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THE RELATIONSHIP BETWEEN FUNCTIONS OF THINKING STYLES AND ACADEMIC ACHIEVEMENT MOTIVATION AMONG STUDENTS OF PAYAME NOOR UNIVERSITY, IRAN

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ABSTRACT

The present study aimed to investigate the relationship between functions of thinking styles and academic achievement motivation among master students majoring in different fields in Payame Noor University, Rasht. This was an applied descriptive study. The statistical population consisted of 7000 master students in Rasht Payame Noor University in 2013-2014 academic years. According to Morgan Table, 365 individuals were selected using stratified random sampling method. Sternberg Standard Thinking Styles Questionnaire was used to examine functions of thinking styles. Hermans Standard Achievement Motivation Questionnaire was used to examine academic achievement motivation. Face and content validities of the questionnaires were also examined. Reliability of the questionnaires was examined by implementing a pilot study on 30 individuals with Cronbach's alpha. In the questionnaire of functions of thinking style, the Cronbach's alpha was obtained as 0.822 for legislative thinking style, as 0.890 for executive thinking styles, as 0.792 for judicial thinking styles. The alpha coefficient was estimated as 0.86 for achievement motivation questionnaire. In inferential statistics, Kolmogorov Smirnov Test, Pearson correlation coefficient, stepwise multiple regressions were used to analyze the collected data. The results showed the positive relationship of legislative, executive and judicial thinking styles with academic achievement motivation among students. In other words, the greater the legislative, executive and judicial thinking styles of the students, the greater their academic achievement motivation.

Keywords: *Thinking Styles, Academic Achievement Motivation, University Students*

INTRODUCTION

Thinking power is the main distinguishing feature of human life. All human successes and achievements depend on fruitful, dynamic and effective thoughts. Understanding learning-focused models related to thinking styles and motivation is a major advance in psychology in the twentieth century (Atkinson *et al.*, 1998). Many assumed poor students can be successful. One reason behind their failure may lie in the fact that we are incapable of understanding diversity of their thinking and learning styles. The teaching method used to teach these students may be incompatible with their thinking styles. From psychological perspective, it is essential to recognize thinking styles of students and understand the relationship between these styles and such factors as academic achievement, age, gender, etc.

People have different attributes, which are manifested in their different abilities, talents, preferences and eventually their thinking styles. These differences should be noted in order to properly direct people in their academic and occupational paths. Different individual thinking styles may be the most important issue that we should be aware of. Negligence of thinking styles in different situations may lead to negligence or elimination of the most important valuable talents as well as potential capitals.

Sternberg (1998) defined thinking style as the way an individual thinks. He believed that thinking style is not a capability but refers to the method an individual use his capabilities. Although people have similar capabilities, they do not share similar thinking styles (Seif, 2008). People with different thinking styles tend to use their abilities in different ways and react according to their thinking style. For this purpose, many assumingly poor-functioned students can act successfully in classrooms. In fact, the teachers are unaware of diversity of the students' thinking styles.

Psychologists have noted the necessity to pay attention to motivation in education due to effective relationship of this factor with new learning, skills, strategies and behaviors. Academic achievement

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motivation is one original structure proposed to explain motivation, which refers to those behaviors leading to learning and development (Yousefi *et al.*, 2009). Thinking Styles are effective variables in achievement motivation. One major problem in modern education lies in the method used to educate students and coordinate their thinking styles with complex and highly variable situations of current era and challengeable conditions of the future (Ghoorchian, 1999).

Understanding various thinking styles helps people to adjust their thoughts with different thinking styles and simultaneously succeed in communications. According to Attribution Theory, Viner (1960) stated that individual thought (understanding and interpretation) about causes of success and failure majorly determines achievement motivation but not immutable early life experiences (Seif, 2003).

