

# Matching Teaching/Learning Styles and Students' Satisfaction

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## ***Abstract***

Part of the theoretical literature and researches conducted in the western countries especially in the USA, concerning learning styles and teaching styles, hypothesize that: a) students' learning styles are different based on their gender, college degree, and major, b) teachers' teaching style is consistent with their learning style, and c) matching teaching style/learning style would result in better outcomes, including student satisfaction. The major purpose of the study, reported in this paper, was to investigate these postulates about the students and the faculty members of the School of Education and Psychology at Shahid Beheshti University of Tehran, Iran. The Learning Style Questionnaire (Peter Honey, 2006) and The Trainer Style Questionnaire (Peter Honey, 2007), which have identical categorization for teaching/learning styles, were used to identify styles, and for identifying students' satisfaction, Siddharthan's questionnaire (1999) was employed. The results of the study showed that there were significant differences in the students' learning styles, based on their gender, college degree and major. The data also revealed that instructor's teaching styles, whether indicated by themselves—considered as 'intended teaching style'—or by their students—considered as 'actualized teaching style'—were consistent with their learning styles, also significant differences were found in teaching styles of the instructors, based on gender and no differences based on academic discipline. The results also indicated that students whose learning styles were congruent with the instructor's teaching style were more satisfied than those who did not enjoy this congruity.

**Keywords:** learning style, teaching style, matching hypothesis.

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### Introduction

Learning and teaching are among the most pivotal functions of the universities and colleges, as well as any other educational/training institution, typically emphasized and highlighted in their vision/mission statements. This is evident in a sample of vision/mission statements of 40 universities in which 'learning' and 'teaching' are cited with frequency of 55 and 45 respectively ([www.niu.edu/strategicplan](http://www.niu.edu/strategicplan). Accessed: November 14, 2010).

Learning and academic achievement are very complex interactions and influenced by a variety of factors, including learners' learning styles and instructors' teaching styles (Robotham, 1999; Rinaldi, 2008). Individuals are unique in the way they learn and teach, and this has been always a challenge to educators and researchers alike. Following Cronbach and Snow's postulation in late 60's that individualizing teaching to the need of learners would improve their satisfaction and achievement (cited in Keri, 2002), the proposition that students learn and study in different ways has emerged as a predominant pedagogical issue (Hawk and Shah, 2007), and numerous studies have been done about individual differences in relation to learning and academic achievement, a big chunk of which is about '*learning style*', '*teaching style*', and '*matching hypothesis*', which are the variables considered in this study.

According to Witkin (1973), as cited in Cano et al. (1992) learning style is an important factor in several areas, including students' academic achievement, how students learn, how a teacher teaches, and the student-teacher interaction. The term 'learning style', which began to appear in the 1970's (Robotham, 1999), refers to the concept that individuals differ in regard to what mode of instruction or study (teaching style) is most effective for them (Pashler et al., 2008). On the other hand, each teacher is unique in many ways, and varies from others in such characteristics as: learning style, teaching style, and personality style (Kadolph, 2008).

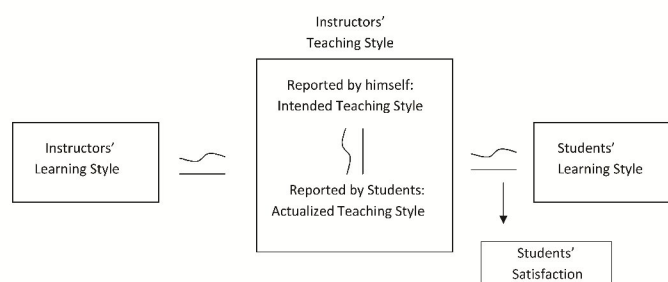
Variety of definitions, models, and instruments of learning and teaching styles have been developed in academic circles, but the shared concept they impart, either implicitly or explicitly, is the uniqueness of individuals in teaching-learning process. Reiner and Willingham (2010) maintain that 'the concept at the center of learning

