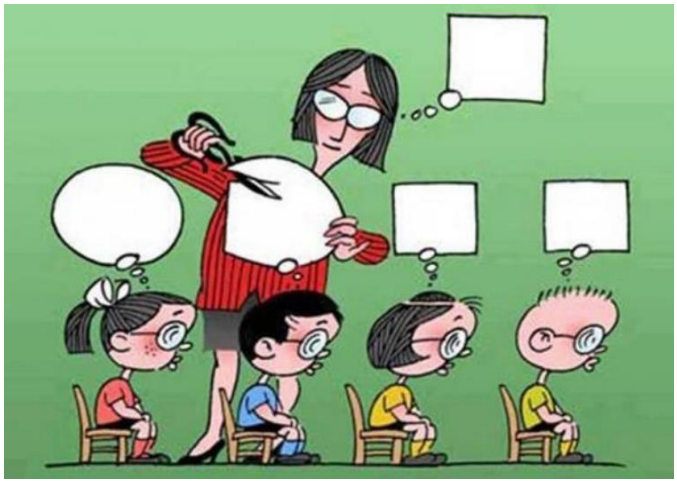
Creating a Culture of Critical Thinking for Educators

"The Art of Teaching Thinking"



CrCrTh 692

Research and Engagement

Prof. Peter Taylor

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N. Sinem Mankir Oztan

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Research Question: How can I create a culture of critical thinking in a school environment?

Audience: educators and administrators who are interested in promoting critical thinking skills.

Why such interesting in this paper? (GOSP)

In my experience as a science teacher in Turkey, we have not been taught how to learn effectively and to think critically in schools, so when students graduate, or before they even graduate, they forget what they learned in a short time and can't develop any different perspectives to analyze the situations. Over recent years, learning and teaching have experienced a great transformation by the rapid development of technology and economy. The limitations of current educational reforms and strategies are felt much more nowadays.

While strong focus points are on measuring learning outcomes and standardized tests, in this report, I explain why critical thinking is important—to me personally and to education in Turkey. Also, learning strategies and being independent thinker are essential for being life-long learner. I remember from metacognitive class that low-achieving students are not aware of cognitive process in mind that can lead to effective learning.

Finally, I will be sharing my own model guide of creating a culture of critical thinking in a school that helps you to understand how we can help pupils to think critically. Besides describing the basic components of critical thinking, what a culture of critical thinking in schools looks like, how that culture gets created, I will provide new ways of giving each one the best chance to achieve his or her potential.

I. Introduction

"Culture matters not only to realize curricular goals, but also as a shaper of students' development as powerful thinkers and learners. "Enculturation" is the key to deep learning and the development of the habits of mind and dispositions needed in a changing world."

Harvard University researcher Ron Ritchhart

You can describe your school as a warm and welcoming environment. Academic achievement can be guaranteed. Nature and garden with beautiful plants could surround it and you can sense of care and positivity in your school atmosphere. Hallways could be accessorized by student products and the staff could have the enthusiasm for what they do. However, what about the culture of critical thinking in your learning environment?

I believe that it is not enough to provide an environment in where students feel comfortable. It should promote the critical thinking beside of academic success. This paper could guide you to transform your school. I will try to describe what the critical thinker means and why it is important and to represent my own model/guideline which will cover professional development, routines, environmental factors, activities and frameworks vs. In conclusion and bibliography part, you can see educators or organizations inspired me.

Regardless of challenges you face in learning environments or diverse population, you can have an understanding of how the culture of critical thinking looks like and how to take actions. In order to enhance the critical thinking, you should know that you have to work continually to build it. It will take time. Even than longer than you think. Prior knowledge, habits, perceptions and conception of members of cultures could be challenging situations to overcome. To make it easier for you, I divided mainly my paper into two parts: first body will represent you basic definitions and aspects, in second part I will share the model/guideline which includes steps to follow and implement. This flow will deepen your understanding the culture of critical thinking and apply into your own life. In order to reach more audience, I tried to give a broad range of subject areas like art, math or science and various types of activities (maps, videos…) for different skill types (reflective or digital literate) to be implemented.

In upcoming part of introduction, you will find what my motivation to make this research is, the definition of a critical thinker and why being critical thinking is so important.

i. My own motivation

I observe that failures of critical thinking often occur when we agree with information that is consistent with our own points of view. In other words, we hear what we want to hear, and see what we want to see. To be sure whether our decision is better, we should check what is happening that is related to awareness. I would like to share my own model/guideline of creating a culture of critical thinking in a school. I can call it as "The Art of Teaching Thinking" for now that covers Awareness, Time, Opportunity to Apply, Environment and Routines.

I see that while instructional curriculum are designed, people tend to neglect the vital role of culture of critical thinking that enhance learning. In order to promote deep understanding and sustain a lifetime of inquiry, learning environments should engage students (even other members) to process of creating culture. Identifying the basic descriptions and aspects and then walking through models/frameworks/activity or guide that enable us (educators, administrators) who are interested in fostering critical thinking are steps to be taken.

While making my research I thought about how schools become places of critical thinkers. For *intellectual gain*, how *intellectual pain* should be developed. While creating solutions and models for creating culture, I tried to design the development of thinkers who can question, be aware, create, take action and engage. I read experts' articles or books and used their work as a part of my project. To make thinking visible, I tried to use diverse methods, skills and activity ideas for different subject areas. Hope you enjoy it and apply it for your own dreams.

ii. Definition of critical thinkers who…

- **Generate their own questions**
- **Assess information**
- **Communicate and collaborate**
- **are Reflective**

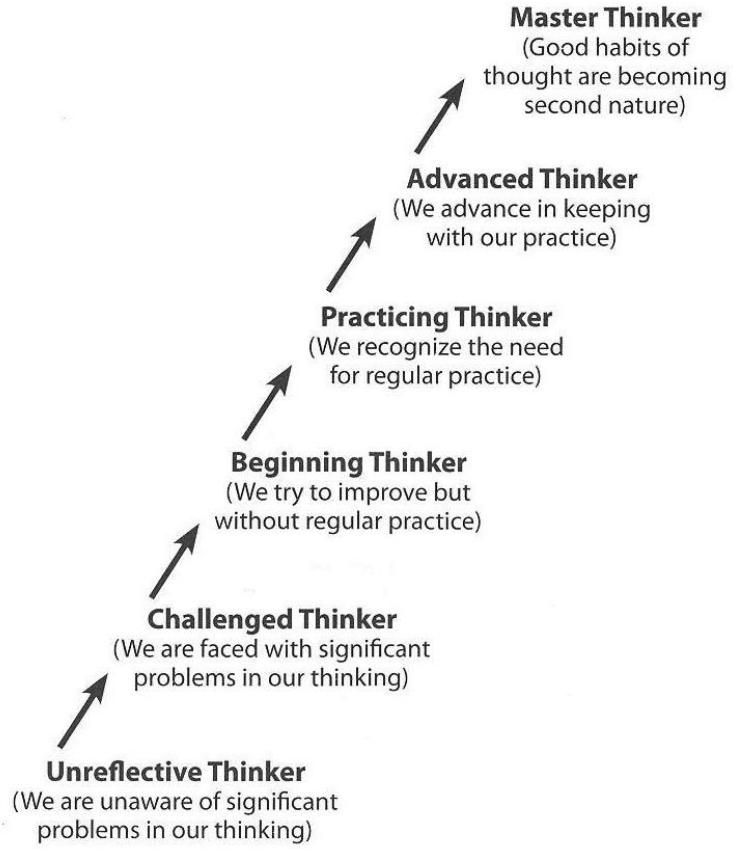
(After a general introduction to the definition, I will go deeper for each one in next parts.)

While defining main things about critical thinking/thinker, my main source was Dr. Richard Paul and Linda Elder who are the founder of The Foundation for Critical Thinking. I mostly will refer their definitions and don't go so deep for the definitions because my main issue is that focusing on my own model to create a culture of critical thinking. I think there is no need to try to redefine some terminologies individually and also I'm not expert to do it. However, I will design my own model parallel to their great ideas and enthusiasm.

They (2007) define a critical thinker as:

- *raises vital questions and problems, formulating them clearly and precisely.*
- *gathers and assess relevant information, using abstract ideas to interpret it effectively,*
- *comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards,*
- *thinks openmindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications and practical consequences,*
- *communicates effectively with others in figuring out solutions to complex problems.*

And also, they show the stages of critical thinking development like this:



As you will see the rest of my paper, I will try to show how to be a master thinker. Steps are designed starting from the theories ending to action. At the conclusion part, I will refer steps for being sustainable and at the model you will find how to take action and create environment to apply.

- **Generate their own questions**

"'How do you know so much about everything?' was asked of a very wise and intelligent man; and the answer was, 'By never being afraid or ashamed to ask questions as to anything of which I was ignorant.'"

—J. Abbott

Think about what types of questions you tend to ask. Are you good at asking important or relevant questions or you fail? It is important that you should care both how you question and also how others question or fail. How do your questions guide you to take actions? Do you notice to improve the quality of them later? In CCT program, I learnt that just answering questions is not enough for better thinking. The matter is whether you generate your own questions which drive thinking. Now, I pay attention to generate more meaningful, deep and insightful questions. I see that they also help me to shape my own path.

