DEVELOPING AN INSTRUCTIONAL LEADERSHIP MODEL FOR PROMOTING PRIMARY STUDENTS' CREATIVE THINKING SKILLS

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Abstract

The purpose of the study is to develop an instructional leadership model for promoting primary students' creative thinking skills. This study is based on Blase and Blase's model, Tsai's model, Mellou's model and Cole's model. This study intends to investigate whether there would be significant differences in the instructional leadership of principals and science subject leaders in term of school locations, school level, position and qualification. It is based on the six instructional leadership dimensions. Both quantitative and qualitative approaches were applied in this study. Cluster sampling method was used: 112 principals and science subject leaders, 482 lower primary school teacher and 240 lower primary school students from 96 schools were selected as participants. Independent Sample *t*-Test, one way ANOVA, post-hoc Tukey HSD, Pearson product-moment correlation, simple linear regression and multiple regression were employed for the analysis of quantitative data. A significant difference was found in overall instructional leadership performance by school level (F=3.39, p=.037). Principals and science subject leaders in primary schools rated overall instructional leadership performance higher than those in middle schools (*Mean difference*=.30, p=.023) and those in high schools (*Mean difference*=.28, p=.040). Principals and science subject leaders' performance on instructional leadership was positively and significantly correlated with lower primary school teachers' performance on teaching practices. Performance of lower primary school teachers on teaching practices appears to be the best predictor of lower primary school students' creative thinking skills. Qualitative study suggested that school locations, school plants and facilities, and teaching learning materials may be the main source effecting the differences in instructional leadership. Based on the research findings, this study reveals an instructional leadership model for promoting primary students' creative thinking skills.

Keywords: Instructional Leadership, Teaching Practice, Creative Thinking

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Introduction

In the fast-changing world, understanding, identifying, and nurturing the creative potential is relevant in education if teachers want students able to solve academic and personal problems and challenges, to find innovative solutions and alternatives, and to have better tools for success. According to Facione (n.d., cited in Rusbult, 2001), creative or innovative thinking is the kind of thinking that leads to new insights, novel approaches, fresh perspectives, new ways of understanding and conceiving of things. Creativity is an effective resource that resides in all people and within all organizations.

Moreover, to maintain the country's competitiveness in the twenty-first century, the skilled scientists and engineers must be cultivated to create tomorrow's innovations. To do so, the creative thinking skills of the children need to be nurtured since they are in early childhood (Pee, 2012). If the goal is to teach and nurture future scientists, the principals as instructional leaders need to understand, support and nurture the creative. However, Dr. Khin Zaw (2001) stated that education is already overloaded with pleasant but ineffective workers, including teachers and administrators. The kind of person who is eager to share the excitement of innovative and intellectual pioneering in multidisciplinary fields relevant to education and pedagogy is needed. Therefore, effective teachers and instructional leaders are needed for promoting primary students' creative thinking skills in science teaching.

Significance of the Research

To keep abreast with the information age, creative thinking skills are viewed as crucial for educated persons to cope with the rapidly changing world. Information is expanding at such a rate that individuals require transferable skills to enable them to address different problems in different contexts at different times throughout their lives. According to Gough (1991), many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information.

Moreover, countries across the world are recognizing that a broad range of competencies are needed to prepare children for an unpredictable future. According to Dr. Khin Zaw (2001), through thought man can not only

make some sound predictions of what the future is to bring but he can cope with the new. Not establishing innovative skills at the elementary level can damage a child's creative potential and hinder their success in future endeavors (Robinson, 2006). Therefore, developing creative skills is crucial to education.

Therefore, it is necessarily important to produce the creative thinkers in Myanmar. Until now, there has not been enough educational support to educate children who have high creativity and special talents in schools and they have been neglected. It also needs to be considered about their latent ability and creativity that should be developed and supported. In order to do so, first, it is needed to develop an instructional leadership model for promoting students' creative thinking skills.

Theoretical Framework

This research work was guided by following theoretical framework. In this study, six dimensions of instructional leadership are as follows.

Encouraging teachers to build a creative environment: To promote creativity, the instructional leaders encourage science teachers to build a creative environment that includes emotional environment and physical environment. The emotional environment are has a relaxed, comfortable, open and non-threatening atmosphere. In the physical environment, things that reflect students' learning are displayed throughout the classroom. Moreover, the instructional leaders have to recognize and praise teachers who can build the creative classroom environment.

