

Background

This classroom Action Research project is inspired by Susan M. Brookhart’s belief that “life outside of school is better characterized as a series of transfer opportunities than as a series of recall assignments to be done (Brookhart, 2010, pg. 5) It is my belief that knowledge can only be transferred when one’s level of understanding for a particular topic goes deeper than simple recall. As a result, the purpose of this research is to model and introduce Visible Thinking Routines designed to help students become aware of and fluent in thinking that leads to deeper levels of understanding. The types of thinking that are vital to understanding as outlined in Making Thinking Visible (Ritchhart, Church, Morrison, 2011) include 1) wondering and asking questions, 2) observing things closely and describing them fully and in detail, 3) building explanations and interpretations, 4) reasoning with evidence, 5) making connections, 6) looking at different viewpoints and perspectives, 7) capturing the core of a concept and 8) uncovering complexity and going below the surface of things.

Research Questions

Primary Question:

How do students’ awareness and conceptions of the process of thinking change with the use of thinking routines designed to make thinking more visible in the classroom?

Secondary Questions:

How effective are the Visible Thinking routines in targeting their intended key thinking skills for students?

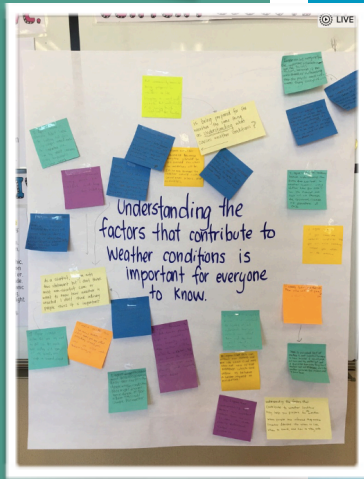
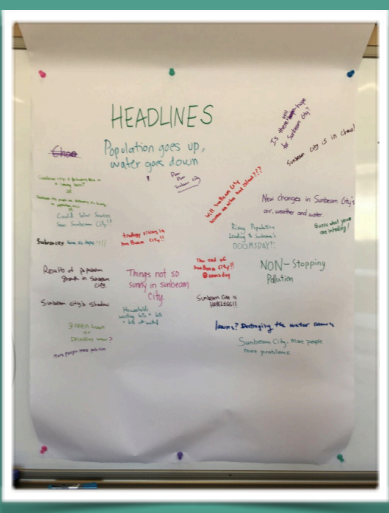
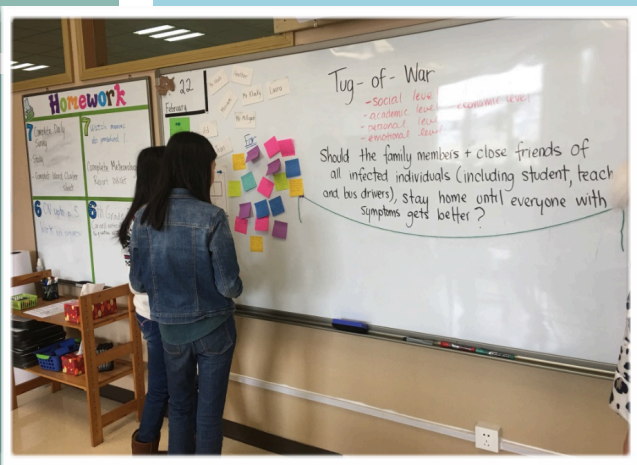
How will the inclusion of the Visible Thinking routines affect me as the classroom teacher?

Demographics

The classroom action research was carried from October 31st, 2016 to March 10th, 2017 at Dalian American International School in Dalian, People’s Republic of China. The school is an international school founded in 2007 to serve the educational needs of international residents. The research project focused on my seventh grade class consisting of ten boys and ten girls. Of the twenty students in the class, seven are classified as English as an Additional Language Learners (EAL). A typical trimester is nine weeks long and the students rotate between an A and B day schedule. Class periods are ninety minutes long, Monday through Thursday and seventy-five minutes long on Fridays. The students come from the United States, Canada, Germany, Japan, China, Korea, and India. Out of the twenty students, ten were new to the school. I had taught six of the remaining ten students for six consecutive years and the other four for at least two consecutive years.