They determine the intellectual deepness of your work. Sometimes, questions direct toward the issues or possible solutions. I know really good critical thinkers around me and their common points are routinely asking questions, trying to understand the problem and trying to see it from the different perspectives. Before making decisions, they ask powerful questions.

I believe that this is related to our priorities, values and our previous personal academic or professional experiences. We need to create such a culture of formulating questions. You can start from the basic level. To support this idea, the first step of my model starts with "increase the awareness" that includes a tool called as question formulation technique (QFT). You can find its details and "how to do" under the second body of my paper.

Bu in this section, I would like to share my findings from my research about generating question. Elder and Paul (2006) provide some strategies for formulating more powerful questions:

1. Whenever you don't understand something, ask a question to clarify precisely what you do not understand. Never answer a question unless you understand what it is asking.

2. Whenever you are dealing with a complex problem, formulate the question you are trying to answer in several different ways (being as precise as you can) until you hit on the way that best addresses the problem at hand. Then figure out what issues, problems, or ideas you need to think through to answer the question. Figure out what information you need to consider. Do

you need to look at the question from multiple viewpoints? If so, detail those viewpoints as clearly and accurately as possible before proceeding to answer the question.

3. Whenever you plan to discuss an important issue or problem, write down in advance the most significant questions you need to address in the discussion. Be ready to change the main question if necessary. As soon as the question is clear, help those in the discussion stick to the question, making sure that the dialogue builds toward an answer that makes sense.

They also gives some sample questions you can ask to discipline your thinking.

• *What precise question am I trying to answer?*

• *Is that the best question to ask in this situation?*

• *Is there a more important question I should be addressing?*

• *Does this question capture the real issue I am facing?*

• *Is there a question I should answer before I attempt to answer this question?*

• *What information do I need to gather to answer the question?*

• *What conclusions seem justified in light of the facts?*

• *What is my point of view? Do I need to consider another?*

• *Is there another way to look at the question?*

• *What are some related questions I need to consider?*

• *What type of question is this: an economic question, a political question, a legal question, an ethical question, a complex question with multiple domains?*

- **Assess information**

As the world is getting globalized and technology is getting transformed, the amount of information has been increasing and the ways of digital tools usage have been changing. Economies are more challenging and mostly based on digital environment. Even, information is now stored in online databases. Because of that, I made research about the roles of information and digital literacy skills to enhance learning and thinking and then examined implications for practice.

I've been experiencing that young people, even adults, are not aware of when and why they need information. Even worse, they don't know where and how to find information. These aspects are the minimum characteristics of an ideal global citizen. I realized that students firstly need information literacy skills because they will remain amateur users of information while

studying. A critical thinker should look for information sources which are credible, unbiased, and accurate.

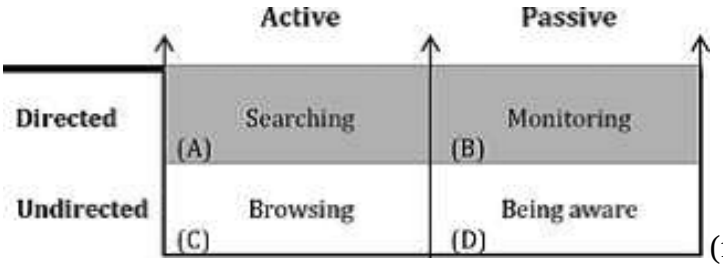
I didn't forget some realities like being a responsible educator that requires becoming aware of digital developments and like learners' prior knowledge and behavioral patterns. These require that I should offer better practice examples for deeper and more relevant learning. For example, millions of people have been creating content and producing knowledge on the Web. This creates big challenges for both educators, parents and also learners because they don't know how to find reliable information even though they are exposed to large amount of information. This affects their productivity, critical thinking and entrepreneurship because they try to manage the uncertainty that causes the transformation of learning and thinking.

I believe that "think well" is not enough to develop thinking and to enhance learning. My project will guide educators to help students to promote innovative and critical thinking and strengthen their own academic achievement. Being a critical thinker and learner means to be able to engage in society in effective and meaningful ways. Education has never before played such an important role in our planet. And, we cannot skip the reality of how digital technology has dominant roles over people while teaching how to learn and while creating a learning and thinking culture. Knowing how to use the digital tools, when to use it, how often to use it or why to use it are issues to be solved. I tried to provide lots of source for audience to find their own way for being active in online environment.

To think critically means being open-minded and skeptical when seeking out the facts, information sources, and reasoning on issues which individuals are intending to judge, examining issues from as many sides as possible; rationally looking for the good and bad points of the various sides examined.

Researches show that people need information literacy skills in order to locate and discriminate reliable information. Using literacy skills, they can assess the credibility and validity of information to critically interpret arguments. For CrCrTh 670, I designed a wikispace that is about how to promote information and digital literacy skills to enhance thinking and learning. I found out tens of models, activities or models about research skills designed by professional organizations and authors to embed to page but here I just share one of them. It tells modes of information seeking (Bates, 2002). *These come from the consideration of whether the searcher is Active or Passive in their search strategy and whether the search is Directed or Indirected (King, 2013).*

If you are interested in learning different research modes, you can read more at **Appendix 1**.



(from Darling & Foster, 2012, pg. 434)

Searching is both directed and active, attempting to answer questions and develop understanding specific topics or questions.

Monitoring is directed but passive and involves scanning information collected around topics of interest but with no particular question in mind just keeping abreast of developments and 'news' and being alert for anything which may be pertinent to a current inquiry.

Browsing is active but undirected, there is no specific topic in mind and the researcher is simply grazing over anything which catches their attention and allowing themselves to follow strings which may or may not lead to valuable information

Being Aware is both passive and undirected and means simply being aware of all the unsolicited information that surrounds us and allowing our attention to scan it for relevance while not paying direct attention to it.

- **Communicate and collaborate**

While working on creating a culture of critical thinking, communication and collaboration are unavoidable. Giving learners meaningful and challenging opportunities to work and collaborate with others is important. The dialogue that results not only allows pupils to develop social and teamwork skills, but talking about what and how they are learning also improves their understanding and their capacity for reasoning and argument. Collaborative learning has both a cognitive and a social function. As Costa (2008) points out, *"Together, individuals generate and discuss ideas, eliciting thinking that surpasses individual effort. Together and privately, they express different perspectives, agree and disagree, point out and resolve discrepancies,*

and weigh alternatives. Because people grow via this process, collegiality is a crucial climate factor."

Collaborative work offers opportunities to see the extent for students to develop negotiation skills and a sense of fairness and respect for others' view. In the progress, students not only participate in collaborative work but begin to take advantage of the opportunities for learning from others, giving and responding to feedback, leading and helping others.

While making research for my project, I have designed or recreated some activities. I translated "Focused Listing" and "Send-A-Problem" activities to **online collaborative learning**. I needed to combine them and created a new one. While doing it, I would like to focus on these **goals**: encourage collaboration, enhance creative making, and relate to their own interest.

Note: You can see the original ones of activities at the end of the file **Appendix 2**

Combination of Focused Listing and Send-A-Problem and Transformation of them to Online Collaborative Learning Activity:

I was inspired by focused listing in the first step while determining Pfocus (focus problems). The rest of the activity is inspired by Send-A-Problem. (I revised most of sentences mentioned in original ones.)

Each group (3-4 people) gets together in different breakout rooms.

PQA (Problem, Question and Answers)

Description:

1) Pfocus can be used as a brainstorming technique to generate focus problems. It asks the students to generate problems. Once students have completed this part, they can use this list to facilitate PQA.

2) Ask students to list 5-7 problems that are related to your course's weekly goal. From there, each member of a group generates a problem and writes it down on chat box. You might ask students to discuss the list and then to select the one that they can all agree on.

First two steps take 20 min. @ breakout room

3) PQA can be used as a way to get groups to discuss and review material, or potential solutions to problems related to content information.

4) Each member of the group writes as many questions about the problem selected by a group as he can. He changes any statement to a question. They don't stop to discuss or answer questions. 10 min.

5) They write down each question exactly as it was stated. They write them on chat box in breakout rooms.

6) Choose the most important question cooperatively. And question becomes the title for new thread in blackboard. Each group has one thread. 10 min.

7) Ask the question to other members among same group. 10 min.

8) If the question can be answered and all members of the group agree on the answer, then that answer is written as answer of that thread. If there is no consensus on the answer, the question is revised so that an answer can be agreed upon.

9) Each group creates their own question and answer as one thread on discussion board of Black Board. To do this, one person takes responsibility like a recorder in a group work. 5 min.

Break 5 min.

Total time until now: 60 min

10) Each group gets together and starts to read other group's thread subject: their question.
11) After reading the first question, the group discusses it. If the group agrees on the answer, they click on first group's answers to see.

12) If there again is consensus, they proceed to the next question. If they do not agree with the first group's answer, the second group write their answer in that thread as an alternative answer. 10 min for each thread/Question

13) Each group (ex: there could be 3 groups with 4 people in class) follows the same procedure outlined above. It means there will be three different thread subject (our question: Q) and different answers for each question at the end of the class. (10x2=20 min)

14) Each group checks/reviews every question and answer. 10 min.

15) Finally, whole class discussion will be hold about three questions and their answers in main breakout room. 20 min.