Reinforcing teachers to apply various teaching styles: The instructional leaders need to reinforce science teachers to use classroom activities such as brainstorming, thumbnail sketches, matrixes, small group, direct analogy, synectics, attribute listing, new uses, question stem, changing words, creating a product and silent demonstration.

Encouraging teachers to apply assessment strategies: The instructional leaders encourage science teachers to use of journals, open-ended problems, portfolios, interviews and performance assessment as measurements. To promote creativity, instructional leaders can give feedback. Giving praise is

also important for promoting creativity. The instructional leaders need to reward the creative behaviours of science teachers and students and be respectful of unusual questions and opposing ideas.

Encouraging teachers to enhance good teacher-student interactions: Good teacher-student interactions are necessary for promoting creativity. Therefore, the instructional leaders encourage science teachers to interact with students friendly. Moreover, the instructional leaders reinforce science teachers to become a good communicator and a good listener. In order to promote creativity, the instructional leaders give suggestions that science teachers must allow students to make suggestions freely.

Providing adequate teaching learning materials for the teachers: To promote creativity, the instructional leaders and science teachers should provide an abundant supply of interesting and useful materials, make students ease of resources access and communication with other sources, receive new technology in time and provide books on creativity.

Providing opportunities to develop knowledge concerning with creative thinking for the teachers: The instructional leaders need to invite professionals from other institutions to impart their knowledge to students and science teachers, invite experts to give talks to students and science teachers on the importance of creative thinking in society and make science teachers promote creative education through talks, seminars and courses. Reflective writing and discussion allow science teachers to develop ideas that can be integrated into their evolving personal pedagogy and professional practice.

Aims of the Research

Main Aim

The main aim of this study is to develop an instructional leadership model for promoting primary students' creative thinking skills.

Specific Aims

The specific aims are as follows:

    (1) To study the level of lower primary school students' creative thinking skills.

(2) To study the relationship between the perceptions of principals and science subject leaders on knowledge and performance of instructional leadership for promoting primary students' creative thinking skills.

(3) To investigate the variations of knowledge and performance of principals and science subject leaders for promoting primary students' creative thinking skills in terms of their personal and school related factors.

(4) To study the relationship between the perceptions of lower primary school teachers on knowledge and performance of teaching practices for promoting primary students' creative thinking skills.

(5) To investigate the variations of knowledge and performance of lower primary school teachers for promoting primary students' creative thinking skills in terms of their personal and school related factors.

(6) To develop the validated instructional leadership model for promoting primary students' creative thinking skills.

Research Questions

Based on the specific aims, this study is mainly targeted on the following research questions.

(1) What are the levels of lower primary school students' creative thinking skills?

(2) Is there any significant relationship between the perceptions of principals and science subject leaders on knowledge and performance of instructional leadership for promoting primary students' creative thinking skills?

(3) What are the variations of knowledge and performance of principals and science subject leaders on instructional leadership for promoting primary students' creative thinking skills in terms of their personal and school related factors?

(4) Is there any significant relationship between the perceptions of lower primary school teachers on knowledge about teaching practices for promoting primary students' creative thinking skills and their actual performance?

(5) What are the variations of knowledge and performance of lower primary school teachers for promoting primary students' creative thinking skills in terms of their personal and school related factors?

(6) What is the instructional leadership model for promoting primary students' creative thinking skills?

Definition of Key Terms

The concepts underlying the development of the investigation are carefully defined as the important terms.

(1) **Instructional Leadership** is predicated on the assumption that teachers and principals need to work together as colleagues to improve teaching and learning in schools (Hoy & Hoy, 2006).

(2) **Teaching Practices** influence on student learning which are related to effective classroom learning and student outcomes (Brophy and Good, 1986; Wang, Haertel and Walberg, 1993, cited in Teaching and learning international study (TALIS), 2009).

(3) **Creative Thinking** is a novel way of seeing or doing things that is characterized by four components: fluency (generating many ideas), flexibility (shifting perspective easily), originality (conceiving of something new) and elaboration (building on other ideas) (Alvino, 1990, cited in Cotton, 1991).

Limitations of the Study

This study was concerned only with the instructional leadership of principals and science subject leaders, teaching practices of lower primary school teachers and creative thinking skills of lower primary school students from selected schools in Yangon Region.

Operational Definition

In this study, instructional leadership is the actions taken by the principals and science subject leaders that need to work with lower primary school teachers for promoting primary students' creative thinking skills in teaching natural science. Perceived instructional leadership was examined by the mean responses of principals and science subject leaders from Basic Education Schools on five-point Likert-scale questionnaire consisting of fifty-

three items. The higher the mean values of responses, the greater the level of perceived instructional leadership.

