

Critical Review

Toward a Synthesis Framework for the Study of Creativity in Education: An Initial Attempt

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Abstract: *This paper aims to briefly review the major creativity research lines and attempts to synthesise the various kinds of studies into a more comprehensive framework. Reviewing the developments of creativity research, this essay mainly adopts Csikszentmihalyi's (1999) Systems Model of Creativity to map a conceptual framework for the study of creativity. The framework involves three subsystems of individual, domain, and field; this critical review also attempts to integrate the theories of Amabile (1983; 1996) and Sternberg and Lubart (1995) into the conceptual framework.*

Major Lines of Creativity Research

Human civilisation has depended on its creativity for many aspects of activities in the social, economic, and individual realms. In the knowledge economy, a feature of scientific and technological revolutions, economic growth correlates with innovation potential. Creativity is regarded as the major component of innovation potential and has thus received increased attention.

Reviewing the literature concerning creativity, we find that there are some major development lines for the study of creativity. The review of creativity research has included literature published in books and articles in a range of disciplines. There is a large variety of creativity research and the range is extremely broad. With regard to the origin of creativity research, it is widely believed that the modern age of creativity research began with Guilford's presidential address in 1950 to the American Psychological Association (APA). In the lecture, he argued for the limitations of intelligence tests and his investigation of "divergent thinking" (Mayer, 1999; Craft, 2001; Wyse and Dowson, 2009). In many ways creativity research has been developed over the past 60 years. Scholars such as Mayer (1999) attempt to identify the creativity research developments in the various methodologies, Ivcevic (2009) tries to map the different theories established, and Ryhammar and Brolin (1999) categorise the development into four major lines.

Table 1. Creativity Research Categories

Scholars	Creativity Research Categories
Mayer (1999)	<ol style="list-style-type: none"> 1. Psychometric 2. Experimental 3. Biographical 4. Biological 5. Computational 6. Contextual
Ryhammar and Brolin (1999)	<ol style="list-style-type: none"> 1. Personality approach 2. Cognitive approach 3. Stimulation of creativity 4. Social-Psychological approach
Ivcevic (2009)	<ol style="list-style-type: none"> 1. Individual traits and beliefs 2. Biological dispositions 3. Interactions with environment 4. Social groups 5. Situational elements 6. Implicit situation

By reviewing the literature, no matter how creativity has been investigated from the various methodologies or been developed as different theories, the studies can all be simply identified into the categories of personality approach, cognition approach, the ways for stimulating creativity, and creativity in the social context. Hence, the following part of the review will be illustrated as *Personality approach*; *Cognition approach*; *Stimulation approach*; and *Social Confluence approach*.

Research concerning personality in creativity embraces various aspects, such as personality assessment, personal traits, and personal motivation. Two major approaches contributed to the field are biographical and biological methodologies. While biographical approach has special interest in analysing personal traits, biological methodologies mainly focus on the biological characteristics of creative or non-creative persons. For instance, biographical approach researchers, Getzels and Csikszentmihalyi (1976), investigated artists, and Simonton (1984) utilised biographical methods on prominent people; in another direction Mayer (1999) examines how biological impairments affect creativity.

Compared with the former research which mainly focuses on personal traits, a cognition approach researcher pays more attention to an individual's cognition process, such as intelligence, unconscious, and mental process. Psychological and Psychometrics are the two major approaches of creativity investigation under the cognition umbrella. Mayer (1999) concludes that while psychological researchers attempt to describe the cognitive process involved in creative and non-creative thinking, psychometric approaches try to develop creativity related measurement or assessment. The most well-known work by psychometrics is arguably Guilford's efforts in 1950 and 1967 of measuring, which tested of divergent thinking. This is regarded as the starting point for all psychometric measures of creativity.

After realising the urgent priority of promoting creativity, researchers have started to ask two kinds of questions: “Can creativity be trained or taught?” and “How can we stimulate people’s creativity?”. According to Solomon (1990), both organisations and educational institutions have invested substantial time and resources developing and experimenting with creative training programmes. However, different kinds of creativity researchers advocate and develop different methods for stimulation. Cognition psychologists advocate various forms of programmes for stimulating participants’ thinking processes. In the other way, behaviourism researchers believe that creativity is something that can be learnt from environment, something which like all other behaviours can be explained in terms of reinforcement, and be trained for in the stimulating-responding process.