Total time: 60 + 30 min + 20 min=110 min

While recreating this activity, I tried to find answers the questions below.

1) Identify the specific purpose of the technique (exactly how does it support collaboration?)

There are both group and individual works during activity.

In phase P: brainstorming promotes collaboration.

In phase Q: Each member tries to generate questions about the specific problem that is picked up by the group. It increases the group dynamic.

In phase A: They will share their own answer but then they will choose or generate the best answer as a group. Whole process in terms of their quality of question and answer will show their performance.

2) Rewrite the description of the technique so that it is modified for online use, and indicate the context in which such a technique might be used for online collaboration. Make sure to explicitly point out how online resources need to be set up.

They will need breakout room with Hangout (group discussion and chat box) and need to use Black board. They will write their own question and answer as a new thread.

3) Summarize briefly what elements of effective collaboration might be lost or gained when attempted through online means?

Active engagement and collaboration in a small group will be supported during all activity. Moreover, they will work on their own interest while choosing their problem and question. While generating questions and answers, creative making will be enhanced because they will be generating, producing, receiving, responding, monitoring and evaluating. This activity provides a central space for members to talk about and interact and those are important aspects of collaboration. They all understand other participants' thinking and learn many things and it shows us how they work collaboratively.

Lost elements could be broken internet connection, missing hardware to complete the activity, unreliable/passive/aggressive group member or unresolved disagreements.

4) What implications involve the thinking of the individuals?

While they determine their own Pfocus, they create their own problem and they solve it collaboratively. It provides many ways of interacting and working together.

- **are Reflective**

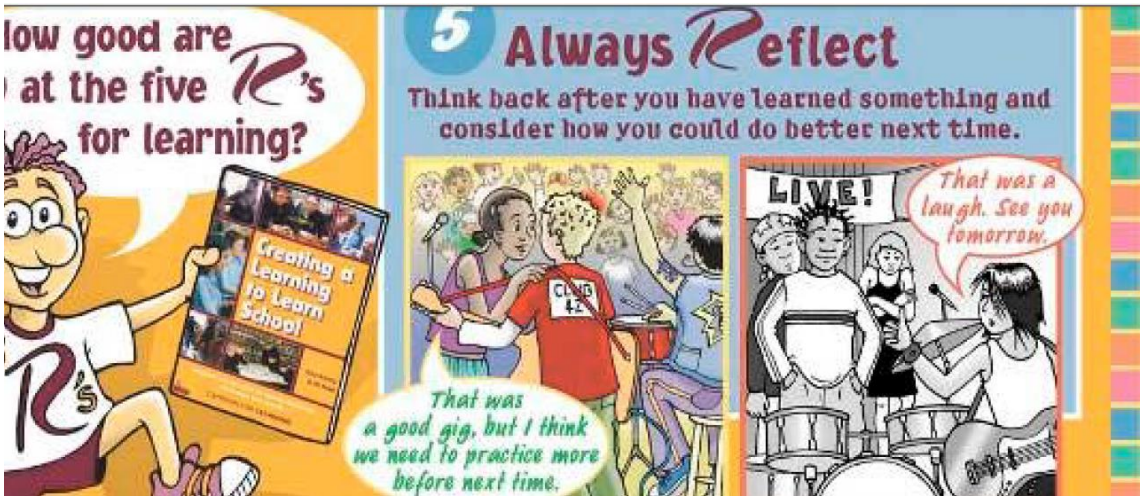
Instead of reforming just the surface of educational structures, we should go deeper and create more meaningful solutions. *"Empirical evidence about how the mind works, how the brain develops, how interests form, how people differ, and most importantly, how people learn has expanded tremendously over recent decades."* (Olson, 2003; Sawyer, 2006) This covers the fact that learners should metacognitively and motivationally be active in their own learning process. Being reflective is one of steps of this process.

While reading The Campaign (2004) by Centre for Learning and Teaching University of Newcastle in England, I saw that they had used 5R's model: Readiness, Resourcefulness,

Resilience, Remembering and Reflection. This is a model of the knowledge, skills and dispositions utilized by effective lifelong learners and has been developed as the framework for research in Phase 3. Here, I just share the reflection part. If you would like to see the whole table, you can read the article[1].

	Attitudes/Attributes	**Skills** Demonstrates ability to:	**Knowledge** Knows how:
Reflectiveness	• Looking back • Improving learning and performance	• Stop and reflect (eg ask • questions, observe, see • patterns) • • Experiment with learning • • Evaluate learning	• To stop and reflect (eg ask questions, observe, see patterns), • To experiment with learning • To use different ways to evaluate learning

In the case studies part of the project, I found that they used a project called "Stop! Time to Reflect" while they were focusing on reflectiveness. As research methods, they used PIPS and baseline assessment in Foundation Stage, teachers logs, pupils' learning logs, project questionnaire, pupil interviews with pupil views template and digital images. For an older age group, informal observations, teacher questionnaire, pupil questionnaire, case study of Year 4, SATS data, project questionnaire and SMT monitoring were used. At the end of this part, I will



[1] http://www.campaign-for-learning.org.uk/cfl/assets/documents/Research/Phase3Year1Report.pdf page12.

try to offer some practices inspired by these. Also, I liked their poster to remind students to do more often. (It was covering 5R model but I focused on reflection part.)

"Reflection is an active process whereby the professional can gain an understanding of how historical, social, cultural and personal experiences have contributed to professional knowledge and practice." (Wilkinson, 1996).

While being reflective, we are needed to look back on a situation, learn from it and then use the new knowledge to help us in future similar situations. It helps us to gain new understanding and insights which make sense of our experiences. The constructed meaning guides actions in practice. Moreover, you can be more open to ideas and can express yourself freely in the future. It is a mean of assisting us to explore our thoughts and feelings about our previous experiences.

Costa and Kallick (2008) mention students' stages of reflection in Learning and Leading with Habits of Mind this way:

Kindergarten: Describes what is drawn. Focuses on drawing. Comments on realism. Shows interest (what student really loves). Mentions use of color. Mentions use of letters. Pays attention to what letters spell.

1st Grade: Focuses on conventions. Wants papers to have a neat appearance. Talks about what was liked in drawing.

2nd Grade: Focuses on details. Focuses on colors. Shows development of an idea. Relates to content of story (how student feels about the content of what was written).

3rd–5th Grade (Learning-to-Read Stage): Responds in depth to dictation. Starts to write by self.

iii. The importance of critical thinking

Aimed to

- share why these skills are vital for 21th century learners (in order to create a dissatisfying situation among audience to change their conception)
- insert propositions and counter-counter propositions

There has been never as serious a challenge to education as a country's current need for higher order thinking skills. Nowadays, the needs of 21th century underline the failing of current programs. Educational standards, testing methods, higher achievement are mostly discussed however the major factors influencing student achievement like autonomous and sophisticated thinking skills perceive less attention.

Higher order cognitive abilities are necessary for an improved schooling system and critical parts of educational curriculum. Researchers have presented evidence that indicates that students can develop their thinking skills in specific content area if they are trained[2]. These findings and my previous experiences influenced me work on creating a culture of critical thinking.

Teachers and educators should be concerned with how a thinking skills course or training is implemented in a learning environment. The most successful classrooms are those that encourage students to think for themselves and engage in critical thinking. In this paper, I will try to explain and demonstrate a well-organized set of strategies for teaching that invites and supports critical thinking. At the same time I will show other educators how to adjust their practices to subjects they teach and the needs of their students. My inspirational points, the philosophy behind this product and course plans will demonstrate teaching methods in action and show my colleagues how they can use related teaching methods to achieve similar goals. It includes general ideas about assessment and mind tools as well as classroom management techniques.

Proposition 1: Students can regulate their own learning process in a culture of critical thinking.

In order to regulate one's own learning process is related to self-awareness that is an important element of critical thinking. Understanding of self and understanding of others need both critical thinking skills and emotional skills. We should promote those skills in a school environment to

[2] Davis, S. F., & Buskist, W. (Eds.). (2008). p482. *21st century psychology: A reference handbook.* (Vols. 1-2). Thousand Oaks, CA: SAGE Publications, Inc.

get a higher level of achievement. Researches show that self-regulation have positive and long lasting effects on children's social-emotional well-being and their academic success.

Proposition 2: Students and teachers get hands-on experience learning how to think critically. They can begin to apply these skills in other settings (transfer to real life).

In order to evaluate the quality of thinking, we should improve their skills by creating such a school environment where they could practice and transfer these skills into real life. Just teaching the content is not enough, understanding, evaluating and practicing are other essential steps to be taken. They should have self-assessing, self-examining and integration to the whole system.

Proposition 3: Students and teachers communicate effectively with others in a culture of critical thinking.

We need at least basic level of reasoning, developing an argument and thinking critically for our daily communication. If we have the capability to see something from different perspectives, we could be better communicator. Also, we should cultivate critical thinking skills including the ability to learn how to follow others' thought process and reasoning. It will make formulating an effective response and communicating easier.

Proposition 4: Critical thinking skills are best taught while understanding the interconnections among systems.

If critical thinking skills are taught in specific context in school and students are promoted to interconnect the relations among them, students can display the information and discuss their reliability and analyze the results accurately.