Mac Clan believed that the individuals needing great achievement tend to display their personality traits (the individuals achieve great success due to their certain personality traits) (Staki *et al.*, 2010). Academic achievement is defined as dominance on theoretical knowledge in a certain field. In other words, academic achievement refers to the fact that how much learners have been successful in achieving objectives in a certain training period (Seif, 2003). Atkinson *et al.*, (1998) defined academic achievement as a learned or acquired capability in terms of offered courses. In other words, academic achievement is defined as individual learned or acquired capability in terms of scholastic issues, which are measured by standardized tests (Seif, 2005). Paying attention to psychological factors is one important factor in academic achievement. Academics studied the role of thinking styles in academic achievement in different cultures such as Hong Kong, China, Philippines, Spain and the United States (Zhang, 2004).

According to the information given in this section, some studies related to the research topic are mentioned:

Solgui (2011) investigated the relationship between thinking styles and academic achievement of students. The statistical population consisted of all students in Kermanshah Payame Nour University in 2009-2010 academic years among which 230 students (102 males and 128 females) with a mean age between 18 and 22 and a standard deviation as 1.72 were selected using cluster random sampling method. The questionnaires were distributed among the individuals. In this study, Sternberg Thinking Styles Questionnaire was used. All students frequently used the following thinking styles from the highest frequency to the lowest frequency: legislative, external, hierarchical, judicial, anarchic, liberal, executive, global, conservative, local, oligarchic, and internal and monopolist. Thinking styles of female students were as follows from the highest to the lowest frequency: legislative, external, judicial hierarchical, anarchic, conservative, executive, global, oligarchic, liberal, local, and internal and monopolist. Comparison of frequency of thinking styles showed that all the students had legislative thinking styles in terms of functioning had hierarchical thinking styles in terms of format, global thinking style in terms of thinking level, external thinking style in terms of scope, liberal thinking style in terms of tendency.

Kadivar *et al.*, (2010) investigated the relationship of thinking style and self-regulation with academic achievement motivation among student. For this purpose, a sample consisting of 200 secondary school students in 2009-2010 academic years were selected using multi-stage sampling method. The results showed that thinking style and self-regulation had a significant and positive relationship with academic achievement motivation. In addition, the results of multiple regressions showed that return of variance on achievement motivation scores was statistically significant in terms of three variables of executive, judicial and legislative thinking styles. In addition, the results showed significant relationship of thinking styles and self-regulation with academic achievement motivation.

Abolqasemi *et al.*, (2010) investigated the function of thinking styles and its relationship with academic achievement among the students majoring in Technical Engineering, Psychology and Educational Sciences in Tehran University. The former aimed to compare the function of thinking styles and its relationship with academic achievement among the students majoring in Technical Engineering, Psychology and Education Sciences in Tehran University. The findings were collected through Sternberg and Wagner Thinking Styles Questionnaire and a self-report academic achievement questionnaire. The obtained data was analyzed using such statistical methods as Pearson Correlation, multiple regression and independent t-test. The results showed that the students majoring in Psychology and Educational Sciences

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frequently used executive thinking style while the students majoring in Technical Engineering frequently used legislative thinking style. There was no statistical difference between the students in terms of judicial thinking style. In addition, executive thinking style among engineering students and legislative thinking style among Psychology and Educational Sciences students could significantly predict academic achievement. There was a significant difference between male and female students majoring in Technical Engineering in terms of executive and judicial thinking styles. Female students more frequently used executive thinking style than male students while male student more frequently used judicial thinking style than female students. Furthermore, male students majoring in psychology and educational sciences more frequently used legislative thinking style than female students.

Shokri *et al.*, (2006) investigated the relationship of thinking styles and approaches to learning with academic achievement of students. Thinking Styles and Study Process Questionnaires were implemented on 398 individuals (203 males and 195 females). Mean scores of the individuals were collected through university degrees to evaluate academic achievement of the students. The findings showed the positive and significant relationship of legislative, judicial, liberal, hierarchical, external thinking styles and deep learning approach with academic achievement. In addition, executive, local, conservative and oligarchic thinking styles had a positive and significant relationship with surface learning approach. Moreover, judicial, hierarchical executive and legislative thinking styles could significantly predict academic achievement of students.

