Unleash the Creativity Within

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Today's teachers are encouraged to take a creative approach to teaching. So how can we help teachers enhance their creativity and translate the creativity into creative teaching? In this research, we have identified four important factors that affect teachers' creativity, namely drive, organizational support, organizational climate and autonomy. Creativity fosters creative teaching and such influence is moderated by contextual factors, such as climate and autonomy. An empirical test based on 238 teachers from Singapore schools found positive evidence in support of the proposed model. Implication of the findings from the research and suggestions for future research are also provided at the end of the paper.

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1. Introduction

The literature has identified various factors effecting creativity (e.g., Zhang, Tan, & Fang 2004; Zhang & Fang 2009). Creativity can be viewed as the "ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints)" (Sternberg & Lubart 1999, p.3). It has also been regarded as a multi-faceted construct (Tan & Zhang 2005). Rhodes (1961) identified four P's of creativity, namely product, process, person, and press to explain its multifaceted nature. Product is expressed as language, craft, or other forms of outcomes; "process" describes the mental processes in creating ideas; "person" includes cognitive abilities, biographic traits, and personality; and "press" describes the relationship between a person and his or her environment. In this research, we shall focus on the process-oriented definition which highlights creativity as a process that results in innovative products (Edmonds & Candy 2002; Kazanjian, Drazin, & Glynn 2000; Sears & Baba in press).

2. Literature Review

Creative people   People are the force behind creativity. Although it is still under debate that being creative is a gifted (Albert & Runco 1989; Feldhusen & Treffinger 1990) or learnt (Barron 1961; Simonton 1994; Yamamoto 1964) quality. It is unanimous that the motivation or drive within a person is a crucial determining force. Motivation is the willingness to perform and relates to the degree to which an individual desires and is willing to exert effort to perform his job (Ivancevich, Konopaske, & Matteson 2005). Amabile (1987) believed that task motivation is an essential element in creative performance. "Task motivation makes the difference

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between what a person can do and what a person will do". Individuals need to have the motivation to carry out a task or solve a problem even if they already possess the required knowledge, skills, abilities, etc. (KSAOs). They have to be motivated to develop desired skills and to apply them in new situations and the motivation can be enhanced through the perceived relevance of the learned skills (Ettington & Camp 2002). Challenge also affects motivation. Since a challenge brings out the best in people and stimulates an individual's motivation to succeed, employees who are challenged will be motivated to be creative (Amabile 1996).

Organizational Support Employees will be creative when they are given adequate resources to conduct their work (Delbecq & Mills 1985) and feel comfortable psychologically and physically (Dineen & Collins 2005). The belief that employees are being supported by allocations of time, funds, equipment, physical & material factors, and administrative structure is necessary for them to function creatively (e.g., Tagiuri 1968; Tesluk et al. 1997). Starko (1995) found that the conditions in the physical environment, including attractive and well-organized facilities, can have a positive effect and inspire the creativity of employees. The awareness of specific processes and tools and how to use them appropriately are also essential to an individual's creative performance (Amabile 1987, p.249).

Climate Organizational climate is defined as enduring characteristics of an organization which distinguishes it from other organizations (Moran & Volkwein 1992). It is consists of several dimensions (Kaplan & Evans 1997). First, it embodies members' collective perceptions about their organization with respect to autonomy, trust, cohesiveness, support, recognition, innovation, and fairness (Ekvall 1999; Miller 1999; Moran & Volkwein 1992). In addition, it also reflects the prevalent values, beliefs, norms, and attitudes of the organization's culture (Joyce & Slocum 1990; Moran & Volkwein 1992; Taguiri 1968). Furthermore, it serves as a basis for interpreting the situation and as a source of influence for shaping behavior (Moran & Volkwein 1992). For example, these values, beliefs, history, and traditions of the organization would affect employees' propensity to be creative (Joyce & Slocum 1990).

The more challenge, freedom, support, trust, open discussions, humor, and risk taking the individual perceives in the immediate social work environment, the more likely they are to engage in those creative behaviors (Isaksen 1994).

