According to Carr (2006) Praxis, which is actualizing what is good and knowing how to apply it, is formed in a dialectical process of practical reasoning. Practical philosophy recognizes that “knowledge which guides praxis always arises from and must relate back to practice” (Carr, 2006, p.426).

The iterative process of CPAR (see figure 6, Valencia College, 2005) generates phronesis, which is the disposition to act wisely and well (Kemmis, 2009). Kemmis (2009) asserts that practitioners learn phronesis by acting as well as possible through information provided by praxis. According to Cochran-Smith and Lyttle (2009) and Kemmis (2009) this knowledge stands apart from the end-product knowledge that is gathered through traditional research. Since the knowledge gathered about our practice is contextualized, the aim in sharing the research findings would not be to replicate, but rather to share our story and use what aspects of our story are relevant for others (Kemmis et al, 2014).



Figure 5: Iterative Cycle of Action Research.

### Limitations

Striking a balance in action research to maintain a critical perspective, share power and develop the project can be difficult. According to Kidd and Kral (2005), the ambiguity of the research process and where it will lead can create anxiety and frustration for the researchers. As a result, researchers may fall back on their own power and consequently inhibit the process from unfolding as it should. In addition, participants who are acculturated to the traditional research methods of relational hierarchy may be resistant to sharing power with the researcher (Kidd & Kral, 2005). Also, if the researcher, such as myself, is in the field, critical ways of knowing may be difficult to maintain (Kidd & Kral, 2005).

While I participate in the CPAR at my school, it will be important to be aware that the process may not have a clear direction and result. However, I think the process can lead to unanticipated information about creating cultures of thinking. It will be important for me to be persistent and keep an open mind during the process. I also anticipate some reluctance by some participants to share in the process due to the fact that I completed a literature review on the topic. Therefore, I think it is important to maintain that applying this process in my classroom is

new for me as well. Communication and inclusion of other's thoughts and ideas will set a tone of trust and mutual respect of what each participant has to bring to the process. I also anticipate that at certain times in the process I will need to share my knowledge from my research. For example, the process of documenting student thinking will be new for all of us. However, based on the literature review I gained some understanding of the intent of documentation and I can share my knowledge and understanding. However, we will all be at the same level regarding the practical knowledge of how to implement the routines in our classroom.

CPAR requires the involvement of co-participants, which may create a challenge as these participants bring their own self-interests and perspectives. (Kemmis et al, 2014; Kidd & Kral, 2005). The advice provided from Kemmis et al (2014) regarding this difference is "to find a way that recognizes differences while seeking unforced consensus about a way around or through them" (p. 153). Therefore it will be important to communicate freely with all participants involved, including the students who will be affected by the implemented thinking routines (Kemmis et al, 2014). It will be essential that participation in the research is voluntary and comprised of individuals who share the same concern about the challenges of transitioning towards a competency based approach in education.

Another challenge with co-researching is the loss of motivation by some participants (Kidd & Kral, 2005). As a result, only a few participants do the bulk of the work while the others become unmotivated or feel a sense of resignation. The process may also be affected by the competing pressures prevalent in the teaching profession as well as the possibility of teachers transferring or moving. Another potential tension may result in a contrast between the acculturated view that all concepts must be completed and that summative marks be assigned at the end of a term, whereas thinking routines are very process oriented and looks at a longer view

of education. Although our district report cards are changing to reflect reporting on processes, teachers find shifting from short term summative views to longer process orientated views challenging to navigate. A potential support strategy is to develop a template in the initial planning process. The template could include an essential understanding of the concept with coinciding thinking moves, as well as a place to link the process and knowledge outcomes that will be reflected on during the process for reporting purposes. This will assist educators to see the relevance and value of using routines as an assessment guide for the next reporting period.

Although it is important to be aware of the limitations this method entails, there are rewards to using CPAR as a method. It is one of the better ways to generate knowledge for people involved (Kidd & Kral, 2005). In my school district and province we will be undergoing a shift in educational approach towards competency based education. All participants involved will be affected by this change and we are motivated to better understand how to transition towards this approach. In addition, Kidd and Kral (2005) point out that action research moves beyond understanding towards a direct role in change. This is also significant because the Alberta Education ministerial order calls for incorporation of competencies in education and action research provides participants with methods of how to test the use of thinking routines and creating a culture of thinking as means to develop students' competencies. Below I will discuss the rationale for using CPAR as the method of action research for my capstone project.

### **Plan Rationale**

According to Kemmis et al (2014), CPAR begins with an identified shared concern among educators and society. This concern problematizes current practice by reflecting on whether these practices are educational, just and inclusive (Kemmis et al, 2014). Although my co-participants will share these concerns, the problems should connect to larger societal issues

(Kemmis, 2010). To begin, it is important to define what is meant by educational. Kemmis (2006) identified practices as educational if they provide opportunities for:

Developing the knowledge, values and capabilities of the individual and capacity for self-determination, self-expression and self-development. As well, throughout the rising generations of developing discourse and culture, social relations, institutions, practice and materials in the interest of bettering the collective (p. 462).

Societal concern for the development of both cognitive and non-cognitive competencies of young people has placed the need for transforming our educational practices. This is evident in the Alberta Education ministerial order which mandates the inclusion of competencies in our program of studies. Beyond the societal concerns for the development of competencies in our students, the practitioners' goals of those involved in CPAR is to help nurture and develop skills and abilities for all students to become successful contributing members of society. Therefore, Kemmis's (2006) definition of education best fits the aim of what the participants would hope to achieve when examining our practice. CPAR also incorporates action to improve or as Kemmis et al (2014) refer to as "practice changing practice" (p. 88). This change necessitates that we reflect on our practice, how we understand our practice, and the conditions in which we practice (Kemmis et al, 2014). The shared concern expressed by my colleagues requires that we examine our current practice and ask how it needs to change to help develop competencies in our students. Below I will examine the current practice in relation to Kemmis's definition to reflect on how educational the practice is or could be.

Table 2: Elements of practices and practice architectures

Elements of practices and practice architectures	
The project of our practice/The practice tradition in which our practice occurs	Sayings - Cultural -discursive arrangements
Does this practice (lie the practice of teaching students how to write expository texts, or our recycling practices at school for example) produce untoward, irrational, unsustainable, unjust consequences for anyone involved or affected? Are we all equally satisfied with our current practice? Or if not, have we identified a shared felt concern? Do we all understand what we are currently doing here - the project of our practice in the same way?	In relation to our practice (the way we do things around here) is what is said (and thought) in this practice and in this situation, rational in the sense that it is reasonable, coherent, comprehensible, accurate, sincerely stated and morally right and appropriate? Or is there evidence that what is said and thought is irrational and that it is unreasonable, contradictory, incoherent, incomprehensible, inaccurate, insincerely stated (or deceptive) or not morally right and appropriate? Or do different people have different views about whether what is said and thought in this situation is rational rather than irrational?
Doings - Material / economic arrangements	Relatings - Social/political arrangements
In relation to our current practices (the way we do things around here) are the things that are done, the resources used in doing them, and the infrastructure of facilities, equipment, set-ups productive and sustainable? Do different people have different views about whether our current practices are productive rather than unproductive? Do they have different views about whether our urgent practices are sustainable rather than unsustainable?	In relation to our current practices (the way we do things around here), are the ways people relate to each other and the social arrangements of the situation just? Or are they unjust because they involve power relationships of domination or oppression (Young, 1990) Do they foster solidarity and a sense of inclusion and belonging among people? Or do they create exclusion or conflict among people? Do different people have different answers to these questions?
Public Sphere to investigate and change some of the differences identified above	
Meeting one another in a public sphere, can we reach (1) intersubjective agreement about the language we use to understand our practices? (2) mutual understanding of one another's perspectives about the consequences of our practices and (3) unforced consensus about what to do about our situation?	