II. First Body

In this chapter, I will be sharing the aspects of critical thinking. Then before creating my own model, I identified the current situation of critical thinking.

i. Aspects of culture of critical thinking

In this part, I will try to explore the aspects of creating a culture of critical thinking. As educators, we have responsibilities to improve students' thinking skills. We should keep them awakened about thinking about their own thinking and how they can learn better.

Flexibility is important while learning/teaching critical thinking skills. Flexibility should be viewed as a multidimensional concept that supports different strategic options. I think it is a prerequisite for better understanding and thinking critically because it enables a thinking to produce a number of different ideas. While technology and scientific information changes, students could identify how improvements in technology/science can lead to new changes/discoveries. So, they can apply their understanding and reasoning skills to a variety of situations.

"We need to create a culture that "enculturates" students into good thinking practices. "(Perkins, 1993). He was mentioning three different aspects of culture of critical thinking in his article that are exemplars, interactions and explanations.

"It's proved helpful to view enculturation as involving three elements: exemplars, interactions, and explanations. We absorb a culture because we encounter examplars - people around us, or historical or fictional figures who embody certain norms and practices; and because we have interactions with friends, teachers, parents, and others that highlight certain expectations; and because, now and again, people offer direct explanations about anything from table manners to how to make better decisions (p.99)."

Perkins briefly describes what this means for educational practice. Thinking is not a separate lesson for students. Rather, it must be part of the culture in which teachers provide exemplars, interactions and explanations. Perkins gives examples of these three elements, as they pertain to enculturating thinking in the classroom.

I would like to give an example for environment and interaction: Imagine a trip to a school afterhours: no students or teachers around. How much could you discern about the learning and thinking that goes on there just by walking the hallways and stepping into classrooms? What does the room arrangement tell you about how students are expected to interact? Where the teacher's desk is and what does its placement reveal? What's up on the walls, and who put it there? What does a collection of finished, graded projects from the last unit taught say as opposed to a messy chart paper brainstorm of developing ideas? Or, are there both? What does a room without anything on the walls communicate? (Ritchhart, Church, and Morrison, 2011, page 243).

iii. Identifying and developing dispositions of current situation

Developing thinking dispositions – being flexible and open –occurs within a cultural context. Patterns of behavior and thinking should be developed to become our habits. Therefore, the ways of immersing students in a culture of critical thinking in a school should be found. Starting to value the thinking, giving students enough time to think, providing opportunities for thinking in school day and creating a learning environment of practicing those skills are steps to foster awareness of thinking.

Before asking students thinking critically, evaluating the information or reasoning, we should ask ourselves this question: Have our classroom/school routines and procedures supported a culture of thinking? To make a change in our school, I must first evaluate the current situation and compare my current teaching practices and classroom environment to the ideas wanted.

Before asking learners to do something, we should be sure to activate the key thing: intrinsic motivation and tendency. When students believe that a topic matters, they are more motivated to learn and think broadly. Who decides which topic is more important not problem here but I know that if topic is universal, it could come first. Asking these types questions both encourage participants to have motivation and push them to think: Why does this topic matter to me/people around me/ to the world?

Project Zero (2010) says that "*successful perspective takers are able to identify various perspectives in a given situation; provide evidence for thoughts, values and feelings these individuals may hold; and explain how societal or more forces – particularly roles and relationships- shape their perspectives."* Also, in order to identify the point of view, they share this table:

Point of view	
Who is involved in the situation?	Identify various actors in the situation
How does he/she feel, think or act?	Describe thoughts, feelings, behaviors
Why might he/she think this way?	Explain how social relations, cultural values and views of themselves may shape their perspective in the situation.
What else might I need to find out?	Reflect on the limitations of one's interpretation and the questions that could still be pursued.

Finally, schools must develop students' inclination to think and awareness of occasions for thinking as well as their thinking skills and abilities. Having a disposition toward thinking enhances the likelihood that one can effectively use one's abilities in new situations.

And also, I liked this self-assessment tool because it can be used to identify our or others' dispositions if we adapt it to our own classroom. (taken from Project Zero)

The Development of a Culture of Thinking in My Classroom: Self-Assessment

Imagine someone were to stop into your classroom on any random day or time. How likely would this visitor be to notice each of the following actions described below. For each statement assign a rating between 5 and 1 using the following scale:

5 = Hard to miss it
4 = Highly likely to notice
3 = Hit or miss depending on the circumstances
2 = Not very likely to notice
1= I doubt anyone would notice.

EXPECTATIONS	Rating
1. I make a conscious effort to communicate to students that my classroom is a place in which thinking is valued.	
2. I establish a set of expectations for learning and thinking with my students in a similar way that I establish behavioural expectations.	
3. I stress that thinking and learning are the outcomes of our class activity as opposed to 'completion of work'.	
4. "Developing understanding" is the goal of classroom activity and lessons versus knowledge acquisition only.	
5. Student independence is being actively cultivated so that students are not dependent on the teacher to answer all questions and direct all activity.	

LANGUAGE	Rating
1. I make a conscious effort to use the language of thinking in my teaching discussing with students the sort of thinking moves required by verbs such as 'elaborate', evaluate', 'justify', 'contrast', 'explain' etc.	
2. I seldom use generic praise comments (good job, great, brilliant, well done) and instead give specific, targeted, action-oriented feedback that focuses on guiding future efforts and actions.	
3. I use "conditional" phrases such as 'could be', 'might be', 'one possibility is', 'some people think' or 'usually it is that way but not always'.	
4. I try to notice and name the thinking occurring in my classroom. For example, might I be heard to say things like, "Sean is supporting his ideas with evidence here", or "Sam is evaluating the effectiveness of that strategy right now", or "Iris has presented an interesting analogy today".	
5. I use inclusive, community-building language by talking about what "we" are learning or "our" questions.	

MODELING	Rating
1. Thinking is regularly on display (my own as well as students) in the classroom.	
2. I demonstrate my own curiosity, passion, and interest to students.	
3. I display open-mindedness and a willingness to consider alternative perspectives.	
4. It is clear that I am learning too, taking risks, and reflecting on my learning.	
5. Students model their thought process by spontaneously justifying and providing evidence for their thinking.	

Developed by S. Brooks & R. Ritchhart 2012

TIME	Rating
1. I make time for students' questions and contributions.	
2. I provide the "space" for students to extend, elaborate, or develop the ideas of others.	
3. I avoid disseminating an abundance of ideas without the time to process them.	
4. I give students time to think and develop ideas before asking for contributions.	
5. I monitor the amount of time I talk so as not to dominate the classroom conversation.	

OPPORTUNITIES	Rating
1. I ensure that rich thinking opportunities are woven into the fabric of my teaching and students aren't just engaged in work or activity.	
2. I focus students' attention on big subject matter issues, important ideas in the world, and in meaningful connections within my discipline and beyond.	
3. I provide students with opportunities for students to direct their own learning and become independent learners.	
4. I take pains to select content and stimuli for class consideration in order to provoke thinking.	
5. I provide opportunities to reflect on how one's thinking about a topic has changed and developed over time.	

ROUTINES	Rating
1. I use thinking routines and structures to help students organise their thinking.	
2. I use thinking routines flexibly, spontaneously, and effectively to deepen students' understanding	
3. I am good at matching a routine with appropriate content so that students are able to achieve a deeper level of understanding.	
4. Have thinking routines become patterns of behaviour in my classroom; that is, do students know particular routines so well that they no longer seek clarification about the mechanics of the routine, instead going straight to the thinking.	
5. Students' use routines and structures to further their understanding and as a platform for discussion, rather than as work to be done.	

PHYSICAL ENVIRONMENT	Rating
1. Displays in the room inspire learning in the subject area and connect students to the larger world of ideas by displaying positive messages about learning and thinking.	
2. I arrange the space of my classroom to facilitate thoughtful interactions, collaborations, and discussion.	
3. My wall displays have an ongoing, inchoate, and/or dialogic nature to them versus only static display of finished work.	
4. I use a variety of ways to document and capture thinking, including technology.	
5. A visitor would be able to discern what I care about and value when it comes to learning.	

INTERACTIONS	Rating
1. I ensure that all students respect each other's thinking in my classroom. Ideas may be critiqued or challenged but people are not.	
2. I make it clear that mistakes are acceptable and encouraged within my classroom.	
3. Students are pushed to elaborate their responses, to reason, and to think beyond a simple answer or statement? For example, by using the "What makes you say that?" routine.	
4. I listen to students and show a genuine curiosity and interest in students' thinking. It is clear I value their thinking.	
5. I listen in on groups and allow them to act independently rather than always inserting myself into the process.	

III. Second Body

In this chapter, after examining definitions and identifying dispositions of current situation, I will provide some sample exercises/models and their reasoning to create a culture of critical thinking in a school.

Model/Guideline of creating a culture of critical thinking in a school

"The Art of Teaching Thinking"

i. Foster Awareness

To understand and address global issues, students will need higher-level thinking skills and schools must promote critical thinking skills. Firstly, each person should be open and flexible to understand, negotiate and balance diverse views and beliefs to increase his own awareness level in multi-cultural environments. We can begin asking questions ourselves before making our new decisions to foster the awareness. While talking about our own thinking, we will have been made the thinking explicit. Sharing decisions and wonders aloud, others also will get a chance to explore other possibilities. It is a type of role modeling in classroom.

