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Singaporean Children's Views of Desirable Activities and Useful Activities for Fostering Creativity

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Singaporean children's views of activities that they desire in the classroom and that they consider useful for fostering creativity are investigated. In the first study, 225 children (age 9-12 years) rated on a 5-Likert scale the degree of desirability of 25 activities that they wish to have. Three interpretative factors were identified. Factor 1 refers to conventional activities that take place every day (e.g., doing worksheet, spelling words). Factor 2 consists of alternative activities that can generate different learning atmospheres (e.g., games, riddles, learning computer skills). Factor 3 represents activities that demand children's active involvement (e.g., role-plays, project work). In the second study, 115 children (9-12 years old) rated the degree of usefulness of the same activities for fostering creativity on a 5-Likert scale. Four interpretative factors were identified. Factor 1 is defined as basic knowledge acquisition (e.g., reading, teacher demonstration). Factor 2 consists of activities that can generate enjoyment in classroom learning (e.g., quizzes, competition). Factor 3 represents activities that challenge children's independent learning skills (e.g., writing, project work). Factor 4 is composed of two activities related to the acquisition of multime-

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dia expertise (learning computer and video show). Discussion on the inclusion of children's views in classroom learning is presented.

Key words: children's views, desirable activity, useful activity

Introduction

Recent educational reforms in Singapore initiated several new programs aimed at preparing an informational and a technological learning environment (Teo, 1997), implanting a sense of community (Lee, 1997) and cultivating thinking and independent life-long learning (Goh, 1997). One of the main focuses of these initiatives is fostering children's creative potentials, a counterbalance to the overemphasis on good grades and examination results. Fostering creativity calls for ways to facilitate active children participation and involvement, the introduction of various learning activities, ways to enhance intrinsic motivation and self-confidence, and opportunities for knowledge and skills acquisition (e.g., Cropley, 1992; Torrance, 1995). To be able to perform creatively, individuals should acquire knowledge and skills and possess intrinsic motivation, (e.g., Amabile, 1983). They should be given the opportunity to perform and exhibit their products, and to gain social recognition from their contemporaries and predecessors (e.g., Simonton, 1988; Csikszentmihalyi, 1988). They should also be exposed to various cognitive and learning strategies (e.g., Fogarty & Opeka, 1988), learning activities (e.g., Martin, 1996) and modes of assessment (e.g., Bellanca, Chapman & Swartz, 1997; Fogarty & Stoehr, 1995).

Fostering creativity in school challenges teachers' competence and confidence in providing a supportive learning environment. It also challenges them to adopt a more learner-centered approach to learning. Within the learner-centered educational framework, various issues related to how empowerment, enjoyment, self-perception and self-determination can motivate learners are discussed. Learner-centered education recognizes individuals' differences and unique learning styles (Lambert & McCombs, 1998). Individuals are given the opportunity to discover their strengths and

weaknesses, and ascertain strategies that match their needs and learning styles.

In designing classroom activities and in selecting suitable learning materials, teachers consider individuals' experiences, socio-cultural backgrounds and their views. Instead of focusing on how teachers deliver information, the learner-centered approach to teaching focuses on how teachers can empower learners with the responsibilities to acquire knowledge and skills. Empowerment is an indispensable element of learner-centered education which highlights the process of building trust among learners by recognizing and releasing information, self-monitoring possibilities, decision-making rules, appraisal processes and vision (e.g., Randolph, 1995). The key features of empowerment are autonomy, competence (Gagne, Senecal, & Koestner, 1997), self-image, self-awareness, hope and motivation (Feste & Anderson, 1995), to name a few. It is reported that learner-centered curricula enhance learners' motivation of learning and enjoyment of school, and seem to have positive ramifications for long-term achievement (Phillips & Stipek, 1993). Together with competence and motivation, enjoyment is related to positive psychological outcomes (Frederick & Ryan, 1993).

The learner's self-perception in the academic domain constitutes a motivational factor (Lange & Adler, 1997). A learner must first believe that he (she) is sufficiently competent in order to execute the instrumental actions that lead to achievement. When a learner perceives his (her) control over and responsibility for the learning processes, methods and strategies, he (she) will be committed to the task and motivated to achieve. Learning motivational theories and models highlight the significance of the learners' mastery behaviors that emphasize the opportunity to work independently and seek out challenging tasks. Learners are goal-oriented. They participate as active agents in the learning process (Lange & Adler, 1997).

