Primary School Teachers' Creative and Innovative Differences in Cognitive Process

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Abstract

This study aimed to identify the creative and innovative differences in cognitive process of primary school teachers in the district of Batang Padang, Perak. Sample of study consists of 1520 teachers from 95 primary schools from district of Batang Padang, Perak. This study is in the form of survey. Quantitative data obtained through the questionnaire with the validity of the 8 items are 0.97. Findings of the study of creative and innovative differences in cognitive processes is high, M = 2.78, SD = 0.44. The study has signified that there are mean distinction by type of school in sub-component of creative and innovative. For National Primary [Chinese Primary: M = 2.80, p <.05; Tamil Primary: M = -1.16, p <.05], Chinese Primary [National Primary: M = -2.80, p <.05; Tamil Primary: M = -3.96, p <.05] and Tamil Primary [National Primary: M = 1.16, p <.05; Chinese Primary: M = 3.96, p <.05].

Keywords: Cognitive processes, Innovative, Creative, Primary School, Teachers.

Introduction

The 21st century has lead Malaysia to face internal and external challenges due to the impact of globalization, liberalization and development of Information and Communications Technology (ICT). Consequently, the Ministry of Education (MOE) committed to provide educational development programs to produce knowledgeable, skilled, ICT literate and honourable citizens to meet the National Education Philosophy.

According to Hamza (2000), changes in the education system starts from schools. Schools have been touted as a "factory of educating and developing people". Schools produce a knowledgeable and skilled human as a product relevant to life in the present. Any changes implemented in schools should be carefully planned so that the results will bring positive outcomes. It should involve the school entire school community and surrounding society and the successful of the changes is depends on many factors, especially teachers.

Romesh (2003) in his study posited that the teacher's role is essential in shaping the creativity of the students. A creative teacher should conduct a significant activity in the right situation with accordance of the abilities and needs of the students. The creative ability of the students in the class and creative ideas of the students should be used to build a community of excellence. Creative people are always in a happy mood and have a peace of mind that can help them in problem solving easily. They have the ability to adapt new ideas and able to evaluate views of others effectively. On top of that creative people are always engaged with activities that benefit the community in whole. Hence, the intellectuality of the teachers to assess the ability of the students will help the students to build their creativity in the school.

Maslow (1970) stressed people who are creative, innovative and have the originality able to demonstrate a uniqueness that leads to changes, creativity and originality. A creative thinker is who illustrate the efficiency and the ability to use the mind to explore possibilities, create new stuff, original, unique and valuable in form of concrete, abstract, or ideas.

According to Gunseli (2006), universities in developing countries require a group of people who can think and have an interest in science to face the world's problems.

The integrations of critical thinking skills in education at the universities are important for the developing countries in order to develop a politically, economically and culturally ideal society. The creativity of the teachers is vital in shaping a country's educational philosophy.

Abdullah (2006) posited that human capital is to be made must be able to think critically and creatively, ability to create new opportunities, have the endurance, the ability to cope with the changing global scenario and able to adapt problem-solving skills. Human capital development of the nation seeks to ensure that Malaysia has the knowledge and expertise for the provision of high employment in the various types of employment.

Hasan (2004) in the theory of thought and ethical stated that teachers must fully integrate to enhance the character and personalities that can build a civilization of the country. It includes four types of human thought and ethics; the spiritual thinking, niche, scientific thinking and creativity. Creative thinking is about the creative and lateral thinking, which is based on innovation, imagination, fiction, subjective, implicit, beautiful, interesting, positive and alternatives. This type of thinking was born from the right brain hemisphere. Educational theory of mind is highly suitable as a core and the basis for formulation of stature and character of the teachers that can be applied to school children by revolutionize their minds.

Cognitive theorist believes that individuals motivated when they experience cognitive imbalance or a desire to find solutions to a problem is occurred. Teachers need to ensure students have the desire to seek information and solutions and need to ensure that learning takes place with the constant search by the students. Nowadays, the members of the society have the impression that teaching is not an attractive career due to the workload. Furthermore, there are some who see school as an organization that is bombarded with various heavy workloads and at times, this task is not something that is planned but arises from unexpected situations. If such a situation allowed continuing, it is quite certain the atmosphere of teaching and learning in schools will be moving towards an unmanageable situation and the school will fail to achieve desired goals. Thus, the attributes of teachers who are willing to accept the burden of heavier teaching duties and achieve the desired level of job satisfaction is very important in the school working environment.