- Sample Activity:

Same patterns in QFT the activities:

Space: Physical space is organized for maximum learning.

Emotion: Respect and rapport create a culture of learning. Each student sees himself/herself as a valued member and active participant in the learning process.

Learning environment: Positive attitude and appropriate behavior are strongly incorporated and enforced. Students may change their seating arrangement daily based on their interests, pre-assessment results, and activity and learning styles.

Question Formulation Technique (taken from The Right Question Institute)

Time: 60+ 60 min	Part 1
Main Idea	Questioning (QFT)
Quote	The most common source of management mistakes is not the failure to find the right answers. It is the failure to ask the right questions. Peter Drucker
Outcome	• Participants will be responsible for their own learning. • Participants will learn how to generate their own questions.
Content	• QFT QFocus: me/myself Rules
Details:	• Introduce QFT method (teacher role) *Make Just One Change* tells all process. I have this book. • Rules for producing questions (teacher role) 1. Ask as many questions as you can 2. Don't stop to discuss, judge, or answer any question 3. Write down every question exactly as it is stated. 4. Change any statement into a question. • To facilitate the process (teacher role) • Develop ideas and generate questions (student role) • Think about and name challenges in following the rules (student role) • Key points: 1. No shaping 2. No rephrase 3. 5-7 minutes 4. Discuss the rules before introducing the QFocus. 5. Students discuss the rules in groups. 6. Don't tell them about what they missed. The goal is for them to think themselves.
Reflection/ Evaluation	Write log entry What might be difficult about following the rules? Easy, difficult or not sure? Why? What did you learn about yourself and others? Why is it important for you?
Space	Class, projection in dark
Emotion	Amusement, curiosity
Skills	Questioning, divergent thinking, convergent thinking,

Instructions:

1. Review Question Formulation Technique (QFT) rules with students. Discuss advantages/disadvantages of these rules.

a. Ask as many questions as you can.

b. Change any statement to a question.

c. Do not stop to discuss or answer questions.

d. Write down each question exactly as it was stated.

2. Assign student roles.

a. Scribe – writes down questions

b. Rule keeper – makes sure no one breaks the rules

3. Hand out large sheet of paper and markers to each group, as well as the question focus. Do not allow students to start to discuss the question focus. The focus can be 1 word, a phrase, a quote, an image – whatever will provoke good questions.

4. Give students 5-10 minutes to generate as many questions as they can. Circulate to make sure that students are adhering to the rules.

5. Have students count up the questions. (I'll usually make a big deal about who has the most).

Time: 60+60 min	Part 2
Main Idea	Questioning (QFT) and creative thinking
Quote	The more you ask questions, the more thoughts come to your head and it helps expand your learning. Dan Rothstein and Luz Santana
Outcome	• Participants will be responsible for their own learning. • They will learn the difference between closed- and open-ended questions. • They will know how to change questions from kind to another. • They will think about how they ask their questions. • They will know how to rank the order/prioritize. • They will analyze, compare, contrast.
Content	• Warm up activity (use your creativity): If this ring had a magical power, what would it be? • QFT Improve Questions Prioritize Questions
Details:	• Teacher role 1. Introduce a definition for closed/open-ended questions (yes/no, one word, explanation?) (open: why, what, how ; closed: when, where, who, is, can ,do) 2. Support participants as they categorize questions. (C or O) 3. Facilitate a discussion on the advantages and disadvantages of closed/open-ended questions. (4 min) 4. Support participants as they work on changing questions from one type to another. (3 min) 5. Establish criteria to prioritize (also promotes self-directed learners) Ex: Choose the most important questions Choose the three questions you want to answer first Choose the three questions that most interest you 6. Monitor groups 7. Make sure to let students know how much time they have to complete the task. • Participant role 1. Review list of questions they have produced 2. Categorize questions as closed/open-ended. 3. Name advantages and disadvantages of asking closed/open-ended questions. 4. Practice changing questions from closed to open-ended ones. 5. Prioritize questions (10 min) 6. Have discussion while deciding which questions should be the priority ones. 7. Need to provide a rationale for why they chose their priority questions. 8. Report their work
Reflection/ Evaluation	Write log entry What might be difficult about following the rules? Easy, difficult or not sure? Why? What did you learn about yourself and others? Why is it important for you?
Space	Class
Emotion	Curiosity, gratitude, joy
Skills	Questioning, divergent thinking, convergent thinking, analyze, synthesize, evaluate, comprehend, Discovering alternatives, Classifying, Reaching a conclusion which is consistent with a given set of assumptions, Reasoning, Making decision, Judging, categorizing

Advantages and disadvantages of closed- and open-ended questions

Closed-ended questions Answered with yes/no or one word answer		Open-ended questions Need an explanation	
Advantages	Disadvantages	Advantages	Disadvantages

Instructions:

- Introduce/review the idea of a closed vs. open question. Discuss the advantages/disadvantages for each.
- Have students label questions as C/O – closed/open and explain that sometimes a question is better open or closed. Students can change any open to closed and vice versa.
- Finally, have students put a star by their 3 priority questions.

Have each group explain why they chose their 3 priority questions.

ii. Give enough time to think

Beside to creating awareness, giving time to discuss thoughts or to answer could be second step to be taken without repeating or rephrasing the question if there isn't an immediate response. Silence will help them to formulate their thinking. Also, you can get students to write their thoughts down if you have students with characteristics of intrapersonal.

I would like to share a few activity idea.

- See Think Wonder (Ritchhart, R., Church, M., & Morrison, K. (2011))

While teaching human rights, you can use the routine of "I See and I Wonder" to give the children the opportunity to look at a situations were children didn't have their rights. The beauty of this routine, is that it forces the children to slow down. And to really look at pictures, and focus on what is it that they really see. And then they can wonder about what that might mean. It stops them from drawing conclusions too quickly. You can give them some photographs to

look at and want them to use the routine of See Think Wonder. Asking ‘what do you see,’ what are the kinds of things that you might say about this?” could be good examples.

- While reflecting your own thoughts, you need more time like this:

When we began this study of _____, you all had some initial ideas about it and what it was all about. In just a few sentences, I want to write what it is that you used to think about_____.

Take a minute to think back and then write down your response to “ I used tothink…”

Now, I want you to think about how your ideas about _____ have changed as a result of what we’ve been studying/doing/discussing. Again in just a few sentences write down what you now think about _____. Start your sentences with, “But now, I think…” (from Thinking Classroom Resource Guide pdf.)

It provides a chance to students to see how their mind or thinking changed after watching a film, listening to a speaker, experiencing something new, having a class discussion or reading a new information. Then, they can share and explain their shifts in thinking. Once students become accustomed to explaining their thinking, students can share with one another in small groups or pairs.

iii. Provide opportunities to apply

I believe that effective teachers are powerful mediators of children’s thinking and learning. They design learning environments that stimulate children’s curiosity. Educators can also engage children in thinking routines throughout the curriculum to provoke thinking. Just learning or teaching skills are not enough for mastering skills. They must be applied in the school. Providing opportunities is our role as educators. Giving them to take some roles like a leader in a meeting could be a good example. It could be helpful for people whose role is acting as a governor to manage the moment so they have a chance to get a real experience learning how to think critically. Then, they can transfer these skills into another settings. Moreover, others know that questions will be asked and may start asking the questions themselves earlier and it promotes critical thinking in a school environment.

- Sample Activity: Skill sharing

Materials:

Printer-size paper (8.5” x 11”),

pens, camera

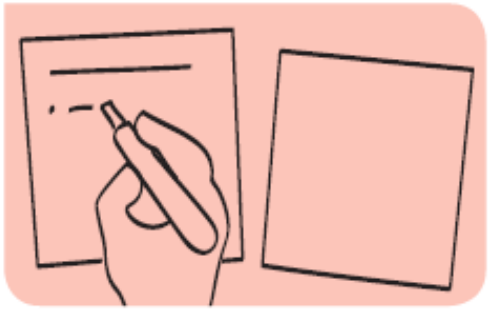
optional: stickers, photos,

markers, colored paper

Instruction:

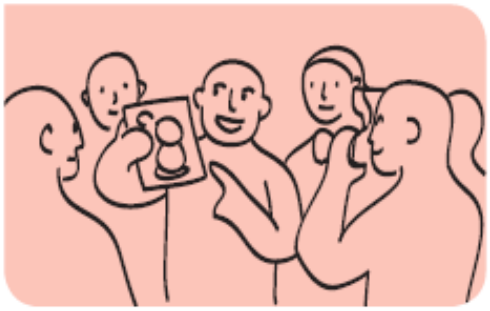
Time: 60+60 min	
Main Idea	Skill sharing
Quote	Learning how to learn is life's most important skill. Tony Buzan
Outcome	• Participants will be responsible for their own learning. • They will share skills with others. • They will reflect their own skills. • They will be aware of their needs.
Content	• Skill share
Details:	• Skill share (Taken from Frog Collective Action /Frog Design) Encourage your group members to share their unique skills—and determine what skills they may need to reach their goals.
Reflection/ Evaluation	After class, they will spend 1 or 2 hours (Time Banking) for each other to help and share own skills with others.
Space	garden
Emotion	Respect, gratitude, pride, hope, awe
Skills	• Comparing, contrasting • Searching and locating items/information • Making decisions • Being reflective • Discovering alternatives

1. Hand out two sheets of paper per group member. On the first sheet, have each person write:
   - The name they'd like the other group members to call them
   - The skills and talents they have and believe are relevant
   - One recent accomplishment



2. On the second sheet of paper, ask each person to create something that expresses who they are and what they like. For example, they could create a drawing or a collage. But group members don't *have* to use the paper. They could also make a skit, a dance, sing a song about themselves, and so forth.

