



An Investigation into the Relationship Among Self-Concept, Classroom Environment, Self-efficacy and Mathematics Achievement of Iranian Highs

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ABSTRACT

This research studies the level of achievement in mathematics by concentrating on the role of self-concept, classroom atmosphere and self-efficacy among Iranian high school students. This paper is a survey, quantitative and correlation one and based on the random sampling technique involving 400 respondents from students of Tehran, Iran. Data analysis was done through using SPSS and AMOS. Findings were analyze via correlation in studying the relationships among the variables. The results of this study indicated that the learning environment can influence mathematics learning. The results imply that self-efficacy, self-concept, and classroom atmosphere influence the learning of mathematics. Considering the role of the mentioned factors in learning mathematics, teachers are recommended to pay attention to these aspects of learning as well.

Keywords: Self-concept, Classroom environment, Self-efficacy, Mathematics Achievement

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INTRODUCTION

Psychologists and experts in the field of educational sciences have always been attempting to prepare favorable educational and learning conditions in their researches and theories. While behaviorists ignore the intrinsic factors by placing emphasis on extrinsic factors in explaining behaviors, cognitivists accentuate individual and intrinsic factors (Pervin, 2001). Albert Bandura's socio-cognitive theory plays a significant role in justifying the process of teaching-learning and its conceptual dependents in a way that this theory has been used as a reference for many scientific books and articles in the past decades (Pervin, 2001).

Self-efficacy is the key element in this theory, which relates to an individual's conception of his/her ability in doing his/ her particular tasks. Self-efficacy mentioned as one of the factors affecting the mathematical performance. Anjum (2006), Martin et al (2004), PahlevanSadegh (2005), Nasr Isfahani (2003), Peterson et al (2000), Pajares and Miller (2003), and Wilkins et al (2004) reported the direct and indirect effect of self-efficacy on achievement in mathematics. Mathematics self-efficacy could be defined as "the assessment of individual's confidence in his/ her ability to solve or complete a certain mathematical problem successfully" Hacket and Bets (cited by Pajares et al, 2003).

The other effective variable in the achievement in mathematics is self-concept. Several researches (PahlevanSadegh, 2005; Nasr Isfahani, 2003; Wilkins, 2004; Pajares and Miller, 2003; Martin et al., 2004; Peterson et al., 2000; Anjum, 2006; Poorasghar, 2004).verified the effective role of self-concept on the mathematical progress in separate studies. One's take and

perception on him/herself which s/he greatly values is called self-concept by Rogers (cited by Kadivar, 2007).

It could be said that an individual's learning and educational progress are under the influence of complicated conditions. These conditions have various elements, each affecting this issue in its particular way. One of the elements of these conditions is the background and the environment of teach (Bigs et al., 2003). Accordingly, it could be said that people who have more various experiences in more appropriate environments will be more efficient individuals in comparison with those deprived of such environments. With respect to the effect of the learning atmosphere on learning, it can be inferred that the recognition of those classes that are more appropriate environments is significant (Fraser, 2002) and the change of learning atmosphere has always been one of the intervening factors in better learning. (Ramsden, 1988).

This paper will discuss the relationship among self-concept, self-efficacy, and the atmosphere of classroom and their effect on achievement in mathematics. Thus self-concept, self-efficacy and the atmosphere of class are independent variables and achievement in mathematics is dependent one. Therefore, the aim of this study is to examine the relationship between students' mathematical self-concept, mathematical self-efficacy, and the atmosphere of class and whether they influence mathematical progress among Iranian students in high school.

1.1. Research Questions

1. Is there any significant relationship between self-concept and achievement in mathematics of high school students?
2. Is there any significant relationship between class atmosphere and achievement in mathematics of high school students?

3. Is there any significant relationship between self-efficacy and achievement in mathematics of high school students?
4. Are there any significant relationships among self-concept, the class atmosphere, self-efficacy and the achievement in mathematics of high school students?

1.2. Research Hypothesis

1. There is a significant relationship between self-concept and achievement in mathematics of high school students.
2. There is a significant relationship between class atmosphere and achievement in mathematics of high school students.
3. There is a significant relationship between self-efficacy and achievement in mathematics of high school students.
4. There are significant relationships among self-concept, the class atmosphere, self-efficacy and the achievement in mathematics of high school students.

1.3. Theoretical Framework

The present study has been conducted based on Bandura's socio-cognitive theory. This study contends that human behavior is explained through the interaction between human and environment which is named mutual causality by Bandura, refuting the approaches that maintain an individual is stimulated by internal forces or those that consider human devoid of choice in nature. Humans affect others as much as they are affected by both internal and external factors influence one's behavior formation. In this approach, behavior, personal factors and environmental parameters act as interdependent factors.