Treatment

Routine	Description	Thinking Skill
Think-Puzzle-Explore	An adapted version of KWL chart that has student document what they think about a topic instead of what they know, what puzzles them about the topic, and how they can investigate the puzzle.	Activating prior knowledge, wondering, planning
Chalk Talk	An open-ended silent discussion where students consider ideas, questions or problems by responding silently in writing. Builds understanding in a collaborative way.	Uncovering and Identifying prior knowledge, questioning
Headlines	Students capture key points using a limited amount of words but communicate the core message.	Summarizing
I Used to Think..., Now I Think...	Students examine and explain how and why their thinking has changed as they consolidate new learning	Reflecting and metacognition
What Makes You Say That?	Used throughout a class discussion to get students to elaborate on their thinking and fosters a disposition for evidential reasoning.	Reasoning with evidence
Tug-of-War	Students create a visual tug of war by placing cards that explore the arguments for both sides of a dilemma to go beyond the surface and develop an appreciation for deeper complexities.	Gaining perspectives, reasoning and identifying complexities



Data Collection

Research Questions	Student Evaluation of Thinking Survey	Concept Map	Student Visible Thinking Routine Questionnaire	Daily Student Exit Ticket	Daily Teacher Reflection Survey	Teacher Perception Survey	Teacher Visible Thinking Routine Questionnaire
1A. How do students’ awareness of the process of thinking change through the use of thinking routines designed to make thinking more visible in the classroom?	X	X	X	X			
2. How effective were the Visible Thinking routines in targeting the intended key thinking skills for students?	X	X	X	X			
3. How will the inclusion of the Visible Thinking Routines affect me as the teacher?	X			X		X	X

Evaluating the Effect of Visual Thinking Routines on Student’s Awareness and Conceptions of Thinking and Understanding in the Science Classroom

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Conclusions/Application

Modeling and using the Visible Thinking Routines helped students’ awareness and conceptions of thinking shift from physical actions to more cognitive actions. Student thinking also shifted from simply identifying physical actions to making connections between the physical actions and the cognitive actions. Not all students benefited in the same way and most of my EAL students struggled to make the leap but this in turn provided a better understanding of where they are and the importance of addressing the emotional side of thinking for understanding.

Students visible thinking routine survey results were positive for the most part but the treatment phase was not long enough for the students to fully comprehend the effectiveness or value of the visible thinking routines on their understanding. Students were able to determine that thinking for understanding was valued in the classroom through the use of the Thinking Routines but were unable to find value in it for themselves or value in using them in other classes. The Thinking Routines and the emphasis on the thinking for understanding activities helped to establish a common cognitive language to the classroom.

Through this treatment I was able to get my students to think and to develop an awareness of thinking for understanding on an individual basis. The treatment also helped to establish a unique culture of thinking in the class.

This classroom action research project made me reflect on what I thought was important in the classroom and how I could communicate that to my students. Through these routines I not only made my own thinking visible for the students, but I was also able to get a better understanding of my own students’ thinking ability and processes.