According to self-determination theory and its mini-theory of the cognitive evaluation (Deci & Ryan, 1985, 1991), autonomous forms of motivation (e.g., intrinsic motivation) lead to positive outcomes such as high levels of creativity (Amabile, 1983), more cognitive engagement, less drop

out and better conceptual learning. When students think that they are competent in the academic domain, there is an increase in their autonomous motivation. Autonomous motivation varies as a function of one's feelings of competence and self-determination (e.g., Karsenti & Thibert, 1995). Perceived academic competence and perceived academic self-determination positively influence autonomous academic motivation, which in turn has a positive impact on school performance (Fortier, Vallerand, & Guay, 1995).

When a person is self-regulated and self-determined, it is likely that his (her) performance and motivation will increase. The same outcome is reported when students possess high internal locus of control and self-esteem (Sterbin & Rakow, 1996). Pupils' motivation can also be enhanced through the use of cognitive strategy (Young, 1997) and metacognitive strategies (Konrad, 1997). These strategies help learners become active participants in their own performance. Through active participation, learners build up a sense of ownership for their learning activities, a motivating force for effective learning.

Despite the fact that learners' experiences, socio-cultural diversity and views are important considerations for any educational reform (Nieto, 1994), children's views are underrepresented in the educational research literature (Glenny, 1996). Children's views are information about what they like and dislike, what they have experienced, and what they perceive as useful, manageable and interesting. Considering children's preferences and wishes is important as it can help establish a pleasant and positive learning environment. When children's preferences and wishes are integrated effectively into lessons, children are (more) likely to commit themselves to the learning activities and processes.

In this paper, primary four and five Singaporean children's (9-12 years old) views of desirable learning activities and useful activities for fostering creativity are examined. The learning culture of these children is featured by two streaming examinations taking place at the end of primary four (school-based) and again at the end of primary six (national). Conventionally, Singaporean children of these school years experience changes in learning environment, learning method and learning expectations. For instance, in-

stead of sitting in a cluster (primary 1 and primary 2), children sit individually in rows (primary 3 onwards). Given the constraint in the seating arrangement, children's opportunities to interact with their peers are limited to activities such as group discussions, competition, role-plays, acting, science experiences, cultural center visits and recess. The frequency of physical movements is confined to the change of instructional activities that sometimes require the change of venue. Watching videos, acquiring computer skills and performing science experiments, for instance, are activities that take place in the resource room or the science laboratory.

The streaming exercises determine the types of classes (in primary five and six) and schools (in secondary levels) that children will undertake. In addition to the change in physical environment, children may experience a change in parental and teacher expectations. As they grow older, children are likely to be expected to discipline their behavior and to manage their work. Classroom behaviors are likely to be monitored strictly within the framework of rules and regulations.

Recognizing the new educational aspirations and the importance to investigate children's views, five research questions are formulated:

- (1) What kinds of activities do children desire to have in the classroom?
- (2) Do children perceive desirable activities in the classroom differently across gender groups?
- (3) How do children perceive their creative competence and characteristics of a creative person?
- (4) What kinds of activities do children regard as useful for fostering their creativity?
- (5) Do children perceive activities that are useful for fostering their creativity differently across gender groups and/or across self-declared creative (not creative) groups?

Children's views of desirable classroom activities have not been researched extensively in Singapore. The current study serves to enrich the local literature on this issue in general and research question 1 (of study 1) is specifically defined for this purpose. Singaporean children did not perform different gender-related perceptions of desirable activities for English

(Tan, 1998a) and mathematics (Tan, 1998b) lessons. The rationale of formulating research question 2 (of study 1) is to confirm the results of previous (similar) studies. Three research questions (3-5) were elicited for study 2. Local researchers and educators have not given ample attention to children's views of creativity. It is believed that self-perceived competence (creative/not creative) and children's perception of a creative person (research question 3) should be examined together with their perceptions of useful learning activities for promoting creativity (research question 4). In addition, the study should also examine different perceptions of learning activities that are useful for promoting creativity across groups (gender, self-perceived creative/not creative (research question 5).