Research has identified six aspects of school climate values which are present in effective schools: organizational cohesiveness, collegiality, proactive communication, participative decision-making, safety, and trust (Edmonds 1986; Lezotte 1990; Sizer 1984). Supportive environment is also an important element to the creativity climate in a school (Tesluk et al. 1997).

Autonomy Litwin & Stringer (1968) and Schneider & Bartlett (1968) had proposed four organizational climate dimensions: (a) individual autonomy- based on the factors of individual responsibility, agent independence, rules orientation, and opportunities for exercising individual initiative. (b) The degree of structure imposed upon the position- based on the factors of structure, managerial structure and the closeness of supervision. (c) Reward orientation- based upon the factors of reward, general satisfaction, promotional achievement orientation, and being profit minded

and sales oriented. (d) Consideration, warmth and support- based upon the factors of managerial support, nurturing of subordinates and warmth and support.

3. Theoretical Framework

The literature has identified various factors impacting on creativity. The purpose of the current research is to select the most influential ones to construct a causal model which, when supported by empirical research, will be able to provide a mind-map for school administrator to direct their effort to build an education system that fosters a creative teaching context.

Drive is an internal tendency to face challenge and pursue success. Drive is the force that sustains motivation. People who are strong in drive tend to inject more energy in their course of action. The tougher the task, the more effort they would put in. There has been an increasing emphasis on promoting creativity in schools. The objectives set by the education administration and the expectation held by students and parents result in high demand and pressure. In such context, teachers with strong drive will tend to enhance their creativity, be able to generate more ideas, find more novel ways, and posse more new perspectives. As such, we propose the following:

> *Hypothesis 1*: People with strong drive toward creativity tend to become more creative.

Organizational support is a crucial factor to enable creativity. To generate and experiment with new ideas, teachers frequently need allocations of extra time, budget, facilities, equipment, and materials. In addition, they may also need administrative support, including clearance of existing administrative constraints and procedural obstacles. Inspiration, encouragement, feedback, and appreciation from the administration would also be important factors for teachers' creativity. Therefore, it is proposed:

> *Hypothesis 2*: The stronger the organizational support in the school, the more likely a teacher tends to be creative.

When teachers perceive the social environment of the school to be challenging, free and open to discussions, supportive, trustworthy, humorous, and risk taking, it will enhance creativity. A positive school climate where teachers, principals, heads of department, and school administrators encourage, recognize, support, and reward creativity would be likely to foster higher creativity among teachers.

> *Hypothesis 3*: When the school climate is perceived to be more positive and favorable, teachers tend to be more creative.

To be creative also means to break away from the existing ways of thinking and working. Unfortunately, teachers are likely to be constrained from the existing administrative rules and procedure, as well as reporting and approval processes. These may not only hinder the progress of creative and innovative projects, but also arouse a sense of setback among the teachers involved. An effective way to solve the problem, is to grant the teachers necessary authority. For example, they may be allowed to design their teaching, gather supporting pedagogical materials, and set assessment method. It is conceivable that self-control and management will be a great boost to creativity.

Hypothesis 4: Teacher autonomy would likely generate higher creativity.

Teachers' attitude would lead to teaching performance (Fang & Wang 2006). An assumption that appears to underlie research within the psychometric tradition is that creativity, if possessed, can be expected to exert its influence and lead to creative outcomes in a variety of contexts and domains (Diakidoy & Kanari 1999). It can lead to a chain reaction of positive and creative outcomes.

Creativity is a desirable characteristic for many teachers. A creative teacher has an advantage in applying innovative ideas in teaching. When unexpected problems occur, creative teachers are more likely to find novel solutions to solve it.

Hypothesis 5: The more creative a teacher, the more likely creative teaching performance would be delivered.

Although teachers with higher creativity tend to be able to achieve higher level of creative teaching performance (Hypothesis 5), a supportive context would greatly facilitate the conversion from creative intention and ideas to creative teaching practice. Such context would consist of school climate and management style.

