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High School Students' Perceived Creativity Self-efficacy and Emotions in a Service Learning Context

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Our study examined the relationship of creativity self-efficacy and emotions of high school students (n = 279) in Singapore before and after they attended a three to five-day international service learning program. Participants completed a creativity self efficacy scale, the Positive Affect and Negative Affect Scale (PANAS), Satisfaction With Life Scale (SWLS) and Subjective Happiness Scale (SHS). We found a positive, significant correlation between creativity efficacy and positive affect, life satisfaction and subjective happiness but negative correlation with negative mood affect. In addition, students whose creativity efficacy was moderately high were found to have reported higher ratings of life satisfaction after having participated in service learning. Our findings provide initial evidence suggesting that service learning with positive intervention is positively related to creativity self-efficacy and happiness of youth.

CREATIVITY AND SELF-EFFICACY

This paper reports on a study designed to examine the relationship of creativity self-efficacy and emotions of high school students in Singapore after performing service learning. Creativity self-efficacy is a concept coined to describe "the belief one has the ability to produce creative outcomes" (Tierney & Farmer, 2002, p. 1138). To perform creatively, it is important for people to be confident of their abilities to do so. Creativity self-efficacy is the underlying psychological process that influences an individual's level of self-confidence in working towards novel and appropriate ideas or behaviors (Choi, 2004). The concept of creativity self-efficacy revolves around the social componential theory (Amabile, 1983) and Bandura's (1997) social cognitive theory, and particularly the concept of self-efficacy. The social cognitive theory regards people as agents of their own experiences. People act with intention, set goals and plan courses of action, self-regulate and motivate, and reflect on their own functioning (Bandura, 2001; Bandura & Locke, 2003). Self-efficacy is defined as the self-

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confidence people have in their capability to exercise some level of control over their own functioning and environmental demands where they organise and execute courses of action required to attain desired results in specific tasks or domains (Bandura, 1989). A strong sense of efficacy is vital for successful functioning, exerting substantial impact on performance, achievement and wellness (Bandura, 2001). Self-confident people are motivated to act towards their goals and persevere, even if they are faced with challenges (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001).

The componential theory of creativity (Amabile, 1983) describes the interaction of three components for creative performance: Creativity-relevant process, domain-relevant process, and task motivation. Creativity self-efficacy refers to a person's beliefs in regulating creativity-relevant processes operating on a general level, where they influences responses in any content domain and determine the novelty of the response (Amabile, 1996). Domain-relevant process operates at an intermediate level. Task motivation operates at the most specific level, determining an individual's approach towards a particular task. The higher the levels of each of these components, the more creative the product will be. A person's positive emotions indicate the presence of task interest, commitment and motivation.

The Strive for a Full Life

Our study on high school students' perceived creativity self-efficacy regarded the importance to develop strengths of youth as a means to a psychologically fulfilling life (Seligman, 2002). A positive intervention was embedded in a short, service-learning program. The intervention was designed with reference to the "strengths approach" to talent identification, a precursor to related constructs such as subjective well-being (Diener, 2000), positive emotions (Fredrickson, 2000), and creativity (Cassandro & Simonton, 2002). It is believed that people can change on the "malleables" (such as satisfaction, subjective well-being and performance) if they are aware of their talents and character strengths (Clifton & Harter, 2003). They can experience positive emotions, be engaged in activities, and purse greater meaning in life, if their talents and strengths are identified and if they have the opportunities to use these abilities (Seligman, 2002).

Our study measured the participants' emotional states with reference to the three routes and components of a happy life (Seligman, 2002): positive emotions (the *pleasant* life), engagement (the *engaged* life) and meaning (the *meaningful* life). The *pleasant* life consists of positive emotions about the past (such as contentment and fulfillment), present (such as smelling freshly baked bread or eating ice cream), and future (such as optimism, faith, and hope). Positive emotions about the future, especially hope and optimism, can serve as buffer against depression (Seligman, 1991, 2002).

