

The Effect of Interactive Management Style on Academic Adjustment, Math Anxiety and Academic Engagement of Students

Abolfazl Ghasemzadeh Alishahi^{1*}, Mojtaba Panahi², Maryam Samadi³

1. Associate Professor, Department of Educational Sciences, Faculty of Education & Psychology, Azarbaijan Shahid Madani University.
2. M.A, Department of Educational Administration, Marand Branch, Islamic Azad University, Marand, Iran.
3. M.A, Department of Educational Sciences, Faculty of Education & Psychology, Azarbaijan Shahid Madani University.

Article history:

Received date: 2021/06/12

Review date: 2020/09/20

Accepted date: 2020/10/31

Keywords:

Academic Adaptation, Mathematical Anxiety, Academic Engagement, Interactive Management Style

Abstract

Purpose: The purpose of this study was to examine the effect of interactional management style on academic adjustment, mathematical anxiety, and academic engagement in elementary sixth grade students.

Methodology: This research was applied in terms of purpose and quasi-experimental in terms of method and with pre-test-post-test design with experimental group and control group. The statistical population consisted of all male students of the elementary sixth grade of district 3 of Tabriz city with a total of 3721 students in the academic year of 2018-2019. The sample size was 57 persons (29 experimental and 28 control) and selected by purposive sampling method. Clark academic adjustment questionnaire, Shokrani mathematical anxiety questionnaire, and Schofield and Becker academic engagement questionnaires were used for data collection. The interactional management style was also implemented based on the researcher-designed package. Descriptive and inferential statistical methods including univariate and multivariate analysis of covariance were used for data analysis.

Findings: Results showed that after applying an interactive management style, the mean of academic adjustment in the experimental group was significantly higher than the control group. The mean of mathematical anxiety and its components (mathematical test anxiety and anxiety of mathematical nature) in the experimental group were significantly lower than the control group. The mean of academic engagement and its components (ability, commitment, and attraction) in the experimental group were significantly higher than the control group.

Conclusion: The study concluded that teacher-student interaction improved academic engagement and academic adaptation and reduced student math anxiety.

Please cite this article as: Ghasemzadeh Alishahi A, Panahi M, Samadi M. (2022), the Effect of Interactive Management Style on Academic Adjustment, Math Anxiety and Academic Engagement of Students, *Iranian Journal of Educational Sociology*. 4(4): 127- 140.

* Corresponding Author Email: ghasemzadee@yahoo.com

1. Introduction

The most important activity to achieve educational goals is the process of teaching and learning. A teacher must be able to manage the class in teaching and learning activities. Classroom management can cause students enjoy in the process of teaching and learning besides good teaching and learning interactions (Yulaini, Rachmawati, Putri, Chayanti, 2021). Well-run classrooms provide the best learning opportunities for the students. Hence, all experts have emphasized the creation of healthy environments and appropriate learning opportunities in their definition of classroom management. For example, Woflek (2004) defined classroom management as using some techniques to create and maintain a healthy environment free of behavioral problems" (cited in Seif, 2019, p. 552). The importance of the classroom management is such that some researchers believe that classroom management and education should not be considered separately, because these two variables have a simultaneous effect on creating a favorable classroom climate (Samadi, Rajaeipour, Aghahsini, Qalavandi, 2008, p. 157). The teacher, as the class manager, provides the grounds for achieving the educational goals by using the available facilities. The nature of the teacher activity in the classroom is intertwined with the classroom management. In the teacher-student interaction, the teacher's classroom management style is of special importance (Evertson, Westein, 2006). One of these management styles is interactive management. Interactive management is a specialized management system that provides more productivity when trying to solve complex management and planning problems. It examines the situational, cognitive, and pluralistic aspects of complexity (Janes, 1995). Interactive management is a systemic approach with a reflection of soft systems. By increasing learning and interaction between stakeholders, this type of management, clarifies, organizes, and interprets the produced ideas (Tuan, 2020). Also classroom management encompasses a wide range of classroom processes and interactions and is a key variable in creating an empowering environment for the teaching and learning; That is, in addition to teaching, it includes all students' interactions with the teacher and with each other, as well as the socio-cultural and psychological environment of the class. In other words, it is a comprehensive term that includes the teacher 's tasks to the monitor the class activities, including students' behaviors, interactions, and learning (Evertson, Westein, 2006). Therefore, it can be expected that the correct management of the class and the selection of appropriate method based on the circumstances create a calm climate away from inadjustment in the learning environment, providing positive feedbacks and a favorable self-image formation in the students.

One of the influential variables in the field of teaching and learning is academic involvement (Amiri, Ebrahimi Moghadam, Babakhani, 2019). Due to the importance of this variable in reducing dropout and increasing student performance, interest in academic involvement has been increasing recently (Karababa, 2020). However, important scientific challenges have been identified for the research on the academic involvement. One of them is the limited coverage of the countries on the research literature that limits the possibility of comparing the level of activities and differences in patterns of academic involvement in different countries (Perkmann & et al, 2021).