No man is an island – it also applies to teaching practice in schools. The collective values and norms would significantly influence teachers thought and action. A previous study has found that when an intention is held in a supportive atmosphere, the corresponding behavior will be enhanced, whereas when an intention is surrounded by an aversive environment, the corresponding behavior is likely to be suppressed (Fang 2000). Thus, a supportive climate would not only foster the generation of creative ideas, but also make it easy for creative teachers to implement such ideas in their teaching practice. The encouragement, appreciation and even admiration from school leadership and colleagues would form a conducive environment in which the creative teachers are more likely to carry out their innovative design and deliver creative teaching performance.

Hypothesis 6: When the teachers with higher creativity are surrounded by a favorable climate, they would be more likely to engage in creative teaching performance.

Teaching style and practice may be more or less constrained by the curriculum structure and administrative system. Teachers are often expected to follow an established curriculum at the school. That includes the pedagogy class activities, as well as assessment. Application of inner creativity by a particular teacher may result in modification to the course content or delivery method, and pose challenges when aligning with the overall structure. Thus these teachers would be compelled to scale back to more traditional teaching practice. Therefore, while the teachers with greater creativity are more likely to deliver creative teaching performance, the freedom and flexibility they may be granted by the system would allow them to unleash their inner creativity and produce corresponding results.

Hypothesis 7: The more autonomy is given to the teachers with higher creativity, the more likely the creative teaching performance could be achieved.

Figure 1. Theoretical framework.
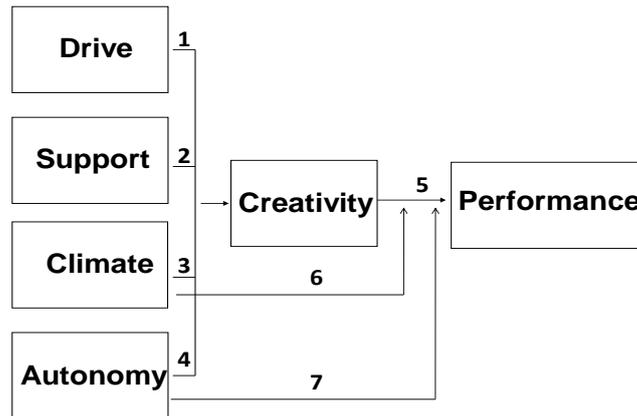
Note: numbers in the figure represent the respective hypotheses.

4. Methodology

Procedures and Participants   This study took place in Singapore, which is a small urbanized state. It has a population of five million people; among them, over 75% are ethnic Chinese. All public schools were under unified administrative policies, compensation packages, curriculum and extra-curriculum activities, and similar working conditions.

There were altogether 238 respondents, with 136 teachers from primary schools and 102 from secondary schools. The surveys were given out randomly using self-administered questionnaires. There were 74 males and 164 females, ageing from 20 to 63 years old. Among the respondents, 71.4% had a Bachelor's degree while 21% had an education diploma. The respondents had teaching experiences ranging from 1 to 43 years, and had been teaching in their current schools for 1 to 35 years.

Measures   The questionnaire was developed with the participation of teachers and administrators of public schools to ensure relevance and face validity. *Drive* was measured using a 5-item scale of Peterson & Harrison (2005). Sample items include "I persist to find the best possible solution to a problem", and "I am competitive." Responses were obtained on a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree) for this and all other remaining scales. The Cronbach α reliability for Drive was .86.

Support was measured using a modified Peterson & Harrison's scale of *resource* with two more items added by the current researchers on budget: "my school allocates sufficient budget for innovation initiatives" and "my department has sufficient funds for innovation projects". The Cronbach α reliability was .91.

Climate contains three sub-scales: supportive environment, social support, and collegial culture. It was measured using scales from Peterson & Harrison (2005) for the first two sub-scales. Additional items were created by the current researchers to capture collegial culture, including "my department is a very cohesive team" and "most of my colleagues are also my friends". The Cronbach α reliability for *Climate* was .91.

Autonomy was measured using a 4-item scale constructed for the current study, referring specifically to school teaching context. Sample items include "I am free to use my own style in teaching" and "I am given the autonomy to prepare my teaching materials". The Cronbach α reliability was .83.

Creativity was measured using a self-created scale. Participants were asked to characterize their creativity as well as rating their creativity in comparison to their colleagues. Sample items include "[I]n general, how would you characterize your creativity level? (1=not at all satisfactory, 7=extremely satisfactory), and "[W]ould you rate your creativity level at work as better, the same, or worse than other people teaching the same subject? (1=much worse, 7=much better). The Cronbach α reliability was .79.

