

The HSATM Roundtable meetings in 2006 and 2007 dealt with various aspects of creativity, showing that this 'elusive' concept was amenable to a number of systematic management tools that can enhance the intrinsic creative characteristics of human beings. We are printing here the 'Takeaways' from the first meeting in the series.

Feb. 15, 2006

UNDERSTANDING CREATIVITY TO ENHANCE INNOVATION

The February 15, 2006 Roundtable meeting was hosted by USARDEC, Picatinny Arsenal. The topic was an extension of the broad theme of innovation, which had been the focus of our 2005 Roundtable meetings. Larry Gastwirt opened the meeting with the comment that the Alliance would continue to deepen our understanding of innovation, moving our emphasis in 2006 to the creativity dimension. He pointed out that creativity is an aspect that applies throughout the innovation process. He also indicated that, while the topic is a difficult one to treat in terms of a brief overview, we would follow the same approach that was successful last year and begin with a broad look at creativity, to provide a foundation upon which we can build both understanding and ability during the course of the year.

The following is a summary of the presentation by Tony Le Storti, executive consultant for IDEATECTS, who was the guest facilitator for this Roundtable and its reprise on the morning of April 26, 2006 at ISO, Jersey City.

Exploring the nature of creativity, Tony noted that creativity seems to exist in two cate-

gories. Viewed as a process, creativity is the cognitive process by which new ideas are formed, evaluated, and actualized. Conceptualized as a product, creativity is a novel and appropriate response to an open-ended problem (Teresa Amabile). Further, one can view creativity as a natural power of the mind, a skill set that can be developed, an attitude or style, and a means for problem solving. Creativity also seems to have two "faces" or aspects: invention and discovery, which have a reciprocal relationship.

Looking at the connection between creativity and innovation, one can define innovation as the creation of value through the implementation of new ideas. In this definition, which the Alliance has been using, it is noteworthy that there is a creative act in terms of both the novel ideas and the new value that those ideas represent. Creativity, as the centerpiece of the "front end" of innovation, is the insight that ignites or initiates the innovation process, but it is also the "brainpower" frequently required to bring an initial concept to full fruition in order to implement or commercialize it. One may expect, therefore, strongly focused creative efforts in the invention/discovery and idea refinement phases of the innovation process, but one should not be surprised to see creativity manifested throughout the process.

While each individual approaches creative efforts in a unique manner, it is also possible to abstract or generalize "the creative process." In doing so, however, one should not view such a generalized version as a linear, set sequence. Rather, it may be more appropriate to see the "phases" as cognitive states that people may occupy as they go

about their creative problem-solving.

Having noted that, the creative process begins with desire or motivation. It is the sensing of a "gap" between a goal state and the current state that establishes the internal tension that will drive the rest of the process. Preparation is the phase in which problem-solvers immerse themselves in the problem situation; it may be a matter of gathering resources, doing additional learning, or getting to understand the challenge better. Preparation is also the time for "rituals," such as putting on music or finding a quiet spot, that prepare the thinker physically or psychologically to be creative. Manipulation or composition is the phase in which problem solvers consciously work to form the new concept or pattern. But since creativity cannot be willed on demand, people often experience a period of incubation, a time in which they consciously leave their problem, but subconsciously continue to work on it. This is sometimes followed by intuition, the sense that the creative answer is about to crystallize. Then comes illumination, the "Eureka!" moment of creative insight. But pragmatic creativity requires a further stage: verification, the evaluation and (initial) implementation of the novel idea.

One may also consider the components of creativity, the clusters of skills and traits that come together to engender productive thinking. These include domain skills (job-specific knowledge and abilities), process skills (creative problem solving and decision-making ability), motivation (especially intrinsic motivation that focuses on the value of the work itself), and environment (hopefully, a situation that promotes and encourages creative thought).

Further, creativity can be characterized by a set of behaviors and characteristics. As Paul Torrance has pointed out, the cognitive aspects include fluency (the ability to generate many potential solutions to a problem), flexibility (the ability to generate different kinds of solutions from different perspectives), elaboration (the ability to combine or build upon basic ideas), and originality (the ability to produce novel or unique concepts). These are complemented by a set of affective traits including courage, tolerance for ambiguity, imagination, competence for complexity, curiosity, open-mindedness, playfulness, and persistence.

Unfortunately, creativity is a somewhat perishable phenomenon that can be prevented or constrained by a variety of deterrents or hindrances. While there are too many such obstacles to be listed individually here, they can generally be placed in the categories of habit, perceptual blocks, emotional or psychological constraints, and cultural and/or environmental obstacles. For example, one interesting cognitive bias that touches on a number of these categories is structured

imagination (Thomas Ward). Structured imagination is the anchoring of creative thought to current reality and experience. Research on this topic indicates that even efforts at very open-ended creativity are often constrained by current concepts and categories.

There are, however, established approaches that promote creative thinking. These include provocative problem definition and analysis, focusing on function, challenging assumptions, thinking analogically, exploring the unexpected, and utilizing negative evidence to promote new learning. Also, there are some well-established and proven problem-solving models or approaches that help to structure creative thinking. These include Osborn-Parnes Creative Problem Solving (Alex Osborn & Sidney Parnes), Synectics (George Prince), Lateral Thinking (Edward de Bono), TRIZ (Genrich Altshuller), and Ideatects Problem Solving (Anthony Le Storti).

It is also worth noting that experiential creative thinking has shown itself to be a curvi-

linear, recursive process. Rather than being linear and sequential, more challenging problem-solving often moves forward and backwards and forward again numerous times as the problem-solver learns, evaluates progress, reconsiders formulations, generates new alternatives, and so forth.

Tony reflected that, as we consider this study of creativity, it might be heartening to reflect on Goethe's dictum: "Every individual is a marvel of unknown and unrealized possibilities." At the reprise of this first Roundtable of 2006, Tony also stated that "everyone is creative; it is a natural power of the human brain. The real question is "are you being creative?" His prime thesis, as stated above, is that there exist real processes/models that can enhance the intrinsic creative characteristics of human beings. Future Roundtable meetings will explore the application and benefits of some of the methodologies. ■