The *engaged* life pursues involvement and absorption in work, intimate relations, and leisure (Csikszentmihalyi, 1990). Seligman (2002) surmised that we can enhance engagement and flow (the state or moments when we are highly engaged in challenging activities) by identifying people's signature strengths (highest strengths) and talents and enlist them, as much as possible, each day as we work, play, and relate to others.

The *meaningful* life involves using our signature strengths and talents in the service of something larger than we are, to find meaning and purpose in living (Seligman, 2002). "Positive institutions" such as religion, politics, family, community, and nation

provide the place where we can serve to establish a meaningful life, and in so doing, produces a sense of satisfaction and the belief that one has lived fruitfully (Myers, 1992; Nakamura & Csikszentmihalyi, 2002). Performing or carrying out such activities produce a sense of meaning and are strongly correlated with happiness (Lyubomirsky, King, & Diener, 2005).

Service Learning for Growth and Well-being

In line with the engaged and meaning life, we identified service learning as the domain of our study. Evidently, through engaging in service learning in a positive institution, students are given the opportunities to connect their personal goals and to apply what they are learning to real-world situations. Ngai (2006) found that service learning helped students develop recognition of and faith in their potential, enhanced their self-assurance, assumption of new responsibilities and achievement of individual growth. They became more responsible citizens and agents of social change. Through service learning, students transformed in their perceived empowerment, value of voice and commitment to continued advocacy efforts (Ethridge, 2006). Service learning enhanced significantly students' writing skills, critical thinking, grades, and increased leadership and self-confidence in students (Astin, Vogelgstang, Ikeda, & Yee, 2000).

Service learning is described as a balance between community service and academic learning where service and learning goals are explicitly integrated (Eyler & Giles, 1999). Our service learning program considered Ethridge's (2006) elements which differentiated it from community service: integrated learning, student voice, high quality service, civic responsibility, collaboration, reflection and evaluation. The service learning program adopted an underlying framework of inquiry, so that a deeper context for learning was provided as part of the program (Rappoport, 2000). The program was a multidisciplinary process of problem-solving meant to address a specific situation. Before deciding upon a service solution, students had to learn to generate and creatively solve meaningful questions. The components of a service learning program included selecting a local public policy issue, researching the problem and analyzing the findings, problem solving, taking civic action, assessing and reflecting on the results and process. Positive intervention was an essential component of our service learning program. Specifically, to ensure growth and psychological well-being the facilitator held a feedback session to allow students to voice their learning points and record their emotions of the day. All participants were provided opportunities to acquire ample skills and apply skill appropriately (domain-relevance processes) prior to and during their stay in the host country. The program had a clear, inquiry-based structure for data gathering and analysis.

METHOD

Participants

A total of 389 high school students participated in the study comprising 165 females and 223 males. One participant did not provide gender details. The participants were aged between 14 and 18 years (M=15.64, SD=.84). From that total, 279 participated in the study before and after their international service learning trip.

Measures

Creativity-relevant efficacy scales. The creativity-relevant efficacy scales measured cognitive style (n = 4, e.g., I am good at coming up with new ideas) and working style (n = 5, I constantly check to see how well I am doing). Three creativity efficacy scale items (Beghetto, 2006; α =.86) were labeled in this study as cognitive style ("I am good at coming up with good ideas.", "I have a lot of good ideas.", and "I have a good imagination."). Tan (2007) added five items to the three suggested by Beghetto (2006), of which one was related to cognitive style (CS) and four related to working style (WS): I am good at combining existing ideas (CS), I can focus on solving problems and complete activities (WS), I can focus on doing something new and valuable (WS), I wish to improve skills so that I can make something original (WS), I check to see how well I am doing when I am coming up with new ideas (WS), and I continue doing my task even if I face difficulty in coming up with good ideas (WS). A five-point Likert scale was used with indicators: 1 'very much unlike me', 2 'unlike me', 3 'moderately like me', 4 'like me', and 5 'very much like me'.

