

Running Head: CREATIVE AND CRITICAL THINKING

Creative and Critical Thinking Skills in Practice

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### Abstract

This paper provides a brief overview of strategies, techniques, and tools for teaching creative and critical thinking skills. De Bono (1971) created lateral thinking as a method to break away from vertical thinking methods and created the Cognitive Research Trust (CoRT) program to promote the teaching of thinking skills. While not all educators and researchers agree that thinking skills can be taught, there are numerous strategies and techniques that have been developed to promote creative and critical thinking skills in schools (Barell, 1995). New technologies are also being used as amplification and reorganization tools that transcend the limitations of the mind by providing a way for learners to reach higher levels of understanding (Jonnasen, 2000).

## **Introduction**

Blooms Taxonomy (Bloom et al., 1956) is often referred to by educators to promote the higher levels of thinking including analysis, synthesis, and evaluation. While most educators agree that reaching higher order thinking skills for students is important, many students lack the skills necessary to reach the higher levels of Blooms Taxonomy. This paper examines some of the strategies, techniques, and tools that have been developed for teaching students creative and critical thinking skills.

## **Cognitive Research Trust**

De Bono (2004) has spent much of his career developing strategies and techniques for teaching thinking skills to students. De Bono has developed a set of cognitive tools for promoting the teaching of creative and critical thinking skills known as the Cognitive Research Trust (CoRT) with the first CoRT thinking lessons published in 1974. The CoRT program (CoRT, 2004) consists of over sixty lessons focusing on developing critical and creative thinking skills. De Bono (1985) coined the term “operacy” as the skill of doing, and is a critical component in the CoRT system. For De Bono operacy is to thinking, what numeracy is to mathematics, and literacy is to reading.

De Bono (1971) introduced the term lateral thinking as a method to break out of the traditional vertical method of thinking that occurs in most schools. Traditional vertical thinking in schools originates from a logical yes/no system evolved from the traditional western Socratic teaching of dialect and argument. Lateral thinking is generative thinking that can break away from assumptions that may be a blocking point. Lateral thinking allows one to explore relationships in new ways that are often overlooked or not even considered by

vertical thinking methods. The strategies used to promote lateral thinking can be used by children and adults alike.

De Bono has been criticized that his programs lack the rigorous scientific proof to justify his claims. Dingli (2001) compiled a literature review of some research studies of the CoRT program. Most of the articles have affiliations with the University of Malta perhaps because the CoRT program is copyrighted and trademarked and unavailable for use by outside researchers. While findings of the initial literature search yielded few articles from outside research journals De Bono's CoRT system has been implemented in schools around the world for millions of students and has demonstrated positive gains on standardized test scores (Edwards, 1992). Barak and Doppelt (1999) conducted a three year study of the CoRT program when integrated with technology and found students had a deeper understanding and provided new insights of how to use the CoRT program in a technologically rich environment to promote deeper thinking.

De Bono (1985) in his book, *Six Thinking Hats*, uses a hat as a metaphor to change ones mode of thinking. Each hat color represents a different type or mode of thinking. Table 1 is a listing of each hat by color and the associated traits of thinking each represents.

Table 1. Six Thinking Hats – Summary of hat colors and represented traits.

Hat Color	Associated Traits
White Hat	<b>Information</b> – Facts and figures; what you have, what you need and where to get it, logical, like a computer.
Red Hat	<b>Emotions</b> – Feelings, intuition, and instincts.
Black Hat	<b>Negative</b> – Why it will not work, pessimistic, devils advocate, pointing out potential problems.
Yellow Hat	<b>Benefits</b> - Positive aspects and values, optimism, sunshine, constructive, best scenario.
Green Hat	<b>Creativity</b> – Alternatives, options, new concepts and perceptions
Blue Hat	<b>Managing the thinking</b> – Ensuring rules are observed, sequencing hats and decision making, control.

Source: De Bono (1985). *Six Thinking Hats*.

The six thinking hats provide a method of role play that signals an active change in the mode of ones thinking. De Bono contends that the balance of chemicals in the brain can have an impact upon thinking and behavior. The hats can be used as an imaginary metaphor to change thinking modes. De Bono (1985) states:

“It is possible that the six distinct thinking hats can, over time, acquire the status of a conditioning signal that triggers a particular chemical background in the brain and that in turn will affect our thinking.” (p. 24).