**Does our educational practice promote individual and collective self-expression?**

Kemmis et al (2014) define educational practices that develop self-expression to be the “way things are understood by (educators, students, administrators, community members) and their opportunity for individual and self-expression” (p. 88). Kemmis et al (2014) illustrate this definition with examples of limiting the way students encounter different kinds of knowledge and free speech. I would expand this to include methods of relating to and manipulating knowledge. The current answer to this question would be that we are limiting ways in which students encounter knowledge by focusing primarily on knowledge acquisition through our content based approach in the program of studies and methods. As outlined in chapter two, we are a knowledge building society and the movement towards competency based approaches is internationally recognized. I anticipate that the thinking routines would allow students to construct knowledge and express ideas. In addition, as I mentioned in chapter one and two, educators such as my colleagues and I struggle with understanding and transitioning towards competency based practices. CPAR would provide an opportunity for us to better understand our own practices and consequently change them to help promote individual and collective self-expression.

**Does our practice promote individual and collective self-development?**

Another branch of educational practice is promoting self-development. According to Kemmis et al (2014), this branch focuses on “the way people do things and their opportunity for individual and collective self-development” (p. 88). Do our practices limit the ways to do things or to develop particular skills sets? I think our current practice is not providing students with an opportunity to fully develop their dispositions to develop the competencies outlined in Alberta Educations’ ministerial order. Although we are transitioning through inquiry learning practices, we have been challenged by our entrenched and fossilized residuals that it becomes challenging

to see another perspective or method. CPAR provides us with the opportunity to test and reflect on how to promote self-development of our students' competencies through thinking routines and by creating a culture of thinking in our classes.

Creating a culture of thinking approaches education from a long view that focuses on the students' identities as learners, which disposes them to display the competencies in the ministerial order. I anticipate that the documentation we gather will begin to demonstrate an improvement in students' thinking skills as well as their ability to independently use them. I also anticipate that educators who adopt and reflect on the student documentation will find this method a valuable approach to move away from solely relying on knowledge acquisition towards helping students develop understanding.

**Does our practice help promote the way people relate to one another and help them to be orientated to the good of each person and humankind?**

According to Kemmis et al (2014) it is also important to examine the social arrangements of practice in CPAR to ensure that the practice is just and inclusive. Do the power relationships cause domination or oppression? I think our current focus on content and knowledge acquisition excludes the voices of students and parents. As educators, we tend to make decisions about our practice without hearing from others. As we transition towards a competency based approach, it is imperative that all perspectives be included. Creating a culture of thinking requires that thoughts and ideas be expressed and discussed, therefore CPAR would help ensure all voices in our school are heard and included. This will help reveal any hidden forms of oppression or exclusion that perhaps we have not thought of in our practice or in this research.

The above rationale addresses the questions that Kemmis (2009) indicates are essential to connect CPAR with the broader issue of creating a better society by improving education for our students. In addition, it is important to examine all aspects of our practice to ensure the

transformation is just, inclusive and educational according to Kemmis' (2006) definition. As one of the transform lead teachers in my school, I feel that CPAR provides an excellent opportunity for my colleagues and I to address our shared concern about the need for methods to develop student understanding and skills in a competency based approach. With the ministerial order from Alberta Education and a change in the future program of studies, CPAR provides an excellent method for the group to embark upon inquiring into the use of thinking routines to assist with creating a culture of thinking in our schools. Outlined below is the plan I devised to put CPAR into action within our schools.

### **Plan**

#### **Establishing Co-Participants**

The first step in CPAR is to gather a group of co-participants who share the same felt concern (Kemmis et al, 2014). As I indicated in chapter one and two, my colleagues have echoed the same concern in casual staff room conversation. Secondly, the ministerial order mandated by our provincial government indicates an imminent need to shift our cultural perspectives in our professional practice. This shared concern is the impetus of further exploring who else hold this concern. To begin, I would include other colleagues who express a shared concern at a staff meeting and who would be interested in implementing the thinking routines in their classroom. I anticipate a small group will be interested to begin with. The reflection questions, posed relate to elements of our practice (the project) and our practice architecture (the practice landscape) ensuring that all aspects of our practice is being examined. Kemmis et al (2014) refer to the initial questions as reconnaissance gathering. The reconnaissance questions reflect analysis of the sayings, doings and relating aspects of our practice. The sayings which Kemmis et al (2014) refer to as the communication space between all participants. Further analysis of the practice architect relate to the cultural discursive

arrangements that may enable or constrain others' sayings. There are a set of questions that assist to analyze the doings - activities that produce or achieve something in physical space which also relates to the practice architect of material-economic arrangement which can enable or constrain others' doings. Lastly, the final set of questions examine the relating aspect of our practice. The relating investigates the social space focusing on the power dynamics of the practice. In the practice architects, the social political arrangements of the practice landscape that may disempower, oppress, and exclude certain individuals making the practice unjust and alienating (Kemmis et al, 2014). I intend to also use these questions at the end to provide an indication of visible thinking as an effective method for teachers transitioning from content to competency based approaches in our practice. See Table 3 for the grouping of questions in each set which is adapted from Kemmis et al (2014).

Table 3: Reconnaissance questions: Identifying a collective felt concern

Elements of practices and practice architectures	
The project of our practice/The practice tradition in which our practice occurs	Sayings - Cultural -discursive arrangements
Does this practice (lie the practice of teaching students how to write expository texts, or our recycling practices at school for example) produce untoward, irrational, unsustainable, unjust consequences for anyone involved or affected? Are we all equally satisfied with our current practice? Or if not, have we identified a shared felt concern? Do we all understand what we are currently doing here - the project of our practice in the same way?	In relation to our practice (the way we do things around here) is what is said (and thought) in this practice and in this situation rational in the sense that it is reasonable, coherent, comprehensible, accurate, sincerely stated and morally right and appropriate? Or is there evidence that what is said and thought irrational or that it is unreasonable, contradictory, incoherent, incomprehensible, inaccurate, insincerely stated (or deceptive) or not morally right and appropriate? Or do different people have different views about whether what is said and thought in this situation is rational rather than irrational?

Doings - Material / economic arrangements	Relatings - Social/political arrangements
<p>In relation to our current practices (the way we do things around here) are the things that are done, the resources used in doing them, and the infrastructure of facilities, equipment, set-ups productive and sustainable? Do different people have different views about whether our current practices are productive rather than unproductive? Do they have different views about whether our urgent practices are sustainable rather than unsustainable?</p>	<p>In relation to our current practices (the way we do things around here), are the ways people relate to each other and the social arrangements of the situation just? Or are they unjust because they involve power relationships of domination or oppression (Young, 1990) Do they foster solidarity and a sense of inclusion and belonging among people? Or do they create exclusion or conflict among people? Do different people have different answers to these questions?</p>
<p>Public Sphere to investigate and change some of the differences identified above</p>	
<p>Meeting one another in a public sphere, can we reach (1) intersubjective agreement about the language we use to understand our practices? (2) mutual understanding of one another's perspectives about the consequences of our practices and (3) unforced consensus about what to do about our situation?</p>	

Kemmis et al (2014, p. 155)

In addition, it is imperative in CPAR's critical paradigm to include all voices of those involved to ensure that no one is alienated or oppressed. The voices of parents and students are sometimes not heard when implementing practices in schools. Although my question examines the use of thinking routines as a method to help teachers transition from a content based to competency based approach, it is within a broader context of creating a culture of thinking for all stakeholders in our school community. Including other participants is an important aspect of CPAR which will help bring about changes in practice.