Study 1: Desirable Activities

Method

Subject

The subjects of this study comprised 225 primary four and five children, 56.7% female and 43.3% male. The average age of the subjects was 9.3 years with a standard deviation of 3.2 years.

Instrument

The instrument was developed with reference to responses of several exploratory studies. Ten items were selected from an exploratory study involving 140 children (8-12 years old). The subjects brainstormed on activities that they desired for various lessons (English, mathematics, social studies and science). The items were games (#1), quizzes (#21), group work (#8), acting or show and tell (#25), constructing something (#18), telling or listening to stories (#3), solving puzzles (#6), competition (#11), riddles (#2), learning computer skills (#4), asking questions (#9), project work (#12), video shows (#10), spelling words (#13), doing worksheets (#19), writing (#23), reading (#16) and correcting mistakes (#15). The numbers in brackets are item numbers.

Also selected were items frequently mentioned by 25 novice teachers (19-23 years old) in a brainstorming session and 140 novice teachers (18-24 years old) in a survey as significant activities for promoting children's creativity: Taking rests (#24), role plays (#17), telling or listening to jokes (#7), learning outside the classroom (#14) and verbal presentations (#5). Teachers' demonstration (#20) and test (#22) are two usual classroom activities, and hence they were also incorporated. Short phrases that clarified the intent of an item were added: Visit museum and/or library (#14), the teacher shows how to complete a task and/or solve a problem (#20), and stand in front of the class and share your ideas (#5). The total number of items was twenty-five. The subjects denoted their preferences with numerical values (1-5).

Procedure

The instrument was administered to the subjects in the class at different time intervals (between February and August 1998). They completed the instrument within 15 minutes. The survey was conducted in English. Before the subjects responded, the researcher had read the instructions. The subjects then rated the degree of desirability of activities that they wish to have. If an activity was not of the subject's interest (i.e., if they do not like and do not wish to have it in any lesson), no answer should be given. To avoid subjective interpretation of the 5-Likert scale, the following descriptions of the scale were given:

- If you like an activity VERY MUCH and wish to have it ALWAYS (in every lesson), then select **5**.
- If you like an activity quite a lot and wish to have it OFTEN (in almost every lesson), then select **4**.
- If you like an activity average and wish to have it SOMETIMES (twice a week), then select **3**.
- If you like an activity a little and wish to have it OCCASIONALLY (once a week), then select **2**.
- If you like an activity VERY LITTLE and wish to have it SELDOM, then select **1**.

Data Analysis

The Cronbach's Alpha reliability of the instrument was high, at 0.84. Factor analysis was employed to reduce children's responses to manageable portions. Interpretative factors were extracted from the analysis representing various types of desirable activities of children (research question 1). The factors were extracted from the principal component analysis using the oblique rotation with Kaiser normalization. The Kaiser-Meyer-Olkin measure of sampling adequacy of the instrument was high, at 0.81. The Barlett Test of Sphericity was large (1530.08, df. 300) and the associated significant level was low (0). To find out significant differences across gender groups, the independent T-test was performed on individual items and factors (research question 2).

Results

Items with a factor loading of 0.30 and above were selected for interpretation. There were three interpretative factors (F) for children's perception of desirable activities which accounted for 40.6% variance (F1 = 21.3%, eigenvalue, $e = 5.3$; F2 = 13.3%, $e = 3.3$; F3 = 6.0%, $e = 1.5$). Alpha reliabilities of the individual factors were F1 = 0.81, F2 = 0.71 and F3 = 0.64. Correlations among factors were between 0.10 and 0.21. F1 (routine) refers to conventional activities that take place every day. F2 (variation) consists of alternative or unconventional activities that can generate different learning atmospheres. F3 (participation) represents activities that demand children's active involvement (research question 1). Table 1 displays factor loadings and descriptive statistics of children's desirable activities. The results between female and male pupils did not show any significant differences (research question 2), and hence supported the previous (similar) studies (Tan, 1998 a, b).