3. Ask each group member to share their first page and whatever they made on the second page. Take notes about what they share, and consider taking pictures as they present so everyone in the group has a record of who each person is for future group members.



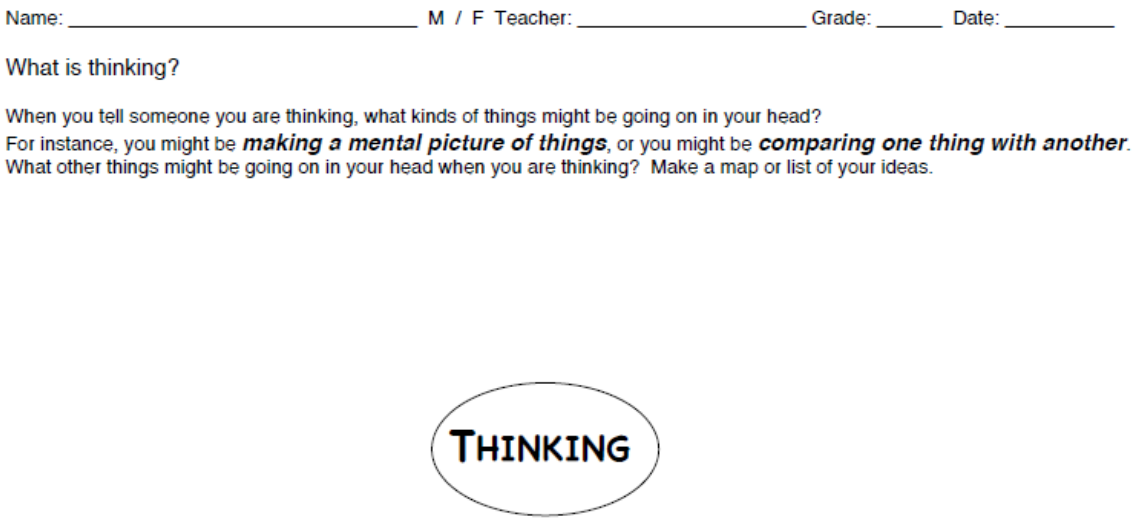
4. Once everybody has shared, ask people to put up their two sheets of paper on the wall. Lead a discussion with the group and capture on a large piece of paper:
   - The types of skills your team has a lot of
   - The skills your team still needs

   Keep this visible where you meet, so group members are reminded of these skills.

- Sample activity: Asking students to represent their own thinking by their own product that could be art, video, photograph, essay or story that should be creative. You can inform them and provoke their imagination. You should develop creative learning environments/settings that value making mistake (as a learning opportunity), making meaning and connecting.

- Sample activity: Thinking map (taken from Making Thinking Visible)

This map can be used as a tool to see what kinds of things might be going on your students' heads. It can be used for teachers too.



Name: _____ M / F Teacher: _____ Grade: _____ Date: _____

What is thinking?

When you tell someone you are thinking, what kinds of things might be going on in your head?
For instance, you might be ***making a mental picture of things***, or you might be ***comparing one thing with another***.
What other things might be going on in your head when you are thinking? Make a map or list of your ideas.

iv. Create a practicing environment

Applying skills in just one class or with a single teacher is not enough to foster those skills. Posing problems, providing learning environments where students generate their own questions and real-life problems with the help of their own inquiry and encouraging them to support their reasoning should be aspects of a practicing environment.

Furthermore, the arrangement of classroom and the design of the learning environment should allow students to work in collaboration and to interact with each other to develop their own meaning. Another issue should be solved in an organization is our tendency to blame others when we face something goes wrong.

I learnt in CrCrTh 601 that thinking can include many different mental processes such as compare, infer, explain, and analyze. Consider the difference between "Let's look at these two

pictures" and "Let's compare these two pictures." The verb compare encourages learners to use a higher level of critical thinking.

In this part, I would like to share some example to show how to create a practicing environment for different level learner having different skills.

- Using multimedia: We can ask students to document their own learning. It makes their

thinking visible. Multimedia resources and hands-on materials make it easier and more enjoyable. Recording videos, programming games or documenting his/her own experiment could be examples. It provides meaningful engagement.

- Creating discussion environment: You can identify specific topics, issues or stories to

attract your students to discussion. Even, asking them to generate their own questions or creating problems to solve could be more effective and meaningful practices. This also promote collaboration too. They can explore their won dispositions and deepen their own understanding. Also, you can see what is going well or not in your class. After identifying what needs improvement, everyone can take action to make something better.

While making research, I found out the Asian Society that designs curriculum for competent students. This part of the project was related to creating practicing environment. This can be adapted to critical thinking. What teachers/leaners can do!!!

Teachers: What can you do?[3]

• Create professional learning communities supporting collaborative work to thoughtfully infuse the curriculum with opportunities for students to investigate and analyze issues of global significance, communicate findings to diverse audiences, and improve conditions.

• Target high-leverage entry points within the curriculum to engage students in rigorous global inquiry, using national, local, and school expectations (e.g., Common Core and state standards) as gateways to deep learning and intellectual development.

• Connect your classroom and curriculum to cultural and educational institutions that can further opportunities for students to learn to investigate the world, recognize perspectives, communicate with diverse audiences, and take action. Institutions may include museums, civic institutions (Red Cross, scouts), afterschool and extended learning programs, and nongovernmental organizations that promote global competence and intercultural communication (Bridges to Understanding, Taking IT Global, World Savvy, iEARN).

[3] Mansilla, V, B. and Jackson, A. (2011) Educating for Global Competence: Preparing Our Youth to Engage the Worldthe Asia Society, New York. Retrieved from http://asiasociety.org/files/book-globalcompetence.pdf

• Develop your own global competence by taking advantage of opportunities to learn about the world's cultures, languages, and interdependent systems, and to broaden your perspective through travel and study abroad.

School and district leaders: What can you do?

• Lead your education communities in developing a deep understanding of the importance of global competence for the success of every student and in considering what a school's mission should be in the 21st century.

• Create opportunities for your schools to systematically investigate how addressing matters of global significance can become a mainstay of a school's culture—reflected in its structures, practices, and relationships with people and institutions outside the school.

• Pilot new and strengthen existing approaches to promote global competence, from new course offerings in world languages and other internationally focused content to globally focused service learning and internships to international travel and virtual exchange opportunities for students and teachers.

• Feature best practices stemming from your schools and communities. Create conditions for interested stakeholders (teachers, administrators, parents, businesses) to reflect about the opportunities embedded in best practices and what can be done to support them and expand their reach.

Their main goal is to train competent students that are able to do the following. It almost looks like critical thinker.

1. Investigate the world beyond their immediate environment, framing significant problems and conducting well-crafted and age-appropriate research.
2. Recognize perspectives, others' and their own, articulating and explaining such perspectives thoughtfully and respectfully.
3. Communicate ideas effectively with diverse audiences, bridging geographic, linguistic, ideological, and cultural barriers.
4. Take action to improve conditions, viewing themselves as players in the world and participating reflectively.

v. Use thinking routines

Having thinking routines that provide a structure and common language for thinking among members of that culture. It is like a guideline for audience have them for getting used to thinking. Beside to repeating them, they should be clear, short and easy to remember. Making them meaningful specifically for each culture and creating cognitive cohesively is one part of roles of creators. While making research about this topic, I found out a source written by Ritchhart (2011) offers a protocol that "*makes thinking more visible in your classrooms through*

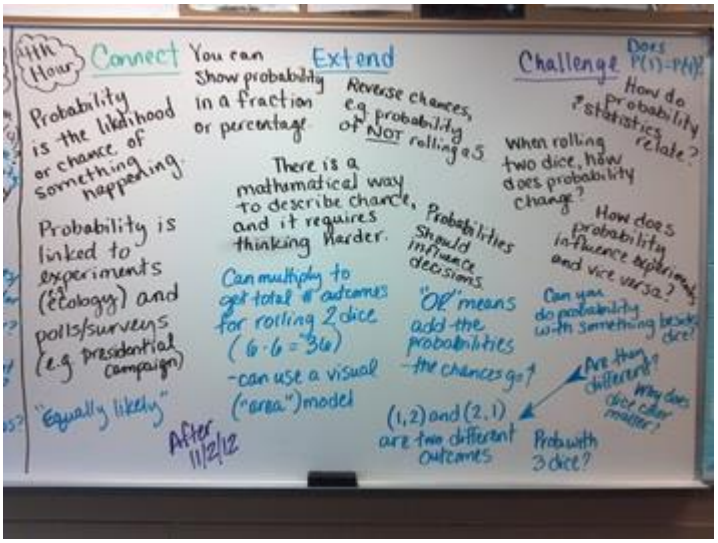
the use of thinking routines and documenting students' thinking."[4] They help children make connections between familiar and relevant events in their lives.