According to the Ministry of Education (2007) in the selection of excellent teachers stressed that outstanding teachers should be able to teach effectively, capable to make the lessons interesting, enjoyable and meaningful to students and to deliver lessons clearly. In addition, excellent teachers should also be able to advance and improve the educational level of the students and encompass of initiative, innovative and creative throughout the years.

This research is guided with the hypotheses as the direction to identify differences in levels of cognitive skills among primary school teachers in the district of Batang Padang, Perak. The following hypotheses were proposed, in accordance with theoretical and empirical evidence.

Ho (1): There is no difference in the mean level of creative and innovative skills in the cognitive processes of teachers in three primary schools in the district of Batang Padang, Perak?
Ho (2): There is no difference in the level of creative and innovative skills in the cognitive processes of teachers in three primary schools in the district of Batang Padang, Perak?

Methodology

Research Design

The cross-sectional survey research is conducted with the assistant of an ex post facto type was used. Survey questionnaires were used to obtain the data from the respondents

Participants

This study was conducted in 95 primary schools in the District of Batang Padang, Perak. It involves a total of 1520 (79%) of the 1917 primary school teachers in this district as the respondent. This study involved teachers in three primary types of schools; 53 of National Primary School (NPS), 23 of Chinese Primary School (CPS) and 19 of Tamil Primary School (TPS).The three types of schools are important because it involves three types of ethnicity from multicultural communities in this country.

Measures

The *Northidge Developmental Scale* created by Gowan (1970) is the instrument used to measure creative and innovative skills in the cognitive processes of the teachers.

The questionnaires is using four point Likert scale containing eight items that are translated and adapted from psychological tests. Additionally the questionnaires are translated and interpreted in accordance with Malaysian culture. The Cronbach alphas in this study are 0.60 to 0.80.

Procedure

Prior to the research is conducted, a written approval and consent letters from Ministry of Education of Malaysia, Sultan Idris Education University, Perak State Education Department, Batang Padang District Education Department and headmasters of the schools is obtained to conduct the research. In every school the objective of the research was briefed to participated teachers. During the data collection, teachers would be explained and assisted with the definition of the measurement.

Data Analysis

Statistical Package for the Social Sciences (SPSS) version 19 is used to analysis the data. As exhibited in Table 1, min score 1indicates a very low cognitive skills, min score 2 indicates the low cognitive skills, min score 3 indicates a high cognitive skills and min score 4 indicates a very high cognitive skills. Table 2 exhibit statistical analysis used to answer research questions and hypotheses.

Table 1: Mean Score Indicator

Mean score	**Indicator for the Mean Score**
0.00 – 0.99	Very Low
1.00 – 1.99	Low
2.00 – 2.99	High
3.00 – 4.00	Very High

Table 2: Statistical Analysis Used For Measuring Creative and Innovative In Cognitive Processes

No.	Research Questions	Hypothesis	Statistics
1	What is the mean level of creative and innovative skills in the cognitive processes among teachers in three primary schools in the district of Batang Padang?	Ho(1): There is no difference in the mean level of creative and innovative skills in the cognitive processes of teachers in three primary schools in the district of Batang Padang.	Mean Descriptive
2	Are there differences in creative and innovative skills in the cognitive processes of teachers in three primary schools in the district of Batang Padang?	Ho(2): There is no difference in the level of creative and innovative skills in the cognitive processes of teachers in three primary schools in the district of Batang Padang.	MANOVA Test

Results and Discussions

Findings on the 1520 respondents shows that the mean and standard deviation for creative and innovative component is quiet high M = 2.78, SD = 0.44. Findings by the type of schools are [NPS: M = 2.76, SD = 0.45, n = 990; CPS: M = 2.70, SD = 0.39, n = 320; TPS: M = 2.99, SD = 0.46, n = 210]. Analysis indicated that the teachers of NPS are moderately high in creative and innovative skills in the cognitive process than the teachers of NPS and CPS. The null hypothesis was rejected because there are differences in creative and innovative skills in the cognitive processes of teachers in three primary schools are high.

The *multivariate* test showed that the independent variable has a significant impact on the eight independent variables [F (16, 3022) = 8825, p <.05]. The *multivariate* test also indicated that there were main effects of school on a combination of eight independent variables of creative and innovative, as exhibited in Table 3.