Table 1 Children's views of desirable activities

	F1	F2	F3	Mean	SD	Rank
<i>Routine</i>						
Teacher demonstration (#20)	.73	.17	-.14	3.56	1.62	9
Do worksheets (#19)	.70	-.27	-.03	3.47	1.59	10
Spell words correctly (#13)	.67	-	-	3.35	1.71	12
Correct mistakes (#15)	.64a	.19	-.32	3.26	1.70	15
Ask the teacher questions (#9)	.64	-.05	-.01	3.06	1.67	20
Group work (#8)	.58	-.14	-.18	3.26	1.51	18
Verbal presentation (#5)	.57	-.02	.17	1.97	1.52	25
Write an essay /composition (#23)	.53	-.15	.27	2.89	1.71	22
Test/examination (#22)	.45a	-.14	.31	2.46	1.79	24
Listen to or tell story (#3)	.44a	.31	.11	2.98	1.54	21
Quizzes (#21)	.40a	.39	.15	3.31	1.69	13
Read (#16)	.38	.15	-	3.93	1.40	4
<i>Variation</i>						
Rest or recess (#24)	-	.71a	-.30	4.07	1.37	3
Games (#1)	-.16	.68	-.03	4.11	1.16	2
Video show (#10)	-.33	.61a	-	3.71	1.48	8
Riddles (#2)	.26	.55	.18	3.75	1.27	6
Solve puzzles (#6)	.18	.55	-.07	3.27	1.44	14
Listen to or tell jokes (#7)	-.13	.54	.09	3.80	1.34	5
Learn outside the classroom (#14)	-	.44a	.32	3.72	1.58	7
Learn computer skills (#4)	-.22	.43a	.38	4.34	1.10	1
Competition (#11)	.30	.42a	.22	3.22	1.75	17
<i>Participation</i>						
Project work (#12)	-.03	-.11	.67	2.61	1.65	23
Role plays (#17)	.04	.15	.60	3.39	1.62	11
Act or show and tell (#25)	.20	.21	.48	3.08	1.68	19
Construct something (#18)	.27	.12	.41	3.23	1.73	16

N=215, a =items selected for interpretation, when they possessed factor loadings of 0.30 and above in more factors, (-) items with factor loadings less than 0.01.

Discussion

Seven out of ten most desirable activities belonged to F2 (variation, #1, #2, #4, #7, #10, #14, #24) and three belonged to F1 (routine, #16, #19, #20). Children learn computer skills and watch videos in media resource rooms where teachers are able to have a combination of video and computer presentations. Learning outside the classroom can also take place in the science garden, laboratory, music room or school field (for physical education). In addition, the children visit cultural and science centers once or twice a year. In an alternative environment, they are likely to be excited over new experiences associated with changes in the nature of the activities and the venue. Activities that are less stressful (#24, #1) were regarded by children as desirable activities. Children seemed to acknowledge the importance of teacher guidance as well as clear and precise instructions (#20). They also perceived the benefit of doing school-prepared and/or teacher-prepared worksheets (#19). Children also liked reading (#16), a school based activity that usually takes place collectively in the school assembly hall.

Activities that were moderately desired were some individual work (#13, #15, #18, #19) and group work of various forms (#6, #8, #11, #17, #25). The five least desirable activities were those that challenge the children's independent and verbal skills. Children regarded standing in front of the class to present results of a discussion (#5) as the least desirable activity. Children seemed to dislike activities that require them to demonstrate their written (#12, #23) and verbal (#3) competence including examination (#22).

Study 2: Useful Activities

Method

Subjects

The subjects were 115 primary four and five children (59.1% female, 40.9% male). They were also participants of study 1. The average age of the subjects was 8.7 years with a standard deviation of 4.2 years.

Instrument

The instrument comprised two pages of questions. On the first page, questions related to children's evaluation of their creativity, intelligence and characteristics of a creative person were printed. Subjects checked "yes" or "no", if they agreed or disagreed with the questions: "I am a creative person", "I am an intelligent person", "I can be creative one day/in the future". Ten statements of creative persons were selected based on the following reasons. First, Singaporean classroom cultures emphasizes high academic achievement and good behaviors. Educators and pupils may associate creative features with *artistic* (non-academic) and unacceptable, *different or alternative* behaviors (see Soh, 1998). To find out whether primary pupils possess different perception of creative and/or intelligent persons, conventional features of high achievers were proposed such as *highly intelligent, popular and doing well in tests or examinations*. Words and phrases printed in *italics* were key characteristics of a creative person described in the instrument. Examples of the statements related to characteristics of a person were "a creative person is highly intelligent" and "a creative person does well in tests or examinations".

