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Fostering Creativity in Schools in Hong Kong: Issues and Challenges from a Systems Perspective

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The importance of creativity in our daily life was first highlighted through an overview of different approaches in the study of creativity. The issues and challenges in fostering creativity in schools were then discussed from the perspective of the confluence approaches, and in particular, the systems model, which emphasizes the interaction of individuals, domain, and field as subsystems. This systems model suggests reasons why traditional schools are inimical to the development of creativity, and provides insights into ways of fostering creativity in Hong Kong schools through effecting changes in all the three subsystems. Implications for helping students develop creativity, curriculum reform, and teacher education from the systems perspective are discussed.

Since time immemorial, young people learned how to adapt successfully by acquiring practical skills from their elders. It is only during the last few generations that young people started to become more and more dependent on schools for acquiring the information necessary to cope with their environment. But as our environment becomes increasingly complex and ever changing, new and effective solutions need to be generated. Recently, educators in Chinese and other Asian societies, including Hong Kong, have come to recognize the importance of creativity (see Elliott, 1999). Indeed, it is believed that only through creativity can we cope with new challenges in novel and appropriate ways. Moreover, as our world is changing rapidly, creativity is likely to assume greater importance in our daily life at both the individual and the societal levels (see Sternberg & Lubart, 1996). At the

individual level, whether we become artists, writers, scientists, salespersons, lawyers, or physicians, creativity is important for success in all these occupations, and certainly in almost any occupation that requires thinking and problem-solving. At the societal level, creativity can lead to new scientific findings, new inventions, new art movements, new products, and new social programs and services. Given that creativity is important for us and for our younger generations, we naturally expect that creativity, inasmuch as it can be nurtured or taught, will be learned and practiced in schools. However, contrary to our expectation, our schools seem to be inimical to the development of creativity (Csikszentmihalyi & Wolfe, 2000).

Before we examine why our schools appear to go against the development of creativity, we need to clarify what we mean by creativity. In fact, implicit in the search for ways to foster, nurture, or develop creativity in schools is the assumption of a specific conceptualization of creativity. However, despite decades of research studies, no one theory or approach has been widely accepted to serve as a unifying basis for the conceptualization and assessment of creativity (see Runco, Nemiro, & Walberg, 1998; Treffinger, Renzulli, & Feldhusen, 1971). Indeed, in the history of the study of creativity, there are diverse approaches, including mystical, pragmatic, psychodynamic, psychometric, cognitive, social-personality, and more recently, confluence approaches (Sternberg & Lubart, 1996). An overview of these approaches will set the stage for exploring ways to foster creativity in our schools in Hong Kong.

An Overview of Approaches to the Study of Creativity

The earliest accounts of creativity were based on mystical beliefs of divine intervention where the creative person was inspired by a divine being to pour out inspired ideas to form otherworldly products. This mystical approach extends to viewing creativity as a result of influences on or connections to the preconscious. Thus, relaxation, meditation, hypnosis, drugs, and visionary and psychedelic experiences could help trigger creativity (Gowen, 1972). With the view that creativity is a spiritual process, this approach does not lend itself to scientific study.

Like the mystical approach, the pragmatic approach does not focus on scientific research, though for a different reason. People are taught to become more creative in various ways, such as through lateral thinking (De Bono, 1971, 1985, 1992), brainstorming (Osborn, 1953), applying synectic thinking (Gordon, 1961), removing mental blocks and adopting the roles of explorer,

artist, judge, and warrior to foster creativity (Von Oech, 1983, 1986). Thus, the focus of this approach is on developing, and perhaps also on understanding creativity. The validity of the training and the underlying ideas has rarely been tested empirically.

A more theory-based approach is the psychodynamic approach, which views creativity as arising from the tension between conscious reality and unconscious drives. Accordingly, writers and artists produce creative work as a way to express their unconscious wishes in a publicly acceptable manner (e.g., Freud, 1910/1964). Further, the preconscious, with primary and secondary processes involved, has been regarded as the source of creativity (e.g., Suler, 1980). The basis of this approach has relied largely on case studies of eminent creators.

Recognizing that highly creative individuals are rare and difficult to study, the psychometric approach seeks to study and assess creativity in everyday people by quantifying creativity as a mental trait using paper-and-pencil tasks (Guilford, 1950). Divergent thinking, in particular, has been mostly and intensely studied for understanding creativity (e.g., Torrance, 1974; Wallach & Kogan, 1965).

