IN SEARCH OF THE THINKING CLASSROOM

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ABSTRACT

Canada's education system, like those the world over, is facing new challenges and new opportunities in an increasingly globalized world where a revolution in digital technology has already transformed many other areas of daily life. Changes in technology, the economy and the pace of change itself have opened up tremendous potential for learning while creating a greater urgency in the need to re-think education. Whether or not information technologies are seen as an integral part of the solution to our current crisis in education the call for reforming education around critical, creative and collaborative thinking is consistent and widespread.

As Canada's sesquicentennial and Quebec's Ministry of Education centenary approach it is timely to reflect on the educational journey that both lies behind us and ahead of us. Since the passing of the Common School Act in Upper Canada in 1816 Canadians have strove to build a publically funded education system open to all and designed to provide children with the knowledge and competences required to participate in society as contributing citizens. According to a range of metrics, Canada has successfully built a world-class education system open to all.

Despite the relative success of Canadian schools, Canada's education system, like those the world over, is facing new challenges and new opportunities in an increasingly globalized world where a revolution in digital technology has already transformed many other areas of daily life. Changes in technology, the economy and the pace of change itself have opened up tremendous potential for learning while creating a greater urgency

in the need to re-think education. In his recent book, *Too Big To Know*, David Weinberger captures the paradoxical state of education when he remarked about society at large saying; "we are in a crisis of knowledge at the same time that we are in an epochal exaltation of knowledge. We fear for the institutions on which we have relied for trustworthy knowledge, but there's also a joy we can feel pulsing through our culture. It comes from a different place. It comes from *the networking of knowledge."* [1]

The transformation in many parts of society brought about by technological innovations has lagged behind in education. Some see this as a missed opportunity, others a crisis facing education. In the late 1990's Steve Jobs lamented the failure of technology to transform education, conceding "I used to think that technology could help education… But I've had to come to the inevitable conclusion that the problem is not one that technology can hope to solve. What's wrong with education cannot be fixed with technology. No amount of technology will make a dent." [2] More recently, Michael Fullan and Maria Longworthy opened a provocative article by stating, "The crisis — and there is no other word for it — in public schooling is a function of the interaction of an enormous push-pull dynamic. The push factor is that students find schooling increasingly boring as they proceed across the grades." [3]

Whether or not information technologies are seen as an integral part of the solution to our current crisis in education the call for reforming education around critical, creative and collaborative thinking is consistent and widespread. And yet, is the call for critical thinking in education really new or as Andrew Rotherham and Daniel Willingham claim, "the skills students need in the 21st century are not new… What's actually new is the extent to which changes in our economy and the world mean that our collective and individual success depends on having such skills." [4]

ENDURING VISION FOR LEARNING PAST, PRESENT AND FUTURE

Advocates for purposeful education, whose goal has long been to create critically thoughtful problems solvers and decision makers, stretch back many centuries. Swiss educator, Johann Heinrich Pestalozzi argued teachers must develop rather than to try to implant knowledge in children. Pestaloozzi observed, "Thinking leads man to knowledge. He may see and hear, and read and learn whatever he pleases, and as much as he pleases; he will never know anything of it, except that which he has thought over, that which by thinking he has made the property of his own mind." [5]

Canada's own Chief Superintendent of Common Schools, Egerton Ryerson, wrote: "If the mind of the child when learning, remains merely passive, merely receiving knowledge as a vessel receives water which is poured into it, little good can be expected to accrue. It is as if food were introduced into the stomach which there is no room to digest or assimilate, and which will therefore be rejected from the system, or [sit] like a useless and oppressive load upon its energies." [6] David Boyle, a teacher at Middlebrook School in Elora during the 1860's and later Canada's leading archaeologist of the late 19th and early 20th century denounced "copying" as "the principal sin of the schoolroom" declaring it "a useless practice, because, like memory work, it did not teach pupils how to think" and to Boyle the primary purpose for teaching was to encourage "the growth and development of intellect." [7]

