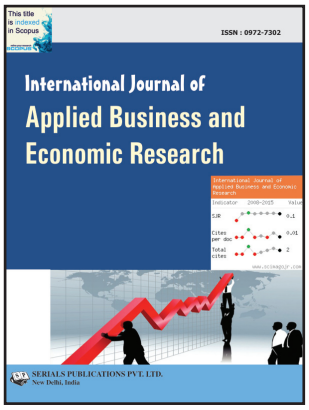

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The Study of the Relationship between Types of Thinking Styles and Creativity among Teachers and Staff in Kashan, Iran

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ABSTRACT

This article seeks to examine the relationship between type of thinking styles and creativity. The study is applied in terms of purpose and in terms of the research method is descriptive - correlation. The statistical population of this research is Shahid Bahonar high school's teachers and staff in Kashan. To collect data relating to the theoretical foundations and extraction of primary factors and indices from library and internet resources and to collect the data needed to test the study hypotheses a questionnaire is used. In order to confirm the validity, the form validity and to verify the reliability Cronbach's alpha test is used that its rate is 0.87 for thinking style questionnaire and 0.73 for creativity questionnaire. To examine the hypotheses, Pearson correlation test and multiple regression analysis are used. The research findings show that there is a significant relationship between thinking styles and creativity of Shahid Bahonar high school's teachers and staff.

Keywords: Thinking style, creativity, high school, Shahid Bahonar high school in Kashan.

1. INTRODUCTION

The importance and necessity of creativity and its growing process in the present era has attracted the attention of educational researchers and planners to analyze the creativity from the educational vision. Educational systems, according to their plans, objectives, content and educational facilities have more effective role in the activation or undermining the ability of the creativity in people. Therefore, a long time ago revision of curricula and educational program and their modification to help develop this ability in children and adolescents has attracted most societies' attention. We also need a deep and fundamental changes

in our educational system to revive this talent and ability. This requires that we know our current position to plan for improving the educational system. By reflecting on our educational system, it can be found that our distance with what could provide the areas for growth and development of creativity in children and teenagers is high. Therefore, attention and research on various educational elements and their role in fostering the creativity of the students, is very important. In the meantime, among effective educational elements, teachers play a key role in this context (Hosseini, 2006). Teachers by modern teaching methods can teach creativity to students and can be their pattern, on the other hand, some researches (Kaufman et. al., 2005; Zhang and Sternberg, 2009; Zhang and Zhou, 2011) have shown that there is a relationship between creativity and thinking styles. Therefore, considering the relationship of types of thinking styles and creativity, can lead educational planners to discover thinking styles that are consistent with creativity and can provide better area for creativity of the students (Torabi, 2011).

Theoretical Foundations of Study

Creativity is one of the variables that is very effective in the process of learning and education. Since one of the important goals of education is training creative talents, considering this ability of student and its impact on learning process and its mediator variables seem necessary. From the view of some researchers, creativity is a structure that is interwoven with emotional and cognitive components (Baron, 2003). Srivasta et. al., (2010) also state that creativity is not a single-sided concept and believe that multi-dimensional cognitive and emotional abilities have a good situation for creating innovation (Srivasta, Childers, Baek, HStrong, Hill, Warsett, Wang, Akiskal, Akiskal, & Ketter, 2010). Sternberg (2001) introduces creativity as thinking about things in an unusual way and reaching to unique ways (Sternberg, 2002). He also believes that thinking styles, knowledge, characters and environment are effective in creativity. Sternberg and Grigorenko (2000) believe that the recognition and application of thinking styles and related factors is essential in the educational and professional world and inattention to it especially in educational situations leads to the lack of development or ignorance of abilities. Creativity related research study shows that cognitive factors including thinking styles affect creativity but the issue of knowing which thinking style has positive or negative relationship with creativity is still in doubt. Thinking styles refer to the individuals' preferred methods in the use of their abilities (Zhang, 2009). Thus, thinking style is not in itself an ability but it refers to how to use the ability. The basic feature of human is his thinking power. Humans with help of their thought have been able to master the complex and varied environment to survive. Also, (Daemi et. al., 2004; Solgi, 2011, Zare and Akhondi, 2012) say people with their own style, think about how to do things (Zare, Akhondi, 2012; Solgui, 2011). Sternberg by offering mental self-government theory, suggests thinking styles at 13 styles that are classified at 5 dimensions of function, shapes, surfaces, slopes and trends. In short, in function dimension, the man with legislator style desires to create, invent and design and do things in his own way. Person executive style, what he called, so the person with judicial thinking style tend to judge and evaluate people and his work. The person with executive style does what is said to him and the person with judicial thinking style tends to judge and evaluate people and works. In trend dimension, the individual with free thinking style tends to do things in new ways and disagrees with customs and the one with conservative thinking style tends to do things in a proper and preset way (Emamipoor, 2001). The thirteen thinking styles can be divided into two kinds of style. The first type of thinking styles (such as legislative, judicial, holistic, hierarchical and liberal) are generating creativity and need to process complex information. Those who apply this kind of thinking style tend to challenge norms and accept