From a different perspective, the cognitive approach focuses on thinking per se, or on problem-solving and logical thought processes. Weisberg (1993), for example, proposes that creativity involves essentially ordinary cognitive processes yielding extraordinary products. Thus, this approach seeks to understand the mental processes and representations underlying creative thought. These processes may include, among other things, retrieval, association, synthesis, transformation, analogical transfer, and categorical reduction. In one popular model, for example, the creative process is hypothesized to include stages of preparation, incubation, illumination, and verification (Wallas, 1926). An extension of this approach is the computer simulation approach in which the computer is used to simulate the creative process or search heuristic, and make novel associations between familiar ideas (e.g., Boden, 1992).

Developing in parallel with the cognitive approach is the social-personality approach, which has its focus on personality variables, motivation variables, and the sociocultural environment as sources of creativity. Regarding personality variables, it has been noted that certain personality traits often characterize creative people (e.g., Eysenck, 1993; Gough, 1979; MacKinnon, 1965). Indeed, there is a long list of personality traits identified to be potentially relevant to creativity, and these include independence of judgment, self-confidence, preference for complexity, aesthetic orientation,

and risk-taking (Barron & Harrington, 1981). As for motivation variables, those that are hypothesized to be relevant include intrinsic motivation (Amabile, 1983; Golann, 1962), need for order (Barron, 1963), and need for achievement (McClelland, Atkinson, Clark, & Lowell, 1953). Finally, the relevant social environmental variables include cultural diversity, war, the availability of role models and resources, as well as the number of competitors in a knowledge domain (Simonton, 1988, 1994). Cultural variability in the expression and valuing of creativity has also been demonstrated in cross-cultural comparisons (e.g., Lubart, 1990).

Confluence Approaches and the Four Ps of Creativity

While the cognitive and the social-personality approaches have each provided valuable insights into the conceptualization and understanding of creativity, the two approaches have rarely been integrated in the investigation of creativity. Increasingly, recent studies have recognized that multiple components need to converge for creativity to occur. Thus, the confluence approaches emphasize the interaction of many different forces (e.g., Amabile, 1983, 1996; Csikszentmihalyi, 1988; Simonton, 1988; Sternberg, 1985; Sternberg & Lubart, 1995; Weisberg, 1993). In one componential model, for example, creativity is described as the confluence of the three components of task motivation, domain-relevant skills, and creativity-relevant skills (Amabile, 1983; Hennessey, 1997). In another model, the investment theory, creativity requires the confluence of six distinct yet interrelated resources that include intellectual abilities, knowledge, styles of thinking, personality, motivation, and environment (Sternberg & Lubart, 1995, 1996).

To organize and understand the diversity and complexity of the different approaches to the study of creativity, Mooney's (1963) distinction of the four components of creativity is helpful. The four components (the four Ps) include the person who creates (cognitive characteristics, personality and motivational qualities, and special events or experiences during one's development), the process of creating, the product of creating, and the press of the environment, situation or place in which the creative act occurs.

Traditionally, while it is recognized that creativity involves all four Ps, researchers, especially those adopting a psychological perspective, tended to focus on the creative person and his or her creative or thought processes. However, it has to be noted that new ideas as well as internalized standards need to come from existing domains of knowledge. Originality, freshness

of perceptions, and divergent thinking ability alone do not constitute creativity until the good new ideas are translated into accepted creative products with some forms of public recognition. Moreover, the individual mental processes involved in creativity have to take place in a context of previous cultural and social achievements, norms and standards, as variations will be judged against norms, and excellence against standards. Thus, considering that an original idea needs to be implemented and yield a product that is judged to be creative by normative standards, it is evident that creativity is not only a psychological but also a social as well as cultural event. The traditional individual perspective on creativity has to give way to a view that encompasses the environment in which the individual operates. Csikszentmihalyi and Wolfe (2000) use a systems model of the creative process to take into account these essential features, and have drawn an analogy between the systems model of creativity and the model of biological evolution, testifying to the many applications of the model for works of innovation. Thus, the implications of this systems model of creativity for education would provide insights into how schools could foster creativity.

