Cognitive Dimensions of Critical and Creative Thought

There have been varying dimensions of critical thought. For example Paul (1990) developed a list of 35 dimensions of critical thought:

**A. Affective Strategies**

S-1 thinking independently

S-2 developing insight into egocentricity or sociocentricity

S-3 exercising fair-mindedness

S-4 exploring thoughts underlying feelings and feelings underlying thoughts

S-5 developing intellectual humility and suspending judgment

S-6 developing intellectual courage

S-7 developing intellectual good faith or integrity

S-8 developing intellectual perseverance

S-9 developing confidence in reason

**B. Cognitive Strategies--Macro-Abilities**

S-10 refining generalizations and avoiding oversimplifications

S-11 comparing analogous situations: transferring insights to new contexts

S-12 developing one's perspective: creating or exploring beliefs, arguments, or theories

S-13 clarifying issues, conclusions, or beliefs

S-14 clarifying and analyzing the meanings of words or phrases

S-15 developing criteria for evaluation: clarifying values and standards

S-16 evaluating the credibility of sources of information

S-17 questioning deeply: raising and pursuing root or significant questions

S-18 analyzing or evaluating arguments, interpretations, beliefs, or theories

S-19 generating or assessing solutions

S-20 analyzing or evaluating actions or policies

S-21 reading critically: clarifying or critiquing texts

S-22 listening critically: the art of silent dialogue

S-23 making interdisciplinary connections

S-24 practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives

S-25 reasoning dialogically: comparing perspectives, interpretations, or theories

S-26 reasoning dialectically: evaluating perspectives, interpretations, or theories

**C. Cognitive Strategies--Micro-Skills**

S-27 comparing and contrasting ideals with actual practice

S-28 thinking precisely about thinking: using critical vocabulary

S-29 noting significant similarities and differences

S-30 examining or evaluating assumptions

S-31 distinguishing relevant from irrelevant facts

S-32 making plausible inferences, predictions, or interpretations

S-33 evaluating evidence and alleged facts

S-34 recognizing contradictions

S-35 exploring implications and consequences" (p. 56)

**Source: Paul, R. (1990). Critical thinking: What every person needs to survive in a rapidly changing world. Santa Rosa, USA: Foundation for Critical Thinking.**

More recently the philosophy of critical thinking has moved away from the generic skill versus disciplinary context debate to promoting an understanding of critical thinking as encompassing various cognitive and affective processes and abilities, attitudes, dispositions and the learning environment (ALTC, 2009). This is partly a result of Ruggiero's (1988) holistic model, where there is a connection made between dispositions, skills and processes. Several authors, for example emphasise the cognitive ability of self-regulation as an essential part of critical thinking (Facione, Facione & Giancarlo, 1997; Pithers & Soden, 2000). According to van der Wal (1999, p. 4), when developing critical thinking skills in university students across a range of disciplines, teachers need to identify between two different types of critical thinking:

* *Situational critical thinking:* critical thinking needed for decision-making used in practical situations in 'practice-based professions', such as social work, nursing, law and other subjects with a practical, situational knowledge component.
* *Epistemological critical thinking:* used in disciplines where critical thinking is primarily applied to epistemological/theoretical positions and arguments, such as disciplines in the humanities, sciences, and other disciplines where the knowledge base is more theoretically oriented than situational oriented.

Related to the dimensions of critical thinking are the activities that learners are expected to engage in. Moon (2008, p. 33) provides a useful categorisation of these 'activities', noting that the central activity of critical thinking, present in all activities, is 'the making of judgements on the basis of assessing different kinds of evidence from difference kinds of sources'. Activities include **reviewing the components and processes of another person's argument, making an evaluation, developing one’s own argument, engaging in critical reflection, considering alternatives, participating in discussion with others, and developing related dispositions through ongoing engagement with the world.**

Educators have offered numerous dimensions of creativity (Cropley, 2001; EUA, 2007), which include:

1. Original/novel - creating new developments and challenging established ideas.
2. Appropriate - developing new approaches that are appropriate to a particular problem.
3. Effective - achieving some purpose whether it is to solve a problem or to make a profit.
4. Problem solving - identifying new solutions to problems ("thinking outside the box") and risking failure.
5. Ethical - creativity it is not usually used to describe selfish or destructive behaviour.

Jackson and Shaw (2006) similarly identified the following meanings of creativity via surveys with academic staff in diverse disciplines: originality, imagination, problem working, willingness to explore, making sense of complexity, thinking outside of and transferring into the disciplinary box, synthesising (making connections and seeing relationships), communication, story-telling and resourcefulness.

It is important to note that there is a difference between creativity as a process (mental) and an outcome of that process; creative ideas/actions do not always yield creative results and creative outcomes are not necessarily based on creative processes (EUA, 2007). Sternberg's propulsion theory of creative contributions proposes that creativity can be of different kinds, depending on how it propels existing ideas forward. Within this taxonomy there are eight types of contributions, divided into three major categories, which specify how creative contributions differ (Sternberg, 2006):

1. Types of creativity that *accept* current paradigms and attempt to extend them (replication, redefinition, forward incrementation, advance forward incrementation)
2. Types of creativity that *reject* current paradigms and attempt to replace them (redirection, reconstruction/redirection, reinitiation, integration), and
3. Types of creativity that *synthesise* current paradigms.

Most definitions of the creative process comprise of three components:

1. The ideas must be different, new or innovative
2. Of a high quality, and
3. Appropriate to the task at hand

Therefore **a creative response is one that is new, good and relevant!** Prominent keywords that feature in creativity definitions are: n**ovelty, innovation and design**, with novelty being the most common (Swirski, et al., 2008). According to Csikszentmihalyi (1990), creativity is the result of interactions between three sub systems: a domain (curriculum), a person and a field (discipline). It occurs when students integrate several different things into a new and unique form.