style theory is this: different students have different modes of learning and their learning could be improved by matching one's teaching (style) with that preferred learning mode'. Traditional method of using learning styles in developing learning is the 'matching hypothesis', the core meaning of which is 'the closer the congruence between the students learning styles and the teachers' teaching style, the higher the level of students' achievement' (Pheiffer et al., 2005). Benefits of matching learning styles and using appropriate teaching strategies (teaching style) for each learning style include decreased anxiety and increased staff and student satisfaction (Chase, 2001). While support for matching has been reported, it has also been acknowledged that a variety of often critical views exist on this issue (Pheiffer et al., 2005). Robtham (1999) stated that for each research study supporting the principle of matching instructional style and learning style, there is a study rejecting the matching hypothesis, and recently Pashler and colleagues (2008) contended that there is no strong scientific evidence to support 'matching' idea, because only few of the hundred studies done in this regard, used appropriate experimental design.

Numbers of studies conducted about learning style, in general though, are far greater than what is done about teaching style (Seevers and Clark, 1993), but the total number of studies about learning styles and teaching styles in western countries, especially in the USA, is much more than what is done in developing countries. Google search for 'teaching style' and 'learning style' in English language showed 572000 and 1190000 results respectively, while there were only 467 and 15400 in Persian language. Ironically, the results for 'teaching style and learning style', and 'learning style and teaching style', were 13200, and 11200 in English, and none in Persian (Accessed: Nov. 30, 2010). Likewise, there were very few scientific articles about learning/teaching styles in Iran, so searching in related sites for similar studies, in Persian language resulted only in 15 abstracts of research articles in Persian periodicals, and no books, review articles, or theoretical articles were found.

The paucity of related studies about learning/teaching styles in Iran; lack of familiarity of almost all of the practitioners and educators in Iranian educational system with the concepts of these three constructs—learning/teaching styles, and matching hypothesis—and derivative models and instruments, and their applications in education

and training; and related pros and cons, all contribute to the fact that this study, to some extent, is among novel ones in that context. But, on the other hand, it replicates and in some way improves different studies conducted in western countries, as such, its conceptual framework (Figure 1), based on which the proposal, questions, and hypothesis, were developed, deducted from review of the literature, theoretical works, and studies in those countries about learning/teaching styles, few of which are referred in the following paragraphs, preceding the statements of the questions and the hypothesis of the study.



**Figure 1. Conceptual frame work of the study**

### **Purpose of the study**

The purpose of the study was to identify the learning styles and teaching styles of the participating instructors, and learning styles of the participating students and students' satisfaction with the classes, and then to examine the following questions and hypothesis, with collected data about learning/teaching styles and satisfaction.

**Questions:** Some researchers and educators (e.g. Dunn and Dunn, 1979; Brown, 2003; and Hawk and Shah, 2007) have postulated that most teachers teach the way they learn, so part of the purpose of the study was to check out the following questions in the target population:

1. Is there any similarity between instructors teaching styles, reported by themselves, considered as 'intended teaching style', and their learning style?
2. Is there any similarity between instructors' learning styles and

their teaching styles, reported by students, considered as ‘actualized teaching style’?

3. Is there any similarity between ‘intended teaching styles’ and ‘actualized teaching styles’?

### **Hypothesis**

Some academic circles maintain that mismatch between learning styles of the students and teaching styles of the instructors’ causes failure, frustration, and demotivation (Peacock, 2001). A considerable number of studies addresses the question of if and how matching learning styles and teaching styles affects students’ outcomes and satisfaction with different aspects of educational process (e.g. Bohler, 1993; Spoon and Schell, 1998; Chase, 2001; Keri, 2002; and Hauer et al. 2005). On the other hand, relationship between learning styles and some demographic variables (e.g. gender, age, ethnicity, college major, college degree, etc.) have been considered in several studies (e.g. Spoon and Schell, 1998; Henson and Hawng, 2002; Keri, 2002; and Heiman, 2006), and so the relationship between teaching styles and some demographic variables (e.g. gender, age, academic discipline, etc.) were studied (e.g. Starbuck, 2003; Nelson Laird and Garver, 2007). Based on these premises examining the following hypothesis in the target population was another part of the purpose of the study:

1. Relationship exists between students’ satisfaction with the classes and between their learning styles and the instructors’ teaching styles, as reported by instructors’ themselves—intended teaching style.