risk. The second type of thinking styles (such as administrative, narrow, single-pole and conservative) need to process simple data. Those who employ this style of thinking, want to maintain norms and are authority- oriented. The remaining four thinking styles (such as anarchy, oligarchy, internal and external) depending on the style of specific task can be placed in complex or simplistic thinking style (Shekari, Kodivar, Faezad, Sangari, Ghenaei, 2006). The researchers believe that good and bad thinking styles are relative and over time, place and situations are different and people are flexible in offering thinking styles (Keras, 2005).

There are many studies that have reported the relationship between thinking styles and creativity. Zhang and Zhou (2011) have examined the factors influencing creativity. The results of this study showed that people who have gotten higher score on legislative, liberal, internal and external thinking styles were more creative (Zhang, Zhu, 2011). According to Zhang and Sternberg (2009) creative people get higher score in the first kind of thinking style compared to the second and third thinking style. Zhang (2002) believes that individuals with higher creativity get higher score in the first type of thinking style. He in his study investigated the thinking models and styles and came to the conclusion that people with creative thinking style use general thinking style more than the partial thinking styles. Kaufman et. al., (2005) by story writing have evaluated the creativity of writers and journalists. After reviewing the stories, creative thinking style writers and journalists were measured, results showed that the more people use style legislation (Kaufman, Baer, Gentile, 2005). Review of previous studies indicates that the thinking style of the former and components associated with creativity. After reviewing the stories, thinking style of creative writers and journalists were assessed and results showed that these people use legislation style more (ibid). Review of previous studies indicates that the first type of thinking style and its components are associated with creativity. Ching and Choun (2004) found a relationship among creativity, critical thinking and thinking styles. Also, Srivasta et. al., (2010) showed a positive relationship between holistic styles and creativity and a negative relationship between creativity and analytical style. Pardo (2002) in a study showed that there is a relationship between thinking styles and creativity and creative people tend to general and legislative thinking styles. In addition, in Iran Nouri (2003) and Razavi and Shiri (2005) in their study concluded that there is a relationship between thinking styles and creativity so that there is a relationship between liberal thinking style and enhancement of creativity and conservative thinking style and loss of creativity. Also findings of Nateghian (2008) in relation to the thinking styles and creativity showed that legislative, judicial, holistic, hierarchical and liberal thinking styles can predict higher creativity scores. Torabi (2011) by investigating the relationship between thinking styles and creativity came to the conclusion that among thinking styles defined in Sternberg's theory, the first kind of thinking style has a positive correlation with all dimensions of creativity. It should be noted that previous researches had shown different degrees of correlation and this can be a proof of the need for research in different societies and consideration of correlation and its causes, on the other hand, past researches have often examined this relationship among university and school students, since thinking styles and creativity are teachable (Sternberg, 1988) and paying attention to the thinking styles and creativity of managers in selecting thinking style that is consistent with teachers and students based on the type of environment and educational tasks can bring useful educational results (Mahmoudi, 2011). Therefore, this study tries to consider this question:

Is there a significant relationship between thinking styles and creativity of teachers and staff of Shahid Bahonar high school? And which thinking style is a strong predictor of creativity?

Research Questions

- Is there a significant relationship between thinking styles and creativity of teachers and staff of Shahid Bahonar high school in Kashan?
- Each dimension of the first type of thinking style to what extent can predict the creativity among teachers and staff of Shahid Bahonar high school in Kashan?
- Is there a significant relationship between each dimension of the first type of thinking style and creativity among teachers and staff of Shahid Bahonar high school in Kashan?

Research Hypotheses

H_1: There is a significant relationship between each dimension of the first type of thinking style and creativity of teachers and staff of Shahid Bahonar high school in Kashan?

H_2: Each dimension of the first type of thinking style can predict the creativity among teachers and staff of Shahid Bahonar high school in Kashan?