Creativity in Social Contexts

It is fair to say that a number of promising lines of work have emerged, nonetheless, they have different disciplinary identities and have been carried out from different approaches. A more coherent framework to carry out a coordinated set of studies therefore is needed for shifting focus from one “specific dimension” such as personal trait to a “system”. Some investigators such as Csikszentmihalyi (1988; 1996; 1998; 2000), Amabile (1983; 1996), and Sternberg and Lubart (1991; 1995) therefore advocate the study of creativity in the social context. According to the scholars above, regardless of whether creativity is considered as personal traits, creative behaviour, a cognitive process, or either something that can be trained, creativity should be ultimately linked to social contexts, and be understood by the interaction processes.

Amabile’s Componential Model of Creativity

Amabile was the first scholar to develop a model within a social context and first published the *Componential Model of Creativity* in 1983 which illustrates the social influences on creative behaviour. The model can be regarded as the first one to comprehensively take into account cognitive, personality, motivation, and social influence on the creative process, and it is also the first which investigates how these factors influence the different steps in the creative process. In Amabile’s (1983; 1996) model, creativity is the creative production that emerges in a five step process, namely (1) problem or task identification; (2) preparation; (3) response generation; (4) response validation; and (5) outcome evaluation. Further, the process interacts with task motivation, domain-relevant skills and creativity relevant skills.

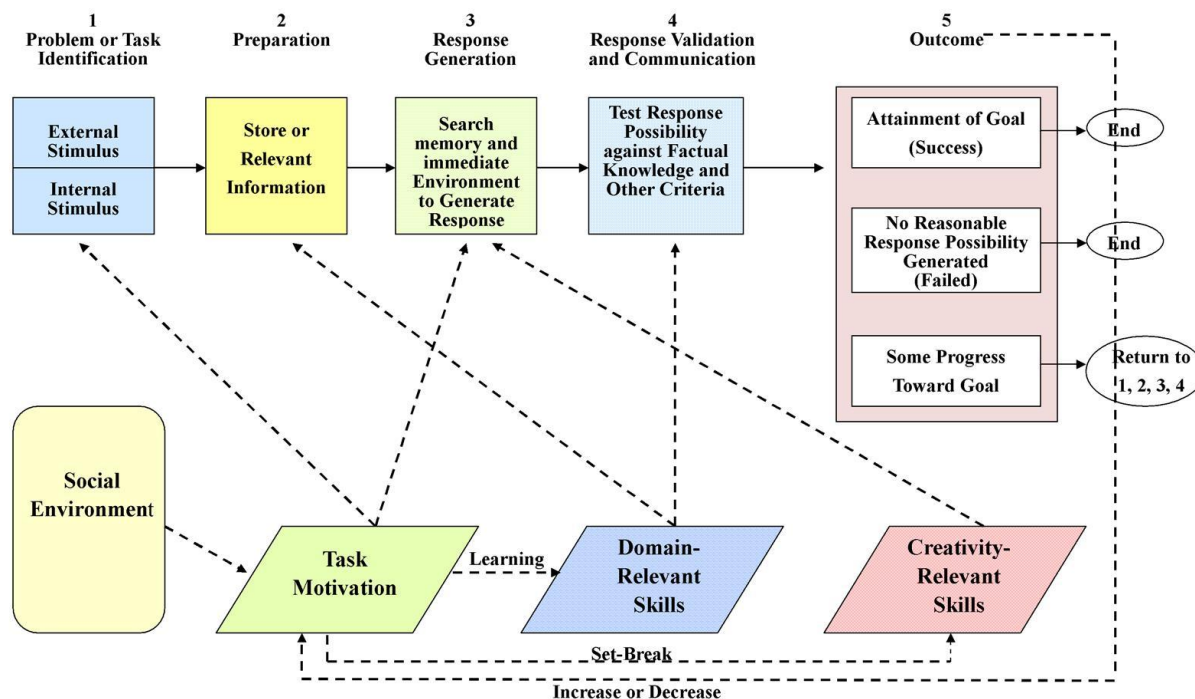


Figure 1. Amabile's (1983; 1996) Componential Model

Source: Amabile, T. M. (1996) *Creativity in Context: Update to The Social Psychology of Creativity* (p 113). Boulder, CO: Westview Press.

