



## A study of the relationship between the thinking styles of the vocational schools' students and their academic performance

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### ABSTRACT

This study aimed at investigating the relationship between the legislative, executive and judicial thinking styles of the vocational schools' students and their academic performance. This is an applied research and both qualitative and quantitative methods were used. A sample of 250 students, 125 girls and 125 boys, were selected through simple random sampling from among the sophomore students of the vocational schools in Ilam province, Iran, in the academic year 2009-2010. To analyze the data, descriptive statistics, Pearson product-moment correlation coefficient and multivariable regression were used. The findings revealed that the students who possessed executive thinking style obeyed and performed the orders in terms of practical thought. However; these students got lower grades compared to other students in specified courses such as mathematics, fundamentals of IT and computer programming. The students who possessed judicial thinking style got better grades compared to other students in terms of practical thought and academic progression in the specified courses. These thinking styles (legislative, executive, and judicial thinking styles) had the potential to predict the standard variable and this potentiality was 0/05 for the executive thinking style and 0/01 for judicial and legislative thinking styles. As for the students who possessed legislative thinking style there was a significant relation between their academic performance and their thinking style. Furthermore, the correlation coefficient of girls and boys was not significant in terms of gender. Analysis of different thinking styles showed that there was a linear relationship between the standard variable (the students' performance) and predicting variables (legislative, executive and judicial thinking style).

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### Introduction

Technically speaking, stylistics is a method through which an individual processes the data and this terminology was coined by the psychologists who did research on sensory and movement abilities (Sternberg, 1997: 191). The word 'thought' means thinking, imagining, believing and reflecting. Therefore, thinking style means way of thinking and reflecting. Although there is disagreement among the theorists as to the thinking styles, there is a general consensus among them about the fact that each individual uses a fixed and different method to decode, store and process the data in the mind and this method is independent from the intelligence (Atkinson, 2002: 183-194). On the one hand, in view of biology, personality, performance and so on, the concept of thinking style is a small scale and psychologically oriented (Skidmore, 1979: 97), but on the other, the concepts of thinking styles got social and cultural aspect through the development of science and technology, and it imposed its features on sociology on a large scale. Identification of the students' thinking styles and perception of their relations to the factors like academic performance are of paramount importance in terms of socio-psychology, not just in terms of psychology which was common until now. According to Robert Sternberg (1997), thinking styles are the ways used by the individuals to process the data. Thinking style is not an ability, but it is concerned with how an individual uses his abilities. Two individuals with the same abilities may have different thinking styles and different styles are neither good nor bad, but they are

just different from each other. According to Sternberg (1997), there are thirteen major thinking styles in the framework of self-management theory which include legislative, executive, judicial, local, global, liberal, conservative, monarchic, anarchic, oligarchic, hierarchial, internal and external thinking styles and each of them has specific features and definitions. Sternberg's self-management theory is based on the hypothesis that all the governments in the world have not come into existence accidentally, but they are the external reflections of the processes occurring in the individuals' mind. Since man governs and controls others by different styles and different governments, he can control himself and his behaviours, and others like the cities, provinces and countries need to be controlled (Castells, 1989: 365-367). One of the main issues of education in the current century is how to educate the students, so that their thinking style is proportion to and consistent with the problematic and challenging situations of our modern world. Some experts believed that human being can deal with his problems in the life, if he uses his thinking styles properly and coordinate them with his capacities. Sternberg and Grigorenko (1998) believed that the study and identification of thinking styles are helpful and necessary to predict educational successes and occupational choices. Therefore, this study made an attempt to investigate the thinking styles of the vocational schools' students in Ilam Province, Iran, and based on this it sought to get the relationship between the thinking styles and the academic achievement. The findings of this study will provide a useful for

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the officials to improve the academic performance of the students through considering the appropriate thinking styles.

### Objective of the Study

#### Main objective

The main objective of this study is to investigate the relationship between the thinking styles ( executive and judicial thinking styles) of the vocational schools' students and their academic performance .The academic performance of the students in specific courses of the field of Information Technology(IT) including fundamentals of IT, Mathematics ,and computer programming were considered.

#### Secondary objectives

1. Investigation of the relationship between the executive thinking style and the students' academic performance in the abovementioned specified courses.
2. Investigation of the relationship between the judicial thinking style and the students' academic performance in the abovementioned specified courses.
3. Investigation of the relationship between legislative thinking style and the students' academic performances in the abovementioned specified courses.
4. Investigation of the effect of gender on the relationship between the students' thinking styles and their academic performance in the abovementioned specified courses.

