

## Chapter 6

# Enabling Creativity: Using Garden Exploration as a Vehicle for Creative Expression and Analysis

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### ABSTRACT

*This chapter uses current developments in cognitive neuroscience to explore the notion that educational activities should involve the whole person. To that end, the author explains in depth an undergraduate college assignment that allows for learning through the coupling of creativity (divergent) and analysis (convergent) thinking in an integrative learning task. First, students explore the concept of metaphor which provides both mental association and ambiguity. With this underpinning, students experience three very different types of gardens and try to uncover the metaphors of nature lying within their design. Students record a journal and take images of the gardens and later create a photographic montage of each garden which reflects the metaphor that the students saw emerging in the garden itself. Accompanying the visual image is a written reflection which discusses the metaphor they experienced sensually in the garden and how it is represented in their images.*

### INTRODUCTION

Recent developments in cognitive neuroscience (CN) particularly as it relates to creativity should challenge the educational community to reassess their teaching practices. The understanding of creativity has expanded through CN research. New studies indicate creative thinking involves the whole brain and is not localized. Creativity utilizes both divergent (the entertaining of multiple ideas) and convergent (the coalescing of this multiplicity) thinking. These new findings hint at the potential benefits of developing creativity in students. Based on this new information, the development or encouragement of creative thinking should exist in all educational classes not just those in such artistic fields of art, music, dance and creative writing. Educators who are committed to the development of students who can examine diverse and seemingly unrelated ideas in order to create a “new” understanding should make creative learning

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tasks the center of their pedagogy. By including creative learning tasks, educators are encouraging two important learning concepts, critical thinking and integrative learning.

This chapter will first examine relevant CN research as it relates to creativity and creative thinking. Of particular interest will be the use of representational systems such as metaphor in the creative task and how divergent and convergent thinking work together in the act of creation. These key findings will be discussed in the ways they connect to two educational constructs: critical thinking and integrative learning. The author will provide a specific assignment using gardens which takes both CN research and educational pedagogy into account as a model for enabling and developing creativity within students at the undergraduate college level and will conclude with ways that the research between CN, creativity and educational pedagogy need to be continued and clarified.

## **COGNITIVE NEUROSCIENCE AND CREATIVITY**

What is creativity? The most accepted definition of creativity was proposed by Sternberg & Lubart in 1999 and is composed of two components. Creativity is “the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints)” (p.677). While this definition is well accepted, its understanding and application to CN is still in its infancy. “There are few neuroscience studies of creativity or of the creative process. This is most likely due to the difficulties of defining creativity and the lack of psychometric means of assessing it...Nonetheless, there may well be a neural basis for creativity” (Haier & Jung, 2008, p. 172). Even though much more research needs to be done, initial understandings have emerged. Whereas creativity was initially thought to reside primarily in the right hemisphere, that idea has been debunked and now it is clear that creativity is much more complex in its processing and involves the whole brain (Sawyer, 2011, Dietrich, 2007). Many regions of the brain, in both hemispheres are active during creative tasks. In fact, to take it a step further, Immordino-Yang (2011) and Immordino-Yang & Damasio (2007) stress that “affective neuroscience is revealing that the mind is influenced by an interdependency of the body and brain; both the body and brain are involved, therefore, in learning” (p. 99). So, not only is the whole brain involved in creative acts but the body as well. These new realizations have import for education. If educators are committed to maximizing learning, then learning activities should be designed that allow for whole brain and body learning in order to encourage and develop creativity.

Studies have also revealed in more detail the mental processes involved in creative acts. Initially creativity was thought to involve only divergent thinking. “Divergent thinking refers to unbound ideational searching or open-ended thinking that is typically evoked in creativity tasks where solutions need to be generated for problem situations that do not have right or wrong answers” (Abraham & Windmann, 2006, p. 39). Divergent thinking has often been paired with two other “prerequisites” to creative acts, defocused attention or disinhibition. However, research shows that creative thinking also potentially involves convergent thinking. Convergent thinking has long been associated with intelligence and has been connected with the concepts of focused attention and inhibition. The distinction between these two is that “convergent cognitive processes...arrive at one correct answer” whereas in divergent thinking “multiple correct responses are plausible” (Haier & Jung, 2008, p. 175). Gorbors and Necka (2003) stated, “these two processes – generation of ideas and evaluation – seem to require intellectual operations that are contradictory in nature” (p. 183) but feel that both are necessary for a creative act. “That is, inhibition, focused attention and controlled processing as well as disinhibition, defocused attention

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