Data Analysis

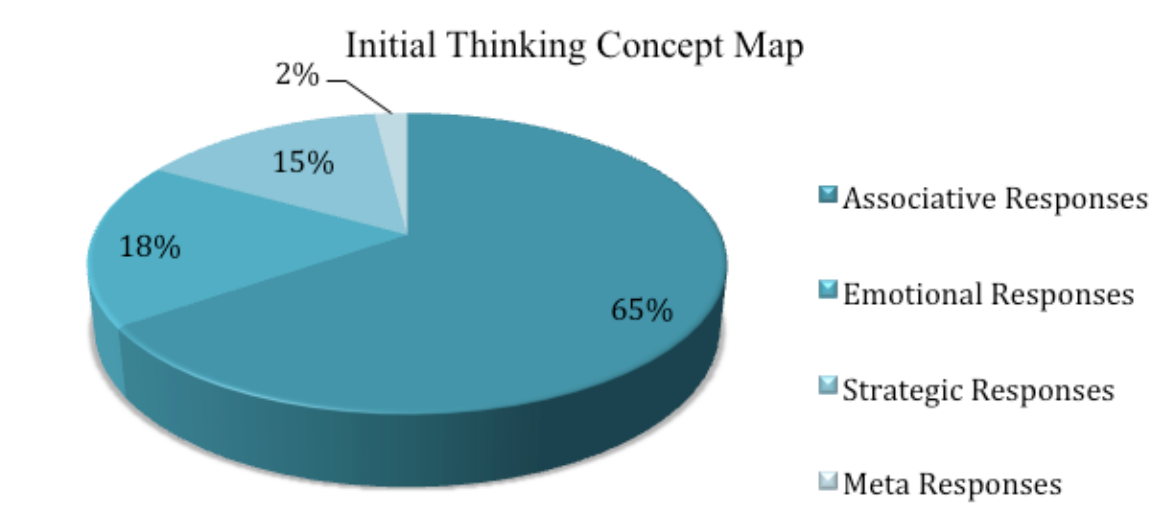


Figure 1. Initial Concept Map, (N=18).