Review of Related Literature

A review of related literature deals with two main parts: (1) creative thinking, (2) teaching science and (3) instructional leadership.

Creative Thinking

Definitions of creativity are not straightforward, and many writers have contributed to the debate about what constitutes creativity, often hotly contesting different views. According to Marrapodi (2003), creative thinking is about expansion of ideas. According to Lee (2005), people engage in unique thinking because of intrinsic desire to find new and better things. This is called creative thinking. According to Alvino (1990, cited in Cotton, 1991), creative thinking is divergent thinking. It generates something new or different. It involves having a different idea that works as well or better than previous ideas.

Moreover, Gardner (1988) argued that truly creative people are those who make a difference to the world. He believes each child, by the age of 7, has developed a capital of creativity upon which they subsequently draw throughout their adult lives. Moreover, Alvino (1990, cited in Cotton, 1991), creative thinking is a novel way of seeing or doing things that is characterized by four components: fluency (generating many ideas), flexibility (shifting perspective easily), originality (conceiving of something new) and elaboration (building on other ideas). There is no guarantee that children think creatively even if they have creative ability. Creative behaviours may not be generated if children fear new thinking or do not want to be creative. According to Lee (2005), characteristics related to creative behaviours are curiosity, run-a-risk, independence and task commitment. According to Amabile (1992, cited in Adams, 2005), as depicted in Figure 1, creativity arises through the confluence of the three components: Knowledge, Creative Thinking and Motivation.
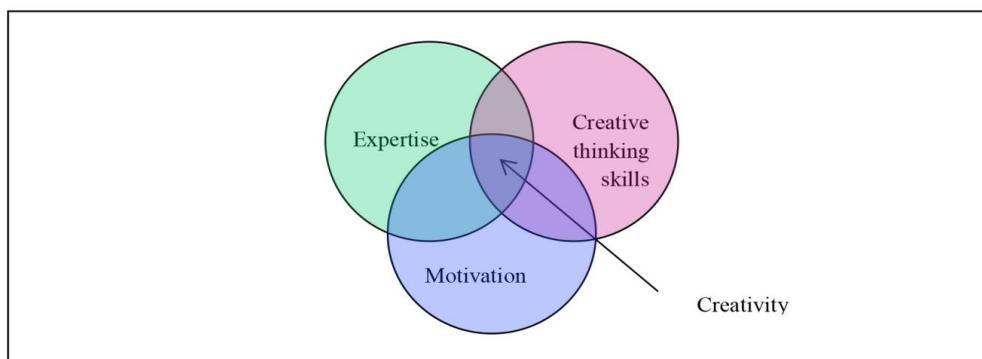
Figure 1: Three Components of Creativity
Source: Adams, K. (2005). *The Sources of Innovation and Creativity.*

Teaching Science

According to Macdonald (1972, cited in Wilson, 2010), creativity is concerned with bringing into being or making something new. This definition can be applied to science with ease. Learning about scientists and their discoveries can help develop better understanding about the nature of science and scientific discoveries. Creative science education is active and child-centered, involving individual problem-solving and exploration. Hicks (2002, cited in Wilson, 2010) stated that features of good practice in creative science teaching and learning are Clarity of focus, Emphasize questioning and enquiries, Teaching approaches, Focus on children doing the thinking, Evaluating learning and Connecting with personal futures.

Instructional Leadership

A critical role for all principals is that of instructional leaders. According to Hoy and Hoy (2006), instructional leadership is predicated on the assumption that teachers and principals need to work together as colleagues to improve teaching and learning in schools. According to Lineburg (2010), principals' instructional leadership strategies are communicating goals, supervising instruction, promoting professional development, providing resources and providing incentives.

In the instructional leadership model of Blase and Blase (1999), effective principal's instructional leadership consists of the two major themes:

Talking with teachers to promote reflection and Promoting professional growth. Tsai (2013) proposed the model that include knowledge, creative thinking, motivation and self-efficacy, goal setting and work group, transformational leadership, and supportive leadership. Mellou (1996, cited in Sharp, 2004) suggests that young children's creativity can be nurtured through educational settings in three respects: the creative environment, creative programmes and creative teachers and ways of teaching. According to Cole et al*.,* (n.d.), four areas as important characteristics of the supportive environment for fostering creativity are: personal teacher-student relationship, assessment, openness and freedom of choice, and classroom activities.