Through parent council, parents have had a small say in the programs of the school. As one of the stakeholders in their child's education, it is important to include their voice and engage them in an ongoing conversation about the goal and nature of education. A survey for the parents to share their thoughts and ideas would be sent out with the following questions: 1) What do you see as the purpose of education? 2) What skills should schools develop to ensure that

your child can be a successful contributing member of society? 3) What concerns do you think the school should address? As the CPAR is put into practice, updating parents at council meetings and engaging them in ongoing conversation about visible thinking also creates awareness. When the documentation is displayed and parents view the documentation, we could engage them in a See/Think/Wonder routine about what they notice, think and wonder about student thinking and learning. This again will include parent voices as we engage in CPAR.

Student voices will also need to be heard. Working in an elementary setting provides challenges for primary aged students who may be challenged to express their ideas. A simplified survey question for students would help to incorporate the voices from students in grades 4-6 and perhaps a few questions for students from grades k-3 using pictures and words to respond.

Cushman and Rogers (2013) as cited by Ritchhart (2015) used three questions to inquire about students' needs in learning. "1) What do you wish teachers knew about you as a learner? 2) What are things teachers do that let you know teachers value and respect you? 3) What advice would you give teachers, to bring out the best in students?" (p. 225). Including other participants and their voices is an important aspect of CPAR which will help bring about changes in practice.

As I mentioned in the limitations, reaching out to include the voice of others and hear their felt concerns could pose potential problems for my research. First, many participants will be new to the methodology of inquiring into their practice so starting with a smaller number of co-participants would make learning the process more manageable (Kemmis et al, 2014). Second, Kemmis et al (2014) assert that a balance of intersubjective agreement about the language we use and mutual understanding of one another's perspectives of the consequences of our practices should be maintained while also reaching for an unforced consensus. Therefore, I intend to

begin with only five educators, including myself, who voluntarily want to investigate the use of thinking routines.

When collective shared concerns are expressed and a small group of educators reach an unforced consensus it is important to use a written intention to clarify what we plan to investigate (Kemmis et al, 2014). It is our written, collective intention that we will reflect upon to evaluate the impact that implementing thinking routines in our classroom has as an effective method for educators when transitioning towards implementing a competency based approach into our practice.

### **Establishing Co-participant Protocols**

In addition, this new approach will necessitate a shared agreement for many participants about the purpose and conduct of the CPAR meetings. These protocols will outline the need for communicative freedom, enabling all participants to be honest and to establish a group norm of trust and reciprocity. To limit my position of authority and power as the researcher, it will be helpful to rotate among the participants the facilitation, minutes-taking and documentation roles at our meetings. (Kemmis et al, 2014) In the interest of promoting intersubjective agreement and mutual understanding of our practice, it is also important for the facilitator to ensure that ideas expressed are accurately understood and morally right and appropriate (Kemmis et al, 2014). As well, all participation in CPAR is to be voluntary. These considerations and principles will be outlined in the group protocol agreement form I modified from Kemmis et al (2014) to communicate and provide consensually agreed upon procedures for CPAR (See Appendix A).

### **Ethical Considerations in CPAR**

According to Kemmis et al (2014) the boundary between research and practice is blurred in CPAR. Educators continuously investigate practices to find better ways to teach. We are

bound by a professional code of conduct to do no harm to student. These considerations apply to the teacher/co-participants who will be forming the group.

### **Planning and Implementing Visible Thinking in the Classroom**

Once the co-participants agree to the protocols we are able to begin planning and implementing visible thinking routines in our classroom. As outlined in chapter two, these routines are designed with epistemic moves to help students move through ideas to deepen their understanding. Teachers would benefit from planning time to review the concept and identify the essential understanding or driving question. As indicated previously, the uses of routines in conjunction with the “big ideas” of a concept are worth learning for students. These essential understandings help focus the learning and provide direction for what concepts students are developing. By providing focus and direction, this helps teachers ensure they are moving towards purposeful, deep understanding and not just providing work or activities.

In the beginning, participants will be new to implementing the routines and it is recommended that they start by choosing one routine that they could use in different subject areas. I developed a template for teachers that identifies what essential understanding and routines would help with the understanding they want to develop (see Appendix A). I anticipate that many teachers will have anxiety and uncertainty as they attempt to implement this new approach. The Compass Point Routine (Ritchhart et al, 2011) will be used to help orientate teachers before they embark on learning and planning. A list of four questions will orientate the group as we collectively embark upon implementing thinking routines in our practice. 1) What worries you about implementing thinking routines? 2) What questions do you have or what do you need to know? 3) What excites you about implementing the routines? 4) What steps are you going to take next to implement the routines? The definition for creating a culture of thinking outlined in chapter 2 refers to an individual or collective group who come together. This applies

to any group that comes together where thinking is valued, visible and actively promoted. The use of the routines with the participants will not only be helpful in learning about the routines, but they are also a method to work through their own ideas and understanding about their own practice as they implement changes.

After listening to their excitement, concerns and questions we will undertake the task of learning more about the thinking routines as part of creating a culture of thinking in our classroom. *Making Thinking Visible* (Ritchhart et al, 2011) has practical guides for choosing and implementing thinking routines in the classroom for educators. In conjunction, I will put together a PowerPoint and gather videos to provide an overview of the purpose of thinking routines and how to implement them. The *Making Thinking Visible* book has a DVD with examples of teachers implementing certain routines in their classrooms that are outlined in chapter two.

As the teachers try the routines in their classroom, it is important that they document student use of the routines and evidence of thinking on chart paper, journals, videos and pictures. The documentation allows teachers to reflect on and interpret the thinking. As well, to compare what they intended to do with what actually happened and use the information to develop student thinking further (Krevechevsky et al, 2013). Interpreting data involves a paradigm shift for many teachers and I anticipate that some teachers will need guidance regarding the types of documentation to gather. Ritchhart et al (2011) outlined the LAST (Looking At Student Thinking) protocol to assist with teachers' analysis of documentation of student thinking (see Appendix C). According to Krevechevsky et al (2013), interpreting documentation with colleagues is a powerful professional development opportunity for everyone as it can expand,

change or strengthen teachers' understanding of learners. As well, as teachers reflect on the documentation and find ways to move forward they can adapt and change curriculum.

Review of documentation is an integral step in the process of using thinking routines to create a culture of thinking in the school as it provides continual support and time for the teacher to research into the thinking their students are doing and how they are progressing. As Krevechevsky et al (2013) state "Documentation 'objectifies' the intangible manifestations of thinking and understanding." Documentation supports three forms of accountability for educators in the learning process (Krevechevsky et al, 2013). Firstly, accountability to self by reflecting on what was intended to be learned in relation to what actually happened. Secondly, documentation provides accountability to each other as professionals to learn and reflect collectively. Lastly, it provides accountability to the larger community by providing evidence of different types of learning that people value but is not reflected on standardized tests. It also provokes conversations about teaching and learning in a wider community by challenging unexamined notions of children's capabilities. All these reasons for documentation, contribute to a larger picture of shifting towards a culture of thinking and promoting the development of competencies in the students. See Figure 7 (<http://www.visiblethinkingpz.org>) below for examples of documentation and questions educators would use to reflect and interpret student thoughts.