### Hypothesis of the study

#### Main hypothesis

There is a significant relationship between the students' thinking styles and their academic performance in the specified courses of information technology (IT) such as fundamentals of IT, Mathematics and computer programming.

#### Secondary hypotheses

1. There is a significant relationship between the students' executive thinking style and their academic performance in the specified courses of information technology (IT) such as fundamentals of IT, Mathematics and computer programming .
2. There is a significant relationship between the students' judicial thinking style and their academic performance in the abovementioned specified courses.
3. There is a significant relationship between the students' legislative thinking style and their academic performance in the abovementioned specified courses.
4. There is a significant relationship between the girl and boy students' thinking styles and their academic performance in the abovementioned specified courses. In other words, gender has a role in the relationship between the students' thinking styles and their academic performance.

### Methodology of research

#### Type of research

This study is an applied research, because it investigated and analyzed the usage of thinking styles in the process of learning and teaching. It is also a mixed research, because both qualitative and quantitative methods were used. This study is a descriptive and correlational research ,because the data are not manipulated and they are represented as they naturally existed.

#### Population, Sampling method and Sample

Population of the study incorporated all sophomore girl and boy students of Vocational schools in Ilam Province ,Iran in the academic year 2009-2010. Genarally speaking, population of the study consists of 2000 students and a sample of 250 students ,125 girls and 125 boys, were selected through simple random sampling as the subjects of the study.

#### Data collection tools

To collect the data, the researchers got the required permit and went to the chosen schools for two weeks. To measure the

students' thinking styles, Sternberg's questionnaire was used(1998).This questionnaire includes 24 items focusing on three kinds of the students' thinking styles ,and the students should have answered the questions in 15 minutes. To answer the questions, the students should have read the statements related to each thinking styles and score each of them on a scale of 7 to 1.If the statement was compatible with the students' characteristics, they should have given the score 7 , and if the statement was not compatible with the students' characteristics, they should have given the score 1.Other statements can get different scores on a range from 7 to 1.Having answered sterberg's questionnaire, students took an exam made by the teacher in the specified courses, fundamentals of IT, Mathematics and computer programming, so that the researchers can measure the students' knowledge. Also, to make the students to give serious consideration to the exam, the teacher told the students that he would grade the exam and these grades would have an effect on their final exam.

#### Analysis of the data

When it came to the analysis of the obtained data, descriptive statistics methods, Pearson correlation coefficient, and multivariable regression were used.

### Results of the research

**Table 1.Descriptive indices related to the four score variables in the two groups of boys and girls**

Statistical indices variables	Number	The lowest	The highest	Mean	Standard deviation
Scores of the specified courses	250	6	28	16.83	3.91
Scores of the executive thinking style	250	2	6.80	4.87	1.07
Scores of the judicial thinking style	250	1.30	6.70	4.83	1.13
Scores of the legislative thinking style	250	3	7	5.72	0.82

Table 1 shows that the lowest grade in the exams was 6 ,and the highest grade was 28 out of 30, and the mean of the grades was 16.83.Table 1 also shows that the lowest score is for the judicial thinking style and the highest score is for the legislative thinking style.

**Table 2.Correlation coefficient between the executive thinking style and academic performance**

Variables	Correlation coefficient	Subjects	Level of significance
Executive thinking style and the degree of the students' academic performance in the specific courses	-0.13	250	0.05

Table 2 shows that the correlation coefficient between executive thinking style and the degree of the students' academic performance is -0.13, and that there is a negative

correlation between these variables when the level of significance is 0.05. It can be said with 0.65 percent of assurance that there is a negative and significant relationship between the executing thinking style and the degree of students' academic performance. It means that if the scores in executive thinking style increase, the degree of students' academic performance in the specified courses will decrease. The findings of this hypothesis are the same as the findings revealed in the studies conducted by Zhang (2002), Zhang and Sternberg (2000), and Sternberg and Grigorenko (1998)

**Table 3. Correlation coefficient between the judicial thinking style and academic performance**

Variables	Correlation coefficient	Subjects	Level of significance
Judicial thinking style and the degree of students' academic performance	0.17	250	0.01

Table 3 shows that the correlation coefficient between the judicial thinking style and the degree of the students academic performance is 0.17, and there is a positive correlation between these variables when the level of significance is 0.01. Therefore, it can be said with 0.99 percent of assurance that there is a positive and significant relationship between the judicial thinking style and the degree of the students' academic performance. It means that if the scores in the judicial thinking style increase, the degree of the students' academic performance will also increase. The findings of this hypothesis are the same as the findings of the studies conducted by Yu-Chn Yeh (2000), Zhang (2000), Barkhordarpour (1999), Farokhi (2004), Rajabi (2005), and Falahat (2004).