In recent years the call for educational reform grounded in nurturing critical, creative and collaborative thinkers has come from many both within and outside of education. Don Tapscott, in *Grown Up Digital*, cautioned; "The ability to learn new things is more important than ever in a world where you have to process information at lightning speed. Students need to be able to think *creatively*, *critically*, and *collaboratively*." [8] When Fullan and Langworthy issued their call to the global educational community to take up the challenge of re-thinking education for the 21st century they too included critical, creative and collaborative thinking as core competences to underpin learning see (along with citizenship, character and communication.[9]

Interest in critical thinking has been elevated to even greater heights in many Canadian educational jurisdictions in recent years. One needs only glance at recent curriculum documents to see the elevated place of thinking in stated goals for student learning. For example, Ontario's new Social Studies Curriculum (2013) includes a vision statement that includes the following: "As well as becoming critically thoughtful and informed citizens who value an inclusive society, students will have the skills they need to solve problems and communicate ideas and decisions about significant developments, events, and issues." [10] This greater urgency can, in part be explained by the arrival of the information age ushered in by the

internet. Today, students are increasingly able to access information anywhere, anytime. The increased ease and immediacy of access to information has reinforced the need for schools to focus on creating thinking spaces.

Over the past decade much of the hype around 21st century learning has shifted the focus from technology infusion to technology as an enabler for quality thinking. As the shift in focus of 21st century learning towards teaching for deep understanding and competence occurs many have begun to realize that the very goals that were sought by progressive educators for generations are once again central – only now more important than ever. Note the similarity between the educational visions extolled by Pestalozzi and Ryerson to a recent statement by the OECD: "Education today is much more about ways of thinking which involve creative and critical approaches to problem-solving and decision-making. It is also about ways of working, including communication and collaboration, as well as the tools they require, such as the capacity to recognize and exploit the potential of new technologies, or indeed, to avert their risks." [11]

Obviously, the idea that the goal of education should be to assist students in becoming critically thoughtful citizens is not new, but achieving the goal has proven elusive and has taken on greater urgency as the complexity of the world increases. University of Toronto political scientist, Thomas Homer Dixon argued in his book *The Ingenuity Gap*, that as the complexity of the world increases, so to does the need for greater ingenuity. He defines ingenuity as the application of skills and ideas to solve practical technical and social problems. Ingenuity, he contends, does not need to be solving problems through new or original ideas. The use of existing knowledge, skills or ideas in a new way to solve a problem is, by Homer Dixon's reckoning, ingenious. If we accept the need for great ingenuity as suggested by Homer Dixon, then schools must do a better job as incubators of critically thoughtful minds.[12] Being able to identify, define, and solve important problems or issues which face humanity from a local to global level, will determine the extent to which our society will succeed in its response to the challenges faced now and those yet to come.

Arguably, making (informed) reasoned judgments in light of criteria has long been and is increasingly the most important work schools do with children. For schools to remain relevant in the 21st century and for societies to address the increasingly complex challenges they will face, schools must figure out how to translate the longstanding call for thinking into actual classroom practice.

RECOGNIZING THE OBSTACLES

Generations of curriculum documents have echoed the calls of countless educational theorists to include critical thinking among several important goals of education. Despite the long-standing claims that critical thinking should be a central part of school culture, classroom implementation has far too often fell short of the rhetoric. As Roland Case (2008) noted: "The idea of critical thinking is not new. For decades – no, for centuries — it has been recognized as an important educational goal by practitioners and theorists alike. Curriculum documents and learning resources in all subjects at every level of school recommend that students be taught to think critically. Despite this long-standing (and, at least, formal) commitment, the extent and manner of teaching for critical thinking is disheartening. Many studies document the enormous preoccupation with transmission of information and rote application of 'skills,' and how little of class time is devoted to thinking. It is a rather depressing irony: critical thinking is much valued and yet inadequately addressed." [13] Matthew Lipman noted that traditionally in virtually all cultures, students are sent to school to learn basic skills and content, but are seldom encouraged to think.[14] Four persistent problems outlined above may help to explain why, despite a long history as a purported central goal of education, progress in establishing classrooms with thinking at the core have been disappointingly scarce.

