

Investigating the Simple and Multiple Relationship between Learning Styles and Preferred Teaching Methods by High School Students in the City of Isfahan

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Abstract

The present study was aimed to investigate the relationship between learning styles and preferred teaching methods by high school students in the city of Isfahan. The study is a descriptive-correlational research. The statistical population of this study includes 86142 male and female students of high schools in the city of Isfahan in 2010-2011 academic years. A sample of 79 female students and 71 male ones has been selected from this population through multi-stages cluster sampling. In order to collect the research data and measure the research variables (learning styles and teaching methods), the standardized questionnaire of Reid (learning styles) and a self-administrated questionnaire of teaching methods have been employed. The results of this study revealed that there is significant multiple correlations between learning style and preferred teaching methods ($r: 0.039$). Based on the results of this study, it was revealed that there is not any significant relationship between individual learning style and students' preferred teaching methods. Another part of the results showed that there is not any significant relationship between collective learning style and students' preferred teaching methods. Finally, a significant relationship has been observed between project learning style and students' preferred teaching methods.

1. Introduction

Each educational effort results in learning. In order to learn content, it is necessary that the learner involves in the educational content and teaching process. The results of different studies revealed that the individual differences of students play an important role in the process of teaching and learning. Indeed, individual differences of learners include learning styles, learning policies, learning capability, age, gender, culture, and so on. It seems that learning style is the most important factor which influences learners' performance in the process of learning. Generally, learning style can be defined as a combination of learner's motivation and information processing in times of involving in learning process (Akdemir, 2007). Hunt believes that learning style refers to how does learning works? Not its quiddity. On the other hand, Dunn and Griggs point out that learning style is a set of biological characteristics which make teaching method a pleasant phenomenon for some ones and an unpleasant phenomenon for others (Nejati, 2010). The importance of training is recognized in the process of learning management. Learners respond teaching policies in different manners. In other words, similar policies may be accepted or rejected by different learners. Indeed, preferring a learning style shows a person's individual interest in selecting learning style (Wintergerst et al., 2003).

Unfortunately, the students' perception of learning, learning styles preference, and learning policies is ignored as a part of educational process. On the other hand, individual approaches to learning can be more important than a set of teaching policies. Indeed, the report of the students' person-by-person learning style is a valuable wealth for teachers about students' actual needs and abilities (Prashing, 2002). This is why that teachers' awareness of students' learning styles help them in training them learning methods rather than transition of information and knowledge. O'Brien (1989) claimed that teachers have to spend more time on helping their students in informing learning styles. The reason is that students need to know how to learn educational contents. On the other hand, the students should learn to improve their learning experience across their life time. The study of teaching methods effectiveness was done by researchers for more than 50 years. The use of different teaching and learning methods promotes learning, improve performance, and develop effective learning approaches. Therefore, teachers have to adapt their teaching methods with students' learning styles.

It is a widely-accepted sentence that everyone can learn, if he/she learn his/her learning method. As a result, it is the function of every teacher to use the educational methods which are consistent with students' learning styles,

personality traits, and their skills in learning process (Prashing, 2002). Obviously, inconsistency between learning styles and teaching methods defects learning process (Lovelace, 2005). In addition, lack of attention to students' expectations and preferences results in the ineffective learning styles in students (William, 2007). The teachers who employ diversified educational policies will be able to produce more knowledge in their students (Khosravi, 2007). Unfortunately, this issue is ignored in classrooms. The result is inconsistency between learning styles and teaching methods. It can be said that recognition of learning styles requires applying teaching methods in training process.

The results of different studies revealed that recognizing students' learning style and developing educational structure based on the learning styles can be helpful in more effective learning. On the other hand, such learning styles can be helpful in times of problems and it can be a good guidance in solving such problems and difficulties (Claxton, 1998). For example, Najafi Kiani et al. (2009) compared the learning styles and students' preferred teaching methods in Fasa University of Medical Sciences. They found that the dominated learning style of students is convergent and attractive styles. Based on their findings, the preferred teaching method of students is collective discussion. Also they indicated that there is a significant relationship between academic field and learning style.

