

Chapter 10

Innovation, Creativity, and Brain Integration

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ABSTRACT

The heart of creative thinking is the incubation stage, in which ideas freely move on a subconscious level going beyond the limits of the problem space to create new solutions. The incubation stage might be fostered through meditation practices that lead to transcending, such as the Transcendental Meditation (TM) technique that cultures greater brain integration in which the brain functions more as a whole. Higher brain integration is seen during the TM session within a few weeks of practice, and after the TM session with regular practice over time. Higher brain integration is associated with higher creativity and greater success in life. Adding the experience of transcending to enhance incubation of creative ideas is innovation from the inside. Training in transcending could be part of forward-looking graduate programs to help their graduates thrive in an ever-changing workspace landscape, and could be a workplace skill to support better performance in many professions.

INTRODUCTION

Innovation includes two interacting processes: *Invention*, the generation of novel ideas, and *Exploitation*, the implementation of these ideas (Bledow, Frese, Anderson, Erez, & Farr, 2009; West, 2002). These two processes may alternate or occur simultaneously but the driving force of innovation is always creative thinking (Haner,

DOI: 10.4018/978-1-7998-5514-9.ch010

2005). Development of creative thinking fosters innovation in the arts, sciences, technology, and political arenas to meet growing challenges (Cropley, Kaufman, & Cropley, 2011).

Creative thinking combines both focused, logical analytical thinking and undirected free flow of ideas. Wallas, a pioneer in creativity research, identified four stages of creative thinking: *preparation*, in which the problem is identified and the details of the problem are explored to understand the parameters of the problem space, *incubation*, inner silence and relaxation where ideas freely move on a subconscious level, *illumination*, the creative insight, followed by the *verification* of the insight (Botella, Zenasni, & Lubart, 2018; Wallas, 1926).

INCUBATION AND ILLUMINATION

Notice, the first and last stages of creativity involve rational thought, critical analysis and controlled processing. During the first stage, *preparation*, one scours the existing literature and critically evaluates the designs of the study, their results and possible ramifications. The final stage, *verification*, also requires focused attention and rational thinking to implement the creative insight. *Incubation and illumination* have a different character. They are marked by transcendence, going beyond the limits of the problem space to create new solutions (Horan, 2009).

Incubation and illumination are the heart of the creative process. The *incubation* stage is essential to be able to think “outside the box.” The proverbial box is the problem space that we explore with our rational analysis. If we remain on the level of rational thinking, the content of our thought will remain “in the box.” The incubation period is when we allow task-unrelated or stimulus-independent thinking—allowing the mind to be silent and play with ideas even sub-consciously to take place (Christoff, Irving, Fox, Spreng, & Andrews-Hanna, 2016). This is thinking outside the box.

The Incubation Stage and Mind-Wandering

The *Incubation* stage is a state of mind-wandering. Mind-wandering or stimulus-independent thought is the process of being temporarily lost in a free association stream of thought, having lost track of time, place, and the current task (Christoff et al., 2016). Singer has labeled mind-wandering during the *incubation* stage as “*positive constructive day dreaming*,” characterized by playful, wishful imagery (McMillan, Kaufman, & Singer, 2013; Singer, 1961).

Frequency of mind-wandering has been investigated using iphone technology in 2250 people (Killingsworth & Gilbert, 2010). Subjects were randomly texted throughout the day, and asked to answer a happiness-question, an activity-question

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