Insights into the creativity process

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Types of creativity tasks

Most models of creativity we have already discussed identify the following conditions as necessary for creative outcomes:

- access to a body of knowledge that is relevant to the creative outcome   This knowledge needs to be sufficiently extensive (that is, have sufficient breadth) elaborated and differentiated, and properly indexed and to be seen as expert   (Simon, 2001). Newton, for example, attributed his creativity in part to "standing on the shoulders of giants." Pasteur noted that "Novel ideas come to the prepared mind."

- access to a set thinking skills that allow the generation of creative outcomes.   There are two aspects to these thinking skills; being able to think in particular ways and knowing the value of thinking in these ways, being able to decide when to think in these ways and to use the ways of thinking selectively.

- the motivation to be creative.

- access to a supportive environment.   Environments conducive to creative scientific research are characterised by (Hewish,2001):
  - freedom and encouragement to follow new leads spurred by one's curiosity,
  - lively interactions within the group to test out new ideas,
  - the courage to abandon fashionable theories and paradigms,
  - the provision of adequate resources for the necessary work.

How the nature of the task and the motivation to do it influences creativity.

Individuals in organisations such as schools can display creativity under different motivating conditions (Unsworth, 2001) :

- First, the reason for engaging in creative thinking (the driver behind the engagement) may be decided by the person themselves, or by others.   Creativity can be initiated intrinsically by the person engaging in the creativity or by others, that is, extrinsically.   In the latter case the person is thinking creatively to meet external or imposed demands.

- Second, the target or problem about which the person is thinking creatively may be open-ended or closed. Closed problems have known methods for solution, eg., classroom algebra problem (Getzels, 1975);   students solve problems after being given the relevant equations. Open problems require thinkers to find, invent, or discover the problems (Dillon, 1982). They need to both scan the environment to find a problem and then define the problem in such a way that it can be solved.

These two dimensions yield four categories of creativity tasks,   An example of each type is shown in the diagram below. As well, the name given to each type of creativity is provided.

problem type		externally	internally
	closed	Management want us to create a more efficient way for making chocolate ***Responsive Creativity***	We decide to create more efficient ways for making chocolate for management ***Expected Creativity***
	open	Management want us to find ways of making healthy types of chocolate ***Contributory creativity***	We want to discover way of making healthy chocolate for ourselves ***Proactive Creativity***

reason for engaging

Unsworth (2001) describes the characteristics of each type of creativity task. These are shown in the following diagram.

problem type		externally	internally
	closed	***Responsive Creativity*** • most prevalent form of creativity studied. Individuals do a previously set creativity problem or task and complete it given the external demands and requirements • individual has the least control over problem solving choice	***Expected Creativity*** • external goal or outcome with a self-discovered solutions selected by the problem solvers. • example : students select from a set the particular problems / issues about which they will think creatively and contribute their responses
	open	***Contributory creativity*** • individuals self-determined and based upon a problem clearly formulated by others • individuals who elect to engage in creativity to help solve problems with which they are not directly involved	***Proactive Creativity*** • individuals think creatively about open ended issues and problems that interest them. • individuals spontaneously provide creative proposals that were not requested • difficult but important to assess • similar to Bateman and Crant's (1993) concept of a proactive personality and the concept of personal initiative

reason for engaging

A key implication of this analysis for teaching creative thinking is that the types of creative thinking demanded for the four types of tasks differ in several ways:

- Creativity is more constrained when students are engaging in creative thinking for external reasons and are doing tasks or problems that are more closed (that is, 'externally imposed'). Responsive creativity may be "less creative" than proactive creativity.

- Creativity will be stronger for those types requiring more effort (proactive and contributory creativity) than for those types requiring less effort (responsive and expected creativity).

- Evidence that the four types of creativity tasks measure different ways of thinking creatively is shown in the finding that responsive creativity, measured using Torrance's (1974) tests of creative motivation and other divergent tasks, does not correlate highly with expected creativity task scores (Davis, Peterson, & Farley, 1974) or with proactive creativity scores (Davis & Belcher, 1971; Guastello, Bzdawka, Guastello & Rieke, 1992; Oldham & Cummings, 1996). Teachers need to be aware that the four types of tasks measure different aspects of creativity.

- expected and proactive creativity involve more scanning and defining skill than responsive and contributory creativity. They are more affected by factors such as curiosity and training in identifying and framing problems.

- proactive and contributory creativity involve communicate one's unique understanding, displaying one's knowledge and to convince or persuade others of one's thinking.

It should be noted that closed problems may not be fully closed and similarly with open problems; the open-closed dimension operates within limits or constraints. As well a particular task might represent different types of creativity, depending on the specific situational circumstances in which it is developed.

Unsworth, K. (2001). Unpacking creativity. *The Academy of Management Review*, 26, (2), 289-297.