H_3: Is there a significant relationship between each dimension of the second type of thinking style and creativity among teachers and staff of Shahid Bahonar high school in Kashan?

2. METHODOLOGY

Research methodology is descriptive and correlational. The statistical population includes 25 teachers and staff of Shahid Bahonar high school in Kashan. The sample size due to the population size and by using Morgan table was equal to 24 people. However, 25 questionnaires were distributed and collected among Shahid Bahonar high school's teachers and staff. Statistical methods of mean and standard deviation were used in the descriptive statistics level and Pearson correlation coefficient and multiple regression analysis were used in the inferential statistics.

Data Collection Tools

A. ***Thinking Styles Questionnaire:*** it is a pencil and paper test that consists of 65 questions. This tool is designed by Sternberg and Wagner (1992) in which the answer of each question is determined on a scale of 5° (completely agree, very agree, somewhat agree, very disagree, completely disagree). The validity of questionnaire was determined by experts and professors of management and Cronbach's alpha was used to assess reliability. The reliability coefficients of this scale for entire questionnaire was obtained $\alpha = 0.87$ in the present study. 9 intended components were obtained by the factor analysis results of thinking styles questionnaire in which 71% of the variance of questions was extracted. The results of factor loadings above 3% with orthogonal rotation generated 9 desired components.

B. ***Creativity:*** Creativity Questionnaire is a pencil and paper scale that is based on the individual's own report. This tool is a self-made scale with 10 questions which is scored based on five-degree Likert scale (strongly agree (1), agree (2), no idea (3), disagree (4), fully disagree (5). The validity of questionnaire was assessed by experts and professors of management and Cronbach's alpha was used to determine its reliability. The reliability coefficients of this scale for entire questionnaire

was obtained $\alpha = 0.73$ in the present study. Due to the researcher-made scale the confirmatory factor analysis was used to determine the validity of the creativity scale structures. Characteristics of good fit of creativity scale show that data of this study have a good fit with factor structure of the scale and this indicates the alignment of questions with creativity structure.

Findings

Table 16.1
Descriptive indicators of variables in the study

	Variable	*Mean*	*SD*	*Minimum*	*Maximum*	*Kurtosis*	*Skewness*
The first type of thinking style	Legal	33/3	69/2	10	24	–18/0	–04/0
	Judicial	51/3	43/2	12	25	58/0	45/0
	Hierarchical	29/3	29/2	11	23	03/0	20/0
	General	78/3	94/1	14	24	–09/0	–10/0
	Free	22/3	42/2	15	25	–40/0	–29/0
The second type of thinking style	Executive	44/3	16/3	9	25	51/1	16/1
	Partial	3/3	43/2	11	23	–28/0	17/0
	Royal	43/3	49/2	10	24	41/0	–30/0
	Conservative	39/3	13/3	8	25	11/0	–25/0
	Creativity	38/4	61/4	18	25	–32/0	–04/0

According to Table 16.1, the value of skewness and kurtosis in distance of ±1.96 shows normal distribution. The above table also shows that among the dimensions of the first type of thinking style, the dimension of general (3.78) had the highest mean and among dimensions of the second type of thinking style, the dimension of executive (3.44) had the highest mean. Furthermore, the inferential findings of this study in the form of hypotheses testing and answering the questions are presented.

H_1: There is a significant relationship between each dimension of the first type of thinking style and creativity of teachers and staff of Shahid Bahonar high school in Kashan?

Table 16.2
Correlation Matrix of first type of thinking styles and creativity

Number	*Variable*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1	Legal	1						
2	Judicial	**34/0	1					
3	Hierarchical	**52/0	**47/0	1				
4	General	**46/0	**47/0	**45/0	1			
5	Free	10/0	**53/0	**25/0	**41/0	1		
6	The first type of thinking style	**69/0	**78/0	**75/0	**75/0	**63/0	1	
7	Creativity	*20/0	**35/0	11/0	**37/0	**60/0	**45/0	1

*$p < 0.05$, **$p < 0.01$

Table 16.2 based on the correlation matrix results shows that all dimensions of the first type of thinking styles have meaningful relation together in two by two form except the relationship between liberal and legal

thinking style (0.10) that is not meaningful. Regarding the first hypothesis testing above table shows that the first type of thinking styles have significant relation with creativity except the hierarchical relationship. The relationship between legal thinking style and creativity (0.20), judicial and creativity (0.35), liberal and creativity (0.37), free and creativity (0.60), the first type of thinking style and creativity (0.45) is a significant positive relationship at 0.01 level. According to study results presented in Table 16.2, null hypothesis is rejected and the research hypothesis is confirmed.