Methodology

In this study, quantitative and qualitative research methods were used. A set of questionnaire to collect the data concerning with the students' creative thinking skills was developed based on the Alternative Uses Test developed by Guilford (1967). Other three sets of questionnaires to collect the required data were developed based on the literature. The reliability coefficient (Cronbach α) was 0.76 for of Guilford's test, 0.88 for students' creative behaviours questionnaire, 0.98 for instructional leadership questionnaire and 0.98 for science teaching practice questionnaire.

Cluster sampling method was used. Forty seven science subject leaders, forty two primary school principals, eighteen middle school principals, fifteen high school principals, four hundred and eighty two lower primary school teachers and two hundred and forty lower primary school students in Yangon Region participated in this study. The descriptive statistics was used to analyze the collected data. Moreover, One-Way ANOVA, Tukey HSD test, the Pearson-product moment correlation coefficient, Simple linear regression and Simultaneous multiple regression were utilized.

Findings

Findings for Research Question (1)

The Perceived Level of Creative thinking Skills of Lower Primary Students in terms of their Creative Behaviours rated by Lower Primary School Teachers

According to the Table 1, it can be said that the perceived level of creative thinking skills of students is moderately high.

Table 1: Mean Values and Standard Deviations Showing Lower Primary School Teachers' Perceptions on Creative Thinking Skills of Their Lower Primary School Students

Variable	Mean	SD
perceived level of creative thinking skills of lower primary school students	2.60	0.48

Scoring Direction: 1.00-1.49=low   1.50-2.49=moderately low
                        2.50-3.49=moderately high   3.50-4.00=high

The Level of Creative Thinking Skills of Lower Primary Students measured by Guilford's Alternative Uses Test

In Table 2, the lower primary school students in District D possessed the highest mean ($\overline{X}$=2.96). Thus, among four groups of lower primary school students, it is assumed that the level of creative thinking skills of the students in District D from the selected schools is the highest.

Table 2: Mean Values Showing Level of Creative Thinking Skills of Students grouped by District   (N=240)

District	Perceived Level of Creative Thinking Skills	
	Mean	**SD**
District A	2.73	1.05
District B	2.42	1.19
District C	2.87	1.38
District D	2.96	0.84

Findings for Research Question (2)

The Relationship between the Perceptions of Principals and Science Subject Leaders on Knowledge and their Actual Performance of Instructional Leadership

Table 3: Correlation between Principals and Science Subject Leaders' Perception on Knowledge and their Actual Practices of Instructional Leadership

Dimensions	Pearson Correlation	Sig. (2-ailed)	Direction of Relationship	Strength of Relationship
E	.42**	.000	Positive	Moderate
TS	.51**	.000	Positive	Moderate
AS	.31**	.001	Positive	Low
I	.37**	.000	Positive	Moderate
TM	.37**	.000	Positive	Moderate
K	.42**	.000	Positive	Moderate
Overall	.38**	.000	Positive	Moderate

**P<0.01

E   = Encouraging teachers to build a creative environment

TS = Reinforcing teachers to apply various teaching styles

AS = Encouraging teachers to apply assessment strategies

I   = Encouraging teachers to enhance good teacher-student interactions

TM = Providing adequate teaching learning materials for the teachers

K   = Providing opportunities to develop knowledge concerning with creative thinking for the teachers

As shown in Table 3, it was found that there was a significant relationship in overall dimensions between the perceived level of knowledge and performance on six dimensions of instructional leadership rated by the principals and science subject leaders, $r=.38$, $p< .01$. The finding also showed moderate, positive direction of relationship between the principals and science subject leaders' perceptions on knowledge and actual performance of instructional leadership.

Findings for Research Question (3)

The Variations of Perceptions of Principals and Science Subject Leaders on Knowledge of Instructional Leadership for Promoting Primary Students' Creative Thinking Skills in terms of their Personal And School Related Factors

According to Table 4, the level of perceptions of principals and science subject leaders on knowledge of instructional leadership for all four groups is moderately high.

Table 4: Mean Values and Standard Deviations Showing Perceptions of Principals and Science Subject Leaders on Knowledge for Instructional Leadership grouped by School Level   (N=122)

School Level	Mean	SD	Remark
Primary School	4.08	0.38	Moderately High
Middle School	4.07	0.30	Moderately High
High School	3.98	0.43	Moderately High

Scoring Direction: 1.00-1.49=low 1.50-2.49=moderately low 2.50-3.49=satisfactory   3.50-4.49=moderately high   4.50-5.00=high

According to the Table 5, statistically significant differences were found among the group of principals and science subject leaders in primary schools, the group of principals and science subject leaders in middle schools and the group of principals and science subject leaders in high schools in the perceived level of knowledge of *encouraging teachers to build a creative environment (F*(2,119)=5.31, *p*< .01).