Table 3: Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.979	8750.553[a]	8.000	1510.000	.000
	Wilks' Lambda	.021	8750.553[a]	8.000	1510.000	.000
	Hotelling's Trace	46.361	8750.553[a]	8.000	1510.000	.000
	Roy's Largest Root	46.361	8750.553[a]	8.000	1510.000	.000
School	Pillai's Trace	.089	8.825	16.000	3022.000	.000
	Wilks' Lambda	.912	8.915[a]	16.000	3020.000	.000
	Hotelling's Trace	.095	9.005	16.000	3018.000	.000
	Roy's Largest Root	.080	15.179[b]	8.000	1511.000	.000

The findings of the study proved that there are mean difference by type of school in sub-components of creative and innovative. NPS [CPS: M = 2.80, p <.05; TPS: M = -1.16, p <.05], CPS [NPS: M = -2.80, p <.05; TPS: M = -3.96, p <.05] and TPS [NPS: M = 1.16, p <.05; CPS: M = 3.96, p <.05]. There are significant differences between NPS, CPS and TPS in the *Tukey* test for differences in sub-components of creative and innovative in the cognitive process.

Eight sub-components of creative and innovative (eight items) are; I was a creative (P1), new ideas always appear in my mind (P2), sometimes I get new ideas to be implemented immediately (P3), I always attempt effective methods of teaching and learning (P4), people thought that I may be unique (P5), my new idea is to help my friends and me (P6), I would like to learn something new and strange (P7) and I'm not afraid to face the challenges (P8). The mean of these items are as shown in Table 4.

Table 4: Mean of Cognitive Skills for Sub-Component of Creative and Innovative

Items of Sub-Component of Creative and Innovative	NPS		CPS		TPS		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
P1	2.74	0.60	2.56	0.60	2.96	0.69	2.73	0.62
P2	2.78	0.59	2.59	0.61	3.00	0.65	2.77	0.61
P3	2.86	0.54	2.77	0.55	2.99	0.59	2.86	0.56
P4	3.01	0.45	2.97	0.39	3.18	0.56	3.02	0.46
P5	2.45	0.67	2.26	0.63	2.61	0.79	2.43	0.69
P6	2.82	0.57	2.68	0.53	3.05	0.55	2.82	0.57
P7	2.96	0.52	2.84	0.53	3.17	0.58	2.96	0.54
P8	2.93	0.53	2.65	0.59	3.07	0.63	2.89	0.57
Creative and Innovative Components	0.82	0.38	2.67	0.36	3.00	0.42	2.81	0.40

The findings for the item, I was a creative (P1) is high M = 2.73, SD = 0.62., N = 1520. Respondents' results by type of school are [NPS: M = 2.74, SD = 0.60, n = 990; CPS: M = 2.56, SD = 0.60, n = 320; TPS: M = 2.95, SD = 0.69, n = 210]. Analysis showed that the TPS teachers are high for the item I was a creative compared to teachers of NPS and CPS. Hence, highly creative teachers have proved their creativity in their career and life.

The results of the item, new ideas always appear in my mind (P2) is high M = 2.77, SD = 0.61., N = 1520. Respondents' views by type of school are [NPS: M = 2.78, SD = 0.59, n = 990; CPS: M = 2.59, SD = 0.61, n = 320; TPS: M = 3.00, SD = 0.65 n = 210]. Analysis indicated that the teachers of TPS are high for the items of new ideas always appear in my mind compared to teachers of NPS and CPS. Thus, teachers felt that new ideas often come to mind at a high level indicates the existence of new ideas applied in creative to improve the quality of teaching and learning, which later helps teachers' careers advancement.

The findings of the item, sometimes I get a new idea to be implemented immediately (P3) is high M = 2.86, SD = 0.56, N = 1520. Respondents' results by type of school are [NPS: M = 2.86, SD = 0.54, n = 990; CPS: M = 2.77, SD = 0.55, n = 320; TPS: M = 2.99, SD = 0.59, n = 210]. Analysis showed that the teachers of TPS are high for the items sometimes I get a new idea to be implemented immediately as compared to teachers of NPS and CPS. Thus, teachers have a new idea to be implemented immediately at high level shows they are very creative and always got good ideas to be implemented for the positive outcome.