Self-efficacy is one of the concepts of Bandura's fundamental socio-cognitive theory. Studies on the interaction between the "individual" and "behavior" in self-efficacy demonstrate that self-efficacy beliefs influence the behaviors of educational progress, such as the choice of assignments, continuity of learning and the amount of effort and acquisition of skills (Shunk, 1991-2002).

It has also been indicated that various particular experiences, such as previous performance, replacement experiences, verbal persuasion and emotional-physiological arousal influence one's personal beliefs. For instance, students who have been successful at school reveal higher levels of sufficiency related to educational performance in comparison with those devoid of successful experiences. Bandura (Shuck 2002) realized that students with high levels of self-efficacy participate more in educational assignments, work harder and endure longer against problems compared with those doubting their capabilities.

Carl Rogers, believed human can affect his/ her destiny or even control it. Since human is free, s/he can determine his/her own happiness or misery with free will. With respect to his belief, the main incentive is the individual's attitude towards him/herself and his/her surrounding world. It seems educational self-concept and educational performances have a bilateral connection. Self-concept has been categorized in 3 levels: general self-concept, educational self-concept and non-educational self-concept and specific areas of self-concept directly related to the learning subject or the type of activity (Bloom, 1982. March et al., 2003).

Another variable affecting mathematical progress that has been studied in this research is the class atmosphere. The environment of class has a vital role in students' educational, behavioral and psychological performance (Kuperminc et al., 2003). The psychological atmosphere of the learning

environment and its contextual and social characteristics as well as teachers' support have a significant role in students' learning behaviors, involvement with assignments, educational values and educational progress (Ames, 1992; Davis, 2002; Pintrich, 2002). The theoretical framework of environmental conception in this research is based on Moos's (1979) conceptualization from the socio-psychological class atmosphere. Based on Moos's theory, the class atmosphere has measurable characteristics like humans. (reported by Choi & Baek, 2002).

2. Literature Review

2.1. Overview of education system, Iran

The education system In Iran education is a necessity for children in ages 6-14 (Grades 1-8). Public education is free. The education system is divided in 5 different levels: pre-school, elementary school, lower secondary education, higher secondary education and higher education. The study programmer lasted 4 years and comprised the ninth through twelfth grades for the 14 to 17 age group. Most education is provided in Farsi (Persian). The academic year is divided into 2 semesters and runs from September to June.

2.2. Overview of achievement in mathematics

Nowadays, there is a plethora of researches on achievement in mathematics. Mathematical self-concept, mathematical self-efficacy and the atmosphere of the class are sub-topics which influence achievement in mathematics. The sub-topics, namely mathematical self-concept, mathematical self-efficacy and the class atmosphere demonstrate the factors that influence achievement in mathematics and the previous research on the relationship between self-concept and achievement in mathematics, the class atmosphere and achievement in mathematics, self-efficacy and achievement in mathematics.

2.3. Overview of Self-Efficacy

2.3.1. Bandura's Self-Efficacy Theory

According to Bandura (1997), self-efficacy is the belief in one's capabilities to organize and execute the course of action required to manage prospective situation. In other words, self-efficacy is a person's belief in his or her ability to succeed in a particular situation. Bandura (1997) described these beliefs as determinants of how people think, behave, and feel. In Bandura's socio-cognitive theory (1997), there are two types of variables including personal variables and situational variables. Personal variables are such as expectations and beliefs, qualifications, skills, goals, perceptions, thoughts, and efficacy. Situational variables are such as rewards and punishments that are interacting with each other to shape behavior. The studies have shown that self-efficacy beliefs play an important role in mediating for all activities related to the development, such as the stability of the task, the use of self-regulation strategies, math and science curriculum choices.

2.3.2. Factors that Influence Self-efficacy

According to Bandura, (1994) some factors such as the effect of family, per role, and school role can be considered as the factors that influence self-efficacy.

2.4. Overview of Self-concept

2.4.1. Carl Roger's Self-concept Theory

The Rogers's (1951) self-concept theory is the perception of one's own values that answered two main questions in person: "Who I am and what I am?" Therefore, this factor reveals a better understanding of him. This assessment could not succeed, neither failed. It only brings the attitude of the person's ability. It's an appalling sense of value or

worthlessness. The thoughts and views which we have about ourselves make our self-concept.

2.4.2. Factors that Influence Self-Concept

Age, gender, Communication with parents, Success and failure, and Environmental and social contexts are among the factors that influence self-concept (Rogers's, 1951).