Table 5: One-Way ANOVA Result Showing Significantly Different Areas in Principals and Science Subject Leaders' Perceptions on Knowledge for Instructional Leadership grouped by School Level

Dimensions		Sum of Squares	df	Mean Square	F	P
Encouraging teachers to build a creative environment	Between Groups	1.45	2	0.72	5.31	0.006
	Within Groups	16.21	119	0.14		
	Total	17.65	121			
Reinforcing teachers to apply various teaching styles	Between Groups	0.41	2	0.21	1.26	n.s
	Within Groups	19.54	119	0.16		
	Total	19.95	121			
Encouraging teachers to apply assessment strategies	Between Groups	0.19	2	0.10	0.40	n.s
	Within Groups	28.47	119	0.24		
	Total	28.66	121			
Encouraging teachers to enhance good teacher-student interactions	Between Groups	0.14	2	0.07	0.28	n.s
	Within Groups	29.97	119	0.25		
	Total	30.11	121			
Providing adequate teaching learning materials for the teachers	Between Groups	0.41	2	0.21	1.06	n.s
	Within Groups	23.01	119	0.19		
	Total	23.42	121			

Dimensions		Sum of Squares	df	Mean Square	F	P
Providing opportunities to develop knowledge concerning with creative thinking for the teachers	Between Groups	0.23	2	0.11	0.33	n.s
	Within Groups	41.04	119	0.34		
	Total	41.27	121			
Overall	Between Groups	0.22	2	0.11	0.78	n.s
	Within Groups	16.67	119	0.14		
	Total	16.89	121			

n.s = no significance

Table 6: Tukey HSD Showing Multiple Comparisons for Significantly Different Areas in Principals and Science Subject Leaders' Perceptions on Knowledge for Instructional Leadership grouped by School Level

Dimension	(I) School Level	(J) School Level	Mean Difference (I-J)	p
Encouraging teachers to build a creative environment	Primary School	Middle School	.08	n.s
		High School	.27**	.000
	Middle School	High School	.19	n.s

Note: **. The mean difference is significant at the 0.01 level.   n.s = no significance

As shown in Table 6, Post hoc Tukey HSD indicates that the group of principals and science subject leaders in primary schools and the group of principals and science subject leaders in high schools significantly differed in the perceived level of knowledge of *encouraging teachers to build a creative environment* among principals and science subject leaders grouped by school level ($p < 0.01$, d=0.33).

The Variations of Perceived Level of Performance of Principals and Science Subject Leaders on Instructional Leadership for Promoting Primary Students' Creative Thinking Skills in terms of their Personal and School Related Factors

According to Table 7, the level of perceptions of principals and science subject leaders on performance of instructional leadership for all three groups is moderately high.

Table 7: **Mean Values and Standard Deviations Showing Perceived Level of Performance of Principals and Science Subject Leaders grouped by School Level** **(N=122)**

School Level	Mean	SD	Remark
Primary	3.91	0.46	Moderately High
Middle School	3.61	0.78	Moderately High
High School	3.63	0.59	Moderately High

Scoring Direction: 1.00-1.49=low   1.50-2.49=moderately low
2.50-3.49=satisfactory   3.50-4.49=moderately high
4.50-5.00=high

According to the Table 8, there was a significant difference on the perceived level of performance in *overall area of instructional leadership* among the school level *(F(2,119)=3.39, p< .05).*

Table 8: One-Way ANOVA Result Showing Significantly Different Areas in the Perceived Level of Performance of Principals and Science Subject Leaders grouped by School Level

Dimensions		Sum of Squares	*df*	Mean Square	*F*	*P*
Encouraging teachers to build a creative environment	Between Groups	2.62	2	1.31	3.29	0.041
	Within Groups	47.37	119	0.40		
	Total	49.99	121			
Reinforcing teachers to apply various teaching styles	Between Groups	4.08	2	2.04	4.91	0.009
	Within Groups	49.44	119	0.42		
	Total	53.52	121			
Encouraging teachers to apply assessment strategies	Between Groups	3.01	2	1.51	2.66	n.s
	Within Groups	67.44	119	0.57		
	Total	70.45	121			
Encouraging teachers to enhance good teacher-student interactions	Between Groups	4.36	2	2.18	4.29	0.016
	Within Groups	60.46	119	0.51		
	Total	64.82	121			
Providing adequate teaching learning materials for the teachers	Between Groups	2.92	2	1.46	2.55	n.s
	Within Groups	68.07	119	0.57		
	Total	70.99	121			