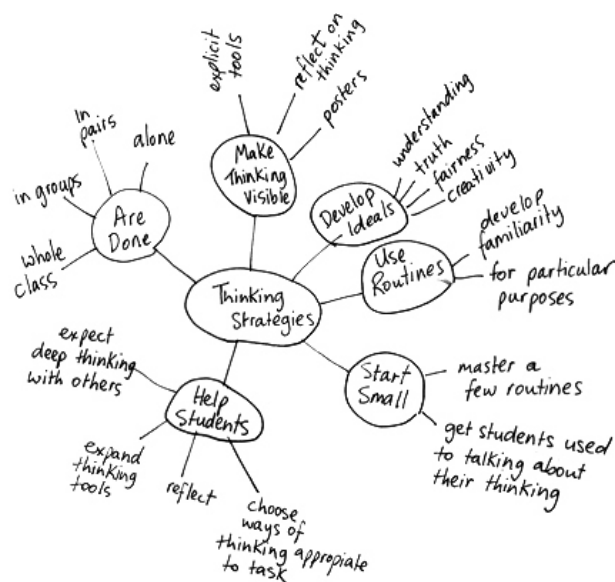
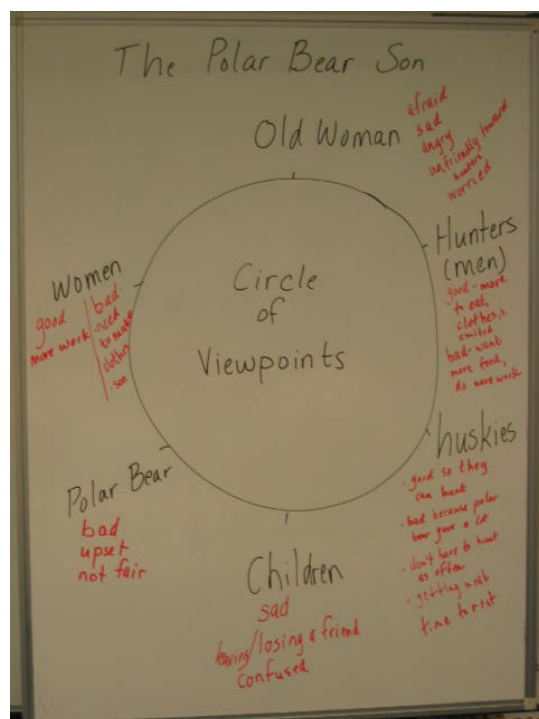


Figure 6: Sample Documentation of Thinking Routines from Students

Although teachers will be documenting student thinking to reflect and move forward in developing these methods in their practice, the evidence and documentation gathered for CPAR should shed light on the shared concern or question for the purpose of the research. The evidence should illuminate an understanding of how the implementation of thinking routines and collective interpretation of the thinking assists teachers to transition from content based towards competency based approaches in their practice. How does using the routines and reflecting on student thinking impact the sayings, doings and relatings in our practice? (See Table 3)

According to Kemmis et al (2014), each participant is a living source of evidence and participants must keep their own records as they continue their involvement in CPAR. Participants should build a portfolio of different kinds of evidence on the impact of how visible thinking impacts the sayings, doings and relatings in their practice. A variety of methods and media are encouraged to triangulate and consequently ensure validity (Cochran -Smith & Lyttle, 2009; Kemmis et al, 2014). Diaries, journals, logs as well as the documentation from the routines can be used to shed light on this area. Audio, video recordings of their practice and reflections on their practice. The online program Notebook provides an excellent method of gathering the evidence in one place that can be shared with all participants. Each participant can have a Notebook to write, upload video or pictures into a digital notebook reflecting their sayings, doings and relatings in their practice using the questions in Table 2 as reflection guide.

Table 4: Investigating practices and the practice architects that support them

Elements of Practice	Practice Architectures
<p>Project</p> <p>What do participants - including myself and others - say they are doing, or intend to do or have done? (Note different participants and others may answer this question differently)</p>	<p>Practice landscape</p> <p>How do different participants (and others involved or affected) inhabit the site in different ways, that is, interact with different people and objects, and occupy different places and spaces in the site as a whole?</p>
<p>Sayings (communication in semantic space)</p> <p>What do different participants say in the practice as they do it (what language is used, especially specialized language used in this practice)?</p> <p>What ideas are most important to different participants?</p> <p>What language ideas do different participants use about the practice (especially to describe, explain, and justify the practice before or after they do it)?</p> <p>How are different participants' language and ideas changing?</p>	<p>Cultural-discursive arrangements (Note: one person's sayings are also practice architectures that enable or constrain other's sayings)</p> <p>Where does this language or specialist discourse come from (text, policies, professional communities, language communities)?</p> <p>Who speaks this language in the site?</p> <p>Who speaks it most/least fluently?</p> <p>Is there contestation among people involved or affected about language or key ideas or importance?</p>
<p>Doings (activities, often producing or achieving something in physical space-time)</p> <p>What are participants doing?</p> <p>Are there sequences or connection between activities?</p> <p>Are intended ends or outcomes being achieved?</p>	<p>Material-economic arrangements (Note: one person's doings may enable or constrain others' doings)</p> <p>What physical spaces are being occupied over time?</p> <p>Are particular kinds of set-ups of objects involved?</p> <p>What material and financial resources are involved (Are the resources adequate?)</p>

<p>Relatings (relationships in social space, especially relationships of power and solidarity)</p> <p>How do participants (and others involved or affected) relate to one another?</p> <p>Are there systems of positions, roles or functions? Are relationships of power involved?</p> <p>Who is included and excluded from what? Are there relationships of solidarity and belonging (shared purposes)?</p>	<p>Social-political arrangements</p> <p>What social and administrative systems of roles, responsibilities, functions, obligations and reporting relationships enable and constrain relationships in the site?</p> <p>Do people collaborate or compete for resources (or regard)? Is there resistance, conflict or contestation?</p> <p>Is the communicative space a public sphere?</p>
<p>Dispositions</p> <p>Understandings: How do participants understand what is happening?</p> <p>Skills: What skills and capacities are participants using?</p> <p>Values: What are participants' values, commitments and norms relevant to the practice (concerning the people and things involved)?</p>	<p>Practice traditions</p> <p>What do our observations tell us about practice traditions in the site, in the sense of 'the way we do things around here'?</p> <p>Is there evidence of professional practice traditions (not exclusive to this site) - like following an inquiry approach in science teaching or following a state policy - and do these enable or constrain what participants how to achieve in this site?</p>

Kemmis et al (2014, p. 154)

### **Monitoring the Evidence**

As I review the teachers' Notebook entries of journals, diaries, pictures, video, I will examine how the method of visible thinking impacts their practice, understanding of their practice and conditions that affect their practice (Kemmis et al, 2014). I will use the questions from Table 2 to assist with the monitoring. At this stage in the process I will begin a narrative account to answer the questions in Table 2. I may notice some evidence missing and plan on how I could obtain more evidence, perhaps using semi-formal interviews or questioning the students. The narrative should be thick and rich with details to provide credibility for the research (Connelly and Clandinin, 1990).