Performance was measured by 6 items, including "I model creative behaviors", and "I often apply new knowledge to effectively solve problems". The Cronbach α reliability was .92.

Demographic information was collected at the end.

Table 1: Correlation and reliabilities

		1	2	3	4	5	6
1	Drive	(.857)					
2	Support	.238***	(.906)				
3	Climate	.188***	.714**	(.909)			
4	Autonomy	.562***	.479***	.403**	(.833)		
5	Creativity	.450***	.437***	.135*	.442***	(.792)	
6	Performance	.744***	.354***	.201**	.622***	.634***	(.902)

5. Findings and Discussion

The purpose of this research was to test a proposed 2-stage model two steps. First, Creativity was regressed on the four predictors. Next, Performance was regressed on all its antecedents. The results from the regression analysis are presented in Table 2.

Table 2. Impact on Creativity and Creative Performance

	1	2
	Creativity	Performance
Drive	.447***	.303***
Support	.255***	.021
Climate	.301***	.112
Autonomy	.148*	.071
Creativity	-	.486***
F	30.906***	44.51***
R²	.347	.488
ΔR²		.141***

Note: *** $p < .001$; ** $p < .01$; * $p < .05$

Column one showed that about 35% of the variance in Creativity were explained by the proposed antecedents (F=30.906, p<.001). Significant predictors included drive (b=.447, p<.001), support (b=.255, p<.001), climate (b=.301, p<.001), and autonomy (b=.148, p<.01). Thus, Hypotheses 1 to 4 were supported.

Column two showed that about 48.8% of the variance in Performance were explained by the proceeding variables (F=44.51, p<.001). Creativity was found to be a significant predictor of performance (b=.486, p<.001). Thus, Hypothesis 5 was supported. Another variable, drive was also found to be significant (b=.303, p<.001).

Next, hierarchical regression was used to test the proposed moderating effects. The results showed that both climate and autonomy indeed significantly moderated the causal relationship between teacher creativity and their respective performance. While results in Table 3 and Figure 2 showed the support to Hypothesis 6 (b=1.388, p<.001), Table 4 and Figure 3 exhibited the supportive results for Hypothesis 7 (b=1.148, p<.01).

Table 3: Moderating Effect of Climate

		Performance	F	R²	ΔR²
Step 1	Creativity	.634***	156.21***	.399	
Step 2	Creativity	.614***	83.357***	.410	.014**
	Climate	.118***			
Step 3	Creativity	1.484***	82.596***	.438	.030***
	Climate	1.096***			
	Creativity*Climate	1.388***			

Note: *** $p < .001$; ** $p < .01$; * $p < .05$

Figure 2. Moderating Effect of Climate

Strong climate - - - -
Weak climate ——————
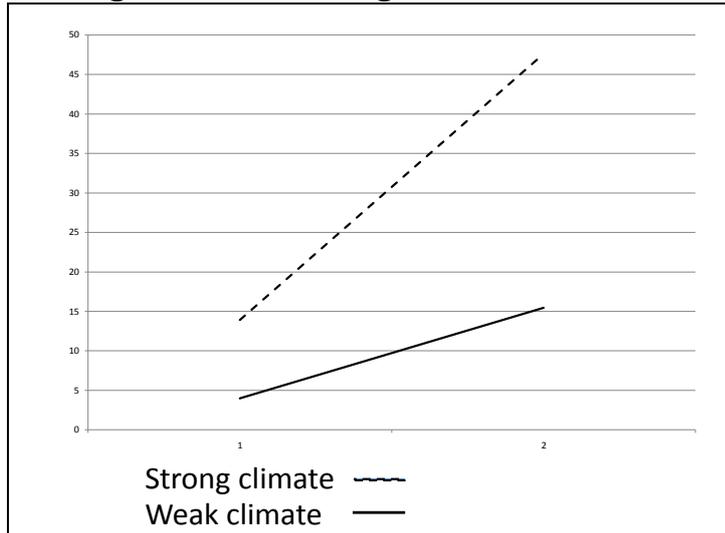
Table 4: Moderating Effect of Autonomy