Dimensions		Sum of Squares	df	Mean Square	F	P
Providing opportunities to develop knowledge concerning with creative thinking for the teachers	Between Groups	0.62	2	0.31	0.45	n.s
	Within Groups	82.17	119	0.69		
	Total	82.80	121			
Overall	Between Groups	2.53	2	1.27	3.39	0.037
	Within Groups	44.37	119	0.37		
	Total	46.90	121			

n.s = no significance

Table 9: Tukey HSD Showing Multiple Comparisons for Significantly Different Areas in Perceived Level of Performance of Principals and Science Subject Leaders grouped by School Level

Dimensions	(I) School	(J) School	Mean	p
Encouraging teachers to build a creative environment	Primary School	Middle	.25	n.s
		High School	.34*	.018
	Middle	High School	.09	n.s
Reinforcing teachers to apply various teaching styles	Primary School	Middle	.39*	.024
		High School	.36*	.027
	Middle	High School	-.03	n.s
Encouraging teachers to enhance good teacher-student	Primary School	Middle	.33	n.s
		High School	.43*	.020
	Middle	High School	.11	n.s
Overall	Primary School	Middle	.30*	.023
		High School	.28*	.040
	Middle	High School	-.02	n.s.

Note: *. The mean difference is significant at the 0.05 level.   n.s = no significance

In Table 9, Post hoc Tukey HSD indicates that in the area of *overall area of instructional leadership,* group of principals and science subject leaders in primary schools significantly differed with both the group of principals and science subject leaders in middle schools ($p < 0.05$, $d=0.48$) and the group of principals and science subject leaders in high schools ($p < 0.05$, $d=0.53$).

Findings for Research Question (4)

The Relationship between Lower Primary School Teachers' Perception on Knowledge and their Actual Performance of Teaching Practices for Promoting Primary Students' Creative Thinking Skills

As shown in Table 10, it was found that there was a significant relationship in overall dimensions between the perceived level of knowledge and performance on six dimensions of teaching practices rated by the lower primary school teachers, *r*=.57, *p*< .01. The finding also showed moderate, positive direction of relationship between the lower primary school teachers' perceptions on knowledge and actual performance of teaching practices.

Table 10: Correlation between Lower Primary School Teachers' Perception on the Knowledge and their Actual Performance of Teaching Practices   (N=482)

Dimensions	Pearson Correlation	Sig. (2-tailed)	Direction of Relationship	Strength of Relationshi
TE	.383**	.000	Positive	Moderate
TTS	.581**	.000	Positive	Moderate
TAS	.583**	.001	Positive	Moderate
TI	.572**	.000	Positive	Moderate
TTM	.573**	.000	Positive	Moderate
TK	.509**	.000	Positive	Moderate
Overall	.569**	.000	Positive	Moderate

**p < .01.

TE   = Building a creative environment

TTS   = Applying various teaching styles

TAS   = Applying assessment strategies

TI   = Enhancing good teacher-student interactions

TTM = Applying teaching learning materials

TK   = Having opportunities to develop knowledge concerning with creative thinking

Findings for Research Question (5)

The Variations of Perceptions of Lower Primary School Teachers on Knowledge of Teaching Practices for Promoting Primary Students' Creative Thinking Skills in terms of their Personal and School Related Factors

As shown in Table 11, there were significant differences between the group of primary teachers (PT) and the group of junior teachers (JT) in *building a creative environment* ($t(480) = 2.30$, $p<0.05$, $d=0.20$) and in *having opportunities to develop knowledge concerning with creative thinking* ($t(480) = 2.04$, $p<0.05$, $d=0.19$). Inspection of two group means indicated that the mean ratings of the group of primary teachers were higher than those of the group of junior teachers especially in these areas.