Csikszentmihalyi's Systems Model of Creativity

Another social context creativity researcher, Csikszentmihalyi, investigates the relationship between creativity and cultural evolution. Inspired by the process of species evolution, Csikszentmihalyi develops the *DIFI* framework in 1988. The *DIFI* framework has three subsystems: *individual*; *domain*; and *field*, each of the subsystems *interact* with the others (D: Domain; I: Individual; F: Field; I: Interaction). Csikszentmihalyi revises the *DIFI* framework and names it *Systems Model of Creativity* in 1999, according to the model creativity can be best understood as a "confluence" of three subsystems. The *domain* includes a set of rules and practices. Any culture composed of thousands of independent domains, and most human behaviours or activities are affected by rules of some domains. An *individual* is the most important one from a psychological perspective. An individual makes a novel variation in the contents of the domain and the variation will be evaluated by the third part of the system, which is the field. The *fields* are held by various gatekeepers, such as experts and scholars, who have the rights to choose which variations can be reserved in the domains. Csikszentmihalyi (1999) takes the position that creativity means "the ability to add something new to the "culture". The creation by an individual must be "sanctioned by some group entitled to make decisions as to what should or should not be included in the domain" (Figure 2).

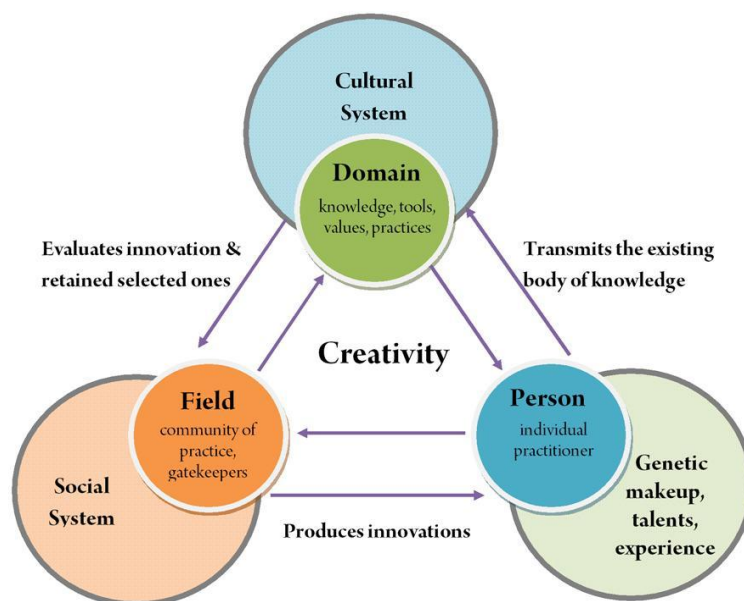


Figure 2. Csikszentmihalyi (1999) *Systems Model of Creativity*

Source: Csikszentmihalyi (1999) Implications of a Systems Perspective for the Study of Creativity, in R. J. Sternberg (ed.) *Handbook of Creativity*. New York, NY: Cambridge University Press.

Sternberg and Lubart's Investment Theory of Creativity

Sternberg and Lubart also investigate creativity in social contexts, they therefore develop the *Investment Theory of Creativity* in 1991. Unlike researchers like Csikszentmihalyi or Amabile who focus on describing the subsystems and its interactions, Sternberg and Lubart have investigated the different factors that might influence creativity. To them creative people are those willing and able to “buy low and sell high” in the realm of ideas. Sternberg (2006) explains that buy low means pursuing ideas that are unknown or out of taste but have growth potential. To Sternberg, creativity as a decision making or choice relies on analytic, creative thinking and practical skills. In the creating process, the investigator needs to take the risk, overcome obstacles, and have tolerance of ambiguity. They assert that creative performance or products rely on many factors that may be well-known. In the *Investment Theory of Creativity*, the production of creativity requires the assistance of combinations of divergent elements, such as intellectual abilities, knowledge, thinking styles, personality, motivation, and environment (Sternberg and Lubart, 1991; 1995).