Several factors have inhibited success in the pursuit of the thinking classroom. Four of these factors that commonly inhibit the nurturing of quality thinking in classrooms include:

LACK OF CLARITY

- Too often critical thinking is equated with "criticism" and is perceived to be an attack of ideas. Properly understood, critical thinking is synonymous with criterial thinking. When we help students to understand that critical thinking is making reasoned judgments in light of clear criteria we can begin to explicitly teach the intellectual tools required for deep thinking.[15]

PERSISTENCE OF BLOOM'S TAXONOMY

- For sixty years Bloom's Taxonomy, posited as a typology of assessment outcomes, has been used as a pedagogical framework that makes the acquisition of knowledge a pre-requisite for thinking and separates recall and comprehension of knowledge from thinking. This has led to more transmission of information to students with fewer filters as thinking is too often reserved for the end or pinnacle of learning rather than being a routine aspect of learning.

- A second consequence of the persistence of Bloom's taxonomy is the perception of critical thinking as "high order thinking" and thereby beyond the reach of some students (primary students; students with learning disabilities) often leading to invitations to think and solve meaningful problems being reserved for the more academic students leaving the students already most disengaged in schools with worksheets to complete.

STANDARDIZED ASSESSMENT OF CONTENT RECALL

- The call for more focus on nurturing critical thinking has come at a time of greater accountability in education. Unfortunately, the two are often incompatible as accountability has led to more standardized tests, and what is easiest to measure in standardized assessments is recall of information. Because what gets measured is what is valued, the result of an increase in standardized assessments has been greater focus on preparing students to be successful on recall tests rather than assessments that require critical, creative or collaborative thinking.

FAILURE TO BUILD CAPACITY FOR THINKING

- Many efforts have been made over the years to frame questions to invite deeper thinking about the curriculum. Too often, the richer questions are not accompanied with the teaching of the intellectual tools students need to develop their capacity to carry out the desired thinking. The consequence of asking more challenging, probing questions without the supports for students to do the thinking can be more frustrated students and a mere separation of those who can and those who struggle which in turn leads to streaming of students around those who are perceived to be capable of thinking and those for whom we should lower expectations by focusing on "lower order questions."

SEIZING THE OPPORTUNITY

Work going on in many jurisdictions across North America offers considerable hope that the current resurgence of interest in critical thinking may yield better results than in the past. The Critical Thinking Community, founded by Richard Paul has been working for the past 33 years to help post-secondary institutions throughout the United States find powerful ways to improve the teaching of critical thinking. (http://www.criticalthinking.org) Here in Canada, The Critical Thinking Consortium (TC^2) has worked for over 20 years with schools and school districts in almost every province and territory in Canada to help with the infusion of critical, creative and collaborative thinking from kindergarten to graduation. (www.tc2.ca) Currently TC^2 is working with more than 55 partners and many thousands of teachers every year to develop materials and help to "tweak and fortify" teaching so that critical thinking is the foundation for learning. The work being done to advance critical thinking in a sustained and comprehensive manner involves three key areas of focus: creating a climate for thinking, creating opportunities for thinking, and building the capacity for thinking and providing guidance for robust thinking.[16]

CREATING A CLIMATE FOR THINKING

Whether face-to-face or virtual, success at creating critical, creative and collaborative learners is largely dependent on creating the conditions for thoughtful communities to flourish. This entails establishing clear expectations that support thinking, establishing routines to nourish thinking and modeling the habits of a good thinking. Let's briefly explore each of these.

SET CLEAR EXPECTATIONS FOR THINKING

If we expect thinking to be a routine part of learning, we must make it an expectation for all students. Here are a few messages we should clearly communicate to students if we hope to create thinking classrooms: [17]

- Students are expected to make up their own minds – not simply accept information as truth.

- All persons are to be treated respectfully by everyone even if their ideas seem wrong.
- Disagreements are not only allowed they are encouraged; but never as an attack on the person.