H_2: Each dimension of the first type of thinking style can predict the creativity among teachers and staff of Shahid Bahonar high school in Kashan?

Table 16.3
Summary of regression model, analysis of variance and regression statistical characteristics of creativity on the first type of the thinking styles

Step	*Model Index*	*Sum of squares*	*Df*	*Mean of sum of squares*	*F*	*Significance level*	*R*	R^2
1	Remaining	81/932	1	81/932	07/68	001/0	60/0	36/0
	regression	23/1658	121	70/13				
2	Remaining	93/985	1	97/492	85/36	001/0	62/0	38/0
	regression	11/1605	120	38/13				

Criterion Variable: Creativity

Stepwise regression analysis results in Table 16.3 show that the liberal thinking style predicts 36% and the legal thinking style 2% of the variance of creativity. Totally, these two variables predict 38% of variations of the criterion variable. The results of variance analyzes presented in the table above, show that these two variables have a significant effect on creativity.

Table 16.4
Stepwise regression coefficients of creativity on the first type of thinking

Indicators / *Variables*	*T*	*β*	*Standard error* *B*	*B*
Free thinking style	12/8	***58/0	14/0	11/1
Legal thinking style	99/1	*14/0	12/0	25/0

style ***$p < 0.001$, *$p < 0.05$

Based on the findings in Table 16.4, impact coefficients and T statistics variables related to thinking style show that liberal thinking style variable in significant level of 0.001 and legal thinking style variable in level of 0.05/0 can surely anticipate the variations related to the creativity variance. In this analysis, liberal thinking style with beta statistics of 0.58 is the strongest and then legal thinking style with beta statistics of 0.14 are variables that predict creativity. Examining the beta coefficients and the value of R^2 indicates that by adding each variable to the model, the explained variance is significantly increased so that the explanatory power of the model is increased from 0.36 in the first step to 0.38 in the second step. Totally, two significant variables in this analysis are the best predictor of creativity. In other words, managers with free and legal thinking style are more creative.

H_3: Is there a significant relationship between each dimension of the second type of thinking style and creativity among teachers and staff of Shahid Bahonar high school in Kashan?

Table 16.5
Correlation Matrix of the second type of thinking styles and

Number	*Variable*	*1*	*2*	*3*	*4*	*5*	*6*
1	Executive	1					
2	Partial	**22/0	1				
3	Royal	09/0-	**46/0	1			
4	Conservative	**54/0	**29/0	**05/0	1		
5	Second type of thinking style	**83/0	**60/0	**33/0	**75/0	1	
6	Creativity	13/0	**30/0	**45/0	08/0	0/12	1

creativity $^{**}p < 0.01$, $^{*}p < 0.05$

The results of the correlation matrix in Table 16.5 show that all dimensions of the second type of thinking styles two by two have meaningful relationship. Regarding the third hypothesis testing above table shows that among the second type of thinking styles, partial thinking style (0.30) at 0.001 level and royal thinking style (0.45) at 0.001 level have significant relationship with creativity.

3. DISCUSSION AND CONCLUSION

The results of first hypothesis analysis indicated a significant relationship between the first type of thinking styles and creativity in a way that the relationship between the first type of thinking styles including judicial, legislative, general, free and creativity was significant and positive at the 0.01 level. Among the first type of thinking styles only hierarchical thinking style had no significant relationship with creativity. The results of this study are consistent with study findings of Nouri (2003); Razavi and Shiri (2005); Zare and Akhondi (2012), Torabi and Seif (2012), Ching and Choun (2004); Srivasta et. al., (2010) because they found similar results. In explaining the above findings it can be said that the first type of thinking styles refers to the thinking styles that are generator of creativity and demanding a higher level of cognitive complexity and their fulfillment requires complex information processing. People with this thinking style are interested in challenging norms and accepting risk. But regarding the absence of a significant relationship between hierarchical thinking style and creativity the obtained findings are antithetic with the study results of Turabi and Seif (2012) and Ching and Choun (2004). In explaining this relationship we can point to the definition of hierarchical thinking style as well as the research community so that in definition of hierarchical thinking style the person with chieftain rank sets the target in hierarchical form and understands the need to prioritize targets (Sternberg, 2002). Accordingly, the research community of Ching and Choun (2004) and Torabi and Seif (2012) was school and university students. Therefore, these people because of having lofty and ideal goals in line with high education indicate divergent thinking in planning to achieve their goals (Torabi, Seif, 2012). While in present study, Shahid Bahonar high school's teachers and staff are mostly married and had two jobs thus, their planning is just to spend life and administrative affairs in repeated or converge form, because these people are in employment of education, and most of their programs are predefined such as time of attendance in school and examinations therefore, they do not feel any need to divergent thinking. The results of second hypothesis analysis showed that among the dimensions of the first type of thinking style, liberal and legal thinking styles can predict the creativity. This study results are consistent with findings of Seif and Torabi (2012) and Ching and Choun (2004). In explaining the creativity predicting