Emami *et al.*, (2003) investigated thinking styles and their relationship with creativity and academic achievement in a developmental study. The statistical sample consisted of 810 students (500 students and 310 college students). The findings showed a significant relationship between thinking styles and academic achievement (GPA). A positive and significant relationship was found between judicial, executive, legislative, monarchic, hierarchical, anarchic, global, local, external and liberal thinking styles and academic achievement among students at 5% significance level. The results of stepwise regression analysis showed that liberal and hierarchical thinking styles could significantly predict high academic achievement among students and oligarchic thinking style could significantly predict low academic achievement among students.

Kim (2009) investigated the relationship of different thinking styles and career choice with high academic achievement among students. For this purpose, 209 high school students filled out the questionnaires related to thinking style and career choice. The findings showed that external thinking style properly predict choosing career in the fields of social sciences in future. However, the students with high external thinking style chose computer and mathematics compared to the students with low external thinking style. Furthermore, hierarchical thinking style could negatively predict academic achievement of students.

Tsagaris (2006) investigated the relationship of thinking style preferences, cultural orientation and academic achievement. For this purpose, 654 students completed the questionnaires of thinking styles and cultural orientation. In order to evaluate thinking styles, the 65-item Sternberg-Wagner Thinking Style Questionnaire was used. In order to assess cultural orientation, the 16-item Gilfand instrument was used. The results showed that hierarchical and monarchic thinking styles predict academic achievement among which hierarchical thinking style predict high academic achievement and monarchic thinking style predict low academic achievement.

Bernardo *et al.*, (2002) investigated the relationship of thinking styles and academic achievement among Filipino students. They wondered whether Sternberg self-government theory and non-Western cultures were applied or not. They implemented Sternberg-Wagner questionnaire on 429 Filipino students. Results of analysis of the correlation between thinking styles and GPA showed a significant correlation between thinking styles and academic achievement.

Cano-Garcia and Hughes (2000) examined the relationship of thinking and learning styles with academic achievement. For this purpose, 210 students filled out Sternberg Thinking Styles Questionnaire and Kolb Learning Styles Questionnaire. The results showed that academic achievement is correlated with learning styles. In addition, executive and internal thinking styles could positively predict academic achievement and legislative thinking could predict low academic achievement.

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Zhang and Sternberg (1998) conducted a study on 622 freshman students. The required data was collected from Sternberg Thinking Styles, university entrance test scores, self-analytical, creativity and practical ability tests. Multivariate regression analysis showed that thinking styles could predict academic achievement more than abilities. The results also showed that academic achievement has a positive relationship with analytical thinking styles among male students. On the other hand, academic achievement had a negative relationship with analytical and creative thinking styles among female students. In general, high academic achievement had a positive correlation with conservative, hierarchical, internal thinking styles while a negative correlation with legislative, liberal and external thinking styles.

Thinking styles and relevant effective factors should be studied given that students and college student constitute a vast majority of Iranian population and due to importance of thinking styles in education and learning and selection of an appropriate career compatible with thinking styles. According to what was mentioned earlier, this study sought to answer the following question: is there a relationship between thinking styles and academic achievement of master students majoring in different fields in Rasht Payame Nour University?

MATERIALS AND METHODS

This was a descriptive (survey) and applied study. The statistical population consisted of 7000 master students in Rasht Payame Nour University in 2013-2014 academic years. According to Morgan Table, 365 individuals were selected using relative stratified and simple random sampling method. Sternberg Thinking Style Questionnaire was used to assess thinking style functions.