2.5. Overview of Class Atmosphere

2.5.1. Moos's Class Atmosphere Theory

The class atmosphere theory is from psychological environment of the classroom based on the concept of Rudolph Moos (1979). According to Beak and Choi (2002), a classroom environment constitutes characteristics which can be measured like the features of a human being based on Moos theory. The Moos theory understands the significance of environmental effects on Lewin's (1936) field theory and Morray (1938), and pressure-need theory (Dorman, 2009). The environment can be defined in terms of its characteristics, as well as a human being is defined by his/her features. Characteristics like warmth and supported entities or stiffness and limited effect can be attributed to the environments and people (Moos, 1979).

2.5.2. Factors that Influence Class Atmosphere

The relationship between students' perceptions with emotional classroom learning environment, creative problem-solving tasks, predicting tools, enjoyment, desire to communicate and pleasure of learning have significant impact on the classroom atmosphere in achievement (Moos, 1979).

2.6. Relationship between Self-concept and Mathematical Progress

One of the influential variables in the development of math is the self-concept math. PahlavanSadegh (2005), Nasr Isfahani (2002), Vilkins (2004), Pajares and Miller (2003), Martin et. al (2004), Peterson and at. el. (2000), Anjum (2006) and Poorasghar (2004) confirmed the self-concept mathematics effects on the development of mathematics in their separate study.

Given the importance of academic self-concept in predicting academic achievement, a lot of researches with different variables in this field have been done. Pajares and Miller (2003) investigated the effect of mathematical self-concept associated with gender and previous performance in mathematical problem-solving using path analysis. In this study, the mathematical self-concept variables and math experience of moderator and high school (previous performance) and his/her mathematical efficiency have a direct impact through the achievement in mathematics. The direct impact of mathematics is calculated as 0/16 that is a significant effect on the achievement in mathematics. (Pajars and Miller, 2003). In this study, the mathematical self-concept is proposed as a moderator and its objective is to evaluate the direct and indirect influence of variables on dependable variables.

2.7. Relationship between Class Atmosphere and Mathematical Progress

The evaluation of class atmosphere and its relationship to academic achievement among students is the topic that has always attracted teachers, administrators, parents, and parental educations' attention.

Teacher communicative style (Bedili, 1992), quality of the relationship between teacher and students (Moorgant, 1991), feel pressure from school officials Rio, 1998), classroom emotional atmosphere (Wang and Harter, 1993- 1994) can

have positive or negative relationship with mathematical progress.

2.8. Relationship between Self-efficacy and Mathematical Progress

Several studies suggest that self-efficacy, particularly in mathematics is a strong predictor in mathematical development. The performed Meta-Analysis on the outputs of academic self-efficacy beliefs considering the years of 1988 to 1991 (Multon, Brown & Lent, 1997) with a sample size of 36, indicate that self-efficacy beliefs have positive relationships with academic achievement and with the size of the total 99% is equal to 0/38. (Zimmerman, 2000). This study tends to regard the direct role of self-efficacy in mathematical achievement; this variable should have a special place in educational research. Therefore, in future studies, self-efficacy beliefs are always moderating variables in the model. This procedure encourages this research, regarding TIMSS (2003), to investigate the low self- efficacy of the Iranian students and their failure and their efforts in this area.

2.9. Previous studies in Iran and Overseas

Kyamsh and Noori (2000, 2001), emphasize the weakness of Iranian students in mathematics based on their findings. Iranian students' poor performance in three of the major issues in the field of education is significant. In this area, PhlavanSadegh (2005), Nasr Esfahani (2003), Nasri (2001), Anjum (2006), Martin et al (2004), Peterson et al (2000) can be referred to. These studies also examine the influencing factors on mathematical function. In this study, the factors affecting the performance of students in mathematics are also considered.

The findings of Nasri's research (2007) who examined the association of psychological factors with the mathematical performance of students in Tehran, with a sample size of 87 paying participants, indicated that self-efficacy and self-concept variables affect mathematical performance and explain it. He also declares that the research is consistent and coordinated with Barati (2003) Shekarkan and Nissi (2006) Rylych (1998) and Marsh et al (2001). In another attempt, Nasr Esfahani (2005) assessed the role of self-efficacy, self- concept, perceived usefulness of mathematical anxiety and mathematical progress in mathematics, middle school students, by following the pattern in which the multi-variable linear hybrid models were removed from math anxiety. In Doctor's Naghsh's research (2008), the role of three scales of class functions perception, such as motivational duty, autonomous support and self-efficacy represent a significant portion of the measured variables in achievement and it can be said that the class structure means the motivational functions have a significant role in measuring the academic achievement of task motivation, the support of important and meaningful measure to support autonomous self-efficacy and an important and meaningful role to measure autonomous evaluation operating mastery in achievement in mathematics.

3. METHOD

The main purpose of this research is to study the relationship among self- concept, self- efficacy and class atmosphere on achievement in mathematics of Iranian students. In this research, the researcher examined all hypotheses by using statistical package for social science (SPSS).