Smith and Riding (1999) study the cognitive style and educational preferences. Their findings revealed that the holistic-analytical style influences preference of collaboration methods (such role-playing and group discussion) and preference of non-print media (such as video and slide show) significantly. On the other hand, styles and gender were found as the effective factors on preference of evaluation methods (individual and group homework and short-answer and multi-choice questions).

With regard to this fact that teaching style influences success of educational processes and there is not any teaching method which can be appropriate in all times and all conditions, it is necessary to adapt teaching methods with learners' cognitive styles (Azadi, 2008).

The review of literature revealed that learning style is the research subject of many researchers in both Iran and other countries. But it should be remembered that different categorizations of learning styles have been presented by these researcher. This has been focused by Reid. Reid categorized learning styles in new form and believed that individuals have different directions in learning. This is why that he grouped learning styles into three sets including individual, collective, and project styles. On the other hand, teaching methods can be categorized in two groups including active and inactive methods. The present study was aimed to investigate the relationship between learning styles (individual, collective, and project styles) and preferred teaching methods by students (active and inactive methods). For this purpose, the following hypotheses have been developed.

- There is a significant relationship between individual learning style and preferred teaching methods by students.
- There is a significant relationship between collective learning style and preferred teaching methods by students.
- There is a significant relationship between project learning style and preferred teaching methods by students.
- There is a significant relationship between combination of learning styles and preferred teaching methods by students.

2. Research methodology

The present study is a descriptive-correlational research. Generally, descriptive study is a set of methods by which the author seeks to describe the existing conditions of under study phenomenon (Sarmad et al., 2005). On the other hand, correlational study is a research by which the author attempts to investigate the relationship between research variables (Gall et al., 2005). The authors of his have attempted to describe the existing conditions of research variables and also investigate their relationships.

2.1. Statistical population and sample

The statistical population of this study includes 86142 male and female students of high schools in the city of Isfahan in 2010-2011 academic years. A sample of 79 (52.7%) female students and 71(43.3%) male ones has

been selected from this population through multi-stages culture sampling. In order to calculate the sample size, the following formula has been used (Sharifi and Sharifi, 2007).

$$n = \left(\frac{N \times Z^2 \frac{\alpha}{2} \times \sigma^2}{\epsilon^2 (N - 1) + Z^2 \frac{\alpha}{2} \times \sigma^2} \right)$$

2.2. Data-collection tools

In order to collect the research data, the following questionnaires have been used.

- Reid Standard questionnaire of learning styles

In order to measure the respondents' awareness of learning styles, Reid Standard questionnaire of learning styles of has been used. This questionnaire consists of 23 items by which the authors can measure students' individual, collective, and project directions. Every item consists of 4 options in which 1 refers to almost, 2 refers to usually, 3 refers to rarely, and 4 refers to never. The respondents should select one of the options in every question. The reliability and validity of the questionnaire have been examined and verified by Wintergrest and DeCapua (2005) and Itzen (2001). The construct validity has been measured through exploratory factor analysis which has explained 0.69 variance of learning styles. In order to investigate the reliability of the questionnaire, Cronbachs' Alpha Coefficient has been used. The coefficient was 0.85 for collective learning style, 0.77 for individual learning style, and 0.65 for project learning style. Since the questionnaire has not been employed in past times in Iran, it is necessary to modify and internalize it based on our culture. In order to investigate the reliability of the questionnaire, Cronbachs' Alpha Coefficient has been used. The primary coefficient was 0.7 and the final coefficient was 0.68. On the other hand, content validity has been used for examining validity of the questionnaire and also it has been modified and reviewed by 5 experts.