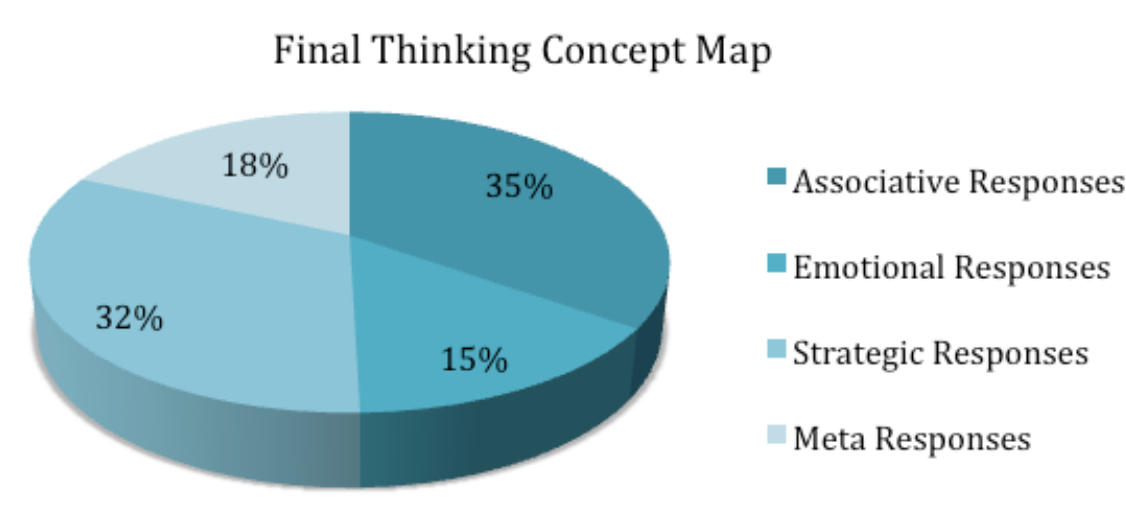
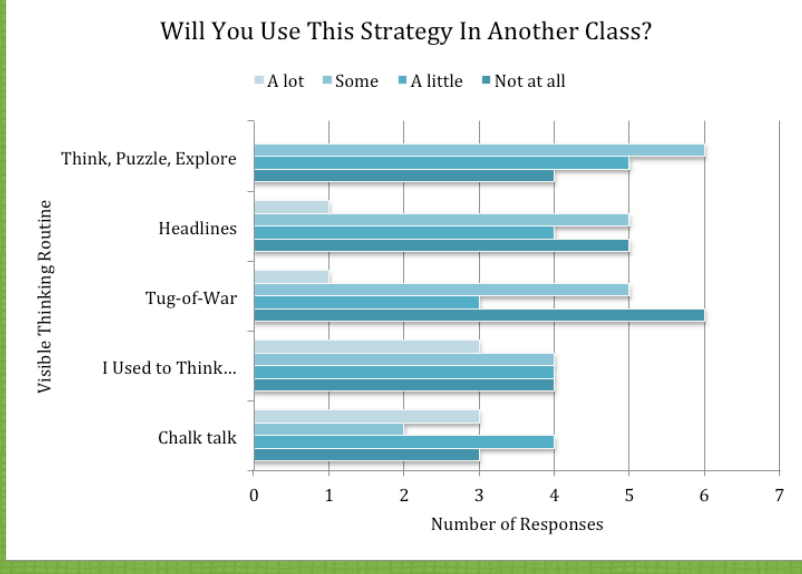
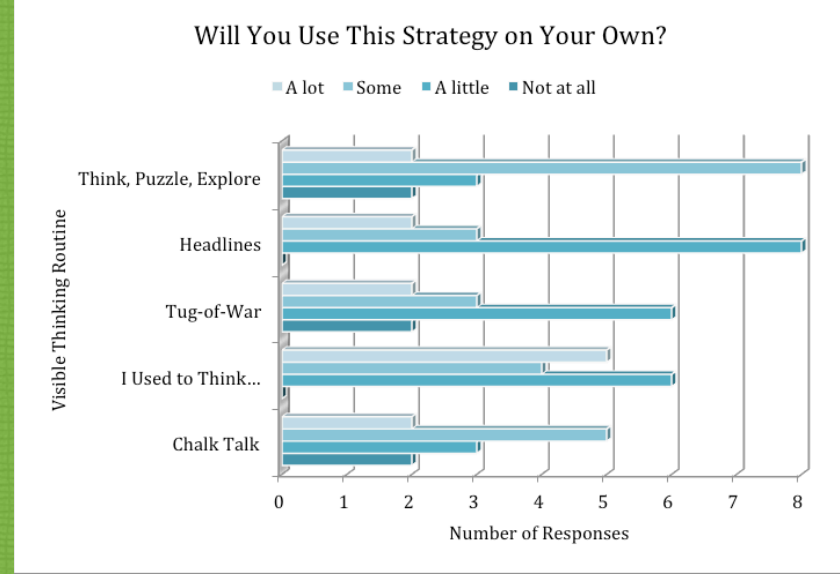
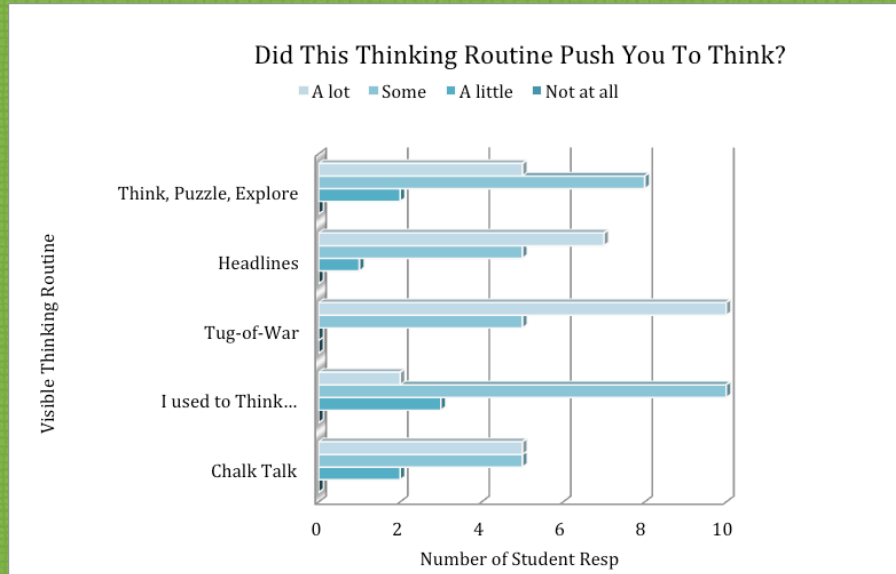


Figure 2. Final Concept Map, (N=16).

Students’ responses on the final Thinking Concept Map showed that their conceptions of thinking are malleable. From the initial to the Final Concept Maps, Associative responses decreased by -39%. Emotional responses had a slight -6% decrease. Strategic responses increased by 1.4% and Meta responses increased by 9.5%.



The results of the Student Visible Thinking Questionnaire (top left) indicated that the Visible Thinking Routines had pushed the majority of the students to think some or a lot. The majority of students also indicated that the routines were effective at targeting specific thinking skills as indicated by the five tables below.Despite this the students indicated that they were not likely to use the strategies on their own (center) or in another class (top right).