Schools from the Perspective of the Systems Model of Creativity

The systems model is a confluence model that emphasizes the interaction between the individual and the environment (Csikszentmihalyi, 1988). Within the model, the environment has two salient aspects, namely the domain and the field. The domain refers to the cultural or symbolic aspect, and the field refers to the social aspect. Creativity occurs at the interface of the three subsystems of Individual, Domain, and Field (Csikszentmihalyi & Wolfe, 2000). In general, the individual, with his or her distinctive cognitive abilities, styles, needs, desires, personality and motivation, receives training and works in a domain or specific discipline of knowledge. Within the domain, there is the field or a collection of individuals and institutions that offer training, positions, and awards, and decide about the merits of the products generated by the individual. Viewed from a dynamic or interactive perspective, the domain, operating within a specific cultural framework, transmits information to the individual, who absorbs the information from the culture and might make changes on what is known. If the changes are judged to be valuable by the relevant field of gatekeepers, they will be selected for inclusion or incorporation into the domain. The domain will then transmit the novelty to the next generation of Individuals. Accordingly, the model emphasizes

creativity in the context of the interaction between the individual and the environment, and defines a variation as creative only if it is adapted to its social environment and is capable of being passed on through time. The systems model has been fully described and applied to historical and anecdotal examples by Csikszentmihalyi (1988, 1996) and Csikszentmihalyi and Wolfe (2000).

Applying the systems model to education, schools can be viewed as having the same three subsystems. The domain can be interpreted to include the academic disciplines and the body of knowledge to be transmitted to students. The field includes the group of educators, teachers, tutors, and mentors who control the knowledge and evaluate students' learning and performance. The individuals are students whose task is to learn the knowledge, and they are evaluated by the field such as teachers in terms of their learning and performance. For the creative process to take place, the individual has to innovate on the content of the domain in such a way that the field will deem the innovation better than what existed before. With this view, Csikszentmihalyi and Wolfe (2000) comment that it is understandable that traditional schools are inimical to creativity.

Consider the scenario in a traditional school. The main task of the school is to transmit knowledge as prescribed by the curriculum with as little change as possible. Students are expected to learn the content of the curriculum as closely as possible, without deviations. The teachers are to ensure knowledge transmission and conformity with prior knowledge, and whether students produce deviations that might be better than what is written in the textbooks is not the concern of the teachers. Typically, students are not expected to generate deviations, teachers are not expected to look for innovations from their students, and even if they notice a promising one, there is no provision for incorporating it into the curriculum. This could be the reason why traditional schools do not foster creativity, and most instances of creativity are recognized to occur outside the classroom, in extracurricular activities, in science fairs, and in artistic and literary competitions.

While the above scenario may not apply to all schools in Hong Kong, many schools are likely to conform to the description of the traditional school that seems inimical to creativity. Thus, the challenge for Hong Kong educators is how to transform these schools into ones that foster creativity in students. The systems model highlights the need to effect changes from all the subsystems — from the individual, the domain, and the field. Csikszentmihalyi and Wolfe (2000) have discussed the contributions from each of the subsystems and their educational implications. These suggestions

are summarized and discussed in light of the development of creativity in Hong Kong schools in the following sections.

Effecting Changes from the Individual

Under the systems model, creativity occurs when an individual makes a change that is recognized by the field as valuable, and this change in the domain will be transmitted through time. With the individual as the focus, it is believed that some persons are more likely to make such changes, because of their better access to the domain, or because of their personal qualities.

Perhaps, access to the domain is a precondition for introducing creative variations in a domain. However, creative persons also have to be motivated to learn and to perform according to rules. Their constant curiosity, intense interest, and enthusiasm for experience allow them to become immersed deeply in the domain to be able to change it. Because introducing novelty in a domain is often risky and without reward, creative persons have to be intrinsically motivated, which helps them to persevere during the long stretches of the creative process when no external recognition is forthcoming. Apart from being intrinsically motivated, creative persons tend to have certain special personal qualities. For one thing, they are likely to be dissatisfied with the status quo, and want to introduce novelty into the domain. Other desirable qualities include divergent thinking, problem-finding, the ability to express oneself effectively, the ability to convince the field about the virtue of the novelty one has produced, and personality traits that favor breaking rules. All these relevant factors might combine to make it easier for creative persons to make creative contributions.

Applying these same considerations to the school setting, students should have good access to the knowledge domain, which is expected to be transmitted to them in school. Students however will be best prepared to introduce valuable novelty into the domain if they have identified with the rules and contents of the given disciplines, and have developed internal criteria of excellence. Being committed to learning, creative students are also likely to express great interest and curiosity, which are the main sources of potential creativity (Csikszentmihalyi, 1996). On the other hand, teachers have to trust that creative students are intrinsically motivated, allowing them to learn to enjoy the acquisition of knowledge for its own sake, and to engage in extended exploration and experimentation (Amabile, 1983). Thus, it is important for teachers to acquaint themselves with each student's particular strengths and interests, so that appropriate curricular materials could be

designed to meet their needs. As part of the curriculum, students should be taught not only on how to solve problems but also on how to formulate new problems or even to engage in divergent thinking. Thus, programs and activities designed specifically to help students develop their creativity might be helpful (e.g., Sternberg & Williams, 1996).