Positive affect and negative affect schedule (PANAS). The Positive Affect Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) is a 20-item scale developed to measure two dimensions of self-reported positive and negative affect. The "Positive Affect" section of the PANAS includes terms, such as "active", "attentive", "enthusiastic", and "excited", whereas the "Negative Affect" section of the PANAS includes terms such as "afraid", "hostile" and "irritable". Respondents are asked to rate the extent to which they have experienced each particular emotion within a specified time period, with reference to a 5-point Likert scale with anchors: 1 'very slightly or not at all', 2 'a little', 3 'moderately', 4 'quite a bit' and 5 'very much'. Participants were instructed to indicate the extent to which each item corresponded to the way they had felt generally. Previously reported reliability coefficients for intensity were .80 and .89, respectively for the positive and negative affect scales, whereas reliability coefficients for frequency were .85 and .79, respectively for the two scales (Watson et al, 1988).

Satisfaction with life scale (SWLS). The Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985) was developed to assess satisfaction with people's lives as a whole. The SWLS is a 5-item broad-band instrument measuring life satisfaction. Examples of items are: "In most ways my life is close to my ideal," and "If I could live my life over, I would change almost nothing." The SWLS uses a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7), yielding a possible score range of 5 (low life satisfaction) to 35 (high life satisfaction). The SWLS is a reliable and valid instrument with a previously reported average Cronbach's alpha coefficient of .85 and moderately high correlations with other measures of subjective well-being scales, such as the Life Satisfaction Index-A and the Philadelphia Geriatric Centre Morale Scale (Pavot, Diener, Colvin, & Sandvik, 1991).

Subjective happiness scale (SHS) The Subjective Happiness Scale (SHS) (Lyubomirsky & Lepper, 1999) is a 4-item scale of global subjective happiness. Two items ask respondents to characterize themselves using both absolute ratings and ratings relative to peers, whereas the other two items offer brief descriptions of happy and unhappy individuals and ask respondents the extent to which each characterization describes them. Items are answered on a 7-point Likert scale. The SHS has a previously reported high internal consistency, where the Cronbach's alpha ranged bet-

ween .85 and .95, and has been found to be stable across samples. The high test-retest reliability (Pearson's r ranged from .71 to .90) and self-peer correlations (r = .65) have suggested good to excellent reliability.

Procedures

The teacher assisted in distributing questionnaires to the participants before, after and during service learning. About two months before they departed for service learning, the participants received appropriate training in Singapore. During the first of their training the participants filled out their particulars and rated the creativity efficacy and emotional scales. During service learning the participants rated their emotions daily in the evening during learning facilitation when they reflected upon their constructive and challenging experiences of the day. After service learning the participants were requested to fill out the same questionnaire. The completed questionnaires were returned to the teacher. On average, for each survey, the participants spent 15 to 20minutes to complete the questionnaire.

Ethical considerations

The researcher asked the participants for their consent to take part in the survey study. After giving informed consent, each participant indicated briefly his/ her general demographics (religion, age, gender) on the first page of the survey. They were informed of the purpose of the study; that their responses were meant for research purpose. The participants were ensured that the researchers observed anonymity and confidentiality of the survey.

RESULTS

All items were subjected to further analyses as none of the item possessed a value of skewness or kurtosis of 1.64 and above. The Cronbach's alpha reliabilities for the scales were high, .70 and above, indicating that presence of internal consistencies. Exploratory factor analysis using principal component and oblimin rotation was performed to all measures, before and after service learning. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett-Test of Sphericity (BTS) were referred. The KMO is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. The BTS is a statistical test for the presence of correlation among the variables. The BTS was significant at the 0.001 level. Table 1 summarizes results of reliabilities and factor analyses.

Mean, standard deviation, skewness, and kurtosis of each scale before and after service learning were outlined in Table 2.

The participants' momentary moods during service learning were recorded. Table 3 shows mean, standard deviation, skewness, kurtosis, and Crobach's alpha of positive affect, negative affect, and affect balance during service learning.

To find out the relationship between creativity self-efficacy and emotions, correlational analysis was performed. Table 4 reports Pearson correlations of the creativity-self-efficacy and emotional scales.