The questionnaire consisted of 23 items, which measured legislative, executive and judicial thinking styles. The 17-item Hermanesh Standard Academic Motivation Questionnaire (revised) was used to assess academic achievement motivation. Content validity of the tools was also assessed. For this purpose, the experts familiar with subject matter were asked to judge about content validity of the questionnaire. In total, it was concluded that the questionnaire had acceptable content validity. Cronbach's alpha coefficient was used to assess reliability of the questionnaires. For this reason, a pilot study was conducted on 30 individuals using the thinking style functions questionnaire with Cronbach's alpha coefficient. The alpha was obtained as 0.822 for legislative thinking style function, as 0.890 for executive thinking style function, as 0.792 for judicial thinking style function. In addition, Cronbach's alpha coefficient was estimated as 0.86 for achievement motivation questionnaire. To analyze the data in inferential statistics, Kolmogorov Smirnov test, Pearson correlation and step-wise multiple regression were used.

RESULTS AND DISCUSSION

Results

The findings obtained from the first hypothesis: there is a significant relationship between legislative thinking style and academic achievement motivation among students.

Table 1 show that legislative thinking style is positively correlated with academic achievement motivation of students. In other words, the greater the legislative thinking styles of the students, the greater his academic achievement motivation.

The relationship between these two variables was statistically significant. The above hypothesis is confirmed since the observed significant level was less than 0.05 ($P < 0.05$, $r = 0.306$). In other words, there was a significant relationship between legislative thinking style and academic achievement motivation among students. In addition, the scatter plot is as follows.

Table 1: Pearson correlation coefficient for the relationship between legislative thinking style and academic achievement motivation among students

Variables	Students' academic motivation	Significance level
Legislative thinking style	0.306	0.001

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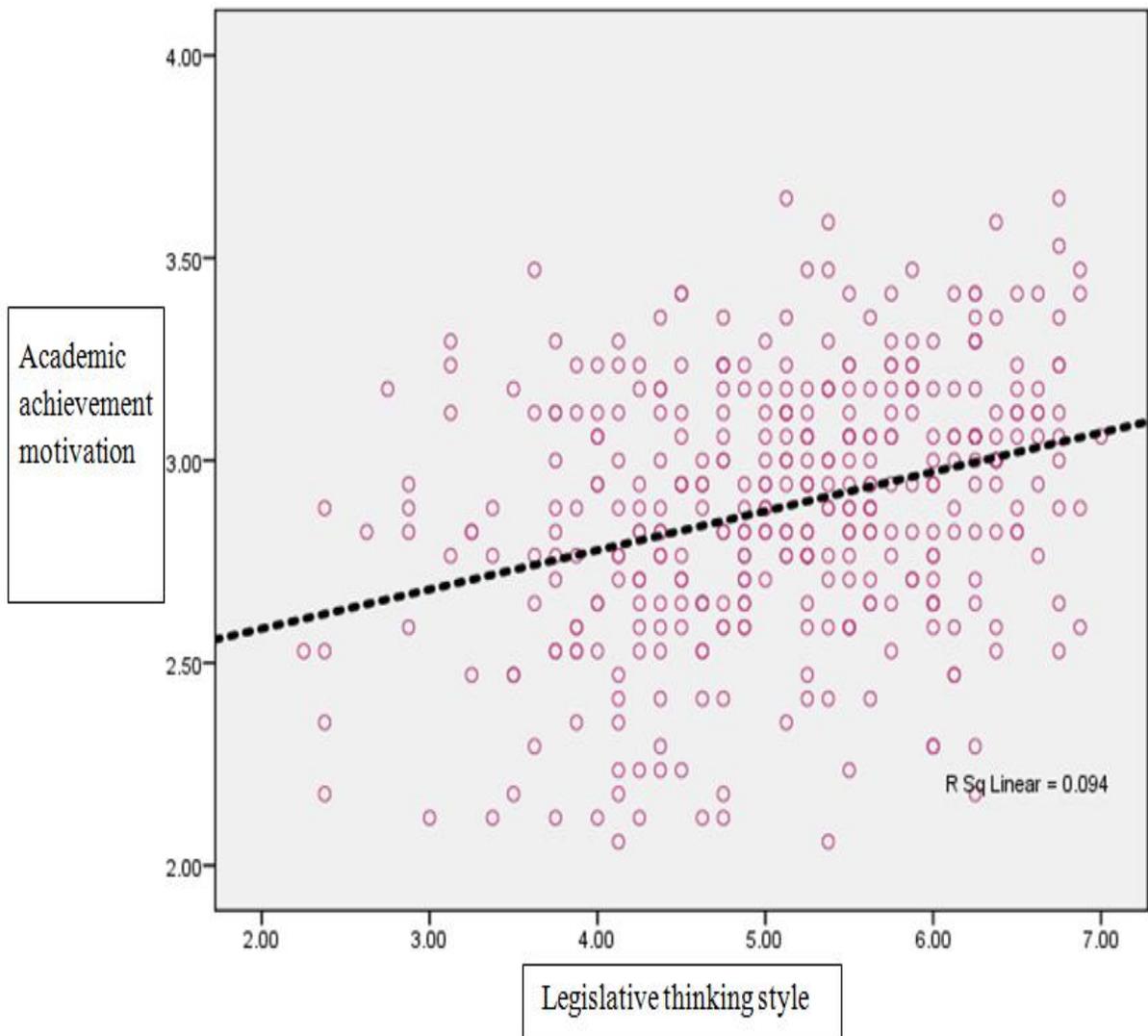