Second, in a pilot study (conducted in early 1997) with 100 student teachers (age 18-25 years), *artistic, dedicated or hard working, resourceful, and risk taking* were some of the most frequently mentioned characteristics. The same characteristics also commonly appeared in the literature. Creative individuals possess skills to generate ideas or *have many ideas* (Clapham, 1997), *have strong interests in their work and like to learn new knowledge and skills* (possess intrinsic motivation) (Amabile, 1983; Simonton, 1994), are *risk taking* (Sternberg, 1996), and are persistent or *hard working* (Heinzen, Mills & Cameron, 1993). On the second page, the twenty-five activities that appeared in the instrument for desirable activities were included. The subjects denoted their perception of the degree of usefulness of the activities in fostering their creativity on a 5-Likert scale.

Procedure

The instrument was administered to the subjects in their respective classes at different time intervals (between August and October, 1998). The average duration for completing the instrument was 15 minutes. Before the subjects responded, the researcher had read the instructions. The subjects then rated the degree of usefulness of the activities for fostering their creativity. To avoid subjective interpretation of the 5-Likert scale, descriptors of the scale were defined. The number 5 meant the activity was very useful in fostering creativity, 4 referred to quite useful, 3 moderately useful, 2 to a certain extent useful and 1 not very useful. If an activity was not useful at all, no answer should be given. The survey was conducted in English.

Data Analysis

Frequency was computed for the children's perception of a creative person and self-evaluation on creative competence (research question 3). The Cronbach's alpha reliability of the instrument was high, at 0.85. Factor analysis (principal component analysis, the oblique rotation with Kaiser normalization) was employed to provide a general overview on various useful activities for fostering creativity (research question 4). The Kaiser-Meyer-Olkin measure of sampling adequacy of the instrument was high, at 0.77. The Barlett Test of Sphericity was large (1116.6, df. 300) and the associated significant level was low (0). Mean for individual factor was computed from the sum of items divided by the number of items. A 2 (female, male) x 2 (creative, not creative) multivariate analysis of variance on individual factors was performed to find out differences across gender and self-declared creative/not creative groups (research question 5).

Results

Nearly all subjects (90.4%) thought that they could be creative in the near future. Less than half of them (40.9%) regarded themselves as creative, and less than one third of them (28.7%) claimed that they were intelligent (Figure 1). The majority of children agreed with the descriptions that a creative person is someone who has many ideas (99.1%, nidea), who likes to learn

new knowledge and skills (92.2%, nskills), who shows strong interests in work (89.6%, interest), and who works hard (72.2%, wrkhard). Between one third and half of them perceived a creative person as someone who is highly intelligent (56.5%, intelli), who is popular among peers (52.2%, popular), who does well in tests or examinations (47%, test) and who behaves differently from others (35.7%, diff) (Figure 2) (research question 3).

Figure 1 Children's self-evaluation

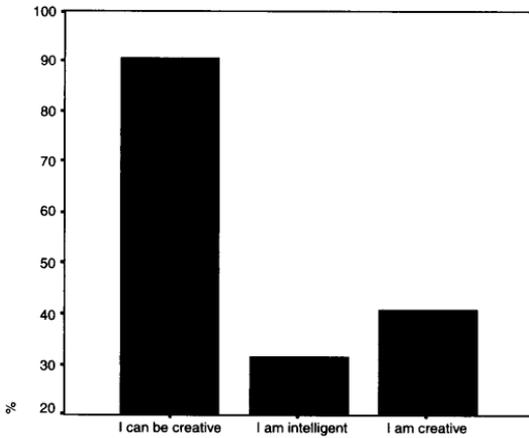
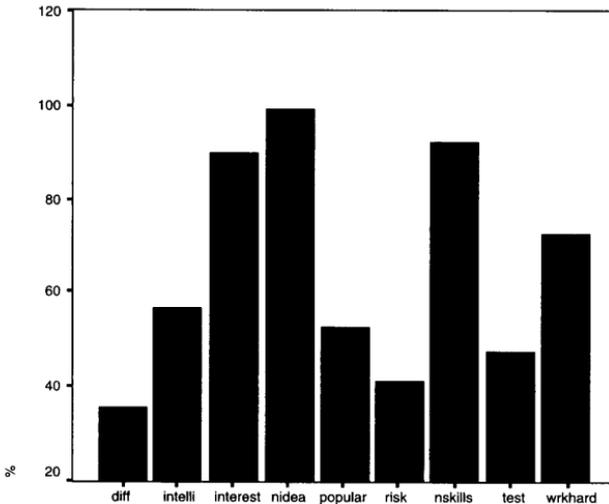


