# Thinking Maps

This Wiki description is actually an advertisement for a system of diagrammatic thinking derived from Section 3 of Upton & Sampson's out of print workbook text, Creative Analysis, for which Innovative Sciences held (or still holds) the copyright. Creative analysis, in turn is based upon Albert Upton's book, Design for Thinking (Pacific Press). The latter book is derived from Ogden & Richards' book, The Meaning of Meaning. The latter authors based their work on that of Victoria Lady Welby, whose writings were directly influenced by a long term exchange of letters with the great American philosopher, Charles Sanders Peirce, developer of the logic of semiotics. Creative Analysis, when taken in its entirety, enables the development of discernment, analysis and linguistic skills in such a way that students are able to apply these in myriad ways. Unfortunately, by leaving out Sections 1 & 2, Thinking Maps removes the depth factor from this remarkable Peircean system.

**Thinking Maps** are a set of graphic organizer techniques used in primary and secondary education ("K-12"). There are eight diagram types that are intended to correspond with eight different fundamental thinking processes. They are supposed to provide a common visual language to information structure, often employed when students take notes.

Thinking Maps are visual tools for learning, and include eight visual patterns each linked to a specific cognitive process. Teachers may apply Thinking Maps in all content areas and all grade levels. The eight map types are:

**Circle Map** used for defining in context

**Bubble Map** used for describing with adjectives

**Flow Map** used for sequencing and ordering events

**Brace Map** used for identifying part/whole relationships

**Tree Map** used for classifying or grouping

**Double Bubble Map** used for comparing and contrasting

**Multi-flow map** used for analyzing causes and effects

**Bridge map** used for illustrating analogies

By linking each thinking skill to a unique and dynamic visual representation, the language of Thinking Maps becomes a tool set for supporting effective instructional practice and improving student performance. Teachers and students, therefore, independently apply thinking skills for their own learning while also having a common visual language for cooperative learning. By having a rich language of visual maps based on thinking processes, learners are no longer confused by poorly organized brainstorming webs or an endless array of static graphic organizers. They are enabled to move from concrete to abstract concepts, think with depth, and directly apply their thinking to complex tasks.

## 1 General information

Thinking Maps are a specific set of graphic organizers used in K-12 classroom settings, or "visual teaching tools that foster and discourage life-long learning," as well as tools that provide students with the skills to be "successful thinkers, problem solvers, [and] decision makers" (Thinking Maps Inc., Pamphlet). Thinking Maps were founded as,"a good skill for the mind" quoted by Dr. Mark Davidson, scholarly teacher of accelerated classes. What he says is that the "one common instructional thread that binds together all teachers, from prekindergarten through postgraduate, is that they all teach the same thought processes" (Thinking Maps Inc., Pamphlet). For example, the thought process of classification might be taught in kindergarten by sorting or grouping, whereas classification in the upper grades might be taught as categorizing a main idea and details. Although we refer to classifying items, concepts, or ideas in different ways with different aged students, the thought process in its entirety is considered classification.

With this belief that all teachers, no matter the grade level, teach the same thought processes, these common set of visual organizers was created by Dr. David Hyerle as a type of language to be used across grade levels, content areas, and disciplines so that "students could learn more effectively and more efficiently." Thinking Maps were also created so that these graphic organizers would "become a familiar part of students' education that it would remain an effective learning tool throughout their academic careers – and beyond" (Thinking Maps Inc., Pamphlet).