Figure 1: The relationship between legislative thinking style and academic achievement motivation of students

Findings of the second hypothesis: there is a significant relationship executive thinking style and academic achievement motivation of students.

The above table shows a positive relationship between executive thinking style and academic achievement motivation of students. In other words, the greater the executive thinking style of the students, the greater his academic achievement motivation. The relationship was statistically significant. The above hypothesis is confirmed because the observed significant level was less than 0.05 ($P < 0.05$, $r = 0.298$). Therefore, the hypothesis was confirmed. In other words, there was a significant relationship between executive thinking style and academic achievement motivation of students. The scatter plot is as follows.

Table 2: Pearson correlation coefficient for the relationship between executive thinking style and academic achievement motivation of students

Variables	Students' motivation	achievement	Significance level
Executive thinking style	0.298		0.001

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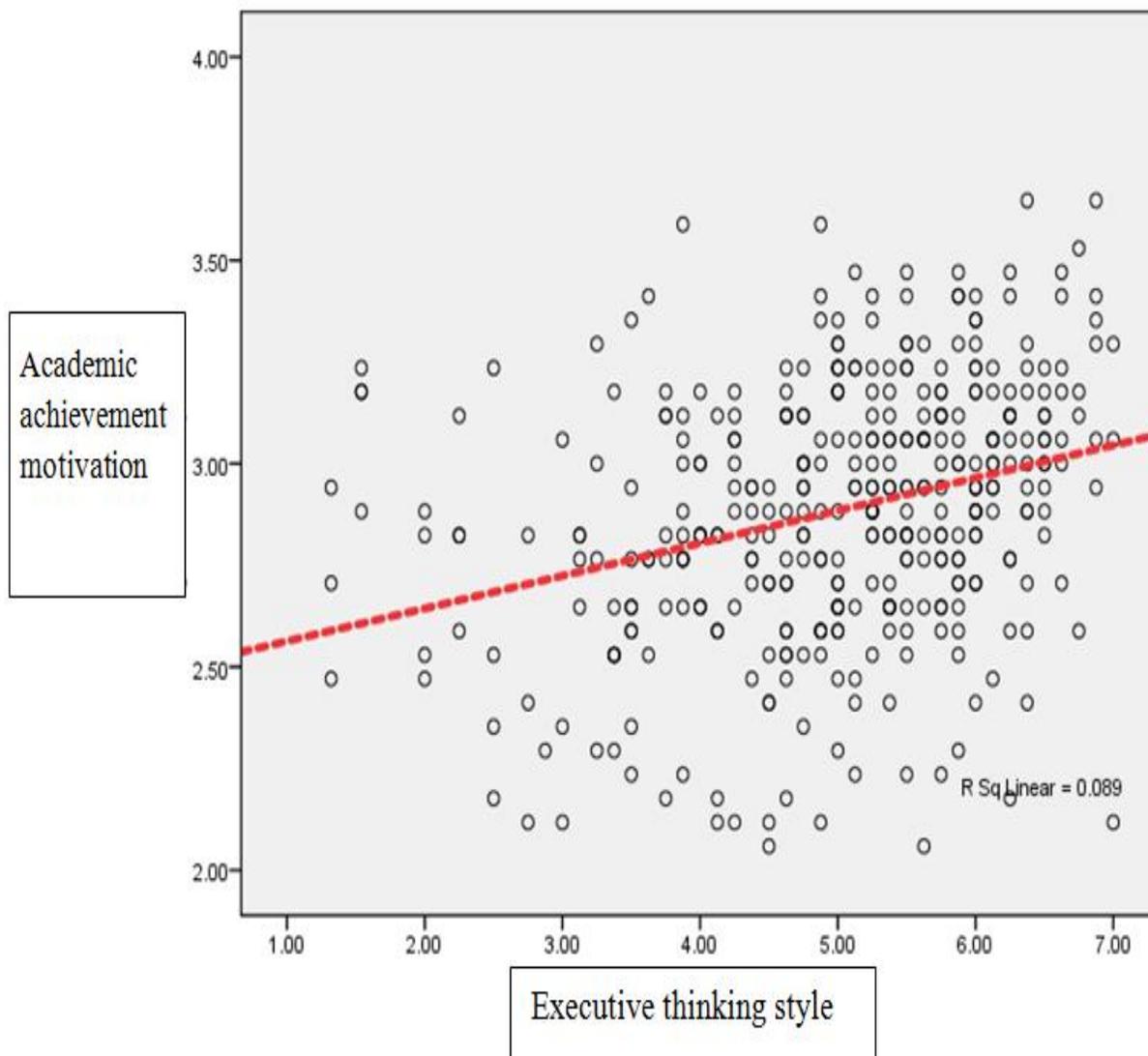


Figure 2: The relationship between executive thinking style and academic achievement motivation of students

Findings from the third hypothesis: there is a significant relationship between judicial thinking style and academic achievement motivation of students.

The above table shows a positive relationship between judicial thinking style and academic achievement motivation of students. In other words, the greater the judicial thinking style of the student, the greater his academic achievement motivation. This relationship was statistically significant. The hypothesis was confirmed because the observed significant level was less than 0.05 ($P < 0.05$, $r = 0.239$). In other words, there was a significant relationship between judicial thinking style and academic achievement motivation of students. The scatter plot is as follows.

Table 3: Pearson correlation coefficient for the relationship between judicial thinking style and academic achievement motivation of students

Variables	Students' motivation	achievement	Significance level
Judicial thinking style	0.239		0.001