An Attempt for a Conceptual Synthesis Framework

Reviewing creativity research development history, much of the literature only highlights a particular focus on one of the many dimensions of creativity, and most of them merely discuss personal related topics (Feldman, Csikszentmihalyi, and Gardner, 1994). The personality interested investigators pay attention to personal traits, whereas the cognition researchers seek to understand cognition, mental, and thinking processes. Another group of researchers, however, regard the training programme as the heart of creativity research, and attempt to develop creativity teaching or training programmes.

Although recent studies of creativity have focused on systems approaches which explore creativity in a social environment, there is nevertheless evidence that researchers tend to focus more on the person and process than on the outcome of the social context in which the creativity occurs (Spiel and Von Korff, 1998).

Compared with the previous creativity research lines described above (personality, cognition, and stimulating lines), I stand by my position that creativity should be investigated through a social context lens. Similar to the views of Csikszentmihalyi (1999), Amabile (1983; 1996), and Sternberg and Lubart (1991; 1995) that creativity can be best understood by linking it to social processes and contexts, and among the social context investigators I prefer to use the relatively simple model provided by Csikszentmihalyi (1988; 1999) - *Systems Model of Creativity*. Furthermore, we can synthesise the three major research lines into the systems model of creativity. In the three subsystems interaction model, creativity is a product of the dynamic interaction among three dimensions of the *individual*, the *domain*, and the *field*. It is reasonable to connect the previous personal related research to Csikszentmihalyi's individual subsystem. The various studies concerning the stimulation of creativity can be linked to Csikszentmihalyi's domain subsystem. In the model, a well-inspired creative person is a result from a dynamic interaction between individual and field, because an individual needs to gain some knowledge from the domain like culture, language, mathematics, or other domains. A creative product is therefore produced by the interaction, however, in the social context model we still need to discuss another dominant factor influencing the recognition of creativity or creative products, which is the *field*. The *field* is created by a group of experts or the people who are evaluating the creative product, those gatekeepers can decide which kinds of product can be regarded as "creative" and subsequently be transformed to a specific domain.

Another issue that occurs here is "Can we synthesise the various social confluence theories?". Since there are many similar ideas suggested by Csikszentmihalyi, Amabile, and Sternberg and Lubart, a combination use of theories provided by these scholars is a feasible scheme. This research maps a conceptual framework integrating the three theories as shown in Figure 3.