3.1. Research Design

The quantitative approach was used as research method. In this method the objectives were explained by statistical description and manipulation, using highly structured instruments and

statistical sample. In this study, which is a survey one, the researcher utilized correlation design. The relationship among mathematical self-concept, the class atmosphere, mathematical self-efficacy and achievement mathematics among Iranian high school students will be examined.

3.2. Population and Research Sampling

This research study will be conducted in Tehran the capital of Iran. The sample will be chosen from Iranian high school students (boys and girls) who study at grade 11 in schools of Department of Education District 2 Tehran, Iran. According to statistics of Ministry of Education of Iran, the number of students in the grade 11 in mathematics are 5599, 3105 boys and 2494 girl which they were studying at 2011-12. The data on the number of students have been obtained in collaboration with the Ministry of Education.

3.3.1. Sample size

According to the target of this study, the participants were selected and examined based on stratified random sampling from the high school students in Tehran. In this research, the researcher considered the parameters of three questionnaires ($N=405$, $q=81$ for 5: 1 ratio). To prevent data reduction, the researcher considered 10 percent more. As a result, 486 questionnaires were spread among respondents (high school students). Finally by consideration of the missing data, the researcher collected 450 samples from Tehran, Iran.

3.4. Data Collection Procedures

Prior to the data collection, a list of schools in Tehran was obtained from Iranian Education Ministry. The researcher distributed the questionnaires among the students. Three questionnaires of mathematical self-concept, mathematical self-efficacy and the class atmosphere were distributed. Before distribution of questionnaires the researcher provided the participants some essential instructions. Finally, since the purpose of this research is predicting the students' achievement in mathematics, their average score in math, geometry and algebra were taken from the high school for 2012-2013 educational years.

3.5. Instrument

In this study, the researcher used 4 instruments to collect data as below:

3.5.1. Demographic Questionnaire

It contains the demographic information of the respondents, such as gender, age and their overall result and mathematics in the mid-year and past year examination in December 2012.

3.5.2. Mathematical Self-concept Questionnaire

Self-description questionnaires were made by Herbert W. Marsh (SDQII) in 1983 based on multi-model and hierarchical Marsh and Sholsun. In this model it is assumed that the concept is comprised of seven distinct and independent dimensions that are combined to create a more general structure. The seven dimensions of self-concept includes physical ability, physical characteristics, the relationship with parents, verbal self-concept, mathematical self-concept and self-concept to other school subjects (Poorasghar, 2004).

The self-concept questionnaire consists of three forms which can be used for the pre-teen years to late adolescence and young adulthood respectively. Marsh, in 1990, revised this questionnaire. The self-concept scale used in this study is consistent with the Marsh model that has been extracted by using mathematical analysis of the relevant factors. This questionnaire consists of 12 questions on a six-item Likert scales and includes mostly false, more false than true, more

true than false, mostly true graded as 2, 3, 4, 5; 1 is :false, not like me at all and 6 is: it isn't like me at all. The scale reliability was reported 0/89. In this study, the questions were examined after performing mathematical self-concept scale.

3.5.3. Classroom Atmosphere Questionnaire

To rate scales to measure the classroom atmosphere, the Questionnaire WIHIC (what is happening in this classroom questionnaire) designed by Fraser, Fisher and Mac Ruby (1996) was applied that is one of the most outstanding combined questionnaires and the other categories, such as justice have been added to the scales (Dorman, 2008). it consisted of 56 questions and 7 subscales, such as dependent students, teacher support, student involvement, investigation, task orientation, cooperation and justice (Equity) (Fraser, Fisher, MAC Ruby, Dorman, 2003). These tools range from a five-point Likert set from almost never (1) to always (5).

3.5.4. Mathematics Self-Efficacy Scale (MSES)

The MSES contains 52 items within three scales: solution of mathematics problems, completion of mathematics tasks used in 6 everyday life, and performance in college courses requiring knowledge and mastery of mathematics. Each of the 52 MSES items is rated on a 10-point Likert scale, with a score of 9 indicating complete confidence and 0 indicating no confidence.

The researcher used three modifications to the MSES for this study based on Langenfeld and Pajares research (1993). The 10-point Likert rating scale was reduced to a 5-point rating scale to improve the ease of administration and scoring. Comparable reliability figures using the 5-point rating scale were found in a pilot study (Langenfeld&Pajares, 1993). The math problems scale of the MSES was adapted from the Mathematics Confidence Scale (MCS) created by Dowling (1978), who utilized preliminary forms in constructing her final two forms of mathematics self-efficacy and performance. It is also to be noted that the internal consistency of the three scales was estimated to be .90 for mathematics problems self-efficacy, .91 for mathematics tasks self-efficacy, and .91 for mathematics courses self-efficacy. Cronbach's alpha for the total MSES was .95. The internal consistency of the 18 mathematics problems was estimated to be .74 (Langenfeld and Pajares, 1993).