power based on the liberal and legal thinking style we can point to the definitions of these concepts and the characteristics of the individuals. The legislator individuals like to enact laws and consider the issues that have not already been planned and organized. In line with the definition of thinking style of legislator we can state that because these people tend to enact their own affairs and have no interest in the pre-programmed affairs thus, such people require innovation and divergent thinking to state their own plans. In theory of Guildford (1987) creativity or innovation based on the divergent thinking is defined. In convergent thinking the result of thinking is already clear namely, there is always a right or wrong answer, but in divergent thinking there is no definitive answer and many possible answers may be available that each of them is logically correct. Therefore, considering that the legislation requires divergent thinking thus, it can be said that individuals' creativity is predictable based on the legislator's thinking style (Guilford, 1987). Another finding of this study regarding the second hypothesis testing was the creativity predicting power based on the liberal thinking style. By looking at the definition of this dimension of thinking style "these people like to think beyond the existing rules and plans and follow maximum changes and pursue complex and ambiguous situations (Sternberg, 2002). It can be concluded that such people have freedom of action in implementing the rules and affairs of life. In this context, Mahmmoudi (2011) in his study stated that gifted students due to having liberal thinking style are looking for innovation and creativity. Also, about Shahid Bahonar high school's teachers and staff it can be stated that these people usually like to show initiative in school and are not bound by administrative orders thus, their creativity can be predicted based on the scores of liberal thinking style.

The results of third hypothesis analysis indicated that among the dimensions of the second thinking styles, the relationship between partial and royal thinking styles and creativity was positive and significant at 0.01 level. This finding is consistent with research results of Golshokoh et. al., (2009) and Ching and Choun (2004) but is antithetic with study results of Zhang (2002) and Srivasta et. al., (2010). Golshokoh et. al., (2009) showed that legislator thinking style, achievement motivation, creativity, partial thinking style and academic achievement are predictors of creativity. Ching and Choun reported that liberal, legislative, hierarchical, anarchists, exterior, partial and general thinking styles are associated with creativity, while Zhang in a study showed a positive relationship between holistic thinking styles and creativity and a negative relationship between analytical style (partial) and creativity. Also, Srivasta et. al., (2010) have reported a positive relationship between holistic thinking styles and creativity and a negative relationship between analytical style (partial) and creativity. However, any research was not found on the relationship between royal thinking style and creativity. In explaining the relationship between partial thinking style and creativity we can point to the definition of this style and personality characteristics of these people. People with partial thinking style often deal with objective problems that often require details. They often have a bias toward facts and circumstances and are realistic people. There is a risk that they do not see the forest for the trees mass. Based on this definition Sternberg (1994) enumerated paying attention to detail as the feature of creative people. In this regard, Guildford (1987) states that creative people with divergent thinking styles have evaluated the affairs and scrutinized the details (Guilford, 1987). Thus, it can be said that Shahid Bahonar high school's teachers and staff with partial thinking style because of analysis of affairs from different angles and paying attention to details have higher score on creativity. In explaining the relationship between the royal thinking style and creativity any study was not found and unlike the findings of this study, royal thinking style definition tends towards one-dimensional and convergent thinking. People with royal thinking style by a goal or need are aroused at a time. They are one-dimensional and full of effort and

believe that goal justifies the means and try to solve the problem and represent problems too simply and have relatively quantitative view towards priorities and other solutions. They are decisive because consider decisions too simple. They are a few regular. People with royal thinking style are one-dimensional and are drawn towards things that give them one-dimensional thinking. They like to see things based on their own position (Sternberg, 2002). Apparently, in the proposed definition of persons with royal thinking style it seems that these people have convergent thinking style. However, in the explanation of these findings, it can be said that in the atmosphere of education that usually commands are hierarchically imposed on teachers and staff thus, they with royal thinking style and because of being one-dimensional and targeted people which is necessary for this style, try various innovative ways to get rid of the subordination of commands and move in the direction that they set for themselves.

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