2. Relationship exists between students’ satisfaction with the classes and between their learning styles and the instructors’ teaching styles, as reported by the students—actualized teaching style.

3. Relationship exists between instructors’ teaching styles, whether intended or actualized, and their gender, and academic disciplines.

4. Relationship exists between students’ learning styles and their gender, college degree, and college major.

### **Hypothetical definitions and operational identification of variables considered in the study**

Learning styles and teaching styles are hypothetical constructs which are defined by some researchers as the *behaviors and actions* the

teachers and the learners exhibit in the learning-teaching process and exchange. The hypothetical definition of learning style adopted for this study was the one provided by Honey and Mumford (2006) as ‘the description of the attitudes and behaviors which determine an individual’s preferred way of learning’, and for teaching style, Fisher and Fisher’s (1979) definition was chosen, who consider teaching style as ‘identifiable sets of classroom behaviors that tend to be consistent though the content that is being taught may change’ (cited in Spoon and Schell, 1998).

Four learning styles and four teaching styles operationally identified in this study by participants, using The Learning Style Questionnaire (Peter Honey, 2006), and The Trainer Style Questionnaire (Peter Honey, 2007), included: ‘Activist’, ‘Reflector’, ‘Theorist’, and ‘Pragmatist’. The LSQ and the TSQ are self-reporting instruments of respectively 40-48 mostly behavioral items which instead of asking respondents directly how they learn or teach, probe their general behavioral tendencies through appropriate items related to any of the four styles. The LSQ (and the TSQ) in fact are not psychometric instruments, but a check list of behaviors and actions, people exhibit when they are involved in the learning and teaching process (Coffield et al., 2004; McDonough and Osterbrink, 2005).

To determine whether students, whose operationally identified learning styles match with the operationally identified teaching styles of their instructors, are more satisfied with the classes of those instructors, than those students who do not enjoy this congruity, they specified their satisfaction, using a 21 items questionnaire (Siddharthan, 1999).

### **Methodology**

**Population and Sample:** The target population considered in this study, were the students—totaling 638—and the fulltime faculty members—totaling 29—of the School of Education and Psychology at Shahid Beheshti University, Tehran, Iran. A none randomly chosen or convenient sample of 444 students and 24 instructors—70% and 86% of the target population respectively—participated in the study, out of which 64% of students were male and 36% female; 67% were undergraduates; 28% at master levels; and 5% doctoral candidates;

70% of the faculty members were male; 30% female; and their department affiliation (academic discipline) were: 8% Counseling; 46% Education; and 46% Psychology.

**Procedures:** Research proposal was initially reviewed, and then approved at the Department of Education, to which the author is affiliated and his assistant was a doctoral student then, thereafter it was sent to the Research Committee at the school level, and from there to the Social Sciences Committee of Research Council of the University. Following the scrutinizing and verification of the proposal at those committees, official confirmation and sponsorship of the Vice Presidency of the University for Research and Technology was issued. Then, operational phases of the project started with the review of the literature, as the first step of the Gantt chart, and followed through other steps to the completion of the study.