### **Enacting and Observing: The Product**

This part of the plan is considered the end of the first cycle of CPAR. After implementing the thinking routines and gathering all of the participants' documentation, it is time to pull the observations together and collate the evidence (Kemmis et al, 2014). This stage is the continuation of the reconnaissance, where participants reflected on current practices and practice architects. All participants share narrative accounts with each other or verbal summaries of their observations and evidence. What aspects of thinking routines are implemented and changed their practices (sayings, doings and relatings) and what parts of using the thinking routines have become part of the practice architects? It is important that this part be done early enough to see if there are any holes or gaps in evidence gathering. Will we need to collect more? As well, by bringing our narrative accounts into the public sphere, we will engage in communicative action with each other and it is essential that we maintain a mutual understanding and unforced consensus of what was said (Kemmis et al, 2014). The following questions from Kemmis et al (2014) act as a guide for discussion and consideration when sharing our evidence:

- Is the way we understand what is happening in the situation rational or unreasonable?
- Are the actions productive and sustainable or turned out did they turn out to be unproductive and unsustainable?
- Are the relationships with others in the situation just and inclusive? (p. 107)

By reflecting on these questions while sharing our evidence, all participants are provided an opportunity to examine and understand their practice in relation to the changes that they made. If the evidence indicates anything untoward in relation to the above questions it is also essential

to explore why. Were there any constraints placed on practices and practice architects by implementing the routine? Or were there outside constraints by our practice or practice architects that placed constraints on effectively implementing the thinking routines?

At this point it is also important to return to the shared felt concern to see what conclusions can be drawn from the appropriateness of the shared concern. Is it still relevant as a shared concern?

- How would we modify our concern now? In addition, it is important to also review our notes from the questions asked during the reconnaissance gathering.
- What could we add to our undemanding and “modify the initial diagnosis of what needs to be done?”
- How did our initial plan compare with what happened?
- How might you change what you did?
- What would you do differently to improve the situation?

I anticipate that using the thinking routines in conjunction with group reflection on the documentation of student thinking will be beneficial for participants and impact their educational practice. As indicated in the rationale and in previous chapters, these routines are designed to promote thinking and learning dispositions in students which will consequently over time develop their competencies as learners. I also anticipate some outside constraints being placed on the effective implementation of the routines because creating a culture of thinking takes a longer view of education that coincides with developing competencies, which takes time to develop. Our current program of studies reflects more of a content based approach which has copious amount of outcomes to be covered in a short time frame (each reporting term). This difference might create tension for educators who feel they need to have all learning completed

by the end of the term. Although the ministerial order calls for an implementation of competencies, the new program of studies, which is currently being developed at this point in time, does not have an implementation date. The imposed time frame of terms and current program of studies might create a constraint on the effective implementation of the routines to develop a deeper longer view of education. This might require participants to modify implementation of the routines so that they are better able to navigate their use in conjunction with the current program of studies in Alberta.

### **Reflection**

At this stage in the research, participants bring their narrative accounts to share in a public sphere for conversation to interpret, synthesize and draw conclusions about the impact visible thinking has on their practice. It is at this phase that I would reflect upon my own practice. According to Kemmis et al (2014) CPAR aims to help educators understand their own practice, the conditions under which they practice in order to make the practice and consequences more rational and reasonable, productive and sustainable and just and inclusive. It is important that I reflect upon myself as participant as well with other participants. According to Kemmis et al (2014) some prompts to consider when reflecting:

- How does my account of my action compare with what I planned to do?
- Did aspects of my practice change in the ways I wanted them to? How? Why?
- What were the anticipated and unanticipated effects? Intended and unintended effects? Side effects? What caused these effects?
- What were the constraints? Why?
- Which aspects of the situation have changed most significantly in relation to the challenges of implementing thinking routines in my practice? What aspects seemed most resistant? Can I now think of another approach that might be worth trying?

- Did my understanding of my practice improve? How? Why?
- In what sense were changes in aspects of my practice in and around my concern regarding transitioning from content to competency based an outcome of my own deliberate changes in practice?
- In what ways did existing practice architectures in my setting turn out to be a source of resistance to implementing thinking routines in my practice? What is the appropriate action to take to negotiate, mitigate or confront this resistance?
- What tensions and connections are among the practice architectures in my work? Which are most immediate interest and concern? Which would be most productive to work on?
- What further changes could be taken to alleviate any conflicts and what resistances do you anticipate? How can I involve others in these changes?
- What rethinking of transitioning from content to competency based approach is necessary?
- What re-planning is necessary?
- What further or alternative actions may be appropriate or feasible?
- What should my next action steps be? How can I best align my efforts with the efforts of my co-participants in the public sphere?
- How does my interpretation of what is happening justify in educational terms my proposed action? (p. 111)

The reflection process is similar to the reconnaissance gathering at the beginning of the research plan. It provides an opportunity for me as a participant to take stock of the impact of thinking routines on my practice and decide if they are beneficial to assist with transitioning from a content based approach in my practice towards a competency based approach.

**Group Reflection**

Finally, all participants draw our reflections together to provide an interpretive statement that synthesizes our conclusions (Kemmis et al, 2014). This reflective statement draws conclusions based on the initial shared concern of the methods to assist teachers transition from content to competency based approaches in education, our initial plan with what was learned from implementing the thinking routines. It should reflect how I see my practice, my understanding of my practice and the conditions under which I practice, as well as how my co-participants may see things similarly or differently from their perspectives (Kemmis et al, 2014). Therefore the statement should provide some indication for myself and others if thinking routines provide a useful tool to incorporate in a competency based approach.

**Conclusion**

This proposed research plan for my capstone project in chapter three attempts to investigate how effective thinking routines can be implemented as a method for educators in transitioning from a content based to competency based approach in their practice. Using CPAR as a research methodology allows me and other educators to test the impact of the thinking routines and creating a culture of thinking has on our practice in its entirety. The impact from the incorporating thinking routines in our classrooms, I anticipate, will make our practice more educational, just and inclusive as we continually work towards improving our practice. I also anticipate the potential results from this research will resonate with other educators who are faced with similar challenges in their practices.

In the next chapter, I will reflect on how making thinking visible fits with my expanded view of education and my role as an educator. I will also outline some advice for educators who are interested in implementing my research plan in their school community.

## Chapter 4

### Reflection

*Culture hides more than it reveals and what it hides, it hides most effectively from its own participants.*

*~ Edward Hall*

“The single biggest problem in education is that no one agrees on why we educate,” is the opening statement in Ritchhart’s (2015) latest book *Creating cultures of thinking: the 8 forces we must master to truly transform our schools* (p.15). Two ideas strike me when I read this statement, first what is the role and purpose of education and second why does no one agree about why we educate? As a teacher, I found it strange that I’ve never considered the purpose and role of education. Our profession assumes that we would know the reason our jobs exist and why we do them. We educate to teach children about the subjects and help them learn. Does this mean the same thing to all of us? Do we agree on what it means to learn and understand? Most importantly, is it effective? Perhaps this lack of consideration partially contributed to the difficulties I experienced transitioning to a competency based approach. However, the methods I had at my disposal to create learning opportunities for my students did not match the purpose as they were based more from a content based approach to education.