ESTABLISH ROUTINES THAT SUPPORT THINKING

In addition to making expectations for the learners clear, teachers can further support the building of a thinking classroom by ensuring routines are established that support thinking. Some of the routines to consider are:

- Involve students in scrutinizing accounts, textbooks, news articles, reports and other "reputable" sources of information for bias, stereotyping, overgeneralizations, and inaccuracy.
- Invite students to explore and defend positions from particular points of view.
- Involve students regularly in identifying and defending criteria to use in assessing work and behaviours.

MODEL THE HABITS OF GOOD THINKERS

It is important for teachers to remember that they are an integral part of a community of thinkers and that their actions and behaviors provide important modeling for students. Consequently, careful consideration for our behaviours in the classroom are important in our efforts to create a thinking classroom. Some of the modeling we should consider include:

- Live with ambiguity – be satisfied with tentative conclusions until a full review of the evidence is complete. Don't always have the answer.
- Sincerely attempt to base all comments and decisions on careful and fair-minded consideration of all sides.
- Regularly acknowledge the existence of different positions and perspectives on an issue.

CREATING OPPORTUNITIES FOR THINKING

When planning curriculum it is common for teachers and curriculum writers to organize around either topics or themes, neither of which effectively serve as an invitation to engage in critical thinking. Consequently, the presence of critical thinking is at best sporadic and when used intentionally is most often found at the end of chapter or units in textbooks or towards the end of a unit of study. When Jay McTighe and Grant Wiggins proposed their *Understanding By Design* model for curriculum planning they recognized the importance of moving beyond topics, themes and issues as curriculum organizers. Understanding By Design, or UbD as it is often referred to, encouraged curriculum planning around a set of essential questions that would lead students to the uncoverage of the "Big Ideas" identified as important in the subject area.[18] UbD was an important first step in moving learning from the transmission of discrete facts to a more active process of learning.

Understanding the nature and purpose of the questions and tasks we use in the pursuit of learning is essential if we hope to nurture students' thinking. In fact, it is equally important that students understand the nature and purpose of the questions/tasks assigned. In essence, we can cluster questions and tasks into three broad groups:

TYPE 1: LOCATING FACTS

- These questions require no decision. They focus on locating or retrieving information. While often necessary for assembling information or ideas needed for problem solving, in themselves, they do not engage critical thinking. Typically these types of questions/tasks have a single or limited number of correct answers.

  Sample Questions:

  How have past civilizations impacted the contemporary world?

  What were the four main cause of World War One?

TYPE 2: DESCRIBE FEELINGS AND PREFERENCES

- Although these questions/tasks do involve making a decision, the decision is based on how one feels, preferences, or emotional reactions and consequently do not engage critical thinking. Unlike the Type One questions, these questions often have no wrong answers and a wide, if not unlimited, range of possible responses.

Sample Questions:

If you lived in New France, would you have preferred to have been a habitant, priest or nun?

What is your favourite time period to study in Canadian history?

TYPE 3: MAKING REASONED ASSESSMENTS

- If we wish to take critical thinking seriously, these types of questions/tasks need to drive the learning. The key attributes of Type Three questions/tasks, referred to as "critical challenges" are that reasoned assessment among options in light criteria and evidence.

Sample Questions:

Considering cause and effect relationships, what order should the main causes (Militarism, Alliances, Imperialism, and Nationalism) of World War One be listed?

Who was the most visionary leader, John A. Macdonald, Louis Riel or Wilfrid Laurier?

A critical challenge can best be defined as an invitation to offer a reasoned judgment to a question or offer a reasonable solution to a problem. While often subtle, what distinguishes a critical challenge from other forms of questions is its power to initiate and sustain thinking. When a question is framed so as to invite guessing, the sharing of an uninformed opinion, the retrieval of information or the mere rote application of a formula, there is little to engage the faculties of thought. By "problematizing" the curriculum, teachers can routinely frame learning around critical thinking opportunities that invite students to weigh evidence in light of criteria and to engage in careful and thoughtful deliberation, often with others. Properly understood, critical challenges are not an alternative to other approaches to learning. Rather the notion of a critical challenge helps to define/clarify the kind of powerful opportunities that any approach must propose if students are to be invited to engage in thoughtful examination of the curriculum.