## 2 History of Thinking Maps

In 1970, Innovative Sciences, Inc. (ISI) was founded by Charles Adams in order to "improve the thinking and problem-solving abilities of the work force" (Thinking Maps, Inc., 2011). Over the next eighteen years, ISI created a variety of developmentally appropriate materials, or "content-based thinking skills," for schools based on research from student reading performance and different educational teaching models (Thinking Maps, Inc., 2011). In 1988, David Hyerle wrote Expand Your Thinking, which was the first resource where his Thinking Maps were published, and at that point, he began training educators to use his Thinking Maps (Thinking Maps, Inc., 2011). In 1994, test results indicated that "Thinking Maps significantly affect[ed] standardized and qualitative measures of student performance" (Thinking Maps Inc., 2011). After more success and schools nationwide piloting Thinking Maps, ISI changed its name to Thinking Maps, Inc. in 2004 to "better promote its mission" (Thinking Maps, Inc., 2011). Today, thousands of teachers across America have been trained in using and implementing Thinking Maps in their classrooms. Thinking Maps are also being promoted in the United Kingdom, Canada, New Zealand, and Australia (Thinking Maps, Inc., 2011).

## 3 Educational theory and Thinking Maps

In his text *Curriculum as Conversation*, Applebee (1996) states that a "curriculum provides domains for conversation, and the conversations that take place within those domains are the primary means for teaching and learning. Through such conversations, students will be helped to enter into culturally significant traditions of knowledge-in-action" (p. 37). When looking at Applebee's (1996) ideas of "knowledge-in-action" and social learning, a connection with Hyerle's Thinking Maps is apparent. When students produce Thinking Maps, conversations among the students and their Maps occur, which is where the real learning takes place. Students are able to "illustrate" and explain their thought processes through Maps, while other students listen, ask questions, agree and/or disagree. Social learning starts when the teacher realizes that his or her classroom needs to be based on a learning community of able and willing learners, where each student has a vital role in the everyday learning by participating and adding to the conversation, which is where Thinking Maps can aid, scaffold, and support.

Moffitt's theory of integrated language arts is widely seen through the use of Thinking Maps. Thinking Maps are products of reading, writing, listening, and speaking, and the aspects of listening and speaking are parts of the thinking processes that students use to explain themselves. Although the same eight Thinking Maps are used across grade levels, the Maps are developmentally appropriate for each age and coincide with Moffitt's developmental principle. In second grade, a teacher may use the Flow Map to sequence the stages and life cycle of a butterfly, while a high school chemistry teacher may use the same map to sequence the changing of an element from the periodic table. One teacher uses the map to illustrate a concrete idea, while another teacher uses the map to illustrate an abstract idea.

When looking at the overarching theories of education, Thinking Maps fall into the Postmodern Constructivism theory. In the Postmodern Constructivism theory of education, learners often use their prior experiences, and when using one of the eight fundamental thought processes and Thinking Maps, learners often do use their background knowledge to continue constructing new meaning and knowledge (Sherman, 2000). Students are also encouraged to create and form their own opinions after self-reflection and creating Thinking Maps, as well as to engage and discuss their individual maps with their peers, even if their ideas differ. Another aspect of the Postmodern Constructivism theory of education that is seen by the use of Thinking Maps is that they promote critical thinking and problem solving (Sherman, 2011).

## 4 Research and rationales for using Thinking Maps

In his book *Student Successes With Thinking Maps*, Dr. David Hyerle (2011) provides a plethora of reasons and research as to why Thinking Maps are beneficial tools for the classroom. Hyerle states that using the eight Thinking Maps promote metacognition and continuous cognitive development for students across their academic careers, as well as adds an artistic and kinesthetic component for students who learn effectively with that specific multiple intelligence (Hyerle, 2011). Lesson objectives can be covered in less time and with greater retention when using Thinking Maps, teachers can determine their students' background knowledge before teaching a unit or area of study, and student performance can be tracked over time in an accurate manner, too (Thinking Maps, Inc., 2011). Through his research, Dr. Hyerle (2011) also found that Thinking Maps help close the achievement gap, as they "can help students [below grade level] self-regulate their own learning and be more successful in the game of school because Thinking Maps serve as a device for mediating thinking, listening, speaking, reading, writing, problem solving, and acquiring new knowledge." The thought processes that educators hope to instill in students are represented similarly throughout the curricula, and integrated thinking and learning across disciplines is promoted (Thinking Maps, Inc., 2011). As fidelity and accountability are also huge aspects in the education field, the idea that Thinking Maps as a school-wide initiative

for use of a common instructional and learning tool and as a shared language among teachers and students is one of Hyerle's (2011) main ideas for the use of this support curriculum.