**Instrumentation:** The LSQ, used as an instrument to identify participants' learning styles, is one of the most popular learning style scheme (Pashler et al., 2008), and has much in common with the Kolb's Learning Style Inventory (1982), and strong correlation with learning cycle. The LSQ is directly derived from Kolb's theory of experiential learning, based on which the learning style concept is developed. Honey and Mumford (2002) note their debt to Kolb's theory ([www.sos.net](http://www.sos.net), accessed: Aug. 22.2011). The concept of learning style expressed by Kolb, adopted with some modifications by Honey and Mumford, is an outgrowth of the personality theory of Karl Jung; the work of John Dewy, emphasizing the need for learning to be grounded in experience; studies done by Kurt Lewin, showing the importance of people being active in learning process (Mc Donough and, Osterbrink, 2005); and Jean Piaget's theory of intelligence resulting from the interaction of the individual and the environment (Hauer et al.2005). The LSQ identifies four learning styles, which could be briefly described as follows:

*Activist:* who likes to get involved in a new experience and enjoy the challenges of change; learns primarily by experience, when there is the opportunity to tackle problems 'hands on'.

*Reflector:* who likes to take his/her time and think things through; learns best from reflective observation and activities where he/she can observe and conduct research.

*Theorist:* who likes to question assumptions and methodologies;

learns best when there is time to explore associations and interrelationships between ideas and situations.

*Pragmatist*: who prefers practicality; learns best from doing things with practical outcomes, where there is a link between the subject matter and job in hand, and where he/she can try out what he/she has learned ([www.qfnance.com](http://www.qfnance.com), accessed: Nov. 18.2010; Romanelli et al., 2009)

The LSQ translated into the Persian Language and respondents—instructors as well as students—were asked to indicate in each item whether they ‘always=4’, ‘often=3’, ‘rarely=2’, or ‘never=1’ act accordingly.

To identify the teaching styles of the instructors, The Trainer Style Questionnaire (Peter Honey, 2007) was used. The TSQ is a 48-item instrument, and a mirror image of the LSQ, which identifies four teaching styles with the same labels as the LSQ does, which could be briefly described as follows:

*Activist*: who is exhibitionist, risk taker, enthusiastic, energetic, uses variety of methods, has a sense of humor to help students to learn, and uses participative exercises where necessary.

*Reflector*: who prepares everything carefully for the class, helps students to reflect on their own experiences, draws conclusion, explores different options, and emphasizes the completion of pre class work/preparation by the students.

*Theorist*: who prepare timetables for the class and makes it clear for the students, shows how things fit together into a coherent pattern, structure, process, or theory, and encourages students to base their decisions/conclusions on careful analysis of facts/available data.

*Pragmatist*: who acts as a role model in how to do things, encourages students to experiment with different techniques, to develop their skills, emphasizes the practical application/implications of the courses contents, and uses case studies/anecdotes and practical examples related to the course contents (Peter Honey, 2007).

Instructors’ teaching styles were identified both by themselves—considered as ‘intended teaching style’—and by the students—considered as ‘actualized teaching style’. To get instructors’ perspective of their own teaching style, 48 items of the TSQ were translated into Persian language and instructors were asked to indicate



how often they act as stated in each item. The ranges of answers provided for instructors to choose from were as: 'always=4', 'often=3', 'rarely=2', and 'never=1'.

To get the students' perspective of the instructors' teaching styles, 48 items of the TSQ were reworded to change the perspective of the statements from the instructors to the students. For example the first item in TSQ stating 'I strive to give course participants an unforgettable inspirational experience through being up-front and visible' was reworded to read: 'The instructor gives students unforgettable inspirational experience, he/she is up-front and visible'. The students were asked to indicate how often their instructors act as stated in each item. Ranges of answers provided for each item to choose from were as: 'always=4', 'often=3', 'rarely=2', and 'never=1'.

A 21-item questionnaire (Siddharthan, 1999) was used to identify the students' satisfaction with the classes they identified instructors' teaching styles. The instrument was translated into Persian language and the range of answers provided for students to specify their satisfaction in regard to each item were as: 'very much=4', 'to some degree=3', 'little=2', and 'very little=1'.