The six thinking hats offer the ability to change thinking roles and provides a language to express thoughts in a constructive manner. Users of the six thinking hats can divorce themselves from personal feelings and beliefs by using the hat metaphor to bring thoughts to the table that may previously have been overlooked or suppressed because of social pressures. One could say, “I am putting my black hat on now and I do not believe this project will be completed on time.” The group could then go on and discuss all the reasons that the project will not be completed on time. This can give a person a disguise to pursue their thoughts in a public forum because one is speaking metaphorically. Black hat thinking can be countered by yellow hat thinking to balance a conversation that can easily be dominated by one mode of thinking. In practice it is easier to say you need to take your black hat off now than to say to a person that they are always being negative.

Another benefit of using six hat thinking in a group setting is that it takes away the argumentative nature that often leads to domination of particular viewpoints. De Bono uses the term “parallel thinking” to describe the process of everyone putting on the same color hat and brainstorming ideas using the traits associated with the hat. The group can then progressively move together through the remainder of the colored hats. This not only

eliminates the arguments but allows for a much more thorough brainstorming session. By using the hats as a metaphor everyone can participate without worrying about what others may perceive of their own viewpoints.

### **Factors in Teaching Creative and Critical Thinking**

Some question whether creativity can be taught at all. Couger (1995) contends that creative thinking can be taught and offers many examples in his book, *Creative Problem Solving and Opportunity Finding*. Couger gives the example of famous poets and musicians that are perceived as being creative but in reality used a system to produce some of their best works.

Emotions also play a role in the thinking process. Some psychologist, Tucker-Ladd (2003), believe that emotions can be triggered at will and can have a profound effect on ones thinking. Tucker-Ladd also states that thoughts can also change emotions and that people can control emotions and thoughts by changing the state of ones mind. Recent research studies suggest that emotions are a very important part of the thinking process and may give some credence to de Bono's claims that altering chemicals in the brain can affect the thinking process.

Barell (1995), a former director of the Association for Supervision and Curriculum Development Network on Teaching Thinking, teaches workshops across the country about teaching thoughtfulness. Methods have been developed to trigger ideas and organize information for processing. Graphic organizers, KWLH charts, goal setting, listening, quality responding, brainstorming, problem-based learning, narratives, analogy/metaphor

use, reflection, and alternate assessment assignments are all strategies to help students reach thoughtfulness according to Barell.

Technology is also being used to promote critical and creative thinking skills. Van Gelder completed a research project on an argument mapping tool known as ReasonAble! in Australia. Students using this tool in a critical thinking course demonstrated gains of 1 S.D. over a semester in ability to think critically (Van Gelder, 2001). Another computer program, Inspiration, is being used as a visual learning and critical thinking tool. According to the Inspiration website:

“Inspiration strengthens critical thinking, comprehension and writing across the curriculum, in language arts, science, social studies and anytime your students need to structure research or other thought processes.” (Inspiration, 2004).

Jonassen (2000) is a proponent of using technology as mindtools for improving meaningful learning and as tools to aide critical and creative thinking in students. Mindtools such as concept mapping tools, databases, spreadsheets, hypermedia, conferencing, and expert systems all offer students increased flexibility in working with and manipulating information. Jonassen makes the case for technology enabled mindtools to be used as amplification and reorganization tools that transcend the limitations of the mind by providing a way for learners to reach higher levels of understanding.

## **Conclusion**

This paper has only scratched the surface of creative and critical thinking strategies, techniques, and tools for teaching thinking skills. Many of the strategies and techniques offer tools to focus thinking and expand one's own personal views and experiences. De Bono (1985) believes that thinking must be viewed as a combination of interacting with information, native intelligence, and thinking. According to de Bono the thinking portion of this interaction can be taught and that one can become a better thinker. Some research suggests that teaching creative and critical thinking skills aided by technology can lead to higher levels of thinking (Van Gelder, 2001). Technology is also being used as a learning tool to reach higher levels of thinking (Jonassen, 2000). New tools are being developed that show promise in improving standardized scores and demonstrate marked improvement in the creative and critical thinking of students.

There is a lack of quantitative research in the areas of creative and critical thinking skills. Many of the research articles focus on qualitative aspects of strategies, techniques and tools but lack rigorous scientific evidence. More focused research needs to be completed in a controlled environment to provide additional evidence that new technologies, strategies and techniques really do improve creative and critical thinking skills in students.

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