3.5.5. The tools to identify the mathematical progress

According to the recommendations of Bandura (1997), for evaluating the academic performance of the students we should consider the actual performance of them. Actual performance may appear when the assignments are important and they have high motivation to do it. Usually the final exam is very important for students and, the researcher uses the math' score of final exam as a tool for evaluating achievement in mathematics.

3.6. Reliability and Validity of Research Instrument

Measuring the reliability is one of high importance for any research. The results of the coefficient of reliability (the reliability of each of the parts in the scale) are reported in Table 3.1. It is to be mentioned that reliability was calculated by Cronbach's alpha.

Table 3.1: Constructs, Dimensions, and Reliabilities (Cronbach's Alpha)

Construct	Dimensions	Items	Reliability
Self-concept (Marsh et al ,1984)	Interest in mathematics	7	0.91
	Perception of ability	5	0.85
	Total	12	0.94

Classroom Atmosphere (Fraser and Dorman, 2009)	dependent students	8	0.84
	teacher support	8	0.87
	student involvement	8	0.87
	investigation	8	0.90
	task orientation	8	0.86
	cooperation	8	0.88
	justice (Equity)	8	0.90
	Total	56	0.88
self-efficacy Pajares (1995)	self-efficacy in mathematics	13	0/91
	Total	13	0.91

In this research, in all questionnaires measuring the content validity of the scales, the researcher pursued experts' opinions (3 persons at minimum). They reported an acceptable level of content validity.

3.7. Data Analysis

To analyse the demographic data in this research, the researcher will use descriptive statistical analysis (frequency and percentiles) on the sample groups to obtain a clear understanding of the population. Correlation coefficient has also applied to analyse the relationship among other variables of interest.

4.FINDINGS

This part of the paper addresses the statistical findings of the inquiry. Both descriptive and inferential techniques are chosen on the basis of the data provided by the instruments. To analyze the data in this part, SPSS and AMOS were used in a full analysis of moment structures.

4.1. Demographic Information of Respondents

In this part demographic information was considered which included sex, age, and educational area of Iranian students. The results are presented below.

4.1.1. Gender

The findings showed, 58% of participants were boys (n=232) and 42% were Girls (n=42).

4.1.2.Age

In this research the age group of the participants were from under 16 to 19 years old (four groups). The analysis of Iranian students shows that 14.2% (n=57) of the respondents belongs to the age group of 16. Also 70.5% (n=282) of the respondents were under 17 years old. 11% (n=44) of participants belongs to the age of 18. While 4.3% (n= 17) were under 19 years old.

4.1.3.Educational Area

The research participants were chosen of four educational areas. 30% of students were from the educational area 2 (n= 120). 13.5 % of students were from educational area 4 (n= 54). Also 34.8% of students were from educational area 6(n= 139). Finally 21.8% of students were from educational area 19 (n= 21.8).

4.2.Test of Normality Assumption

AMOS tested the individual variables for normality. The findings showed there were no cases exceeding the critical value point for Mahalanobis distance statistic with $p < .001$, which indicated no multivariate outliers in the data. Thus there were no outliers in the data and the assumptions of independence, and normality were met.

4.2. Research Hypotheses

4.2.1. There is significant relationship between Mathematic Self-concept and achievement in mathematics of high school students.

The correlation between mathematic self-concept and achievement in mathematics score among Iranian high school students was found to be not statistically significant, $r(400) = .012$, $p > .01$, two-tailed. In other words the findings show there are no relationship between mathematic self-concept and mathematics achievement among sample groups. In other words, the result of research expressed that it is not direct effect of math self-concept on math achievement.

Table 4.1: Correlation between Mathematic Self-concept and achievement in mathematics

		Mathematic Self-concept	Achievement in mathematics
Mathematic Self-concept	Pearson Correlation	1	.012
	Sig. (2-tailed)		.808
	n	400	400
achievement in mathematics	Pearson Correlation	.012	1
	Sig. (2-tailed)	.808	
	n	400	400

4.2.2. There is significant relationship between class atmosphere and achievement in mathematics of high school students.

The correlation between relationship between class atmosphere and achievement in mathematics score among Iranian high school students was found to be statistically negative significant, $r(400) = -.365$, $p < .01$, two-tailed. The results showed perception of the classroom environment has a significant impact on math self-concept. It means the positive perception of the classroom environment is associated with higher levels of math self-concept.