Administration of the instruments: To get a more accurate perspective from the students regarding the instructors' teaching styles and their satisfaction with the classes, the questionnaires were distributed during the last session of the spring semester, 2010. So, after 16 sessions of attending classes and experiencing instructors' teaching styles, the students were in better position to assess instructors' teaching styles and express their satisfaction with their classes.

Validity and reliability of the instruments: The LSQ and the TSQ have been more widely used and studied in management training and education in business settings so their validity and reliability has not been studied in the academic circles extensively and existing data concerning their validity and reliability is very limited. No study was found about teaching style, using the TSQ.

Few studies, done about psychometric properties of the LSQ, were non-confirmative (Klein et al., 2007; Duff and Duffy, 2010), while the authors of the LSQ, as stated in Coffield et al, did not assess the validity of the LSQ and specified that the LSQ is not a psychometric

instrument, rather it is a check list about how people learn (2007). Furnham, though stated that various studies, done in different countries, have provided evidence of reliability and validity of the LSQ (in Soklofske and Zehidner, 1995), and according to Romanelli (2009) the validity of TSQ and its predictive accuracy has been improved comparing to the Kolb's LSI.

The Gronbach's Alpha coefficient was calculated for the 4 instruments used in this study. A coefficient of 0.88 was achieved for the LSQ; 0.79 for the actualized version-reworded of the ISQ; 0.78 for the intended version of the TSQ; and 0.85 for the instrument used to measure the students' satisfaction. Calculation of the coefficient for the individual items of the four instruments, after reversing the negative ones, also showed that none of them should have been deleted from the list.

To establish the validity of Persian translation of the instruments, they were reviewed by a Panel of four associate professors, two from the Department of Education and two from the Department of Psychology, and based on their recommendation the instruments were edited.

### **Findings**

To indentify the learning styles of the students and faculty members participating in the study, and also to identify teaching and styles intended as well as actualized ones the mean scores of the latter group were calculated for each of the four learning styles and teaching styles. The results are depicted in figures 2 to 5.

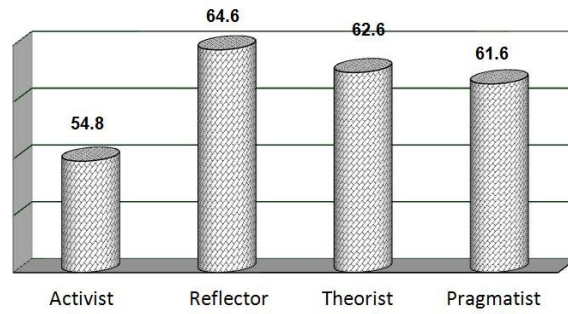


Figure 2- Students' Learning Styles

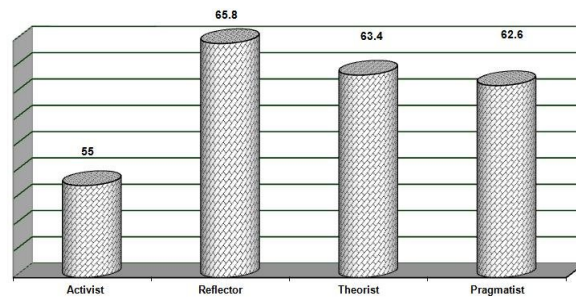


Figure 3 – Instructors Learning Styles

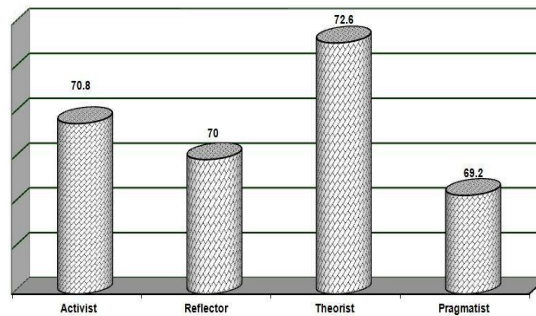


Figure 5 – Instructors Teaching Styles as reported by the students (Actualized Teaching Style)