		Performance	F	R^2	ΔR^2
Step 1	Creativity	.629***	154.25***	.395	
Step 2	Creativity	.562***	82.965***	.414	.019**
	Autonomy	.152**			
Step 3	Creativity	-.041	24.111***	.435	.021**
	Autonomy	-.581*			
	Creativity*autonomy	1.148**			

Note: *** $p < .001$; ** $p < .01$; * $p < .05$

Figure 3 Moderating Effect of Autonomy

Strong autonomy - - -
Weak autonomy ——————
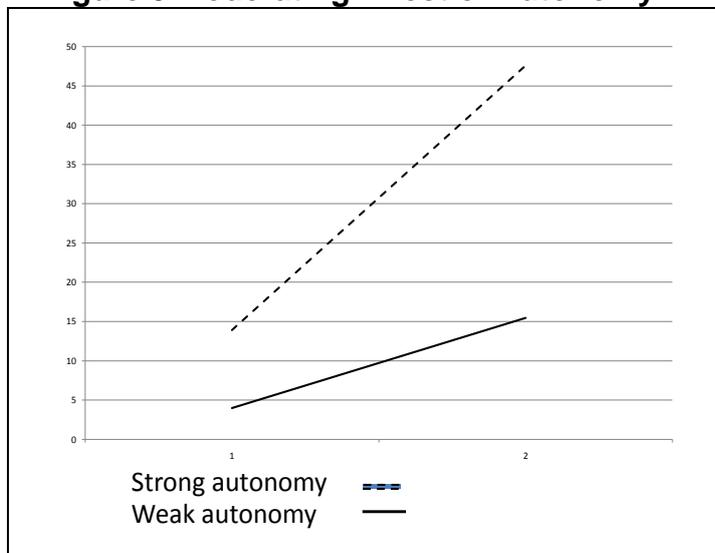
Creativity can be viewed as a caliber or ability. Although it has been argued as a gift, many believe that creativity can be cultivated and improved. The current research is to explore factors enhancing or improving teachers' creativity and empirically test the proposed model.

The four factors identified as having impact on teachers' creativity were drive, organizational support, climate, and autonomy. The results provided strong support to the proposed model. All four factors were found to significantly predict the level of creativity and creativity, in turn, predicted teaching performance.

Furthermore, some interactive effects were also confirmed. School's climate and teacher's autonomy are important factors which, on top of fostering teacher creativity, also enhanced a teacher's likelihood of transforming his/her creativity into tangible teaching outcomes. When an administrative system gives teachers more autonomy to apply their creative ideas, allows them to experiment with their teaching, and is more tolerant of variations and setbacks, creative teaching performance is more likely to be achieved. An un-hypothesized interactive effect was found between climate and creativity on their impact on teaching performance. This result should be logical. As Fang's (2000) study showed, organizational culture and workplace climate have a significant impact on the attitude-behavior linkage. An attitude is more likely to lead to corresponding behavior in a favorable environment, but less likely to manifest in a less conducive context. As such, causal linkage between creativity and creative teaching performance would be strengthened in a more favorable school climate.

An additional linkage was found between individual drive and creative teaching performance. The possible rationale for such relationship is that to convert creativity traits to a creative teaching performance requires far more determination. For example, it may require more mental and physical effort, more energy to overcome obstacles, and willingness to take more risks and enduring failure. While creative design lays a good foundation for creative teaching behavior and performance, drive would generate more energy to carry it out.

The results from this study suggest a few empirical implications. First, establishing and implementing creativity and innovation projects need organizational support. They consume money and materials, and requires facilities. Information and reference database need to be established as well. Budgetary and logistic support are needed. In addition, teachers must be given sufficient time to think creatively, explore different perspectives and play with ideas. A teacher without adequate resources and has a too busy schedule with no time allocated for creative thinking will be unlikely to engage in creative behaviors. Administrative support may also come from management in terms of clearing structural hurdles.