The item, I always attempt effective methods of teaching and learning (P4), the results are high M = 3.02, SD = 0.46., N = 1520. Study respondents' view by type of school are [NPS: M = 3.01, SD = 0.45, n = 990; CPS: M = 2.97, SD = 0.39, n = 320; TPS: M = 3.18, SD = 0.56, n = 210]. The teachers of TPS are high for the item I always attempts an effective method in teaching and learning than teachers of NPS and CPS. Thus, teachers who are attempt effective methods of teaching and learning at high levels indicate that they are very creative and demonstrate interest in the teaching style.

The results of the item, people think that I may be unique (P5) is high M = 2.43, SD = 0.69., N = 1520. Respondents' results by type of school are [NPS: M = 2.45, SD = 0.67, n = 990; CPS: M = 2.26, SD = 0.63, n = 320; TPS: M = 2.61, SD = 0.79, n = 210]. Analysis indicated that the teachers of TPS are high for the items people think that I am a unique as compared to teachers of NPS and CPS. Its can be conclude that, a unique mind always produce a unique and extraordinary ideas. Thus, people think that an exceptional nature will shows a high level of their astonishing expression at a certain time.

The findings of the item, my new idea is to help my friends and me (P6) is high M = 2.82, SD = 0.57, N = 1520. Respondents' views by type of school are [NPS: M = 2.82, SD = 0.57, n = 990; CPS: M = 2.68, SD = 0.53, n = 320; TPS: M = 3.05, SD = 0.55, n = 210]. Analysis showed that the teachers of TPS are high for the items of my new idea is to help my friends and me compared with teachers of NPS and CPS. Therefore, the high level of my new idea is to help my friends and me, showed that the ideas can be used in improving teaching and learning.

The item, I would like to learn something new and strange (P7), the finding is high M = 2.96, SD = 0.54, N = 1520. Respondents' results by type of school are [NPS: M = 2.96, SD = 0.52, n = 990; CPS: M = 2.84, SD = 0.53, n = 320; TPS: M = 3.17, SD = 0.58, n = 210]. Analysis indicated that the teachers of TPS are high for the items I would like to learn something new and strange compared to teachers of NPS and CPS. Thus, the nature of like to learn something new and strange at high level shows that the teacher has an interest in new things and would like to discover innovations in improving teaching and learning.

The results of the item, I'm not afraid to face the challenges (P8) is high M = 2.89, SD = 0.57, N = 1520. Respondents' views by type of school are [NPS: M = 2.93, SD = 0.53, n = 990; CPS: M = 2.65, SD = 0.59, n = 320; TPS: M = 3.07, SD = 0.63, n = 210]. Analysis showed that the teachers of TPS are high for the item I'm not afraid to face the challenges than teachers of NPS and CPS. Hence, I'm not afraid to face the challenges at a high level shows that the teachers are very brave and has owns ideas and approach to face challenges in career and life.

The findings had answered the question of the study to measure the levels and differences in creative and innovative skills in the cognitive processes among primary school teachers by type of school. But the study had to reject the null hypothesis because there are different levels of creative and innovative skills in the cognitive process by type of school among primary school teachers.

Conclusion

Creative thinking is defined as the ability to combine ideas to fulfill a necessity. As an agent of civilization movers, teachers should always ensure the quality of education. Therefore, every teacher must acquire the skill of creative and innovative. Creative thinking enables the teacher to come out with new ideas to achieve their undertaking. Creative thinking skill also involves the courage to challenge the commonly used strategy and able to see a situation from different angles and perspectives. Creativity arises from investment of time, preparation or diligence as required, concentration, a strong determination, dedication and self-discipline. Moreover, creative people ready to take risks to achieve their goals in unique way and rejecting all the commonly used alternatives. On top of that creative thinking involves flexibility and originality ability. Flexibility is about the skills of going out of the common approaches to solve problems and consider new perspectives. While originality is the ability to generate original ideas that never been introduced.

Creative-minded teachers must be bold, creative, and should take own initiative to introduce the techniques of teaching and learning for students in owns way. This move is compatible with the *reconstructionalism* principle whereby the teachers acting as agents of changes and problem solver to improve student achievements. Attitudes and interests of the students are vary, but the common attitudes and interests can be formed by the teachers through various techniques of effective teaching and learning. Interesting teaching and good personality of a teacher can arouse the interest of students towards the learning process, which in turn will affect the students' achievement. Hence, the success and the failure of the Malaysian National Education Philosophy is solely depends on the characteristics of the teachers. A creative and innovative skill in the cognitive processes is important for the teachers to produce outstanding students whom compatible with changes of the world and be the main source for the realization of national aspirations and expectations for 2020.

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