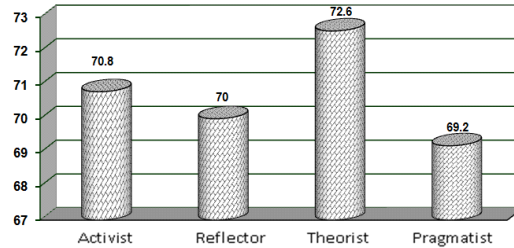


Figure 4- Instructors' teaching styles reported by themselves (Intended Teaching Style)

According to figures 2 and 3 the dominant or the most preferred learning style of the students and instructors is 'reflector', while their least preferred style is 'activist'.

The dominant or preferred teaching style among the faculty members (figure 4), reported by themselves—intended style—is 'theorist', while the student reported dominant teaching style among the faculty members were 'actualized' as well as 'pragmatist' (figure 5).

Figure 6, which shows that instructors' learning styles are to some extent similar to the teaching styles reported by themselves (intended style), provides the answer for the first question of the study. Chi-Square calculation and analysis showed that the similarity is statistically significant at 95% level.

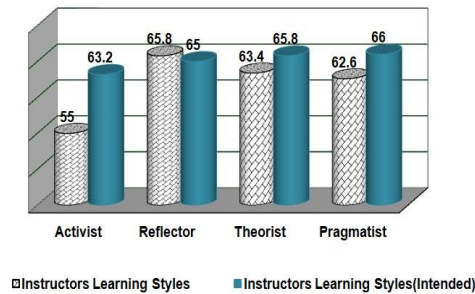


Figure 7 – Instructors Teaching Styles as reported by students (Actualized) vs. instructors' Learning Styles

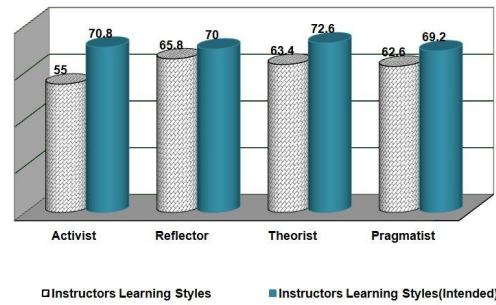


Figure 6 – Instructors Teaching Styles as reported by themselves (Intended) vs. their Learning Styles

Figure 7, which indicates that there is a big similarity between instructors learning style and their teaching styles, reported by students (actualized), provides the answer for the first question of the study. Chi-square calculation and analysis also showed that the similarity is statistically significant at 95% level.

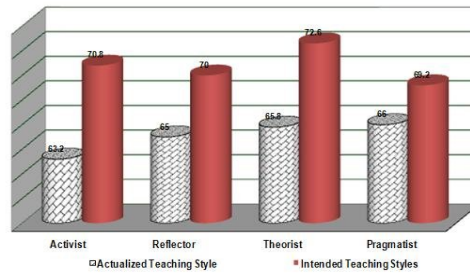


Figure 8- Intended Teaching Styles vs. Actualized Teaching Style

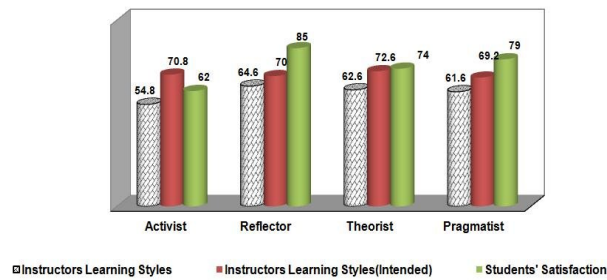


Figure 9 – Match between Students' Learning Styles and Instructors' Teaching Styles (Intended) and students' satisfaction

Figure 8 provides a negative answer to the third question of the study concerning the similarity between intended and actualized teaching styles. Chi-square calculations and analysis also confirmed that the similarity is not statically significant at 95% level.