Secondly, autonomy is indispensible. For idea exploration and creativity to take place, teachers need to feel that they have some autonomy over either how their time is allocated or in the determination of how their work is to be done. Teachers must be given the autonomy to be creative in the way they conduct their lessons and prepare their teaching resources. When they have the freedom, discretion, and self-determination in carrying out tasks, they will try to self-generate more ideas and achieve more creative outcomes. Teachers ought to be given autonomy, within

certain limit toward developing curriculum, designing classroom activities, and choosing proper teaching styles. If possible, they may also be granted the power to do assessment and set examinations. School administration must have a vision, administrative structure and systems must be reviewed and, if necessary, revamped to meet the requirement of thinking schools and creative teaching and learning environment.

Thirdly, collegial environment and supportive climate are important. Building supporting teams will provide teachers with technical and social support as well as removing psychological uncertainty and fear when creating and implementing unconventional ways of teaching and learning.

Finally, drive for creativity from within a teacher is most crucial. When jobs are complex and demanding, individuals with drive would be more likely to focus all of their attention and effort on their jobs. They would be persistent and more likely to consider different alternatives, which should result in creative outcomes. The mission and vision of creative teaching and learning need to be communicated to teachers. Understanding and commitment need to be built into the heart and mind of the teachers. Thus, teachers will be willing to exert effort on top of their normal workload, and explore novel ideas outside their comfort zone.

There are weaknesses in the current research. First, the creativity and creative teaching performance are all from the perspective of teachers. We investigated whether and how the teachers have exhibited certain creative tendencies. However, an important perspective is to examine how well the students have benefited from their teacher's creative teaching. Future research needs to address this issue.

Future research can continue to examine other contextual features of the school environment. For instance, it will be interesting to find out how different amounts of time, materials and informational resources given to teachers will affect their creativity.

6. Conclusion

In this paper, we report on the factors that influence teachers' creativity in schools. We offer a better understanding of how the school climate, organizational support, and individual factors influence the thinking, perception, and behaviors of teachers that lead to the desired outcome of creativity. This will help schools to understand the context within which their teachers currently work and to ascertain whether there is a match for the level of creativity preferred. By providing a suitable climate that enhances creativity as well as sufficient resources, schools can help teachers to increase their overall creativity levels.

References

Albert, RS & Runco, MA 1989. 'Independence and cognitive ability in gifted and exceptionally gifted boys', *Journal of Youth and Adolescence*, vol. 18, pp. 221–30.

Amabile, T 1987. 'The motivation to be creative', in S. Isaksen (ed.), *Frontiers of Creativity Research.* Bearly Ltd, Buffalo, NY, pp. 223-54.

Amabile, TM 1996. *Creativity in context.* Westview Press, Boulder, CO.

Barron, F 1961. 'Creative vision and expression in writing and painting' in DW MacKinnon (ed.), *The creative person.* Institute of Personality Assessment Research, University of California, Berkeley, pp. 237–51.

Delbecq, AL & Mills, PK 1985, 'Managerial practices and enhanced innovation'. *Organisational Dynamics*, vol. 14, no. 1, pp. 24-34.

Diakidoy, IN & Kanari, E 1999. 'Student teachers' beliefs about creativity', *British Educational Research Journal*, vol. 25, no. 2, pp. 225-43.

Dineen, R & Collins, E 2005. 'Killing the goose: Conflicts between pedagogy and politics in the delivery of a creative education' *The International Journal of Art & Design Education*, vol. 24, pp. 43-52.

Edmonds, R 1986. 'Characteristics of effective schools', in U. Neiser (ed.) *The school achievement of minority children*. Eribaum, Hillsdale, New Jersy.

Edmonds, E & Candy, L 2002. 'Creativity, art practice, and knowledge' *Communications of the ACM*, vol. 45, no. 10, pp. 91-5.

Ekvali, G 1999. 'Creative climate', in M Runco & S Pritzker (eds.) *Encyclopedia of Creativity,* VI, Academic Press, San Diego, pp. 403-12

Ettington, DR & Camp, RR 2002. 'Facilitating transfer of skills between group projects and work teams' *Journal of Management Education,* vol. 26, no. 4, pp. 356-79.