In my undergraduate education program, we learned how to write objectives and unit and lesson plans. We also learned how to teach the subject, but never stopped to consider why these subjects are important or what ideas from these disciplines are worth learning. We never reflected on why we are approaching education in this manner. Once I secured a teaching position, I was too busy trying to implement the program of studies and cover all the material to even consider the reason and purpose we educate. Perhaps this is the reason why Eisner (1979) states “teachers will close the door and do what they know how to do and believe is best for

students” (p.82) when faced with new ideas related to education. Perhaps the daily grind gets in the way of reflecting upon these questions that may seem too big and vast with the limited amount of time we have to teach. Upon reflection, it seems apparent that my perception of education, curriculum, learning and pedagogy was rather limited. In this chapter, I will reflect on how my combined experiences within the Masters of Education program have expanded my beliefs, thoughts and actions regarding education and my role as an educational professional.

The perceptions we enact in our classroom—implied or explicitly understood—are driven by beliefs that we hold about education, learning and our role as a teacher. These beliefs or world views may not be pure in form, but rather exist on a continuum that has shaped education. Eisner (1979) calls these world views that impact curriculum ideologies. He defines these curriculum ideologies as “beliefs about what schools should teach, for what end and what reason” (p.48). Eisner (1979) clarifies that the term ideologies is used in a plural form as there is no single belief that drives education (p. 47). The realization that these pluralistic world views influence curriculum expanded my understanding of the influences and drive that the beliefs place in enacting the curriculum. Therefore, I define my expanded view of curriculum as a set of interrelated beliefs that are set in motion. Beliefs are the compass that provides direction before we set sail with our students on the voyage of learning. Therefore it is important as educators that we are aware of the beliefs we are setting in motion in our classrooms.

Previously my belief was that the curriculum was the program of studies and I was delivering that program to my students so they could learn the content identified in the outcomes. This perspective coincides with the Bobbitt’s Scientific method in curriculum (Flinders and Thornton, 2013) which makes the curriculum adhere to scientific protocols of experimentation (p.12). In addition, the Taylor paradigm with the designed Basic principles of curriculum and

instruction began to ask the questions about the purposes of education and how to organize these methods (Flinders & Thornton, 2013). According to Taylor, objectives provide goals for the curriculum, are clearly stated and provide a selection and organize content. As well, specified behavior and content makes evaluating outcomes a possibility. However, one of the limitations Eisner (Flinders & Thornton, 2013,) points out is that an “unexamined belief in curriculum objectives can become dogma.”(p.109). In retrospect this dogmatic view of objectives and outcomes contributed to some of the difficulty I experienced when implementing the new program of studies. It is so engrained to look at the outcome first and provide activities that would support the outcome. I ignored the scope and sequence which provides the connection to the essential understanding of which I should have been developing. It is also so engrained that objectives be developed for lesson plans that many of my colleagues and I had problems expanding our understanding.

Both Bobbit and Taylor’s scientific view of curriculum translated into the perception of the learner and teacher. The learner has needs and the needs have to be met by the school. In this paradigm, teacher as technician is the role of the educator. We must deliver the prescribed program of studies that was designed through consultation with outside subject specialists. As was my initial limited perception of education and my role to deliver the program of studies and help students learn the content, this view of education is the dominant view that persists today.

Although this dominant view of education prevails, this belief is not the only one that has influenced the way I viewed my role as an educator. As Eisner (1979) indicates, the ideologies that shape education are not enacted in a pure form. Although I saw my role as an educator primarily as a technician, I did have students in my room who had unique needs and came with their own individual strengths and weaknesses that I needed to consider when helping

them learn. One of the major criticisms of the Taylor paradigm and the scientific approach to education is that it created a culture that was alienating and indifferent to the student as a person (Eisner, 1979). In contrast to this perception of education, progressivists brought the worldview of human development and the needs of the child into the educational paradigm.

It is through thinking and providing the resources for children to think that intellectual growth is provided. According to Eisner (1979) “What Dewey called growth did not emerge from biology or genetics alone; it requires resources from culture” (p.68). This is significant in changing the perception of the learner from a fixed intelligence to seeing the learner as capable of learning and growing. Dweck’s (2000) research, as well as Deakin - Crick and Goldspink (2014) research highlighted in chapter two, confirms this belief. Creating cultures of thinking aligns with this notion that learners can make meaning and with Dewey’s perception that “educational situations through which a child becomes increasingly able to deal with and grows increases a child’s competence” (Eisner, 1979, p.68). It becomes our focus as educators to provide an environment that promotes growth in understanding. Ritchhart (2011, 2015) sees culture as an avenue to develop the intellectual capacities of students. It is interesting to note that even as I reflect back on Eisner’s (1979) discussion on progressivism, I continue to develop a deeper awareness of how this transpires in the classroom. Initially, I looked at the statement of the whole child and noticing the needs of the child as important. However, it is also the belief that the child is capable of learning and growing that expands my view of the nature of education. This statement also indicates that the global shift towards competency based approach in education is shifting towards a belief that the learner is capable of growing and developing competence. This belief about the learner as capable of thinking and processing

changes the educator's approach to learning. Learners seen as meaning makers are capable to build knowledge and understanding.

The concept of considering who the learner is translates to an expanded notion of the learner and learning consequently expanded my understanding of pedagogy beyond delivering the program of studies. Mere transmission of knowledge to a passive learner is too narrow a definition that does not address the responsiveness of the practitioner to the needs of the learner. This notion of pedagogy is reiterated in Loughran's (2013) expanded definition of pedagogy that becomes more complex through the teacher-learner relationship which develops as a result of the problematic nature of learning.

In order for a teacher to be responsive to the needs of learners, practitioners must first be aware of those needs. When I anticipate struggle or notice disengagement and respond accordingly, I am noticing first then adjusting my practice accordingly. However, with my shift in focus towards building understanding, I will also adjust to ensure students are making the kinds of connections I focus on in the thinking routines and that they are building an understanding. When my staff and I reflect on the documentation of student thinking, we are noticing places of understanding and misunderstanding and discussing where to take their thinking next to assist with meeting their needs. All of this reflects a more complex role of an educator.

Along with the expanded view of pedagogy, I broadened my view of curriculum. Critical Theorists brought to light some of the challenges associated with the focus on objectives and content. Eisner (1979) brought forward the notion of explicit, implicit and hidden curriculum. The explicit curriculum is stated openly in the program of studies. This explicit curriculum corresponded with my own limited view of curriculum. However, through the overt teachings

and structure of the school, there are implied messages. These are subtle messages about learning and education provided to our students and reinforced as the culture of the school.

The hidden curriculum is about how what is excluded provides a message to our students. When focusing on certain subjects, for example, as sanctioned or considered core, sends a message that other subjects such as art and health are not as important. This could be applied to forms of knowledge and understanding. The message sent is that knowledge is an object and learning is passive. My experience with students is that assigning grades sums up what a student is capable of and establishes a fix mind set with regards to intelligence. This broadened my perception of curriculum that the beliefs that are set in motion and these beliefs are what create the culture of our classroom and school.

According to Eisner (1979) it is the hidden and implicit curriculum that impact students in some way more profoundly than the explicit curriculum. Ritchhart et al (2011) and Ritchhart (2015) continually ask educators to reflect on the messages of learning that we are sending our students. I think this is why creating a culture of thinking resonates with myself as an educator. Critical theorists are important to the development of curriculum because they create an awareness that otherwise might not have been considered.

Awareness and understanding of how we learn and the concept of different forms of knowledge are beginning to make their way into education. The notion that there is one way to make meaning or represent knowledge and understanding was questioned as other theories began to point to multimodal representation. The concept of cognitive pluralism has expanded my understanding of learning and the role of education. No longer is there one way to arrive at understanding nor is there only one way to represent understanding. This has become evident with implementing balanced literacy and a revised math curriculum that promotes different

methods of arriving at an answer through inquiry. However, my research in this capstone project has provided me with an opportunity to develop a better understanding of the way that students are able to develop understanding both collectively and individually.