"*Thinking routines typically consist of a series of questions that teachers ask children in order to lead them through the steps of critical thinking and to help them understand where their own ideas come from. These routines support children's development as self-directed learners and promote learning for understanding"* (Project Zero 2010).

I would like to give some examples in this part:

- You can use Connect-Extend-Challenge[5] routine to build a culture of thinking in a Math class. Its purpose is to "help students make connections between new ideas and prior knowledge. It also encourages them to take stock of ongoing questions, puzzles and difficulties as they reflect on what they are learning".

CONNECT: How are the ideas and information presented CONNECTED to what you already knew?
EXTEND: What new ideas did you get that EXTENDED or pushed your thinking in new directions?
CHALLENGE: What is still CHALLENGING or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?



[4] Ritchhart, R., Church, M., & Morrison, K. (2011). Making Thinking Visible: How to Promote Engagement, Understanding, and Independence for All Learners. San Francisco, CA: Jossey-Bass. Retrieved November 22, 2015, from http://admin.kasa.org/Professional_Development/documents/ThinkingClassroomResourceGuide.pdf

[5] Ritchhart, R., Church, M., & Morrison, K. (2011). taken from http://www.rcsthinkfromthemiddle.com/connect-extend-challenge.html

Participants can have the opportunity to develop their own lesson plan(s) using one or more strategies presented in the book. I think that this is more suitable for elementary level.

- Project Zero offers practical suggestions and resources that include thinking routines

and protocols. They provide the opportunity to change the culture of meetings in a school setting, shifting their focus from logistics to collaboration and productivity. I think that they can be used to mediate and resolve conflicts, reflect on behavior and progress. They increase engagement by providing opportunities to discuss how they might adapt them to their own school environment. Also, providing students to investigate and identify their own inquiries help us to create a culture of critical thinking.

IV. Conclusion

You have found the basics about critical thinking and creating such a culture so far. Beyond it, models, activities, strategies and tools provided you chances of how to implement. It is time to take action and see the progress. Here, I can offer you two different tools taken from Elder and Paul (2006). You can fill them each day or week depending on your own needs.

- *Daily/weekly Action Plan*

The key idea I am focused on today is:

The settings in which I can best practice using this idea are:

I plan to practice using this idea in the following ways (using the following strategies):

- *Daily/weekly Progress Notes (To be completed at the end of each day/week)*

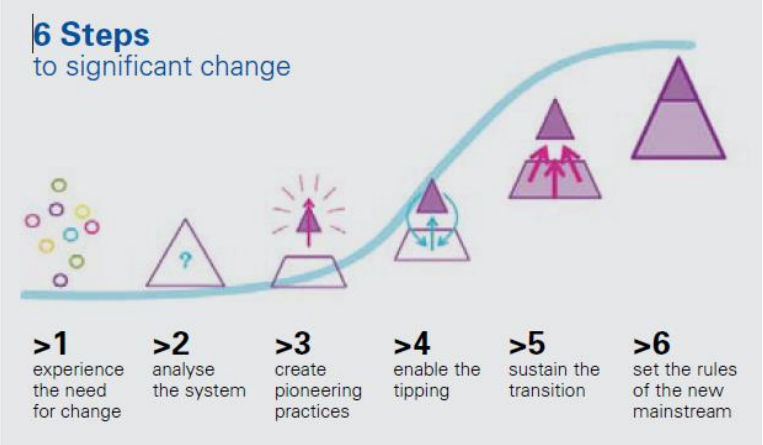
Today I was successful in using the following ideas/strategies:

The key insights that emerged for me as I attempted to take ownership of this idea were:

One problem in my thinking that I now realize I need to work on is:

I plan to continue working on this problem in my thinking by using the following strategy:

Last spring, in conceptual change course, I learnt that changing behavioral patterns and conceptions is a long process. In order to achieve to gain high level thinking skills, we need sustainability. To prove my idea, I made researched sustainable behavior articles and took a screenshot of the paper (Curran and Chapple, 2011) that shows the six steps to significant changes. As you see, the approached is required to embed sustainable behavior.



In upcoming part of conclusion section, you will find limitations; further steps to expand my dreams and educators/experts whom I examined their work.

i. Limitations

While arriving to the end of semester, I met David Jakes's story metaphor to think about schools and their vision. It reminded me some possible limitations. He (2012, cited in Ritchhart, 2015) says that *we need to change our language from one of limits to one of possibilities: "Creating a new story requires that the author or authors of that new story cast aside the destructive 'Yah But' mentality, and ask 'What If?'"* He gives a few What if questions samples like these:

• What if schools **were less about preparing students for tests** and more about preparing them for a lifetime of learning?

• What if schools **measured success not by what individuals did on exams** but by what groups were able to accomplish together?

• What if understanding and application of skills and knowledge rather than the **mere acquisition of knowledge were the goal**?

The parts of the sentences I bolded could be limitations of creating a culture of critical thinking in a formal setting. The most impressive one was that *"What if we sought to develop a culture*

of thinking in our schools, classrooms, museums, meetings, and organizations?" I have focused on this and been working for that. However, I know there are more limitations. I would like to give some examples:

- Organizational and Behavioral change: Living in a society cause people do

many things by observing others and copying. People continue to do things without consciously when other people approve of their behavior. These habits are hard to change even though people want to change their behavior.

- Self-expectations influence whether they feel involved to make a change. They

need to take incentives.

- Social influence also has an effect on it. Social awareness and values could be

changed. Positive actions of peers make thinking visible. This could shift the norms and encourage others. "Thinking big and starting from small" could be my mission. ☺

- Having short-term thinking or goals also affect critical thinking habits

negatively because people don't have enough perception of sustainability yet. They care short term contribution rather than long-term decisions and values. Having long-term strategies could be the solution.

- Cultural: *"Thinking routines help incorporate thinking language*

into the classroom because they both promote a thinking disposition in children and create the language to do so. Thinking dispositions are inclinations and habits of mind that support productive thinking and are teachable over time across diverse situations (Tishman, Perkins, & Jay 1995; Ritchhart 2002; Ritchhart & Perkins 2008, cited in Salmon, 2010).

We can activate people's values, beliefs and practices that are shared by the members of a community. To create a classroom culture of thinking, teachers can begin by revisiting their own beliefs about and understanding of thinking. We can encourage them to think about the importance of things. Repetition is important factor that cause people to exposure to these values more often. We can do it by education, different technological medium or public opinion.

I believe that there are many opportunities for educators to identify ways to implement these recommendations or better ones in their own learning environment. This can create real momentum for change. The lack of information, cultural tendencies and policies should be identified very well to encourage cultural shifts. Reporting outcomes and logging the progress could be good starting points.

ii. Further steps to expand my dreams

I would like to share my dreams I want to realize in upcoming years below.

- Applying this strategy taken from Creating Cultures of Thinking The 8 Forces We Must Master Truly to Transform Our Schools[6] by Ritchhart (2015) in my own teaching environment.

UNCOVERING THE STORY OF YOUR SCHOOL OR CLASSROOM

• Using the method of the Gallup Youth Survey, create a list of twenty-five adjectives: ten positive (engaged, interested, curious . . .), five neutral (coasting, comfortable, fine . . .), and ten negative (tired, bored, frustrated . . .). Ask students to select three words from the list to describe how they usually feel in school in general or in your class in particular. Include a question asking students to identify how they see themselves academically: near the top, above average, average. What does the pattern of response tell you?

• Use the "My Reflections on the Learning Activities in This Class" survey (appendix A) to assess students' views about the types of thinking that are most present in a particular class lesson. How do students' views match with your own?

• Uncover the messages the school sends teachers about what it means to teach at your school. Have the faculty respond in writing to the prompt, "For a first-year teacher beginning his or her career at our school, what messages would he or she pick up about what it means to be a teacher here? What kinds of professional conversations would he or she recognize as dominating our time? What would he or she notice about how one develops as a teacher over the course of his or her career if one stays at this

[6] http://www.pz.harvard.edu/sites/default/files/Chapter%201%20CCOT_Ritchhart_Sample.pdf page 35

school?" Share and discuss people's responses in small groups to identify themes, and then share them with the larger group.

• Go on a "learning message walk." Visit as many classes at your school as you can on a given day, stopping in each class for just five to ten minutes. The purpose is not to evaluate teacher performance but to get a general feel for students' experience in classes. Pay attention to engagement and participation. Are all students participating or just a few? Note the level of intellectual challenge and the teacher's press for thinking. Is this just more of the same, or do students really have to dig in and think? Get a feel for the discourse in the classroom. Are students engaging and responding to one another, or is it only a Ping-Pong dialogue with the teacher? Take note of how students are working: whole class, small groups, in pairs, or individually.

- Designing rubrics/checklists of critical thinking for different subject areas. I liked the table[7] below that represent global competence matrix for science designed by asiasociety.org.