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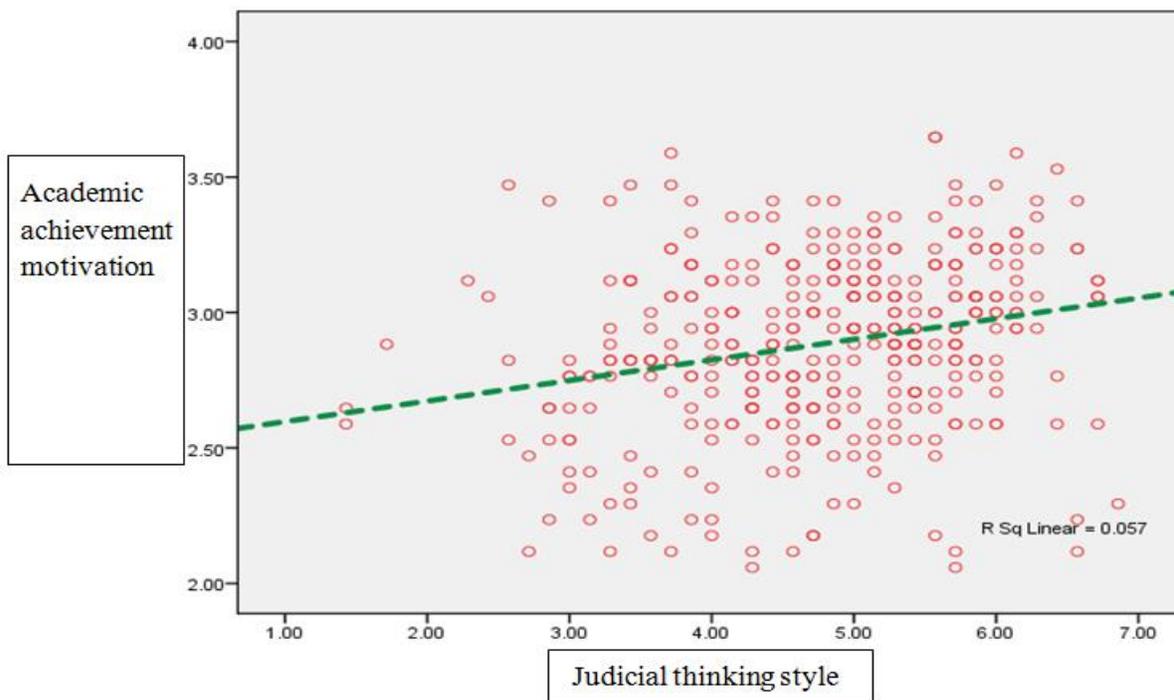


Figure 3: The relationship between judicial thinking style and academic achievement motivation of students

Findings of the fourth hypothesis: attitudes of students Rasht Payame Nour University towards the relationship of functions of thinking styles with achievement motivation based on different field of studies

The above table shows high correlation between legislative thinking style and achievement motivation while low correlation between judicial thinking style and achievement motivation among students in Agriculture and Natural Resources, Technical Engineering and Humanities. In addition, there was a high correlation between executive thinking style and achievement motivation while low correlation between judicial thinking style and achievement motivation among students majoring in art and architecture and basic sciences.

Table 4: Pearson correlation coefficient for the relationship between functions of thinking styles and achievement motivation in different fields

Field of study	Number	Legislative thought and achievement motivation	Legislative thought and achievement motivation	Judicial thought and achievement motivation
Technical Engineering	63	0.286*	0.233	0.072
Basic Sciences	43	0.318*	0.332*	0.238
Humanities	204	0.338**	0.325**	0.298**
Agriculture and Natural Resources	18	0.707**	0.423	0.360
Art and Architecture	47	0.010	0.110	0.094

**Correlation is significant at 0.01 level (two-tailed); *Correlation is significant at 0.05 level (two-tailed)

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Findings of the fifth hypothesis: components of thinking styles can predict academic achievement motivation in students.

To analyze the above hypothesis, Pearson correlation coefficient for the relationship between components of thinking styles should be initially checked. If there was a significant relationship between these components, stepwise multivariate regression would be used.

The above table shows Pearson correlation coefficients of the relationship between thinking style components. The coefficient was obtained as 0.296 for the relationship between judicial and legislative thinking styles, as 0.480 for the relationship between executive and legislative thinking styles. Then, all relationships were significant. Then, stepwise multivariate regression analysis can be used to examine the above hypothesis. Only legislative and executive thinking styles could be included in the equation. Legislative thinking style was effective in academic achievement motivation up to 9.4%. Executive thinking style was effective in academic achievement motivation up to 3.7%. Both legislative and executive thinking styles were effective in academic achievement motivation up to 13.1%. Results of analysis of variance of sum of squares from regression are shown in the following table.