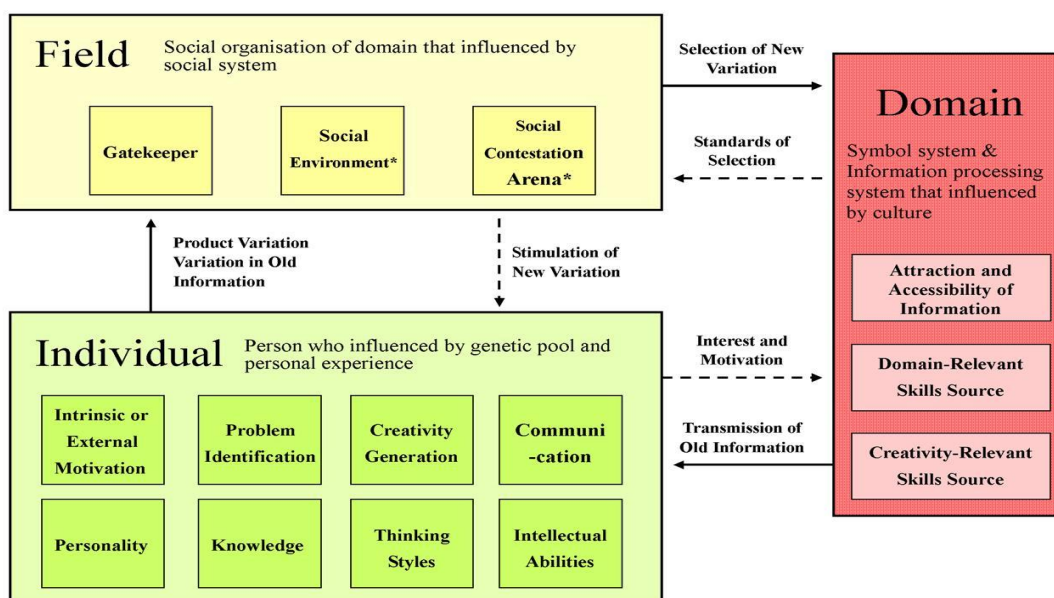


Figure 3. A synthesis framework integrating the theories provided by Csikszentmihalyi, Amabile, and Sternberg and Lubart.

Mainly adapted from Csikszentmihalyi's *Systems Model of Creativity*, the synthesised framework also involves the three subsystems of individual, domain, and field. A common feature of the three theories is that all the scholars emphasise the importance of motivation and personality; we therefore include "motivation" and "personality" in the individual subsystem. Another similarity is that the scholars all advocate that an individual needs to acquire some specific knowledge from an external source (domain) to create new ideas or product (creativity generation), and our framework hence contains "knowledge" and "creativity generation". In Amabile's *Componential Model of Creativity*, she clearly explains the process of creating, including problem identification, preparation, creativity generation, response validation and communication and outcome.

In Sternberg and Lubart's *Investment Theory of Creativity*, a successful creative person can be regarded as a persuasive seller that is able to "buy low and sell high" in the realm of ideas, the seller needs to create something which is both novel and valuable. The person needs to firstly identify the problem or questions, and then use his / her knowledge and intellectual abilities to produce. Three intellectual skills are particularly important: (1) the synthetic ability to see problems in new ways and to escape the bounds of conventional thinking; (2) the analytic ability to recognise which ideas are worth pursuing; and (3) the practical-contextual ability to know how to persuade others (Sternberg, 1985). Also, Csikszentmihalyi argues that identifying the problem and question is central to creativity. This research thus sorts out and embeds the similar parts into the conceptual framework from the theories, among them "problem identification", "creativity generation", "intellectual abilities", and "communication".

With regard to the domain level, in Amabile's theory, creativity happens when three elements interplay with each other: domain-relevant skills; creativity related skills, and task motivation. This research already allocates motivation into the individual subsystem, but how about domain-relevant skills and creativity-relevant skills? In the beginning I hesitated to locate these two skills in the domain subsystem since I believe those skills are something developed from the interplay between the domain and an individual. After careful consideration, no matter how the skills developed, it would inextricably be linked to the culture, symbolic system, and the information transmitting process that exists in the domain, this research thus locates these two skills in the domain subsystem. Nevertheless, if we use the term "skill", it is more likely to express the ability within an individual but not the existing information in domain, this research hence shifts the term to "domain relevant skills source" and "creativity relevant skills source". Further, Csikszentmihalyi and Wolfe (2000) also suggest that the attraction and accessibility of information plays an important role in the transmitting of information from domain to individual, we therefore involve the "attraction and accessibility of information" in the domain subsystem.

To Csikszentmihalyi the definition of creativity means one's ability to add something new to the "culture". That is when a person has the ability to discover and formulate new problems, and has the intensity of interest and motivation in the chosen domain, the person "might" have the ability to produce creative products with originality and value. However, the issue that occurs here is that, *Are the creative products qualified to make a contribution to what he called "culture"?* The qualifying process needs the support of the third subsystem-field. The easiest way to define a field is to say what it includes: all those who can affect the domain (Csikszentmihalyi, 1988, p 330).

Field is related to the person [the gatekeeper who] operates the social organisation in the world. A field is necessary to determine whether the innovation is worth making a fuss about (Csikszentmihalyi, 1996, p 41).

In his 1994 publication with Feldman and Gardner - *Changing the World: A Framework for the Study of Creativity*, Csikszentmihalyi argues for the importance of field for the limits of a person-centred view of creativity:

Personality, values, intrinsic motivation, and discovery orientation give valuable clues as to who may turn out to make a creative contribution in art - and perhaps other domains as well - in the last decades of the twentieth century. But in the course of our investigations it became very clear that a prediction based on these factors left much of the variance in creative achievement unexplained.... (Feldman, Csikszentmihalyi and Gardner, 1994, p 143).