BUILD CAPACITY FOR THINKING

While nurturing a community of thinkers helps to establish a climate for thinking and framing learning around critical challenges creates opportunities for critical thinking and creativity, they alone are insufficient in helping to cultivate quality thinking among students. If we hope to assist all students in learning to think and thinking to learn then we must pay close attention to the intellectual tools they require to engage in quality thinking.

Much of the frustration teachers experience when attempting to engage students in thinking critically stems from the fact that students often lack the required concepts, attitudes, knowledge, criteria or strategies – in short, they lack the tools needed to do a reasonably competent job. It is often assumed that mere repetition will improve students' reflective competence. No doubt some will improve by repeatedly trying to figure things out for themselves, but most will be more successful if they are taught the requisite tools for the task.

Although the specific tools depend on the nature of the challenge facing the thinker, promoting critical thinking is largely a matter of helping students master an ever broadening repertoire of five types of intellectual resources:[19]

- *Background knowledge*: knowledge of relevant information about a topic that is required for thoughtful reflection. Although it should be obvious that we cannot think critically about a topic if we know little or nothing about it, many accounts of critical thinking are based on a presumption that thinking skills or operations are independent of the content areas to which they are to be applied. Properly understood, relevant background knowledge is not separate from any skill, but part of what is required to be skilled. For this reason, individuals need to acquire information relevant to the range of topics that we want them to be able to think critically about. Presumably this range of topics is (or should be) found in the subject matter of the curriculum. This point speaks strongly for embedding the teaching of critical thinking with the teaching of curricular content.

- *Criteria for judgment*: knowledge of the appropriate criteria or grounds for judging the reasonableness or merits of the options presented by a thinking challenge. To think critically is essentially to engage in deliberations with the intention of making a reasoned judgment. And judgments inevitably are made on the basis of criteria. For this reason, an important category of tool is the range of context-sensitive criteria spanning the diverse intellectual tasks found in the curriculum, from what makes for a good argumentative essay, a sound interpretation of a primary or secondary source, an insightful analysis of a work of art or historical photograph, or effective lecture notes.

- *Critical thinking vocabulary*: knowledge of the concepts and distinctions that are needed to think about the challenge. Although other tools also refer to concepts, "critical thinking vocabulary" refers to concepts that expressly address distinctions foundational to thinking critically—for example, knowledge of the difference between "conclusion" and "premise," "cause" and "correlation," or "cause" and "effect." Peter Seixas' work in the area of historical thinking has helped focus history education in schools across Canada on six historical thinking concepts that underpin student understanding (historical significance, evidence, cause and consequence, continuity and change, historical perspective, and ethical judgment.)[20]

- *Thinking strategies*: knowledge of procedures, heuristics, organizing devices, algorithms and models that may be useful when thinking through a challenge. Good critical thinkers draw upon a great variety of strategies to work their way through the challenges facing them. This category of tools is most closely aligned with what others call skills, although we believe they are more responsibly viewed as strategies. Thinking strategies may be very elaborate, such as following a comprehensive decision-making model, or they may be very focused, addressing a specific task, such as paraphrasing a statement to improve understanding. There are literally thousands of strategies that guide individuals in working through the challenges they encounter.

- *Habits of mind*: commitments to the range of values and principles of a careful and conscientious thinker. Although more commonly described as dispositions, we prefer the term "habits of mind" to refer to the intellectual ideals or virtues that orient and motivate thinkers in ways that are conducive to good thinking, such as being open-minded, fair-minded, tolerant of ambiguity, self-reflective and attentive to detail.

The five categories of intellectual tools cited above draw support from within the diverse body of literature on thinking. There are "schools" of thinking that focus on each of the five tools identified. The conceptual framework suggested in this chapter is intended as a more complete synthesis of the range of critical thinking building blocks than is otherwise found in any single account. This allows for a rich, curriculum embedded approach to nurturing critical thinking that spans grades and subject allowing for critical thinking to serve as a powerful methodology for learning rather than one of several competing goals for education.