Figure 2 Children's views of a creative person



Items with a factor loading of 0.30 and above were selected for interpretation. There were four interpretative factors for children's perception of useful activities for fostering creativity which accounted for 51.1% variance (F1 = 22.2%, eigenvalue, $e = 5.6$; F2 = 14.7%, $e = 3.7$; F3 = 8.7%, $e = 2.1$; F4 = 5.5, $e = 1.4$). Alpha reliabilities of the individual factors were F1 = 0.87, F2 = 0.70, F3 = 0.71 and F4 = 0.66. Correlations among factors were between 0.04 and 0.22. F1 (basic knowledge acquisition, $M = 3.66$, $SD = 1.02$) comprises seven activities. F2 (enjoyment, $M = 3.53$, $SD = 0.84$) consists of nine unconventional activities that can generate enjoyment in classroom learning. F3 (acquisition of independent skills, $M = 3.92$, $SD = 0.79$) represents activities that challenge children's independent learning skills. F4 (multimedia expertise, $M = 3.75$, $SD = 0.98$) is composed of two activities related to the acquisition of multimedia expertise (research question 4). Table 2 displays factor loadings and descriptive statistics of useful activities for promoting children's creativity. The multivariate analysis did not generate any main effects (gender, creative/not creative). The between-subject tests reported that the mean for F1 ($F(1,111) = 4.93$, $p < 0.05$) was significantly higher for self-claimed creative children ($M = 3.87$, $SD = 0.9$) than for their counterparts who claimed that they were not creative ($M = 3.50$, $SD = 1.07$) (research question 5).

Discussion

Though nearly all the children possessed hope to become creative, they evaluated themselves humbly. Four out of ten children claimed that they were creative, and less than three out of ten admitted that they were intelligent (Figure 1). Children seemed to hold a positive attitude toward the development of their creative potential, but were critical of their competence and ability. Four activities (#8, #15, #16, #20) with the highest means (the first ten) belonged to F1 (basic knowledge acquisition), three (#11, #17, #21) to F2 (enjoyment), two (#3, #14) to F3 (independent skills acquisition) and one (#4) to F4 (multimedia expertise). The children in this study

Table 2 Children's views of useful activities for fostering creativity

	F1	F2	F3	F4	M	SD	Rank
<i>Basic knowledge acquisition</i>							
Test/examination (#22)	.85	-.12	.17	-.02	3.52	1.69	17
Spell words correctly (#13)	.82	-.09	.11	.04	3.55	1.61	14
Do worksheets (#19)	.80	-.16	.10	-.15	3.62	1.53	13
Teacher demonstration (#20)	.79	-.24	.15	.12	3.83	1.41	5
Correct mistakes (#15)	.78a	.10	-.19	-.35	3.79	1.54	6
Ask the teacher questions (#9)	.71a	-.13	-.58	.09	3.52	1.48	16
Group discussions (#8)	.50a	.34	.21	-.33	3.71	1.20	8.5
Verbal presentation (#5)	.46a	.14	-.03	-.35	3.05	1.41	22
Read (#16)	.35	.13	-.18	.13	4.26	1.09	2
<i>Enjoyment</i>							
Games (#1)	-.16	.74	-.08	.15	3.63	1.16	12
Role plays (#17)	-.15	.69	.23	-.11	3.71	1.29	8.5
Competition (#11)	.18	.68	-.13	-.10	3.97	1.26	3
Act or show and tell (#25)	-.08	.65a	.45	-.16	3.41	1.37	18
Riddles (#2)	.04	.54	-.11	.23	3.64	1.11	11
Rest or recess (#24)	.31	.48a	-.26	.19	3.03	1.73	23
Listen to or tell jokes (#7)	.02	.46a	.07	.36	3.07	1.42	21
Quizzes (#21)	.13	.43a	.30	.19	3.75	1.25	7
Solve puzzles (#6)	.03	.42a	.07	.37	3.54	1.36	15
<i>Independent skills acquisition</i>							
Learn outside the classroom (#14)	.01	-.12	.71a	.37	3.95	1.38	4
Writing/Composition (#23)	.13	-	.61	-.27	2.90	1.66	24
Construct something (#18)	.11	.01	.61	.21	3.22	1.76	19
Project work (#12)	.03	.22	.59a	-.39	2.59	1.71	25
Listen to or tell story (#3)	.15	-.17	.44	-	3.65	1.24	10
<i>Multimedia expertise</i>							
Learn computer skills (#4)	.07	-.10	.11	.63	4.33	1.01	1
Video shows (#10)	-.20	.19	.14	.60	3.17	1.44	20