Academic engagement refers to the quality of the students' efforts to purposefully engage in the educational activities to achieve desired outcomes (Linnenbrink, Pintrich, 2003). Deci and Ryan (2012) consider the concept of engagement as a part of a broader model of human motivation that has expanded over the past few decades. Linnenbrink and Pintrich (2003) consider academic engagement as a kind of psychological investment and a direct effort to learn, understand, and master the knowledge and skills and arts that educational activities are used to promote. According to Reeve (2002), engagement is a visible manifestation of motivation, which includes the size, intensity of effort, and emotional quality of participation in the activities. It should be noted that support and intimate relationship with teachers form a positive academic attitude in students, which by itself leads to the school satisfaction (Klem, Connell, 2004). The provided conditions create a positive climate in the classroom, which leads to a sense of belonging, joy, passion, and respect for the students. Thus, such a class is an important predictor of the

academic engagement (Reyes & et al, 2012). One of the reasons for the importance of academic involvement is its protective role against dangerous behaviors and its relationship with academic adjustment (Martín & et al, 2020 'Karababa, 2020)

Achieving academic success requires challenge and adjustment to new educational conditions (Zarei, Mirhashemi, Pasha Sharifi, 2012). Academic adjustment is an important indicator of the students' success (Raza, Qazi, Yousufi, 2020). Because, it includes characteristics such as academic abilities, motivations, and beliefs that are important for achieving academic success (Bi, Zhang, Yang, Zhang, 2020). Adjustment is an evolving, growing, and dynamic process, which involves the balance between what individuals want and what society accepts. In other words, adjustment is a two-way process. From one hand, the individual communicates effectively with the community, and on the other hand, the community provides the tools through which the individual can turn his potential abilities into reality. In this interaction, the individual and society undergo some changes and a relatively stable compromise is created between them (Shariatmadari, 2014). Adjustment is assumed to be a more or less conscious process by which an individual adapts to a natural or cultural social environment. This adjustment requires that individuals actively make changes in themselves in order to create harmony between themselves and the environment in order to overcome environmental barriers or satisfy their needs (Mahallati, Abolmaali, 2016). Abdullah, Elias, Mahyuddin and Uli (2009) believe that academic adjustment is a multidimensional concept which refers to the ability of the individuals to respond successfully to the diverse demands of the educational environment. Friedlander, Reid, Shupak and Cribbie (2007) defined academic adjustment as follows: "Academic adjustment occurs when the individuals respond well to the educational demands, which includes motivation to complete homework, success in meeting academic requirements, academic effort, and satisfaction with the learning environment. Given the importance of adjustment, common views on it are first discussed. The first environment a child enters after family is school. School is considered as one of the important centers of academic adjustment in which the duties and rights of the individuals are identified and social values are transmitted. There is a set of behavioral norms that people are expected to conform to in larger societies. There are similar norms in the small school community and when a person can dedicate himself to those norms and expectations, adjustment has taken place (Sotoudeh, 1999, cited in Rahimi, 2011). Academic adjustment plays an important role in the quality of the students' relationship with the school environment (Aghapour, Abu al-Ma'ali al-Husseini, Asgharnejad Farid, 2018). Adjustment as an important ability for reaching good academic performances can be said that can play an important role in the academic performance of the students in various subjects, including mathematics (Crede, Niehorster, 2012).

In order to improve the process of teaching and learning mathematics, it is necessary to identify the problems that exist in the process. The results of various studies show that understanding and learning mathematics depends not only on the cognitive structures, but also on the motivational and emotional factors such as beliefs, attitudes and anxieties (Rekabdar, Soleimani, 2008). Other findings by the scientists have showed that mathematical anxiety significantly predicts progress (Rodriguez & et al, 2020). Mathematical anxiety is a mental condition that arises when confronted with the mathematical content, whether in a situation of teaching and learning, or in solving mathematical problems or measuring mathematical behavior in the individuals. This situation is usually accompanied by high anxiety, mental disorder, imposed thoughts, and psychological stress and as a result, stop of thinking (Alamolhodayee, 2000, p. 103). Mathematical anxiety can be a kind of attitude towards mathematics and to a large extent, considered as an internal matter (Arem, 2010, p. 167). Anxiety about math lessons is a reaction of students to the subject-related elements, which include things like listening to a lecture, teaching math concepts, solving math problems in a classroom, or a math test. This anxiety is caused by several factors, the most common of which is negative experiences in the math education. Students who struggle with anxiety caused by the math lessons feel that they are the only ones suffering from this anxiety (Ahmadi, Ahmadi, 2011).