Fang, Y 2000. 'The effect of distributive preferences on decisions: An empirical study of Chinese employees', *Cross-cultural Management*, vol. 7, no. 1, pp. 3-11.

Fang, Y & Wang, Y 2006. 'Teaching performance and turnover: A study of school teachers in Singapore'. *Employment Relations Record*, vol. 6, no. 1, pp.1-30.

Feldhusen, J & Treffinger, D 1990. *Creative thinking and problem solving in gifted education*, 3rd edn, Kendall-Hunt, Dubuque, IA.

Isaksen, S 1994. *Conceptions of creativity*, The Creative Problem Solving Group, Buffalo, New York, pp. 17-18.

Ivancevich, JM, Konopaske, R & Matteson, MT 2005. *Organizational behavior and management*, McGraw-Hill.

Joyce, WF & Slocum, JW 1990. 'Strategic context and organizational climate', in B. Schneider (ed.), *Organizational climate and culture,* Jossey-Bass, San Francisco.

Kaplan, LS, & Evans, Jr, MW 1997. 'Changing school environment: Restructuring one Virginia high school', *NASSP Bulletin*, vol. 81, no. 589, p. 1.

Kazanjian, RK, Drazin, R & Glynn, MA 2000, 'Creativity and technological learning: The roles of organisation architecture and crisis in large-scale products', *Journal of Engineering and Technology Management*, vol. 17, no. 3/4, pp. 273-98.

Lezotte, LW 1990. Case studies in effective schools research, The National Center for Effective Schools*,* Kendall-Hunt Publishers, Dubuque, IA.

Litwin, G & Stringer, R 1968. '*Motivation and organizational climate',* University Press, Cambridge, MA.

Milter, W 1999. *Flash of brilliance: Inspiring creativity where you work*, Perseus Books, Reading, MA, pp. 101-16.

Moran, ET & Volkwein, JF 1992. 'The cultural approach to the formation of organizational climate', *Human Relations*, vol. 45, pp. 19-47.

Peterson, RE & Harrison, HL III 2005. 'The created environment: An assessment tool for technology education teachers', *The Technology Teacher*, March, pp. 7-10.

Rhodes, M 1961. 'An analysis of creativity', *Phi Delta Kappan*, vol. 42, pp. 305-10.

Schneider, B, & Bartlett, CJ 1968. ‚Individual differences and organizational climate: The research plan and questionnaire development', *Personnel Psychology*, vol. 21, pp. 323-33.

Sears, G & Baba, VV (In press). 'Toward a multi-stage, multi-level theory of innovation', *Canadian Journal of Administrative Sciences.*

Simonton, DK 1994. *Greatness: Who makes history and why*. Guilford Press, New York.

Sizer, T 1984. *Horace's compromise: The dilemma of the American high school*, Houghton Mifflin Company, Boston, MA.

Starko, A 1995. *Creativity in the classroom*, White Plains, Longman, NY, pp. 297-333.

Sternberg, RJ & Lubart, TI 1999. 'Concept of creativity: Prospects and paradigm', in RJ Sternberg (ed.), *Handbook of Creativity,* Cambridge University Press, pp.3–15.

Tagiuri, R 1968. 'The concept of organizational climate', in R Tagiuri & G Litwin (eds.), *Organizational climate: Exploring of a concept,* Division of Research, Graduate School of Business Administration, Harvard University, Boston.

Tan, A & Zhang, AD 2005. 'What's creativity', in A Tan, AD Zhang, & Y Fang (eds), *Lighting the fire of imaginative thinking,* SPN, Singapore and Hong Kong.

Tesluk, PE, Farr, JL & Klein, SA 1997. 'Influences of organizational culture and climate on individual creativity', *Journal of Creative Behavior*, vol. 31, no. 1, pp. 27-41.

Yamamoto, K 1964. 'Threshold of intelligence in academic achievement of highly creative students', *Journal of Exceptional Education*, vol. 32, pp. 401-05.

Zhang, A, & Fang, Y 2009. *Effective teaching, joyful learning, vol. 2*, Pearson Education, Singapore.

Zhang A, Tan, A & Fang, Y 2004. *Lighting the fire of imaginative thinking*, SPN, Singapore and Hong Kong.