N=115, a =items selected for interpretation, when they possessed factor loadings of 0.30 and above in more factors, (-) items with factor loadings less than 0.01.

acknowledged variations in learning environment (e.g., #4, #14), routine activities (e.g., #20, #15, #16) and unconventional activities (e.g., #11, #17, #21). They also regarded some group activities (#8, #21, #11, #17) as activities that are useful in fostering creativity.

Children's conceptions of useful activities for promoting creativity were less "play"-oriented. This argument was reflected in their relatively moderate rankings of riddles (#2), games (#1) and acting (#25) as well as low rankings of recess (#24), jokes (#7) and video shows (#10). Moderate attention was also ascribed to conventional classroom activities such as examinations (#22), spelling words (#13) and doing worksheets (#19) as well as unconventional activities such as constructing something (#18), asking questions (#9), writing (#12, #23) and verbal presentations (#5).

General Discussion

Enjoyment and familiarity (research questions 1 and 2): Children's conceptions of desirable activities include the connotations of a relaxing and pleasant experience (#7, #24), the opportunity to interact with peers (#1, #2, #21), and different experiences in the alternative classrooms (#4, #10) or outdoor (#14). Familiar activities such as reading (#16), teacher demonstrations (#20) and doing worksheets (#19) are included in the children's list of desirable activities. In short, children's conceptions of desirable activities are activities that contain the element of enjoyment and familiarity.

Self-perceived creative potentials (research questions 3 and 5): Children's perception of the typical characteristics of a creative person matches certain criteria of a creative person (e.g., rich in ideas, skillful, highly motivated, knowledgeable) as found in contemporary creativity theories (e.g., Amabile, 1983; Simonton, 1994). Only nearly half of them attributed high intelligence and high examination scores to characteristics of a creative person. Children may employ intelligence interchangeably with high achievement, good academic grades and excellent scores. Creativity is less likely to be linked to high academic-oriented connotations as it was introduced in the

midst of reforming education which rejects overemphasis of the examination-driven learning culture. Self-claimed creative children were significantly more alert of basic knowledge acquisition (F1) than their self-claimed non-creative counterparts. Children of the self-claimed creative group evaluated higher (on average, ten percent higher) than their self-claimed non-creative counterparts on creative persons as someone who likes to learn new skills and knowledge, who works hard, who are good at tests, who takes risk, who is different from other people, and who is interested in work.

Children who participated in the study held a positive belief in unfolding their creative potentials. Positive beliefs are crucial and need to be acknowledged so that the beliefs can be transformed into motivational forces. The children's low self-evaluation should not be interpreted as evidence of low self-esteem. Living in a competitive environment, children are likely to possess high self-expectations and thus are critical towards their own competencies. Further research should examine reasons for children's low self-evaluation and high futuristic aspiration. If the latter can act as a motivating force, children should be encouraged to employ working backward strategies, that is setting attainable goals before laying down steps to unfold their creative potentials.

“Knowledge”- and “skill”-driven conceptions of creativity (research question 4): We realize that children relate the quality of productivity (new ideas), motivation (interest in work), persistence (learning attitudes) and diligence (working hard) to a creative person. Children's conceptions of creativity highlighted basic knowledge acquisition, interest and enjoyment, acquisition of independent skills and multimedia expertise. Unlike their conception of desirable activities that were “play”-oriented, children's conceptions of useful activities for fostering creativity can be “knowledge”- and “skill”-driven. Activities that do not embrace the element of knowledge or skill acquisition such as taking a rest (#24) and listening to or telling jokes (#7) did not receive high attention.