Table 11: Independent Samples *t* Test Result Showing Mean Values of Perceptions of Lower Primary School Teachers on Knowledge for Teaching Practices Grouped by Position

Dimensions	Group	Mean	SD	*t*	*df*	*p*
Building a creative environment	PT	4.10	0.42	2.30	480	.022
	JT	4.01	0.47			
Applying various teaching styles	PT	4.13	0.44	1.46	480	n.s
	JT	4.07	0.51			
Applying assessment strategies	PT	4.18	0.55	.43	415.24	n.s
	JT	4.15	0.49			
Enhancing good teacher-student interactions	PT	4.23	0.59	.18	480	n.s
	JT	4.22	0.48			
Applying teaching learning materials	PT	3.85	0.58	1.03	480	n.s
	JT	3.80	0.52			
Having opportunities to develop knowledge	PT	3.97	0.61	2.04	480	.042
	JT	3.85	0.63			
Overall	PT	4.08	0.43	1.55	480	n.s
	JT	4.10	0.42			

Note: n.s = no significance

The Variations of Perceived Level of Performance of Lower Primary School Teachers on Teaching Practices for Promoting Primary Students' Creative Thinking Skills in terms of their Personal and School Related Factors

As shown in Table 12, there were significant differences between the group of primary teachers (PT) and the group of junior teachers (JT) in *having opportunities to develop knowledge concerning with creative thinking* ($t(480) = 1.97$, $p<0.05$, $d=0.19$). Inspection of two group means indicated that the mean ratings of the group of primary teachers were higher than those of the group of junior teachers especially in these areas.

Table 12: Independent Samples t Test Result Showing Mean Values of Perceptions of Lower Primary School Teachers on Performance of Teaching Practices Grouped by Position

Dimensions	Gro	Me	SD	*t*	*df*	*p*
Building a creative environment	PT	3.9	0.6	1.26	480	n.s
	JT	3.8	0.7			
Applying various teaching styles	PT	4.0	0.6	0.74	480	n.s
	JT	3.9	0.6			
Applying assessment strategies	PT	4.0	0.7	0.92	480	n.s
	JT	4.0	0.7			
Enhancing good teacher-student interactions	PT	4.2	0.6	0.32	480	n.s
	JT	4.2	0.6			
Applying teaching learning materials	PT	3.6	0.6	0.29	480	n.s
	JT	3.5	0.7			
Having opportunities to develop knowledge concerning	PT	3.4	0.7	1.97	480	.04 9
	JT	3.3	0.8			
Overall	PT	3.9	0.5	1.16	480	n.s
	JT	3.8	0.5			

n.s = no significance

Findings for Research Question (6)

The Potential Factors affecting Lower Primary School Students' Creative Thinking Skills

The Beta coefficients were presented in Table 13. Level of lower primary school students creative thinking skills perceived by lower primary school teachers ($\beta=.30$, $p<.05$) appears to be the predictor of level of lower primary school students' creative thinking skills in Guilford's test and vice versa.

Table 13: Simple Linear Regression Analysis for Level of Lower Primary School Students' Creative Thinking Skills Perceived by Lower Primary School Teachers Predicting Level of Lower Primary School Students' Creative Thinking Skills Measured by Guilford's Test

Variables	*B*	Std. Error	*β*	*p*
TSCTS	.65	.32	.30*	.047
Constant	1.26	.86		
*R= .30, R² = .09, F(1,238) = 4.19, *p < .05.*				

TSCTS = Perceived level of students' creative thinking skills

Table 14: Simultaneous Multiple Regression Analysis on Instructional Leadership and Teaching Practices Predicting Perceived Level of Lower Primary School Students' Creative Thinking Skills rated by Lower Primary School Teachers

Variables	*B*	Std. Error	*β*	*p*
OHK	.17	.10	.15	n.s
OHP	-.08	.06	-.12	n.s
OTK	.40	.11	.34*	.050
OTP	.12	.06	.38**	.001
Constant	.18	.59		
*R= .48, R² = .23, F(4,477) = 8.95, *p < .05, **p < .01.*				

OHK = Principals and science subject leaders' knowledge for instructional leadership

OHP = Principals and science subject leaders' performance on instructional leadership

OTK = Lower primary school teachers' knowledge for teaching practices

OTP = Lower primary school teachers' performance on teaching practices

The Beta coefficients were presented in Table 14. According to $β$ weights, performance of lower primary school teachers on teaching practices ($β$ =.38, *p*<.01) appears to be the best predictor of lower primary school students' creative thinking skills rated by lower primary school teachers. Knowledge of lower primary school teachers on teaching practices ($β$=.34, *p*<.05) appears to be the second best predictor of lower primary school students' creative thinking skills rated by lower primary school teachers.