CONCLUDING THOUGHTS

Engaging learners in critical thinking is a complex and multifaceted endeavour that requires educators to embrace the nurturing of quality thinking as a foundational practice in their classrooms. Long seen as a central goal for schools, critical thinking as a methodology for learning has been disappointingly elusive in many schools. Recent work in many schools and schools districts, both within and beyond Canada, is showing promising results as schools are adopting a framework for sustained and deep work to embed critical thinking as a foundational practice in classrooms. The transformative impact on the lives of children we strive for is most likely to happen when thinking becomes a routine part of learning beginning in kindergarten and continuing throughout the grades and across subjects. As teachers find powerful ways to tweak their lessons and identify opportunities to fortify learning by explicitly and intentionally addressing the intellectual tools that best support student thinking and learning they are finding students more engaged in learning and the gaps in achievement narrowing.

NOTES

[1] David Weinberger. *Too Big to Know* (New York: Basic Books, 2012): XIII.

[2] Gary Wolf from *Wired* magazine interviewed Steve Jobs in 1996 Retrieved from http://9to5mac.com/2012/01/18/steve-jobs-whats-wrong-with-education-cannot-be-fixed-with-technology/ November 28, 2013.

[3] Michael Fullan and Maria Langworthy. *Towards a New End: New Pedagogies for Deep Learning* (Seattle: Collaborative Impact, June, 2013): 1.

[4] Andrew Rotherham and Daniel Willingham "21st Century Skills" Not New, But a Worthy Challenge, *American Educator*, (Spring 2010): 17.

[5] Pestalozzi, Retrieved from http://books.google.ca/books?id=pXFJAAAAYAAJ&pg=PA518&lpg=PA518&dq=#v=onepage&q&f=false, December 8, 2013.

[6] Egerton Ryerson, Report on a System of Public Education for Upper Canada (Montreal: Lovell and Gibson,1847).

[7] Gerald Killan. *David Boyle: From Artisan to Archaeologist*, (Toronto: University of Toronto Press, 1983): 31.

[8] Don Tapscott. *Grown Up Digital*, (Toronto: McGraw Hill, 2009): 127.

[9] Michael Fullan and Maria Langworthy. "Towards a New End: New Pedagogies for Deep Learning," (Seattle: Collaborative Impact, June, 2013): 3.

[10] Ministry of Education, Ontario, Retrieved from http://edu.gov.on.ca/eng/curriculum/elementary/sshg18curr2013.pdf, December 8, 2013.

[11] OECD, Retrieved from http://www.oecd.org/general/thecasefor21st-centurylearning.htm, November 29, 2013.

[12] Thomas Homer Dixon. *The Ingenuity Gap* (Toronto: Random House Inc., 2000) Chapter 2.

[13] Roland Case, 2008 "Beyond inert facts" In R. Case & P. Clark. (*Eds.*) *The anthology of social studies: Issues and strategies for secondary teachers* (Vancouver: Pacific Educational Press, 2008) 41-53.

[14] Matthew Lipman. *Thinking in Education*, (New York: Cambridge University Press, 2003) 10.

[15] Roland Case "Moving Critical Thinking to the Mainstage," *Education Canada* (Spring 2005) 45-49.

[16] Roland Case & LeRoi Daniels, "Introduction to the TC^2 conception of critical thinking," *Dimensions* (2003, June), 5-8.

[17] Adapted from Roland Case, R. & Philip Balcaen "Supporting a community of critical thinkers." In R. Case & P. Clark. (*Eds.*) *The anthology of social studies: Issues and strategies for secondary teachers*," (Vancouver: Pacific Educational Press, 2008) 86-96.

[18] Jay McTighe, INTRODUCTION: WHAT IS UbDTM FRAMEWORK? Retr ieved from, http://jaymctighe.com/wordpress/wp-content/uploads/2011/04/UbD_WhitePaper_revised_0612-FINAL.pdf, December 8, 2013.

[19] Roland Case. "Moving Critical Thinking to the Mainstage," *Education Canada (Spring 2005):* 45-49.

[20] Peter Seixas, The Historical Thinking Project, Concepts, Retrieved from http://historicalthinking.ca/concepts, December 8, 2013.