GLOBAL COMPETENCE MATRIX FOR SCIENCE

INVESTIGATE THE WORLD	RECOGNIZE PERSPECTIVES	COMMUNICATE IDEAS	TAKE ACTION
Students use science to investigate the world.	Students recognize their own and others' perspectives through the study of science.	Students communicate about science effectively with diverse audiences around the world.	Students use their scientific knowledge and skills to translate their ideas and findings into actions that improve conditions.
Students: ■ Identify issues and frame investigable questions of local, regional, or global significance that call for a scientific approach or emerge from science. ■ Use a variety of domestic and international sources to identify and weigh relevant scientific evidence to address globally significant researchable questions. ■ Design and conduct a scientific inquiry to collect and analyze data, construct plausible and coherent conclusions, and/or raise questions for further globally significant study. ■ Interpret and apply the results of a scientific inquiry to develop and defend an argument that considers multiple perspectives about a globally significant issue.	Students: ■ Recognize and express their own perspective on situations, events, issues, or phenomena, and determine how that perspective along with their entire understanding of the world is influenced by science. ■ Examine scientific ways of knowing and perspectives about science of other people, groups, and schools of thought, and identify the influences on those perspectives. ■ Explain how cultural interactions influence the development of scientific knowledge. ■ Explore and describe the consequences of differential access to scientific knowledge and to the potential benefits of that knowledge.	Students: ■ Recognize and express how diverse audiences may interpret differently and/or make different assumptions about the same scientific information and how that affects communication and collaboration. ■ Use varying scientific practices, behaviors, and strategies to verbally and non-verbally communicate scientific information effectively with diverse audiences, including the international scientific community. ■ Select and use appropriate technology and media to communicate about science and share data with experts and peers around the world. ■ Reflect on how effective communication affects scientific understanding and international collaboration in an interdependent world.	Students: ■ Identify and create opportunities in which scientific analysis or inquiry can enable personal or collaborative action to improve conditions. ■ Assess options, plan actions, and design solutions based on scientific evidence and the potential for impact, taking into account previous approaches, varied perspectives and potential consequences. ■ Act, personally or collaboratively, in creative and ethical ways to implement scientifically-based solutions that contribute to sustainable improvements, and assess the impact of the action. ■ Reflect on how scientific knowledge and skills contribute to their capacity to advocate for improvement locally, regionally, or globally.

[7] Mansilla, V, B. and Jackson, A. (2011) Educating for Global Competence: Preparing Our Youth to Engage the Worldthe Asia Society, New York. Retrieved from http://asiasociety.org/files/book-globalcompetence.pdf

- Creating a diagram of culture of critical thinking similar to the dynamic interaction among dimensions of global competence[8]:

iii. Educators/experts whom I examined their work

- Richard Anderson
  Washington International School
  Learning and Technology Coordinator
- Kerri Redding
  Washington International School
  Community Service Coordinator and Film/Computer Programming Teacher
- Jim Reese
  Washington International School
  Director of WISSIT, Director of Studies
- Paul Ruther
  Freer/Sackler Museum
  Docent Coordinator
- Ron Ritchhart
  Harvard University Graduate School of Education's Project Zero
  Senior Research Associate at Project Zero, Fellow at the University...

[8] Mansilla, V, B. and Jackson, A. (2011) Educating for Global Competence: Preparing Our Youth to Engage the Worldthe Asia Society, New York. Retrieved from http://asiasociety.org/files/book-globalcompetence.pdf page 12.

- Annette Zamula
  Washington International School
  Visual Arts and Theory of Knowledge Teacher
- Natasha Bhalla
  Washington International School
  Middle School Principal
- Lauren Wilson
  National Building Museum
  Teen Programs Coordinator
- Veronica Boix Mansilla
  Senior Research Associate, Harvard Graduate School of Education's Project Zero
- Marla McLean
  Atelierista and Adjunct Professor at Corcoran College of Art & Design, School Within School (SWS)

Appendix 1

Searching: Searching is the skill most often associated with research in all forms and Google is the most popular search engine in the western world but most students have very poor searching skills. Within Google and in most other search engines there are a set of Boolean operators which students need to gain proficiency with to help them narrow down their searches. Most search engines will recognize AND and OR to differentiate important terms and speech marks or brackets to isolate specific search terms or quotes. Domain Limited Searching is another useful tool where by adding specific words to the search terms a search can be limited to specific sources of information. Tacking on terms to your search inquiry like site:gov will limit a search within Google to only governmental websites, site:U will limit searching to university websites and adding a minus sign before the word site will instruct google where not to look in its search eg. adding on –site:gov would instruct google to look at every site except those with a .gov tag in their URL. Students also need to get familiar with academic search engines like Google Scholar which has its own search protocols. There are online tutorials that come with every search engine which will quickly and simply explain top students how to use all these search defining terms but students also need lots of practice both within class and at home to get familiar with using search limiters and search refiners.

Monitoring: Monitoring involves first employing an RSS Reader (Rich Site Summary or Really Simple Syndication) to collect together all the internet content (feeds) produced regularly that are of interest and then scanning through all the collected feeds on a regular basis looking for topics of value. The most popular RSS Readers today are Feedly, Newsblur, Netnewswire, Bloglines and Newsgator and new ones are generated daily. Most are able to be set to choose feeds very selectively and most have apps to enable the user to access the same feeds from their phone. They can be used to gather all forms of digital data from written blogs and articles to pictures, YouTube clips, podcasts and live broadcast. Learning to use RSS feeds is a critical skill for students to keep up to date with developments globally and in their chosen subjects and needs to be the first step that teachers help set up for any project work, for the Extended Essay, for TOK, CAS, Environmental Systems and Society and for any subject where research is a component part. Monitoring is not the set up part though, monitoring means regularly skimming through all the feeds collected by the RSS Reader, finding the relevant information and downloading or summarizing or filing the important data. If performed on a regular basis, especially in response to questions or lines of inquiry from teachers, monitoring can be a vital tool which keeps the student current and enables them to make relevant connections between their subjects and the world around them. Feeling overwhelmed by information is a common concern of students but by learning good refining skills and specific search skills students can learn to narrow down the scope of their searching and cope with the volume they then produce. Research is more information selection and management than it is searching and finding.

Browsing: “Browsing is the complimentary opposite of monitoring. Here we have no special information need or interest, but actively expose ourselves to possibly novel information. It can be said that monitoring and directed searching are ways we find information that we know we need to know, and browsing and being aware are ways we find information that we do not know we need to know” (Bates, 2002, pg. 5)

This is the skill that most students already have, in abundance. The modern teenager in a western ‘wired’ environment probably spends more time engaged with this activity per day than almost anything else. Most people know it as surfing and it is characterized by a general direction of interest but a willingness to be distracted in almost any direction at all. The tools in use are mostly ‘favouriting’ websites, using place holders or ‘likes’ to keep connected to particular themes or strings. The problem with browsing is that it often takes place when searching or monitoring need to be taking place and as such can be a major distraction.

Being Aware: This is not so much a skill as an awareness of all the messages and information in all media forms that surrounds us all day and every day. As such it is more a practice of mind than a skill – see Mindfulness in the Affective Skills section. Training in internet research skills will be vital for every student who is engaged in any form of inquiry learning or who uses the internet for the completion of any schoolwork. Teachers need to recognize this fact and build sufficient opportunity either within their subjects or as separate skills focused modules to bring all students up to speed with their internet skills. These skills along with communication and collaboration skills are the foundation skills of lifelong learning in the 21st Century.

Appendix 2

Original ones:

Focused Listing

Focused listing can be used as a brainstorming technique or as a technique to generate descriptions and definitions for concepts. Focused listing asks the students to generate words to define or describe something. Once students have completed this activity, you can use these lists to facilitate group and class discussion.

Example: Ask students to list 5-7 words or phrases that describe or define what a motivated student does. From there, you might ask students to get together in small groups to discuss the lists, or to select the one that they can all agree on. Combine this technique with a number of the other techniques and you can have a powerful cooperative learning structure.

Send-A-Problem

Send-A-Problem can be used as a way to get groups to discuss and review material, or potential solutions to problems related to content information.

1.Each member of a group generates a problem and writes it down on a card. Each member of the group then asks the question to other members.

2.If the question can be answered and all members of the group agree on the answer, then that answer is written on the back of the card. If there is no consensus on the answer, the question is revised so that an answer can be agreed upon.

3.The group puts a Q on the side of the card with the question on it, and an A on the side of the card with an answer on it.

4.Each group sends its question cards to another group.

5.Each group member takes ones question from the stack of questions and reads one question at a time to the group. After reading the first question, the group discusses it. If the group agrees on the answer, they turn the card over to see if they agree with the first group's answer. If there again is consensus, they proceed to the next question. If they do not agree with the first group's answer, the second group write their answer on the back of the card as an alternative answer.

6.The second group reviews and answers each question in the stack of cards, repeating the procedure outlined above.

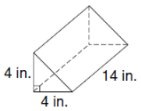
7.The question cards can be sent to a third, fourth, or fifth group, if desired.

8.Stacks of cards are then sent back to the originating group. The sending group can then discuss and clarify any question.

Appendix 3

Connect- Extend – Challenge from Ritchhart, R., Church, M., & Morrison, K. (2011).

VOLUME-IZE YOUR THINKING WITH...

CONNECT	EXTEND	CHALLENGE
VOLUME OF RECTANGULAR PRISM (8.5) How does this CONNECT with what you already know in MATH? How does this CONNECT with what you already know/see in your SCIENCE or INDUSTRIAL ARTS classes?	 So now I have this triangular prism... What would be a volume formula for this shape? **Why/how** did you create this formula? Find the volume of the shape using your formula:	What challenging puzzles have come up in your mind about this topic now that you've been presented with these new ideas and information?

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