To find out if the participants can be re-grouped, cluster and discriminant analyses were performed to responses after positive intervention (Table 5). Cluster analysis on the two creativity efficacy scales and all positive emotion scales yielded two clusters. Cluster 1 was defined as participants with moderate creativity self-efficacy and posi-

Table 1

Factor Structure of Exploratory Analysis (Oblimin Orientation)

	Alpha	*KMO*	*Eigen-value*	*Variance (%)*	*BTS*	*Factor loadings*
Before						
CSE_CS	*.80*	.75	2.54	63.48	546.75, df =6	.73-.87
CSE_WS	*.74*	.79	2.47	49.34	403.06, df = 10	.62-.73
PA	*.78*	.83	3.93	39.27	1098.97, df = 45	.26-.78
NA	*.86*	..88	4.45	60.27	1321.91, df = 45	.42-.77
SWLS	*.82*	.84	2.99	59.81	699.89, df = 10	.70-.84
SHS	*.79*	.76	2.56	64.09	609.82, df = 6	.55-.89
After						
CSE_CS	*.82*	.76	2.63	65.68	438.63, df = 6	.74-.87
CSE_WS	*.76*	.79	2.57	51.35	301.79,df = 10	.66-.79
PA	*.89*	.92	5.06	50.61	1161.00, df = 45	.60-.81
NA	*.91*	.93	5.45	54.52	1345.73, df = 45	.55-.81
SWLS	*.83*	.84	3.09	61.70	560.76, df = 10	.60-.86
SHS	*.75*	.70	2.40	60.11	357.42, df = 6	.60-.87

Note: CSE_CS = creativity self-efficacy (cognitive style), CSE_WS = creativity self-efficacy (working style), PA = positive affect, NA = negative affect, SWLS = satisfaction with life scale, SHS = subjective happiness scale. For BTS of all scales were at the $p < .001$.

Table 2

The Mean, Standard Deviation, Skewness And Kurtosis of All Scales (Before, After the Service Learning)

	N	*M*	*SD*	*Skewness*	*Kurtosis*
Before					
CSE_CS	389	13.50	2.42	-.66	1.75
CSE_WS	389	14.11	2.28	-.55	1.58
PA	385	3.42	.643	-.31	.77
NA	384	2.42	.689	-.16	-.50
PANA_bal	381	.99	.96	.02	.02
SWLS	383	2.51	.52	-.48	.86
SHS	387	21.06	6.12	-.22	-.35
After					
CSE_CS	277	14.10	2.43	-.67	2.03
CSE_WS	278	14.16	2.54	-.44	.84
PA	274	3.62	.70	-.38	.32
NA	277	2.26	.78	-.10	-1.06
PANA_bal	274	1.36	1.06	.02	.54
SWLS	279	2.52	.51	-.46	.93
SHS	277	22.08	6.15	-.33	-.25

Note: CSE_CS = creativity self-efficacy (cognitive style),
CSE_WS = creativity self-efficacy (working style), PA = positive affect, NA = negative affect,
SWLS = satisfaction with life scale, SHS = subjective happiness scale, and *PANA_bal* = *PA – NA.*

Table 3
Positive Affect and Negative Affect during Service Learning

	N	*M*	*SD*	*Skewness*	*Kurtosis*	*Alpha*
PA_D1	281	3.35	.65	-.42	.44	*.86*
NA_D1	279	2.34	.69	-.13	-.97	*.85*
PANA_bal_D1	279	1.00	.97	.10	.11	
PA_D2	271	3.57	.67	-.44	.56	*.82*
NA_D2	273	2.27	.72	-.14	-.91	*.83*
PANA_bal_D2	269	1.28	1.02	-.14	1.30	
PA_D3	244	3.51	.80	-.54	.51	*.92*
NA_D3	243	2.34	.78	-.28	-1.02	*.88*
PANA_bal_D3	243	1.16	1.12	.14	.02	
PA_D4	181	3.52	.72	-.47	.05	*.88*
NA_D4	182	2.25	.77	-.10	-1.29	*.89*
PANA_bal_D4	178	1.27	.97	.10	-.15	
PA_D5	99	3.59	.76	-.63	.61	*.89*
NA_D5	99	2.31	.77	.05	-.63	*.88*
PANA_bal_D5	98	1.29	1.02	-.12	-.38	

Note: PA = positive affect, NA = negative affect, D1 = day 1, D2 = day 2, D3= day 3, D4 = day 4, D5 = day 5, PANA_bal = PA – NA.