Table 5: Pearson correlation coefficient for the relationship between components of thinking styles

Variables	Legislative thinking style	Executive thinking style	Judicial thinking style
Legislative thinking style	1	0.392**	0.296**
Executive thinking style		1	0.480**
Judicial thinking style			1

Table 6: Analysis of variance of sum of squares from regression

Effects	Sum of squares	Degree of freedom	Mean squares	F	Significance level
Regression	5.087	2	2.544	28.083	0.001
Remaining	33.694	372	0.091		
Total	38.781	374			

$P < 0.001$ and $F(2, 372) = 28.083$ in analysis of sum of squares in regression analysis. Therefore, the relationship of executive and legislative thinking styles with academic achievement motivation was significant among students (significance level was significantly less than 0.05). The following table shows the results of regression analysis.

Table 7: Regression analysis of the effect of executive and legislative thinking styles on academic achievement motivation

Variable	B	Std. Error	Beta	T	Significance level
Fixed	2.24	0.088		25.552	0.001
Legislative thinking style	0.071	0.017	0.224	4.259	0.001
Executive thinking style	0.057	0.014	0.210	4.004	0.001

The above table shows the prediction equation as follows:

$$\text{Academic achievement motivation of students} = (\text{executive thinking}) 0.057 + (\text{legislative thinking}) 0.071 + 2.24$$

Regression analysis showed that legislative and executive thinking styles can positively predict academic achievement motivation of students. Judicial thinking style had no significant impact on academic achievement motivation of students.

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Discussion and Conclusion

People have different attributes, which are manifested in their abilities, talents, preferences and eventually their thinking styles. The people are led to the rights paths in their career and education by taking into account these differences. Different individual thinking styles should be identified. Teaching methods and curricula can be adapted with students' needs in universities by understanding different individual thinking styles. As a result, many students can take advantage of their maximum potential and obtain high grades in their courses. These findings are consistent with those obtained by Solgui (2011), Kadivar *et al.*, (2011), Abolghasem *et al.*, (2010), Shokri *et al.*, (2006), Emami *et al.*, (2001), Kim (2009), Tsagaris (2006), Bernardo *et al.*, (2002), Cano-Garcia and Hughes (2000), Zhang and Sternberg (1998).

Recommendations

The results of present study showed a significant relationship between legislative, executive and judicial thinking styles and academic achievement motivation of students. Following recommendations are offered based on study findings:

- Nurturing and strengthening achievement motivation properly energize and orient behaviors, interests and needs of individuals in terms of certain and valuable goals. Thinking styles are educable, can be enhanced and are correlated with achievement motivation of students. Thus, it is recommended that both students and professors be given the necessary training in terms of different thinking styles. As a result, achievement motivation can be developed through learning different thinking styles.
- According to Sternberg's theory, there is no eternal proper thinking style. In other words, thinking styles just refer to individual preferred styles in using their abilities. Therefore, university authorities and professors should provide an environment consistent with the students' thinking styles, so that that the student can attain successful academic achievement.
- It is recommended that university officials and professors guide the students in various subjects at academic centers based on thinking styles of students. Following cases can be cited in this regard:
- The students with legislative thinking style prefer preplanned creative activities such as writing articles, designing projects and planning new training activities. These are mostly successful. Then, these students are encouraged to use and strengthen their legislative thinking styles.
- The students with executive thinking styles prefer tasks given to them by other people. These are the so-called man of action. They generally like to implement laws such as writing articles that reflect views of others, especially the professors, solve problems raised by others and follow others' rules in performing different tasks. They generally tend to take guidelines on what they are supposed to do and how they should do it. Therefore, these students should be given the necessary guidance for academic achievement.
- The students with judicial thinking styles prefer issues requiring analysis and evaluation of ideas and affairs. After giving the students the necessary training, officials and professors should evaluate the tasks performed by these student and give them the necessary guidance, so that the students can attain academic achievement.

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