Table 4.2: correlation between class atmosphere and achievement in mathematics

		Class Atmosphere	Achievement in Mathematics
Class Atmosphere	Pearson Correlation	1	.365**
	Sig. (2-tailed)		.000
	n	400	400
Achievement in Mathematics	Pearson Correlation	.365**	1
	Sig. (2-tailed)	.000	
	n	400	400
**. Correlation is significant at the 0.01 level (2-tailed).			

4.2.3. There is significant relationship between Mathematic self-efficacy and achievement in mathematics of high school students.

The correlation between mathematic self-efficacy and achievement in mathematics score among Iranian high school students was found to be statistically significant, $r(400) = -.110$, $p < .01$. The result of this research about the hypothesis which was about significant effect of mathematical self-efficacy on math achievement showed that math self-efficacy had high effect on math achievement.

Table 4.3: correlation between Mathematic self-efficacy and achievement in mathematics

		achievement in mathematics	Mathematic self-efficacy
achievement in mathematics	Pearson Correlation	1	-.110*
	Sig. (2-tailed)		.028
	n	400	400
Mathematic self-efficacy	Pearson Correlation	-.110*	1
	Sig. (2-tailed)	.028	
	n	400	400

*. Correlation is significant at the 0.05 level (2-tailed).

4.3.3. There are significant relationships among mathematic self-concept, the class atmosphere, mathematic self-efficacy and the achievement in mathematics of high school students.

The correlation between mathematic self-efficacy and achievement in mathematics score $r(400) = -.110$, $p < .05$, and the correlation between relationship between class atmosphere and achievement in mathematics score $r(400) = +.365$, $p < .01$ were found to be statistically significant. In addition, the correlation between mathematic self-concept and achievement in mathematics score among Iranian high school students was found to be not statistically significant, $r(400) = +.808$, $p > .01$, two-tailed. The results of this study show that the learning environment can influence on mathematics learning. The correlation among all variables shown in table 4.4.

Table 4.4: correlation among all variables

		Achievement in mathematics	Mathematic Self-concept	Class Atmosphere	Mathematic self-efficacy
Achievement in mathematics	Pearson Correlation	1	.012	.365**	-.110*
	Sig. (2-tailed)		.808	.000	.028
	n	400	400	400	400
Mathematic Self-concept	Pearson Correlation	.012	1	.102*	.018
	Sig. (2-tailed)	.808		.042	.727
	n	400	400	400	400
Class Atmosphere	Pearson Correlation	.365**	.102*	1	.021
	Sig. (2-tailed)	.000	.042		.681
	n	400	400	400	400
Mathematic self-efficacy	Pearson Correlation	-.110*	.018	.021	1
	Sig. (2-tailed)	.028	.727	.681	
	n	400	400	400	400

** Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

5. DISCUSSION AND CONCLUSION

This part seeks to address the research hypotheses based on the appropriate results derived from the findings presented in the previous section.

5.1. There is significant relationship between Mathematic Self-concept and achievement in mathematics of high school students.

The correlation between mathematic self-concept and achievement in mathematics score among Iranian high school students was found to be not statistically significant, $r(400) = +.808$, $p < .01$, two-tailed. The result of research expressed that it is not direct effect of math self-concept on math achievement. These findings was not closed with some studies in this field. As a result, Nasri (1997) showed and explained that math self-concept was effective on math performance. also this research was in line with Barati(1997) Shokrkron and Nisei(1996) Rylych(1983) and Marsh et al(1991) Ali Asghar (2004), Marsh)1986, 1990; Rees, 1984(Shvlsvn) 1982(Wilkins et al) 2002(quoted by Wilkins(2004). It could be explained that the higher level of competency of students in mathematics, makes students had a better performance. Despite the positive effect of math self-concept on math achievement is evidence that this effect is negative (pahlavansadegh, 2005) and insignificant (Nasr Esfahani, 2003). The result could be related to poor self-concept among Iranian students. Poor self-concept related on to the student's previous academic failure, which he has achieved in his evaluation. Failure of students in the classroom and negative emphasis of teacher about the difficulty of mathematics, also the lack of progress of student in this course, would be cause of coming down the mathematical self-concept.

5.2. There is significant relationship between class atmosphere and achievement in mathematics of high school students.

The correlation between relationship between class atmosphere and achievement in mathematics score among Iranian high school students was found to be statistically significant, $r(400) = +.365$, $p < .01$, two-tailed.

The results showed perception of the classroom environment has a significant impact on math self-concept. It means the positive perception of the classroom environment is associated with higher levels of math self-concept. These findings are consistent with many studies in this field. As results Rahman, 2001; gordon, 1997. Liu, 1994; Burns, 1982 showed that the perception of the classroom environment has influence on math self-concept.

5.3. There is significant relationship between Mathematic self-efficacy and achievement in mathematics of high school students.