Table 4
Pearson Correlations between Creativity Self-efficacy and Emotions (Left – Before, Right – After, Service Learning)

	CSE_CS	CSE_WS	PA	NA	PANA_bal	SWLS	SHS
CSE_CS		.37**	.25**	.10*	.08	.21**	.29**
CSE_WS	.35**		.44**	-.07	.34**	.30**	.32**
PA	.38**	.45**		.28*	.67**	.14*	.30**
NA	-.12**	-.18**	-.03			-.03	.03
PANA_bal	.34**	.43**	.68**	-.74**			.17**
SWLS	.13**	.28**	.23**	-.15**	.26**		.52**
SHS	.24**	.26**	.27**	-.22**	.34**	.48**	

Note: ** (one-tailed); CSE_CS = creativity self-efficacy (cognitive style), CSE_WS = creativity self-efficacy (working style), PA = positive affect, NA = negative affect, SWLS = satisfaction with life scale, SHS = subjective happiness scale, and *PANA_bal = PA – NA.*

tive emotions, whereas cluster 2 participants with moderately high creativity self-efficacy and positive emotions. Discriminant analysis was performed according to the clusters on the creativity self-efficacy and positive emotion scales. Nearly all (99.3%) of the participants were correctly classified. Discriminant function 1 was with an eigen value of 2 and canonical correlation of .82 (Wilks' Lambda = .33, df = 5, chi-square = 294.11, p = 0).

For the participants of the two clusters, two sample paired t-tests were performed to discover significant differences between creativity self-efficacy and positive emotions

Table 5
Clusters and Discriminant Function after Service Learning

	Cluster 1	Cluster 2	Discriminant function 1	Structure matrix
CSE_CS	13.54	14.67	.10	.17
CSE_WS	13.39	14.95	.07	.22
PA	3.51	3.73	.01	.11
SWLS	17.10	27.10	.96	.99
SHS	2.28	2.76	.06	.37
n(%)	141	138	(99.3)	

Note: CSE_CS = creativity self-efficacy (cognitive style),
CSE_WS = creativity self-efficacy (working style),
PA = positive affect, NA = negative affect,
SWLS = satisfaction with life scale, SHS = subjective happiness scale,
PANA_bal = *PA – NA*, distance between clusters = 10.20,
discriminant function = standard canonical discriminant function coefficients.

before and after positive intervention. Effect size was computed as recommended by the Task Force on Statistical Inference of the American Psychological Association (Wilkinson, 1999). In this study, Cohen's d was obtained from the formula d = t-value divided by square root of the number of pairs (Green & Salkind, 2005), with d .2, small, .5 medium, and .8 large effect sizes, respectively. Table 6 summarizes the findings of the paired t-tests and effect sizes.

Table 6
Paired t-tests and Effect Sizes

	Before			After				
	N	M	SD	M	SD	t	p	d
Cluster 1								
CSE_CS	139	13.49	2.39	13.54	2.49	-.26	.07	.02
CSE_WS	140	13.62	2.23	13.39	2.44	1.26	.79	.11
PA	136	3.40	.67	3.52	.70	-1.85	.07	.16
SWLS	138	18.51	5.57	17.09	4.01	3.28	.001	.28
SHS	137	2.37	.53	2.29	.51	2.37	.02	.20
Cluster 2								
CSE_CS	138	14.04	2.25	14.67	2.23	-.27	.001	-.02
CSE_WS	138	14.84	2.14	14.95	2.41	.26	.56	.02
PA	135	3.61	.50	3.73	.69	-2.10	.04	.18
SWLS	138	24.13	5.08	27.10	3.09	-6.78	.000	.58
SHS	138	2.64	.43	2.76	.40	-.05	.001	-.004

Note: CSE_CS = creativity self-efficacy (cognitive style), CSE_WS = creativity self-efficacy(working style), PA = positive affect, SWLS = satisfaction with life scale, SHS = subjective happiness scale, d = Cohen's d.