Figure 9 provides confirmation for the first hypothesis of the study. It shows that students' satisfaction is high where instructors' teaching styles (intended) match students' learning styles. Chi-square analysis was conducted and Somer's d-5 coefficient was used to examine the relationship between students' satisfaction with the classes and the match between their learning styles and the instructors' teaching styles (intended). The results showed that the relationship is direct and statistically significant at 95% level of assurance.

Figure 10 visually confirms the second hypothesis of the study showing the relationship between students' satisfaction with the classes and the match between their learning styles and the instructors' teaching styles (actualized). Using statistical analyses as the ones employed for the first hypothesis confirmed the significance of the relationship at 95% level. Interestingly the relationship found for the second hypothesis was stronger than the one found for the first hypothesis.

Analysis of the data to examine the third hypothesis of the study showed that the percentage of female instructors' with activist teaching style was more than twice the percentage of male instructors' with the same teaching style (4.2% vs. 1.57). On the other hand percentage of male instructors with reflector teaching style was twice more than the percentage of female instructors with the same teaching style. Statistical analysis also confirmed the significance of the relationship between gender and teaching style at 95% level of assurance.

Analysis of the data did not show a significant relation between instructors' teaching styles and their academic discipline. The reason for lack of significant relationship here could be attributed to the similarity of the disciplines considered in the study, Education, Counseling and Psychology.

Frequency and percentage of the data related to the students learning style showed the relationship between gender and learning styles. For example the percentage of female students with activist learning style was higher than the percentage of male students with the same learning style (83% vs. 70%). On the other hand the percentage of

male students with theorist teaching style was higher than the percentage of female students with the same learning style (9.3% vs. 4.9%). So, the relationship between gender and learning style was found statistically significant at 95% level of assurance.

The relationship between students' college major and college degree and their learning styles was confirmed.

### Conclusion

To examine and analyze the relationships between variables depicted in the conceptual framework of the study (Figure 1) and their co-efficiency the Structural Equations Modeling (SEM) was used and Lisrel software was employed.

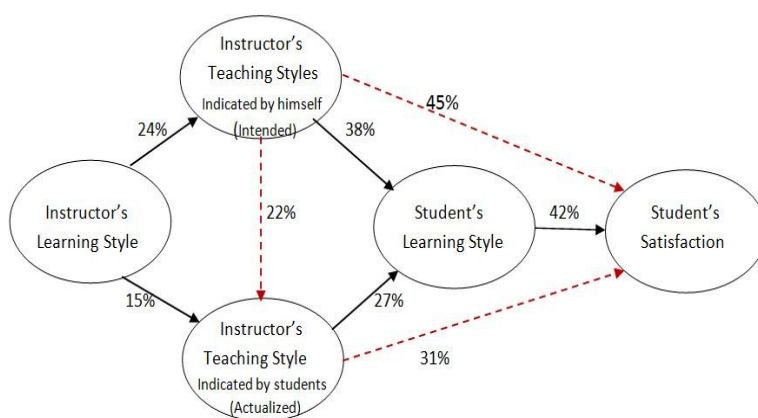


Figure 11- Significance of the relationship between the variables of the study

Figure 11 shows the valence of the relationships between variables included in the framework. The asterisked number next to each line shows the significance of the relationship between two variables mentioned on both sides of each arrow. Broken lines are the ones that were not considered in the conceptual framework but were discovered in SEM analysis. The only relationship which is not statistically important (non asterisked) is the relationship between instructors' learning style, and their teaching style (reported by students), because the instructors' learning styles were identified by themselves, using the Learning Style Questionnaire, and the students were not aware of the behaviors and the actions of the instructors in the process of learning.

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