As discussed previously in the literature review in chapter two, there is research that supports expandable intelligence. It is the environment in which the child is surrounded that provides opportunities for the intelligence to grow (Gardner, 1983 as cited by Eisner (1979); Ritchhart et al 2011, Ritchhart (2015). As Eisner (1979) indicates, “If the kind of mind that children can come to own is, in part, influenced by the kinds of opportunities they have to think and if these opportunities are themselves defined by the kind of curriculum schools provide, then it could be argued that the curriculum itself is, as Bernstien (1971) has suggested, a kind of mind-altering device” (p.81). More expansive and perhaps less sinister sounding is that curriculum is beliefs set in motion that become the culture of the school. It is this culture that shapes the identity of the student as a learner and with that a bigger responsibility on us as educators to become more aware of the messages we are sending to our students about what is considered valued and important.

The concept of cognitive pluralism also expanded my understanding of myself as an educator. Aristotle’s three forms of knowledge--theoretical, practical and productive--have also expanded my understanding of my own professional role as an educator. As I discussed in chapter three, the practical knowledge that educators bring empowers our profession and expands our role further beyond technician. By acknowledging that the practical knowledge educators possess is valid then frees the teacher to enter the role of researcher and thus inquire into our own practice. Through entering the role of teacher-researcher, we are then able to enact what Freire calls praxis, which is “reflection and action upon the world in order to change it”

(Freire, 1970, p.33). No longer do I have to use “best practices” or rely on outside experts to tell me what is best in my classroom. Transforming the role of the educator liberates us to reflect and make changes to better improve the learning for my students.

According to Cochran-Smith and Lyttle (2009) once the practitioner is free to take on the inquiry as stance, a transformative view of practice takes place. A third partner is added to the researcher-teacher relationship - leader. When teachers are researchers and generate knowledge from inside their own practice, not only do they enter a leader relationship to direct their own professional development, they also enter this relationship by sharing their knowledge with others. This interconnected relationship transforms the traditional relationship where the researcher, leader and teacher are seen as separate.

This expanded notion of my professional role allows what Freire defined as praxis as he states, “reflection and action upon the world in order to change it (Freire, 1970, p.33). As I discussed in chapter three with regards to the methodology of CPAR, this process not only allows educators to inquire into the practice but to change it. I referred to Kemmis’s (2006) definition of education and purpose of education in chapter three as the:

1. Developing the knowledge, values and capacities of the individual and capacity for self-determination, self-expression and self-development.
2. Through preparation of rising generations of developing discourse and culture, social relations, institutions, practice and materials in the interest of the collective.

This expanded definition and purpose of education is broad enough, but provides me with a guide to examine my own practice and to reflect if it is working towards providing this towards my students.

The past two years in the graduate program has been a transformative journey that will continue as I grow on my professional path. I intend to apply my new reflective expanded views of curriculum, learning, and pedagogy in my professional practice. I mentioned in chapter one, I am the lead teacher on the transform initiative in our school that assists teachers to implement pedagogical shifts in their practice. Not only will I implement a culture of thinking in my classroom, I will conduct the CPAR with those co-participants who are interested in creating a culture of thinking in their classrooms to develop students learning dispositions as we transition towards a competency based educational approach.

My advice to fellow educators who may wish to implement thinking routines to create a culture of thinking in their school or classroom is to form a small supportive group of like-minded colleagues willing to attempt the similar process to assist with reflecting and building collective understanding. Just as we believe our students learn in a collective so do we as professionals. Collectively reflecting on student thinking steers teachers in the direction of “What will I do next” will assist with considering what changes to practice will need to be made. This will provide direction for educators when they go back into the classroom to continue implementing the thinking routines. As well and most importantly, time is required for collective reflection to continually develop understanding and to make changes and improve our practice. I anticipate that assessing thinking will pose challenges for educators. Due to the limitation and scope of this capstone project, assessment of thinking and learning profiles should be considered for further research at another time.

Eisner’s (1979) final comment “teachers still close the classroom door and do what they know how to do and believe is best for the students they are teaching” (p. ), relates to Ritchhart’s (2015) statement “any curriculum good or bad, will sink or float on the culture of the classroom

it in which it is enacted” (Back cover). Since curriculum are beliefs set in motion, educators are the ones who enact their beliefs, setting in motion the culture of the classroom. Regardless of the methods we use to enact the curriculum we should first be aware of what our beliefs are and the messages we are sending our students. Then we will truly setting the beliefs we have in motion and enacting the curriculum we believe is best for our students. My own practical and theoretical knowledge on my journey in the last two years helped to expand my view of education and my professional practice. I intend to continue to develop in this area as I inquire into my own practice to improve student learning.

## **Appendix A: Group Protocols**

### **Critical Participatory Action Research Group Protocol: Ethical Agreements for Participation in Public Spheres**

Participants in the Creating Cultures of Thinking critical participatory action research initiative agree to articulate in accordance with the following protocols:

#### **1. Respect and open communication**

1. Group members agree to communicate respectfully and openly with one another throughout the project. In particular, this means that they agree, individually and collectively, sincerely to seek (a) intersubjective agreement about the ideas and language they use (b) mutual understanding of one another's points of view and (c) unforced consensus about what to do under the circumstances that exist when a decision about what to do is needed.
2. Each group member agrees to respect the rights of others to withdraw from the study at any time, or to decline participation in particular aspects of the study at any time, or to decline participation in particular aspects of the study, or to have information they have provided removed from any reports emanating from the study. Group members agree to respect the right of any group member to withdraw from the group, the study or part of the study.
3. Group members agree to be open with other members if they think the research is having a negative impact on the group or them personally.

#### **2. Access to empirical material**

1. All group members will have access to empirical material/transcripts that are generated or collected within the context of the group meetings (that is, as 'common empirical material').
2. Access to material that is collected outside of group meetings, but that directly involves group members for instance in observations or face to face interviews, will be restricted to those collecting the information and those about whom it is collected, unless the group members concerned negotiate for such material to be released to the group for the purposes of analysis or discussion (for example, at a group meeting) or in reports or publications. Group members agree that where others are involved (such as participating student who may appear in video-recorded lessons), such release of empirical material to the group will occur only with the consent of those involved.
3. Group members agree that if they wish (for their own publications and/or research purposes) to use common empirical material generated within this project, they need to negotiate that use of the empirical material with other members of the group.

#### **3. Identifiability in reports and publications.**

1. Group members understand that participants may be identifiable in any representations of the critical participatory action research initiative where this involvement is acknowledged. Group members agree that this needs to be considered in all phases of all pages of the initiative and agree to act with discretion so that the institution and the participants can be appropriately safeguarded.
2. Considering the conditions outlined in 3.1 group members agree that:
  - a. it is appropriate to acknowledge the group name (e.g. in footnotes or in 'Acknowledgement' sections or reports of published account of the research); but that
  - b. non-gender specific pseudonyms ( e.g. for direct quotes) are to be used in the main text of accounts so that it is difficult for readers to attribute particular comments to particular people; and
  - c. if, through the course of the study, the group members collectively decide that the naming of the group members in accounts of the research (beyond general acknowledgements) would be beneficial to both the individual written consent to be named would be obtained from each of the group members before anyone is named.

