Chapter 91
Mind Mapping for Critical Thinking

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ABSTRACT

Mind mapping is a visual technique that exploits the way we actually think—through synaptic connections and non-linear associations. Because mind mapping gives practitioners, be they professional or student, access to subconscious observations and connections, it is a powerful thinking tool, useful in a variety of situations in business and in education. This chapter focuses on how mind mapping fosters the kind of flexible and organic thinking vital to critical thinking and the creative problem-solving process. It explains what is at work in the brain as we create new knowledge and how mind mapping exploits these processes to gain intuitive and concrete understanding in situations requiring critical thinking. A step-by-step outline of how to mind map in both individual and group settings is followed by examples of mind maps from both business and education.

INTRODUCTION

Critical thinking, as defined by Scriven and Paul at the 8th Annual International Conference on Critical Thinking and Education Reform, is the "intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (1987, n.p.). We also recognize these activities as those articulated in Benjamin Bloom's taxonomy of learning, in the cognitive domain, as knowledge, comprehension, application, analysis, synthesis and evaluation (1984, p. 18). One can conceive that "critical thinking" is "learning" and, as such, can benefit from the many modes and techniques that facilitate the reasoning and connecting so important to learning, thinking and the emergence of new ideas—not just those of others but also those of our own.

The most important steps in learning and critical thinking are the collecting and connecting of information to create knowledge that can then be analyzed, evaluated and remembered. In critical thinking, this is achieved by a process of questioning and probing. While free-writing and

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note-taking are common verbal tools for doing this, increasingly, attention is being given to visual modes that involve imagery and spatial displays. The graphic nature of visual symbols and displays helps speed up the processes of information absorption, recall and retention as they exploit the brain's ability to rapidly parallel process sensory information like color, shape, size, orientation, and texture. We are, in essence pattern-seekers that use the visual to link mental and emotional associations that arrange information into patterns we can use (Caine & Caine, 1994; Ware, 2008; Kosslyn, Thompson, & Ganis, 2006; Kosslyn, 1988). Hyerle writes, "These visual-spatial-verbal displays of understanding support all learners in *transforming static information into active knowledge*, thus offering a complementary representational system to more traditional literacies grounded in speaking, writing, and numerating" (2009, p. xix). Mind mapping, developed by learning expert, Tony Buzan in the early 1970s, is one visual technique that excels in helping the learner/thinker to collect and connect information, focus on key points, explore alternatives "at one view"[1] and "see" the patterns that turn information into knowledge that is more easily retained and recalled. In addition, sustained practice in mind mapping fosters a habit of thinking that exploits the brain's "almost unlimited capacity for images" (Wolfe & Sorgen, 1990, p. 8).

Buzan observed that the linear process for note-taking and analysis practiced in organizations, both educational and professional, was ineffectual at helping people gather, absorb and retain information. Moreover, the linear outline method crippled thinking for discovery, for creating and exploring new ideas, for finding breakthrough solutions to complex problems (1974). While maps and diagrams have been used for millennia to graphically illustrate the relationships between concrete things, mind mapping is a visual technique for capturing concepts and ideas that exploits the way we actually think—through synaptic connections and non-linear associations. To mind map a problem or an idea, we start with a central focus: a word or image placed in the middle of the workspace. We then create lines radiating out with words or images on them, branching out with each association until we fill the workspace with connections to all aspects related to the central focus. A mind map looks quite similar to a real brain cell (neuron) with its synaptic connections (see Figure 1). The

Figure 1. A neuron with synapses. Courtesy of Dr. Gerry Shaw.