DISCUSSION

The purpose of this study was to explore the relationship between students' creativity self-efficacy and emotions in the context of a service learning experience.

Our findings indicate that participants were in moderately positive moods before and during service learning. The emotional scales measured happiness at the present life: momentary affects (PANAS), emotions for the past (SWLS) and emotions for the future (SHS) (Seligman, 2002). The findings suggest that positive emotions such as life satisfaction (SWLS) and subjective happiness (SHS) had a positive relationship with self-reported confidence in creativity (CSE_CS, CSE_WS). The participants of our study seemed to possess moderate creativity efficacy and happiness. The ratings of creativity self-efficacy and happiness increased after positive intervention. Feedback sessions were facilitated by the teacher in charge of the program daily. During these sessions, the participants recorded their feeling with reference to self-reflective, meaningful learning and rated their emotions of the days. Evidently our participants maintained relatively balanced moods throughout their stay in the host institutes.

Positive Relationship

The positive correlation of the scales measuring positive affect with the efficacy scales supported Bandura's theory that efficacy beliefs influence affect, where an optimistic sense of personal efficacy gives rise to a positive sense of well-being (Bandura, 1989, 2001), and influences a person's self-worth and life satisfaction (Bandura, 1993). The negative relationship between NA and the efficacy scales is supported by Bandura's theory where low efficacy levels bring about negative affect, and may lead to stress and depression (Bandura, 1993). The finding that creativity-relevant efficacy scales were positively correlated with PA supported previous findings that PA influences creative thinking (e.g., Isen, Daubman, & Nowicki, 1987; Seligman, 2002); in our study, the perception of creative abilities. The experience of happiness is resulted from positive emotions and engagement in meaningful task (Seligman, 2002). After service learning, the values of correlation between creativity efficacy and PA and NA were smaller than those before positive intervention. There was a positive increase in relationship between creativity self efficacy and life satisfaction and subjective happiness. These findings suggest that the positive intervention was associated with a pleasant life and an increase in perception of positive emotions related to the past (life satisfaction, SWLS) and future (subjective happiness, SHS) (Table 4).

Attainment of Happiness

The participants were regrouped to moderately low creativity self-efficacy and happiness cluster and moderately high creativity self-efficacy and happiness cluster. Life satisfaction seems a relatively salient indicator to discriminate these two clusters. The moderately highly efficacious and happy participants experienced significant positive change after the intervention. There was an increase in their ratings related to perceived creativity self-efficacy for cognitive style, positive affect, and subjective happiness with a small effect size. Their ratings of happiness with reference to life satisfaction increased significantly with a medium effect size. In contrast, the moderately low efficacious and happy participants rated their happiness (life satisfaction and happiness) after service learning significantly higher than they did before service learning, but with a small effect size. All participants demonstrated significant gains in creativity self-efficacy (cognitive style, CSE_CS), positive affect (PA), life satis-

faction (SWLS), and happiness (SHS); those who were clustered in the group with higher levels of creativity efficacy (Cluster 2) had significantly higher gains in ratings of life satisfaction after participation with medium effect size of .58 (Table 6).

CONCLUSION

The study referred to the theoretical frameworks of Amabile's (1983, 1996) social componential theory and Bandura's (2001) social cognitive theory to construct the measure of the perception of a person's confidence in his or her creative cognitive style and working style. Creativity was regarded, in this study, as a character strength. It is believed that positive emotions would be present, when the strength is identified and developed (Park, Peterson, & Seligman, 2004). Our study included instruments developed by positive psychologists to measure affective self-evaluative reactions of the participants in relation to their performance. As expected, after positive intervenetion there was a positive change in high school students' scored in creativity self-efficacy and positive emotions. Findings from our study suggest that a short, positive intervention (preparation: two months; staying with a positive institute: three to five days) was associated with high school students' perceptions of creativity self-efficacy and happiness. Our study can thus serve as an evidence that supports the notion that positive, short, open and integrated (multi-)cultural experience can enhance creativity (Leung, Maddux, Galinsky, & Chiu, 2008) and/or creative self-efficacy.

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