According to the result of current research the correlation between Mathematic Self-efficacy and achievement in mathematics score among Iranian high school students was found to be statistically significant, $r(400) = -.110$, $p < .01$. The importance of self-efficacy in students' academic progress.

By examining self-efficacy among students in the field of mathematics, Hackett and Betz (1989) recommend to the teachers that they would have emphasize the actual performance of students, also pay attention to self-assessments of their students. The result of this research about the hypothesis which was about significant effect of mathematical self-efficacy on math achievement showed that math self-efficacy had high effect on math achievement. This finding was close with results of Pentich and Digroth, 1990; molten, brown and lent, 1991; zimmerman, bandura and martins ponz, 1992; pajars and valint, 1997; pajars, miler and jonson, 1999; melpas et al, 1999; anjom, 2006. Also the results of karimzadeh, 2001; farhadi, 2011; shakeri, 2011 and afshari, 2010 confirmed the finding of this research Which means that Academic self-efficacy increase with increasing academic achievement. Molton et al, 1991 showed that Beliefs of Self-efficacy are strong predictors of academic achievement. Meta-

analysis of the relationship between self-efficacy and academic achievement showed correlation between these two variables. Self-efficacy affected the motivation of students through the choices they make and the goals that they set for themselves. Self-efficacy students have tendency to choose challenging assignments. Also the high level of self-efficacy lead to high effort to confronting of problems. When students are faced with difficult tasks, working hard, show that this process will lead to academic achievement (bandura, 1997; shank, 1991). Findings of Shank (1986, cited in pagars, 1996) showed that self-efficacy associated with academic achievement in mathematics. In explaining of this results could say that When a person has confidence about his abilities in a certain area, achieved Developments on that field.

5.4. There are significant relationship among mathematic self-concept, the class atmosphere, mathematic self-efficacy and the achievement in mathematics of high school students.

The correlation between mathematic self-efficacy and achievement in mathematics score $r(400) = -.110$, $p < .05$, and the correlation between relationship between class atmosphere and achievement in mathematics score $r(400) = +.365$, $p < .01$ was found to be statistically significant. In addition, the correlation between mathematic self-concept and achievement in mathematics score among Iranian high school students was found to be not statistically significant, $r(400) = +.808$, $p > .01$, two-tailed. The aim of this study was to investigate the relationship between learning environment and academic achievement in mathematics by mathematics self-efficacy and math self-concept. The results of this study shown that the learning environment can influence on mathematics learning. But as it showed in previous research the role of environment of classroom by considering the self-efficacy and self-concept are effective on learning mathematics.

The research literature supported the relationship among self-efficacy, perception of math classroom, mathematics self-concept and achievement in mathematics. According to Bandura, if we believe that we are able to gain the progress, we obtained self-efficacy. The results of the analysis show that self-efficacy had significant direct effect with Academic achievement of students. This finding is consistent with literature review (Pintrich and De Groot, 1990; Hay and Walker, 2000; Pajars and Valynt, 1997; Karimzadeh, 2001; Amini, 2003; Khan Mohammadi, 2005 and Davodi, 2012). When a person has confidence about their abilities in a certain area, then he could achieve any progress on this field. This research supports the efficacy of mathematical, math self-concept and achievement in mathematics protection. (Shiralipoor, Farzad, Haji Hossein nejad and Asadi, 2014). One interesting result was that although the perception of classroom, self-efficacy was associated with mathematics achievement, but with arrive of the self-concept this relationship was lost.

CONCLUSION

These studies emphasize the recognition of factors capable of changing and modification that can play the role of a moderator between educational progress and its corresponding variables. In the present study, the conception of the class atmosphere as an external factor affects mathematical self-concept as well as mathematical self-efficacy and indirectly explains the changes of achievement in mathematics. It could be said that an individual's learning and educational progress are under the influence of complicated conditions. With respect to the effect of the learning atmosphere on learning, it can be inferred that the recognition of those classes that are more appropriate environments is

significant and the change of learning atmosphere has always been one of the intervening factors in better learning.