#### **4. Reflecting on the research process.**

1. In order to ensure that the research process does not compromise the integrity of the group, or impact negatively on those involved, group members agree to periodically review (as a group) how the research is unfolding and impacting on the group and the individual group members.

#### **5. Changes to group membership**

1. Group members agree that, if new members join the group during the project, the new members will be invited to take part in the research and written informed consent will be obtained before they become involved. Group members agree that the new group members will be required to agree to these group protocols.
1. Group members agree that if one or more of the group members no longer wish to be involved in the study, then other group members respect that group members' right to determine what of his or her previous statements can be used in the research.

#### **6. Representation**

1. If not directly involved in the writing of reports about the initiative, group members will be given an opportunity to check that their work and comments fairly, relevantly and accurately (Kemmis & Robottom, 1981) represented in any reports of the research.
2. Group members agree that, if they feel that representations relating to them are not fair, relevant or accurate, they will negotiate with the authors of the report and with other members of the group, to resolve the issue, keeping in mind the principle of respect and open communication above (1.1)
3. The authors of any reports about the work of the group will notify the group about the writing and the existence of reports, and will give group members access to the report and so far as is practicable, will make copies available to group members on request.

## 7. Mediation

In the very unlikely event that there is conflict/relationship breakdown (between group members) that cannot be resolved and that is detrimental to the project and /or well-being of group members, group members agree that (a credible and neutral person) all be asked to act as mediator to help those concerned work through the issues.

## 8. Certification of agreement

We, the undersigned, collectively, individually, and voluntarily give consent to our participation in the critical participatory action research initiative. In providing our group consent, we agree that:

1. We have each read an outline of the proposed initiative, discussed it and understand the purpose, methods, potential risks and benefits of the research.
2. We agree that our participation will be of value to us as professionals reflecting on our own teaching, beneficial to scholarship in the discipline and profession of education and is likely to contribute to the development of participatory action research as a research approach.
3. We regard the study as an extension of and contribution to what we already committed to doing in our professional practice and in our involvement with this group. We see the study as an addition to our established process of collective self-reflection.
4. We undertake individually and collectively to participate in the study in accordance with the group protocols above and in keeping with the values of respect, justice and beneficence.
5. Each of recognizes that we have a right to withdraw without penalty at any time. If a group member withdraws, we respect the group member's right to determine what of his or her previous statements can be used in the research.
6. We understand that not everyone will be able to attend every meeting dedicated to the research project and assume that evidence will continue to be gathered in a group member's absence.
7. We understand that if we have any complaints, concerns, conflicts or disputes about this research we can contact the person identified below who has agreed to mediate if a complaint concern, conflict or dispute arises in the course of this critical participatory action research initiative:

Name:  
 Position:  
 Address:  
 Phone:  
 Email:

### 8. Signed:

Name (Print)

Signature

Date

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**Appendix B: Planner Template**

<b>Thinking Routines to Develop Understanding</b>	
<b>Thinking Moves Required</b>	<b>Thinking routine</b>

### Lessons for Routine - Cognitive Apprenticeship

Routines identify key cognitive processes that moves learners towards independence. The aim of routines is twofold

- 1) Routines help students explore content and ideas
- 2) Ultimate goal take these routines and use them independently

\*Must give students support that they can hold onto as they take the lead - not just push them on the path and hope they find their way. Fisher and Frey (2008) as cited by Ritchhart (2015, p. 133)

Modeling does not mean providing explanations or questions students; it means demonstrating the way experts think as they approach a problem (Fisher and Frey (2008) as cited by Ritchhart (2015 p. 132).

### Modelling and supports for independence

<b>Gradual Release of Responsibility</b> Pearson and Gallgher (1983) as cited by Ritchhart (2015, p. 134)	<b>Interactive Modelling</b>
What is the purpose and what thinking will I model?	How will I state the purpose of the routine?
How will I guide instruction so that the students are supported?	How will I model the thinking behaviour?

<p>What group work will assist to transfer the skills?</p>	<p>*Ask students what they noticed while I was modelling the behaviour? Think-Pair-Share is great to give thinking time</p>
<p>What independent task will I ask students to do to demonstrate use of routine?</p>	<p>Which student or small group of students will model the behaviour?</p>
	<p>What question will I ask to lead a discussion of what they noticed? Think- Pair-Share before whole group discussion</p>
	<p>How will I have all students practice now?</p>

	How will I provide feedback to students? See ladder of feedback
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\* “The two rounds of noticing are particularly noteworthy because this analysis is developing students’ capacity to learn from models in the future by identifying key elements and features that must be present in replicating this model” (Ritchhart, 2015, p.136).

### **Standards and Outcomes**

List the outcomes and processes from the program of studies that will be met through learning these concepts and which ones will be reported on the report card. What subjects are integrated?

Outcomes	KLO’s for Report Card

### Other Skills to be Developed

What other skills is required of students to demonstrate their understanding? Such as technology, forms of writing, role play, project planning

Technology	Forms of writing	Role Play	Project Planning

## Lesson Sequencing and Approximate Time Frame

How will I sequence the learning and what is the approximate time frame I need to consider? Incorporate thinking routines will be placed and places where gradual release or interactive modelling is required and other skills required.

Where and when will I analyze documentation and how will I provide feedback to students?

How long do I anticipate each sequence to take?

Lesson Sequencing	Documentation	Resources/Technology	*Time

- (2) Time - is approximate to help schedule unit. Adapt according to your students' needs and try anticipating where students may struggle and how you will modify to meet their needs.

All questions and considerations for template are adapted from Ritchhart (2015).

### Appendix C: Looking At Students' Thinking (LAST) Protocol

#### Roles

Presenting Teacher: Brings work to share, listens to the discussion, and responds at the end

Facilitator: Keeps track of time, asks the lead questions for each phase, redirects as needed

Documentation: Records the group's work

Presenting the work (5 min)	Presenting teacher provides the context, goals and requirements of the task.
Reading the work (5-10 min)	Ask clarifying questions that will help you understand and read the work. Read the work silently Take notes for later comment.
Describing the work (5 min)	What do you see? Raise one another's awareness of all the features of the work. Avoid interpretation at this point
Speculating about students' thinking (10 min)	Where in the work do you see thinking? What aspects of the work provide insights into students' thinking? Interpret the features of the work. Make connections to different types and ways of thinking.
Asking questions about the work (10 min)	What questions does this work raise for you? Frame questions to get at broad issues as well as specifics. Ask the question behind the question. Rather than "How long did this take?" ask, "This raises questions for me about the time needed to complete the work."  NOTE: Presenting teacher does not respond to the questions at this point
Discussing implications for teaching and learning (10 min)	Where might this work go next to further extend and build on students' thinking? Suggest practical possibilities and alternatives for the presenting teacher. Raise general implications that the work suggests for promoting students' thinking
Responding to the discussion (presenting teacher) (5 min)	What have you as presenting teacher gained from listening to the discussion? Highlight for the group what you found interesting in the discussion. Respond to those questions that you feel need addressing by you. Explain briefly where you think you might now go with the work. How did the process go and feel?

Reflecting on the protocol (5min)	Reflect on general observations. Notice improvements and changes since the last time the group used the protocol. Make suggestions for next time.
Thanking the presenting teacher, the documentator and facilitator	The group acknowledges everyone's contribution. Decide how the documentation will be shared, used and archived for the group. Establish roles for the next meeting

Ritchhart (2015, p. 313)

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