The Regression Equation is:
Lower primary school students' creative thinking skills
rated by lower primary school teachers =   .18+.17OHK   +   .08OHP   +
.40OTK + .12OTP

Model Validation

In the model validation, there were thirty three participants. They all agreed that all the components, namely instructional leaders' knowledge, instructional leaders' performance, teachers' knowledge, teachers' performance and students' creative thinking skills should be included in instructional leadership model.

All the responses given were analyzed to know the applicability of the model for promoting primary students' creative thinking skills. Most of the respondents mentioned that this instructional leadership model can be used in educational setting.

Based on the findings, the review of relevant literature and expert validation, a developed instructional leadership model for promoting primary students' creative thinking skills in teaching natural science at lower primary level was illustrated (See Figure 2).
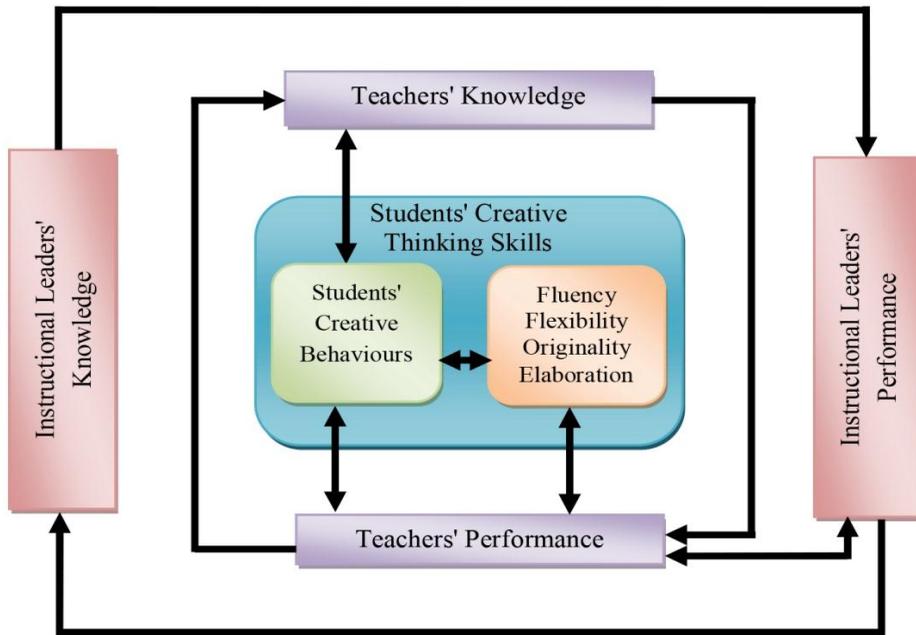
Figure 2: Developed Instructional Leadership Model for Promoting Primary
Students' Creative Thinking Skills

Note:

Dimensions of Instructional Leadership for Instructional Leaders' Knowledge and Performance	Dimensions of Teaching Practices for Teachers' Knowledge and Performance
1. Encouraging teachers to build a creative environment	1. Building a creative environment
2. Reinforcing teachers to apply various teaching styles	2. Applying various teaching styles
3. Encouraging teachers to apply assessment strategies	3. Applying assessment strategies
4. Encouraging teachers to enhance good teacher-student interactions	4. Enhancing good teacher-student interactions
5. Providing adequate teaching learning materials for the teachers	5. Applying teaching learning materials
6. Providing opportunities to develop knowledge concerning with creative thinking for the teachers	6. Having opportunities to develop knowledge concerning with creative thinking

Recommendation

The following recommendations are based on the analyses of the research findings.

- School principals should encourage teachers to make the classrooms become a place where the students are happy, comfortable and talk about their ideas freely.
- School principals should encourage teachers to connect with subject content to real-world situations.
- School principals should provide material support and financial support to the teachers in making teaching learning materials.
- School principals should provide opportunities for staff development.
- School principals should encourage teachers to use the performance assessment and portfolios in all classes.
- School principals should encourage teachers to use student-centred approach such as small group, open-ended questions, problem-solving, question stem, observation, brainstorming, discussion, activity-based learning and demonstration in providing chances for students to think, learn and discover.
- School principals should encourage teachers to listen carefully when students talked about their problems.
- School principals should encourage teachers to answer respectfully when students asked unusual questions.
- School principals and teachers should work cooperatively and deliberately to promote the students' creative thinking skills.

Need for Further Research

The studies at all levels of institutions need to be conducted to investigate how to give instructional leadership for promoting students' creative thinking skills.

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