Effecting Changes from the Domain

From the perspective of the systems model, access to the domain is necessary for creativity to occur. And the creative process will not be initiated unless individuals become interested to assimilate the contents of the domain, and the information contained in the domain is transmitted to the individuals. The reasoning for this precondition is simple. A new and original idea can only be recognized as creative when it is observed against the background of already accepted ideas, which are grouped into domains that constitute the heritage of information or culture.

In the school setting, access to the domain should not be a problem, for the purpose of education is to acquaint students with the contents of the most important disciplines. However, our traditional schools, with an emphasis almost exclusively on the transmission of information rather than on innovation, typically address only a narrow range of students' abilities mapping into a narrow range of knowledge domains. In Gardner's (1983, 1999) terms, traditional schools tend to focus on developing the content of the linguistic and the logical-mathematical intelligences, to the exclusion of the other intelligences in the spectrum of multiple intelligences. Thus, for students in the traditional curriculum, the necessary information on content unrelated to linguistic and logical-mathematical intelligences could be either unavailable or difficult to access. Nonetheless, it is important to encourage students to explore with flexibility and at their own pace as many sources of information as possible. The Internet, for example, might be able to support the acquisition of personalized knowledge, and these new information technologies should have a great potential for making the contents of domains accessible to students.

Given that students have good access to the domain, students still need to be attracted to their learning as prescribed by the curriculum provided by teachers. Unless students are allowed the latitude in exploring and making decisions about the acquisition of their own knowledge, it is unlikely that they will feel enough ownership about the materials to want to assimilate and to innovate. For creative innovations to occur, it is also essential for

creative students to be trained by experts as soon as possible to learn cutting-edge research and knowledge in the particular domain. Schools can contribute by matching potentially creative students with tutors or mentors who might introduce students to their future creative careers (Clasen & Clasen, 1997; Walters & Gardner, 1992).

Effecting Changes from the Field

Under the systems model, novel ideas might not be recognized or adopted as creative unless they are accepted by the field or gatekeepers who make the decision as to whether these ideas should or should not be included in the domain. Here, the field might refer to teachers, critics, journal editors, museum curators, or textbook writers who decide what belongs to a domain and what does not. Thus, creative productivity might be determined less by the number of original individuals than by the receptivity of the field to innovation. It follows that, to increase creative productivity, one needs to work at the level of the fields as much as at the level of individuals.

In the school setting, teachers mostly constitute the field that judges the ideas and products of students. They judge and decide which test responses, essays, or portfolios are to be considered creative. It is likely that receptive teachers are those who enjoy students' explorations beyond the boundaries of textbooks and lesson plans, who allow deviations from the curriculum, and who encourage students to ask questions and explore alternative paths to formulate and solve problems. Thus, teachers can stimulate creativity by getting to know the interests and strengths of their students, by valuing students' curiosity and interest, by keeping their lessons and outlines flexible, by designing activities that are challenging as well as meeting the skills or adapting to the abilities of the students, and by exposing students to learn through extracurricular opportunities such as science fairs, writing contests, and athletic tournaments.

While teachers should be sensitive to the emergence of good new ideas from students, they must also guard against praising every novelty without discrimination, which will not help students develop their internalized excellence standards or the essential criteria for informed evaluations of good ideas. Teachers therefore need to strike a balance between support and challenge, appreciation and evaluation, and freedom and discipline. While the first step of the creative process is to recognize a valuable novelty, teachers might do more to help students bring the novelty to fruition through a variety of activities such as the production of plays, compositions, mathematics

competitions, and science fairs. Publications in school papers or magazines, public displays of art exhibits, plays, or innovations in science fairs will allow novelty to be valued and spread beyond the classroom.

Integrating Changes from the Individual, the Domain, and the Field in Hong Kong

Fostering creativity in schools requires the integration of efforts to effect changes in all subsystems of Individual, Domain, and Field. The occurrence of creativity in schools does not depend simply on the number of gifted or creative students in the school setting, it also depends on the accessibility of the information that students need, and the receptiveness and responsiveness of teachers to novel ideas.