- The questionnaire of teaching methods

In order to collect the data about respondents' preferred teaching methods, a self-administrated questionnaire of teaching methods has been used. The questionnaire consists of 26 items. Each item consists of 10 options by which the authors can measure the respondents' active or inactive teaching methods. In order to measure the validity of the questionnaire, contents validity has been used. For this purpose, the questionnaire has been reviewed and modified by 5 experts. In order to examine reliability of the questionnaire, Cronbachs' Alpha Coefficient has been employed. The primary coefficient was 0.93 among 30 respondents and its final coefficient was 0.94.

2.3. Data analysis

In order to analyze the research data and test the research hypotheses (investigating the relationship between learning styles and preferred teaching methods by students), Pearson correlation coefficient has been used.

3. Findings

As indicated in the past sections, the first, second, and third hypotheses of this study claims that:

There is a significant relationship between individual learning style and preferred teaching methods by students.

There is a significant relationship between collective learning style and preferred teaching methods by students.

There is a significant relationship between project learning style and preferred teaching methods by students.

Table 1: the results of Pearson correlation coefficient between research variables

Variables	Pearson correlation coefficient	Sig
Individual learning style	0.137	0.094
Collective learning style	0.140	0.088
Project learning style	0.385**	0.0005

As the results of table revealed, there is a significant relationship between individual learning style and preferred teaching methods by students ($p \geq 0.05$). In other words, the students with individual learning style preferred inactive teaching method. As the results of table revealed, there is a significant relationship between collective learning style and preferred teaching methods by students ($p \geq 0.05$). In other words, the students with collective learning style preferred inactive teaching method. Another part of the results of table 1 revealed that there is a significant relationship between project learning style and preferred teaching methods by students ($p \leq 0.05$). In other words, the students with individual learning style preferred active teaching method.

The fourth hypothesis of this study indicates that there is a significant relationship between combination of learning styles and preferred teaching methods by students. In order to test the hypothesis, multiple regression method has been used. In this method, three learning styles (including individual, collective, and project styles) are considered as independent variable and teaching method is considered as dependent variable.

Table 2: the results of regression method

Model	Multiple correlation coefficient	Coefficient of determination	Adjusted coefficient of determination
1	0.391	0.153	0.136

Multiple correlation coefficients, coefficient of determination, adjusted coefficient of determination have been presented in table 2. The multiple correlation coefficient was 0.391. The coefficient of determination was 0.153 and the adjusted coefficient of determination was 0.136. This means that about 15.3% of the dependent variable variations (preferred teaching method) can be explained by independent variable (learning styles).

Table 3: the results of regression model

Sources of changes	Sum of squares	df	Sum of squares average	F	P
1	67.611	3	22.537	8.806	$p \leq 0.0005$
	373.644	146	2.559		
	441.255	149			

Predictor (fixed value): individual, collective, and project learning projects.

Dependent variable: preferred teaching methods

As the results of table revealed, the preferred teaching method can be predicted through individual, collective, and project learning projects. In other words, it can be said that the relationship between preferred teaching methods and learning styles is significant.

Table 4: the role of independent variables in predicting dependent variable

	Unstandardized coefficient		Standard coefficient t	T	Sig
	B	Standard error			
Fixed value	4.119	0.787	-	5.237	$p \leq 0.0005$
Project learning style	0.127	0.029	0.364	4.420	$p \leq 0.0005$
Collective learning style	0.015	0.053	0.023	0.286	0.775
Individual learning style	0.040	0.044	0.071	0.909	0.365

Table 4 reveals unstandardized coefficients, standard errors, standardized coefficients of Beta, t-value, and significance level. Because significance level is less than 0.05, it can be said that the regression model is significant. Also all of the variables remain in the model and none of them does not eliminated from model. Based on the results of table 4, project learning style influences teaching methods significantly. As a result, the following formula can be developed.

Preferred teaching methods by students: $4.119 + 0.127$ (project learning style)

Based on the regression model, it can be said that there is a significant relationship between project learning style and preferred teaching methods by students. This means that change in project learning style results in 0.364 changes in preferred teaching methods by students.