**Table 4. Correlation coefficient between the legislative thinking style and academic performance**

Variables	Correlation Coefficient	Subjects	Level of significance
Legislative thinking style and the degree of the students' academic performance	0.47	250	0.01

Table 4 shows that the correlation coefficient between legislative thinking style and the amount of students' academic performance is 0.47 and there is positive correlation between these variables when the level of significance is 0.01. Therefore, it can be said with 0.99 percent of assurance that there is a positive and significant relationship between legislative thinking style and the amount of students' academic performance. The findings of this hypothesis is the same as the findings revealed in the studies conducted by Zhang (1999), Farokhi (2003), Rajabi (2005) and Falahat (2005).

Table 5 shows that multivariable correlation (R and R<sup>2</sup>) is existed between the four variables of executive, judicial and legislative thinking styles and the degree of students' academic performance in two groups of boys and girls. Studies conducted on the relationship between the thinking styles and personalities made it clear that gender and other factors play an important role in the thinking style. Zhang and Sternberg (2001) found out that gender and cultural differences played an important role in the relationship between the thinking styles and academic progression. Also in a research conducted by Jahanshahi (2005), he found out that there wasn't a significant relationship between gender and legislative and liberal thinking

styles, but there was significant relationship between gender and judicial, executive, global, local, and conservative thinking styles. In a study conducted by Razavi and Shiri (2005) on the relationship between girl and boy students' thinking styles and their academic progression, they found out that the girls had a liberal view and their academic progression was better than the boys'.

**Table 5. Multivariable correlation (R, R<sup>2</sup>) for the four variables in two groups of boys and girls**

Statistical indices variables and gender	R	R <sup>2</sup>
Relationship between the executive, judicial and legislative thinking style and the degree of boy students' academic performance	0.40	0.16
Relationship between the executive, judicial and legislative thinking style and the degree of girl students' academic performance	0.53	0.28

Therefore, based on the results of the study it can be said that there was a correlation between the variables in terms of the gender. However, since Z equals to 1.29, it should be said with 99 percent of assurance that the correlation between the variables in terms of the gender was not significant.

$$z = \frac{Zr_1 - Zr_2}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}} = \frac{\frac{0}{590} - \frac{0}{424}}{\sqrt{\frac{1}{125 - 3} + \frac{1}{125 - 3}}} = \frac{1}{29}$$

**Conclusion and Discussion**

This study showed that there was a negative and significant relationship between the executing thinking style and the degree of students' academic performance, that there was a positive and significant relationship between judicial thinking style and the amount of students' academic performance, and that there was a positive and significant relationship between the legislative thinking style and the degree of students' academic performance. Furthermore, the study revealed that gender could have an effect on the thinking styles, so gender can have a role in the relationship between the thinking styles and the degree of academic performance; however, the results show that the role of gender in the relationship between the thinking styles and the degree of the academic performance was not significant. Results of the analysis of multivariable regression also showed that there was a significant relationship between executive, judicial and legislative thinking styles and the criterion variable. The variables including executive, judicial and legislative thinking styles had the potential to predict the standard variable. The findings of this study is the same as the findings of studies conducted by Sternberg and Grinkorenko (1998), Emamipour (2001), Zhang and Sternberg (2001), Zhang (2000), Ti-Fang (2001) and Sternberg (1998). Also Zhang and Sternberg reported a collection of studies which were conducted in China, Hong-Kong and the USA. The findings of these studies showed that the data consequent on thinking styles can predict the education progression. Generally speaking, based on the results, some propositions can be provided which are as follows:

1. The Iranian educational system should not just focus on the abilities of the students in the process of students' learning, but it should also focus on teaching the students how to use their abilities in the process of learning. As Sternberg (1997) believed how to use the ability is as important as the abilities themselves,

and perhaps how to use an ability may be more important than the ability itself.

2. Since the thinking styles had an important role in teaching and assessing, it is necessary on the part of teachers to be aware of their own thinking styles and their students thinking styles.

3. Before any process of teaching ,the teachers should consider their students' thinking styles , if they want their students to progress academically. Furthermore, the teachers should remove their teaching problems by considering their students' thinking styles.

4. Some in-service programs should be hold for the teachers , so that they can learn how to become aware of their students' thinking styles.

5.The researchers can investigate the relationship between the thinking styles and the amount of educational materials considering the factors such as culture, parents' education , small scale ethical, local cultures and so on.

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