In the past decade, Hong Kong educators have focused efforts on effecting changes in the Individual subsystem. The pioneering efforts were psychometric studies on adapting or constructing suitable assessment instruments to identify students with promising creative potential. Representative research programs included those that seek to provide normative data on the Torrance Test of Creative Thinking (e.g., Spinks, Ku-Yu, Shek, & Bacon-Shone, 1995), and the Wallach-Kogan divergent thinking tests (e.g., Chan et al., 2000/2001). It soon became increasingly apparent that the goal of identifying a pool of creatively gifted students for services on the basis of a psychometric test was somewhat elusive if not misguided, especially when this initial notion was considered in the context of the multidimensionality of gifts and talents. As a result, more efforts are now devoted to implementing training programs designed to promote or enhance creativity, creative problem-solving, divergent thinking or higher-order thinking skills in students (see Education Department, 2000). Thus, our past attempts in promoting creativity in schools have been largely restricted to assessing students or teaching them creativity-relevant skills as well as higher-order thinking skills, perhaps with an emphasis on intrinsic motivation (see Cropley & Urban, 2000; Hennessey, 1997). Such efforts however lack comprehensiveness from the perspective of the systems model. What are needed perhaps are corresponding changes in the two other subsystems, our curriculum and our teacher training. Thus, rather than focusing exclusively on creative students, it would be equally if not more productive to focus at the same time on educational institutions, the domain and the field, which may interact with the individual to help foster, nurture and develop creativity.

One way to effect changes in the Domain subsystem for fostering creativity

in the school setting is to implement appropriate curriculum reform. Hong Kong has over the years undergone many waves of curriculum reform, but fostering creativity in schools is often secondary and seldom the primary target for changes. In contrast to past reform efforts, the measures proposed by the current curriculum reform are more revolutionary, and might make it easier for the new curriculum to respond to and accommodate creative variations. Specifically, the proposed changes are in line with moving away from the notion of curriculum as prescriptive syllabus to an open curriculum framework that allows for different interpretations of contents and flexible use of different learning and teaching strategies (Curriculum Development Council, 2001). Further, the intended integration of different disciplinary areas into key learning areas with the teaching of higher-order generic thinking skills might provide conditions more conducive to the nurturing of creativity, as creative problems often arise at the interface of disciplines, and excessive compartmentalization might stifle genuinely new ideas. Nonetheless, Hong Kong educators have now come to realize that more efforts should be devoted to the planning of balanced and integrated curricula that show the mutual interaction of different disciplines while preserving their integrity and distinctness. At the same time, students need to be helped with integrating their knowledge with issues they know and care about as well as making creative variations to the domain or discipline that is of interest to them (see Chan, 2002).

Finally, fostering creativity in schools also requires changes in the Field subsystem or eventually in our teacher education programs. Hong Kong teachers, through their pre-service or in-service training, have to learn to give up the traditional authoritarian teacher-centered or teaching-centered schooling for the democratic learner-centered or learning-centered teaching to accommodate novel and original ideas and products presented by students. Thus, rather than being absolute authority figures, teachers have to become mentors and role models who value novelty and creativity (Chan, 2000). In addition, teachers have to learn to recognize, respect and nurture the creative personality traits and qualities that students exhibit while reminding themselves that potentially creative students are often unusual in their attitudes, values, and demeanor. Indeed, creative behaviors could be interpreted as socially undesirable or as behavioral problems by some teachers (e.g., Chan & Chan, 1999). These teachers who do not tolerate the idiosyncrasies of creative students should be reminded that they might risk intimidating these students into mediocrity. Also contrary to the current practice of emphasizing achievements in tests and examinations, Hong Kong

teachers have to refrain from relying too much on such extrinsic rewards. It is now generally acknowledged that overemphasizing extrinsic motivation using grades, discipline, or promises of conventional success as inducements to study is less likely to stimulate students to think new thoughts (Hennessey, 1997). With teachers who trust the intrinsic motivation of students, and curriculum and methods of instruction that are able to stimulate and sustain students' interests, students are more likely to motivate themselves to ask new questions, explore divergent solutions, and make creative contributions.

In summary, fostering creativity in schools in Hong Kong as in schools around the world requires joint efforts directed judiciously at the interaction of interested and motivated students, balanced curricula and well-presented knowledge, as well as stimulating and inspiring educators and teachers. Such efforts, from the perspective of the systems model, should bring about synchronous changes in all the subsystems of Individual, Domain and Field, which in turn should help foster, nurture, and develop creativity in schools.

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