Serious play: Children in the primary level may hold an implicit connotation for playful activities that can be classified into desirable activities but

not useful activities for fostering creativity. Some "play"-oriented activities (e.g., #7, #10, #24) that are not "serious" may not be evaluated as useful for uncovering creative potentials. Children may relate creativity to hard work and the acquisition of knowledge and skills. Enjoyment was an element of children's conception of useful activities for fostering creativity. Evidently, children gain their socially competent behaviors (Creasey, Jarvis & Berk, 1998) and linguistic competence (Sharpe, 1994) through playing with objects, peers and adults. Further research should be carried out to find out how children set criteria to single out play activities that are useful and/or not useful for fostering creativity. Play and learning are highly valued and encouraged by Singaporean preschool parents (Lim & Honig, 1997). Referring to children's views of serious play, parents and teachers of upper primary school children should approach relaxing and play-oriented learning activities positively and remove biased attitudes towards these activities.

Asking and writing: Under the bilingual educational policy, acquisition of languages is the main learning activity in Singaporean primary education. In primary education, about one third of the curricular time is allocated to English classes, and one-fourth to learning the mother tongue. Though there is strong emphasis on linguistic competence, the children in this study disregarded activities that challenge their written (#12, #23) and verbal skills (#5, #9) as highly desirable activities and useful activities for fostering creativity.

The children's selection of desirable activities may be a reflection of the types of activities that they had experienced in the classroom. The researcher visited classrooms of all the subjects (four visits to each classroom) and found that asking questions was not a frequent activity. Question and answer sessions were organized in a relatively structured manner. The teachers posed questions and the children raised their hands when they wished to answer. To avoid "unbearable" noise levels in a class of thirty to forty, teachers rarely allowed voicing of opinions or views in a non-structured manner.

It is believed that project work challenges children's competence in collecting, selecting, analyzing as well as organizing information and mate-

rials independently (Chapman & Freeman, 1996). In Singapore, schools attempt to introduce project work as a means to foster independent learning and creative thinking. Consistent with the results of desirable activities, the reception of project work was evidently low among primary school children. We should re-examine how project work is introduced to primary school children. Reasons for the low reception of project work and writing should be examined through follow-up interviews and observations. Cognitive and metacognitive strategies should be introduced to help children inculcate interest and motivation in doing independent work.

Examination: Children in this study did not endorse examination (#22) as one of their desirable activities and useful activities for fostering creativity. A year before and during examination years, children are given extensive teacher-designed exercises, school-based worksheets and standardized workbooks. They participated frequently in formative assessments, two to three times per term (three terms a year). In shaping an unconventional classroom culture, educators should introduce alternative assessment modes such as portfolio and performance assessments (e.g., Paris, 1998), and self-evaluation cards (Nakagawa & Matsubara, 1996) that measure learning processes. Self-evaluation and precise learning goals can enhance motivation and improve achievement (Schunk, 1996).

Other suggestions: While the instruments consider activities that take place frequently in the classroom, it should be complemented by activities that are believed to be useful for fostering creativity but are seldom introduced to primary school children. Brainstorming activities and sharing of unusual and new ideas, for instance, may encourage children to be active contributors. Other factors that may influence children's learning and creative competence such as children's self-concept, motivational problems and their home environment should also be investigated. The effectiveness of learning activities recommended and preferred by children should be examined in future studies. A learning activity may be effective even though children may not regard it as desirable. Perhaps, educators should assess the effectiveness of learning activities not only from children's views but also

from other factors such as past experiences, objectives of a lesson, needs of the target groups and the inherent instructional value of learning activities per second.

In line with this study, the teacher's perceptions of desirable activities and useful activities for fostering creativity should also be investigated. Furthermore, the instruments were developed from the responses of high and moderate achievers of upper primary level (primary three, four and five). They may not be suitable for low achievers and lower primary pupils (primary one and two). The instruments can be improved by allowing children of average and low achievement to respond in the language that they are most comfortable with. The instructions and items should be presented in the mother tongue in addition to English. For children who have difficulties in expressing themselves in written form, interviews should be conducted. Pictures and diagrams should be attached to individual items to assist lower primary children's understanding of the items.

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