REFERENCES

1. Ames, c. (1992). Classroom: Goal, structure and motivation. *Journal of Educational Psychology*, 84, 261-271.
2. Amini, S. (2003). A study on the role of self-efficacy, self-regulation and self-esteem in academic achievement of students in the third grade of high school in the field of empirical science in Shahrekord city. Master's Thesis, Faculty of Psychology and Educational Sciences, Tehran University of Teacher Education.
3. Anjum, R. (2006). The impact of self-efficacy on mathematics achievement of primary school children. *Pakistan Journal of Psychological Research*, 21(3-4).
4. Bandura, A. (1994). Self-efficacy. *retriveto*. <http://www.emory.edu>
5. Bandura, A. (1994). Self-Efficacy. In V.S. Ramachaudran, *encyclopedia of human Behavior*, Vol.4, PP.71-78
6. Bandura, A. (1977). Self-efficacy: Exercise of control. New York, H, W, Freeman and company.
7. Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
8. children's social and cognitive development. *Educational Psychologist*, 38(4), 207-234.
9. Davis, H. A. (2002). Conceptualizing the role and influence of student-teacher relationships on Davoodi, S., Talebi, S., Seif, M. H., & Jani, F. M. (2012). Influencing factors on intention to use ICT among English language students of Shiraz University. *Global Journal on Technology*, 1.
10. Farhadi, Esmatollah (2011), The role of anxiety, mathematical self efficacy and attitude in educational achievement at mathematics lesson, MA thesis, faculty of psychology & educational sciences, Tehran University.
11. Fraser, B. J., & Aldridge, J. L. (2002). Junior secondary mathematics student's learning environment and satisfaction in Brunei Darussalam. Paper presented at the Annual Conference of the Australian Association for Research in Education, Western Australia
12. Gordont . Darlene ., (1997). Relationships among academic self-concept, academic achievement, and persistence with self-attribution, study habits, and perceived school environment
13. Hackett, G. & Betz, N. E. (1989). An exploration of the mathematics self-efficacy / mathematics performance calibration, *Journal for Research in Mathematics Education*, 20, 261-273.
14. Karimzadeh, Mansooreh (2011), The study on relationship among self concept (educational and non- educational) and self efficacy with mathematical achievement in female students at Tehran city, MA thesis, Tehran University.
15. Kuperminc, G. p., Leadbeter, B. j., Emmons, C., & Blatt, S. j. (2003). Perceived school climate and difficulties in the social adjustment of middle school students. *Applied Development Science*, 1, 79-55.
16. Marsh, H. W. (1986). Global self-esteem: Its relation to specific facets of self-concept and their

- importance. *Journal of Personality and Social Psychology*, 51, 1224-1236.
17. Marsh, H. W. (1986). Verbal and math self-concepts: An internal/external frame of reference model. *American Educational Research Journal*, 23(1), 129-149.
 18. Marsh, H. W. (1990). A multidimensional, hierarchical self-concept: Theoretical and
 19. Martin, B. A., pro-, U. o. O. i. a. a., Kwai-Choi Lee, C., & se-, U. o. A. i. a. (2004). The influence of ad model ethnicity and self-referencing on attitudes: Evidence from New Zealand. *Journal of Advertising*, 33(4), 27-37.
 20. Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*, 38(1), 30-38.
 21. Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*, 38(1), 30-38.
 22. Nasr Isfahani, Zahra (2003), The role of mathematical self efficacy, self concept, and anxiety, and the perceived usefulness in educational achievement among high school first graders at Tehran City, MA thesis, faculty of psychology and educational sciences, Tehran TarbiatMoalem University.
 23. PahlavanSadegh A. (2005), The review of the relationship between the variables of family, socio-economic status, individual variables with mathematical achievement based on TIMSS Data (2003), MA thesis, TarbiatMoalem University.
 24. Pajares, F., & Miller, M. (2003). Role of self-efficacy & self-concept beliefs in mathematical problem solving: A path analysis. *Journal of Educational Psychology*, 86 (2), 193-203.
 25. Pajares, F., & Schunk, D. (2001). The development of academic self-efficacy. Development of achievement motivation. United States.
 26. Pajares, F., & Schunk, D. H. (2002). The development of academic self-efficacy, In A. Wigfield & J. Eccles (Eds). *Development of achievement motivation* (pp.15-31). San Diego: Academic press.
 27. Parvin, L, E, John A.B (2002), *Psychology of personality (Theory & Research)*, Trans by KadivarParvin, and Javadi, Mohammad Jafar, Tehran: Abiz Press
 28. Pervin, L. A. (2001). A dynamic systems approach to personality. *European Psychologist*, 6(3), 172.
 29. Pintrich, P.R., & De Groot, E.V.(1990). Motivational & self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82, 33-40.
 30. Pintrich, P. R. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory into practice*, 41(4), 219-225.
 31. Pourasghar, N. (2004), Role of self concept and motivation for learning math on mathematical achievement among high school first graders, MA thesis, TarbiatMoalem University
 32. Rogers, C. R. (1951). *Client-centered therapy: Its current practice, implications and theory*: Houghton Mifflin Boston.
 33. Ullman, J. B. (2006). Structural equation modeling: Reviewing the basics and moving forward. *Journal of personality assessment*, 87(1), 35-50.
 34. Wilkins, j.M .(2004). Mathematics and science self- concept: An International Investigation .*journal of Experimental Education*, 72. 331- 346.
 35. Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology*, 25(1), 82-9