4. Discussion and conclusion

Based on the results of this study that have been presented in table 1, it can be said that there is not any significant relationship between individual learning style and preferred teaching methods by students. Another part of the results showed that there is not any significant relationship between collective learning style and preferred teaching methods by students. It is necessary that students' learning styles be considered in implementation and application of teaching methods. This means that teaching methods should be selected in accordance with their learning style. Individual learning style refers to the situation in which students prefer to learn the educational contents individually. This means that application of active teaching methods cannot be effective on the learning performance of students. Obviously, educational experts and professionals know the effects of active teaching methods on the effective and sustainable learning. Indeed, active teaching methods create learning motivations in students and stimulate them to learn main skills and knowledge. However, the results of our study revealed that the students, who use individual learning style, prefer that their teacher employ inactive teaching method. The reason is that such students prefer to study in private environments and so they like inactive teaching methods. As a result, teacher's course is a previous experience in their learning process and reinforces learning in them. Also many students get inactive and traditional teaching methods and their fear from change and inactive learning is the main reasons of why they prefer inactive teaching methods. It is necessary to educate such students and inform them benefits of active teaching methods. It is an important step in improving students' learning process.

Collective learning style refers to the learning style in which students prefer to learn skills and educational contents with their friends and classmates in collective method. The results of our study revealed that the students, who prefer collective learning style, like inactive teaching methods. This is why that teacher should consider consistency between students' learning style and their preferred teaching methods. As a result, the educational performance will be increased. It is should be remembered that inactive or traditional teaching methods decrease students' participation and activity in learning process. The reason is that the basis of such a style is teachers' domination in classroom. It can be said that collective learning style requires active and collaborative participation of students in classroom. The students, who prefer inactive teaching methods, do not know their learning style, active teaching methods, and practical teaching methods, as they have not experienced all of the teaching methods and their responses in our study were based on perception not based on reality in terms of learning styles and teaching methods. All in all, such a problem can be solved through informing students about importance of learning, learning styles, necessity of its accordance with educational performance, and benefits and limitations of every style. Shahnoshi (1998) found that there is a significant relationship between students' learning styles and some of the teaching methods such as active methods (problem-solving, project, role-playing methods) in theoretical courses. The results if his study also showed that there is not any significant relationship between students' learning style and preferred teaching methods by them. This means that they prefer inactive teaching methods. However, the results of his study indicated that there is not any significant relationship between students' learning style and their preferred teaching methods. The results of table 1 revealed that there is a significant relationship between project learning styles and students' preferred teaching methods. In other words, it can be said that students with project learning style prefer active teaching methods. The reason is that teacher help students in better learning through selecting active teaching methods based on their courses subject. The students with project learning style prefer to study their courses in laboratory and library and working on projects. As a result, their knowledge and awareness will be increased. It is necessary that teachers adapt their teaching methods in accordance with students' preferred learning styles. On the other hand, students' motivation will be increased and also their creative thinking will be improved and reinforced. Smith and Riding (1999) found that the holistic-analytical style influences collaborative methods (such as role-playing and group discussion) preference. In other words, students with holistic-analytical style prefer active teaching methods. Najafi Kiani et al. (2009) found that teachers should select teaching methods based on the students' learning styles.

The results of our study revealed that there is a significant relationship between combinative learning styles and preferred teaching methods by students. In order to examine this relationship, multiple regression model has been used. The results of this test have been presented in table 3. The results showed that the regression model is significant for all of three learning styles. It can be said that the relationship between learning styles and preferred teaching methods by students. Based on the results of table 4 in terms of regression model and

standardized coefficients, it can be said that there is a significant relationship between project learning style and preferred teaching methods by students. This means that every change in independent variable (project learning method) results in 0.364 changes in the dependent variable (preferred teaching methods). It can be said that project learning style influences preferred teaching methods by students. Another part of the results showed that individual and collective learning styles do not influence preferred teaching methods by students.

5. References

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