An interesting finding of Csikszentmihalyi through investigating students' performance on arts, although most women scored higher than men, very few women became full-time artists. Conversely, some of the least promising students in terms of creative potential became respected creative artists. Undeniably, the person who operates the field is important for creativity recognition, but I argue that those creative products which are admitted to entre domains are Big-C creativity, which means the unambiguous eminent creative contribution. *How about the Little-C or Mini-C creativity?* Little-C creativity is based on the assertion that creative potential is widely distributed (Craft, 2003; Plucker, Beghetto and Dow, 2004; Sternberg, Grigorenko and Singer, 2004; Kaufman and Baer, 2006); whereas Mini-C is the novel and personally meaningful interpretation of experiences, actions, and events (Beghetto and Kaufman, 2007), and Mini-C creativity "may not necessarily be novel or appropriate to the outside world".

When reviewing Csikszentmihalyi's assumption about individual creativity, it is obvious to conclude that judgement made by others is the major recognition manner.

Creativity is not an attribute of individuals but of social systems making judgments about individual[s] (Csikszentmihalyi, 1996, p 144).

The controversial debate here, and also something which challenges Csikszentmihalyi's assumption, is that if Little-C and Mini-C are both being recognised as creativity, do we still need to regard the gatekeepers as the most dominant part of field? (for Csikszentmihalyi, the term of gatekeeper is those who have the rights to set criteria and make judgements). A salient example challenging Csikszentmihalyi's lens is the case of Vincent Van Gogh. Van Gogh has been regarded as a creative artist worldwide; however, his greatness had not been recognised by his contemporaries during his period of time. Hence, I hesitate to only use Csikszentmihalyi's field concept in my framework. I turn my spotlight to a French sociologist Pierre Bourdieu, who uses the same term-field in his work. Providing us a broader view, Bourdieu described a field as an arena of social contestation. While Csikszentmihalyi's use of the term field tends to emphasise its Darwinian functionality Bourdieu, revealing his Marxist roots, conceives of the field in a complex and conflictual way (McIntyre, 2008). Fields for Bourdieu can be seen as dynamic spaces, the network between the objective and subjective, which "denote arenas of production, circulation and appropriation of goods, services, knowledge, or status, and the competitive positions" (Swartz, 1997, p 117).

I consider Bourdieu's field to be the social place or playground where individuals can share and compete with each other within in. I consider that the broader concept of field can be linked to Amabile's "social environment" and Sternberg and Lubart's "environment". For them, the environment may or may not be a concrete place, and it is not an arena that can only be created by a person. For example, the selection mechanism in the market place might not be only controlled by a person but the whole market. Nonetheless, one similarity between Csikszentmihalyi, Amabile, and Sternberg and Lubart is that when talking about the gatekeeper who has the rights to operate the field or the system, the gatekeeper not only needs to have the ability to recognise other's creativity, but also needs to act as a supporter to stimulate or encourage other's work. Therefore, in the conceptual framework, the field involves three parts, among them "gatekeeper", "social environment", and "social contestation arena".

Conclusion

Human civilisation has depended on its creativity for many aspects of activities in the social, economic, and individual realms; therefore, creativity research has received increased attention. By reviewing creativity research articles published in books and articles in a range of disciplines, we find that it is widely believed that the modern age of creativity began with Guilford's speech in 1950, and the major development lines of creativity research can be categorised into personality approach, cognition approach, stimulation approach, and social confluence approach. The social confluence approach, which is widely used by current scholars, suggests that creativity can be best studied and understood with social contexts. This research attempts to utilise Csikszentmihalyi's model to map a conceptual framework and integrate the theories of Amabile, and Sternberg and Lubart into the conceptual framework. As suggested by Csikszentmihalyi, the conceptual synthesis framework brought out by this review involves three subsystems, including individual, domain, and field. This essay attempts to make more flexible and broader definitions for the three subsystems, with the hope that in the future the conceptual synthesis framework can be employed for creativity research and other related studies in educational settings.

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