In Villalon and Calvo's (2011) *Concept Maps as Cognitive Visualizations of Writing Assignments*, concept maps are discussed as a means of scaffolding university-aged students' ideas in writing, as well as their metacognitive skills. In their study, Villalon and Calvo evaluated a new Concept Map Mining tool, which was used in an "e-learning environment" that automatically generated maps using students' written work (p. 16). The Concept Map Mining tool was used to look at a collection of annotated essays written by undergraduate college students (p. 16). Villalon and Calvo (2011) found that "Cognitive Visualizations [such as Concept Map Mining] provide quality feedback because they make the author's thinking visible, making explicit the mental model learners are using…Within the writing process, providing automatic feedback in the form of [Cognitive Visualizations] allows learners to reflect on their own work and their own mental models that guided its construction, facilitating the development of metacognitive skills" (p. 23). Villalon and Calvo's (2011) study illustrates that the use of concept maps are beneficial to even the oldest of learners in a college setting, and although precise Thinking Maps were not used in this study, the idea of a graphic organizer to "map out" thought processes is universal.

In *Thinking with Maps*, Elisabeth Camp (2007) investigates how individuals think and how thinking is related to language. Camp (2007) states that "…thinking in maps is substantively different from thinking in sentences" (p. 155). This concept supports Hyerle's (2011) idea that Thinking Maps possess an artistic and kinesthetic component, where students can feel free to express their ideas in a "drawing," or map, instead of using complete written sentences. Thinking Maps support learners who thrive with the artistic and kinesthetic multiple intelligences of learning.

David Hyerle (1996) reports numerous success stories with the use of Thinking Maps in his article *Thinking Maps: Seeing is Understanding*. After teachers participated in a year-long professional development in the use and purpose of Thinking Maps, as well as integrated the maps into their curriculum during this training year, the "teachers agreed that the maps had successfully helped students develop their thinking processes and their ability to organize ideas, improved the quality and quantity of their writing, and also motivated them to learn. Further, the maps benefited the teachers by helping them organize content and assess student learning" (p. 88). Hyerle (1996) also reported that the educators who gave Thinking Maps the highest ratings at the end of the year were those who taught English Learners (Spanish-speaking students), as Thinking Maps "enabled their students to transfer patterns of thinking from Spanish into English, to focus on learning, and to build vocabulary" (p. 88).

In *Designs of Concept Maps and Their Impacts on Readers' Performance in Memory and Reasoning While Reading*, Jeng-Yi Tzeng (2010) investigates the effect of Thinking Maps on students' performance of "cognitive operations." In the study, Tzeng had students read two opposing history articles that "argued from different perspectives about a historical incident" that occurred in Taiwan (p. 133). The results of the study indicated that the focus and design of the concept maps may "influence the formation of mental representations, and that this may be facilitative or constraining in regard to the readers' memory formation and reasoning about the reading materials." With regards to the maps' designs, Tzeng uncovered that this can impact a student's memory and/or understanding of a text, which poses as a negative aspect of the maps themselves.

In conclusion, by linking each thinking skill to a unique and dynamic visual representation, the language of Thinking Maps becomes a tool set for supporting effective instructional practice and improving student performance. Teachers and students, therefore, independently apply thinking skills for their own learning while also having a common visual language for cooperative learning. By having a rich language of visual maps based on thinking processes, learners are no longer confused by poorly organized brainstorming webs or an endless array of static graphic organizers. They are enabled to move from concrete to abstract concepts, think with depth, and directly apply their thinking to complex tasks.

# 5 See also

- Portal:Thinking

# 6 References


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