The level of math anxiety of the students is relatively satisfactory. Educational strategies predict students' success and attitude. Hence, teachers must continuously increase students' abilities, attitudes, and behaviors in the related courses (Ganal, Guiab, 2020). Different factors are effective in the occurrence of mathematical anxiety, including aversion to school, poor self-concept, poor math skills, teacher attitudes, and an emphasis on understanding math through practice and tasks (Greenwood 1984, cited in Rekabdar, Soleimani, 2008). Therefore, today, mathematical anxiety is of interest to many psychologists in mathematics education as well as cognitive psychologists. Research in recent years has shown that by creating serious cognitive and educational barriers in learners, unreasonable mathematical anxiety (morbid anxiety) weakens their mathematical self-confidence, causing them to suffer from mental retardation and lack of reasoning skills, strongly affecting their mathematical performance and progress by creating a negative attitude (Alamolhodayee, 2000). This can affect the energy and time that students spend on the math, actually affecting the students' academic engagement. The concept of academic engagement refers to the quality of the efforts that students expend for the purposeful educational activities to directly achieve the desired outcomes (Linnenbrink, Pintrich, 2003), a factor that can be more or less influenced by the conditions and the method the class is managed.

This study was conducted to investigate the effect of the interactive classroom management style on the academic adjustment, mathematical anxiety, and academic engagement of the sixth grade elementary students. Because at the end of the school year, these students will experience big changes from various dimensions while shifting their grades such as the study environment, increased number of courses and teachers, new teaching staff and classmates. Obviously, if these students have enough skills such as high academic adjustment, ability to control anxiety, and good academic engagement, they can cope with these changes well.

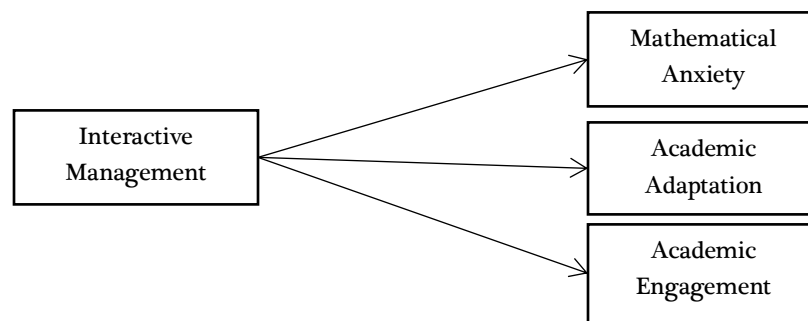


Figure 1. Conceptual model of research

Based on Figure 1, the main research question was whether an interactive classroom management style has an effect on the academic adjustment, mathematical anxiety, and academic engagement of the sixth grade students.

Methodology

This study had an independent variable with two levels (using interactive management style and without interactive management style), whose application effect on the scores of academic adjustment, mathematical anxiety, and academic engagement tests (as a dependent variables) was investigated.

In this study, all male students of the sixth grade elementary school in District 3 of Tabriz in the school year of 2018-2019 were considered as the population, numbering 3721 people from which two (Belal Habashi & Yadegar Imam) male schools were purposefully selected and randomly assigned to the experimental and control groups. 29 people were selected from the sixth grade of Bilal Habashi School as the experimental group and 28 people from the sixth grade of Yadegar Imam School as the control group.

Academic adjustment questionnaire. The Educational Adjustment Questionnaire of Clark, Thorpe, Tieg (1953) was used to measure the students' academic adjustment. This questionnaire consists of 15 items. The

minimum score for each participant is 15 and the maximum score is 75. The validity of this questionnaire was confirmed in the studies of Ardalan & Hosseinchari (2010), Tajali & Ardalan (2010), and Bardestani (2004). Also, its consistency measured by Cronbach's Alpha coefficient was .83, .83 and .79, in the pre-test and post-test respectively. In the present study, the validity of the questionnaire was confirmed by the expert professors and the consistency of the questionnaire was calculated to be 0.81 in the post-test and 0.74 in the pre-test using Cronbach's Alpha coefficient.

Math anxiety questionnaire. The Mathematical Anxiety Questionnaire of Shokrani (2002) was used to measure the students' math anxiety. The questionnaire consists of 18 questions on a five-point Likert scale (never-always) and each item has a value from 1 - 5, which has two components of math test anxiety and math nature anxiety. All items are scored positively. The minimum score for each participant is 18 and the maximum score is 90. The math test anxiety refers to the anxiety state related to the math test session, and the math nature anxiety refers to the anxiety state related to the math problems in the class. The consistency of the questionnaire was reported by Shokrani (2002) to be 0.93. In the present study, the validity of the questionnaire was confirmed by the expert professors. Also, the consistency of the questionnaire was calculated to be 0.75 in the post-test and 0.83 in the pre-test using Cronbach's Alpha coefficient.

Academic engagement questionnaire. Academic Engagement Scale of Schaufeli, Bakker & Salanova (2006) was used to measure the academic engagement of the students. This scale has 9 items on a five-point Likert scale (never- always) and each item has a value between 1 and 5. This questionnaire includes three components of empowerment, commitment, and absorption. All items are scored positively, with a minimum score of 9 for each participant and the maximum score of 45. Academic engagement refers to the learner's level of participation or commitment to the learning activity. This questionnaire was validated in the study of Seif (2018). In this study, the validity of the questionnaire was re-evaluated and confirmed by the expert professors and the consistency of the questionnaire in the post-test was calculated to be 0.77 in the pretest and 0.78 in the posttest using the Cronbach's Alpha coefficient.

At the Preparation stage, the basics of an experimental setting were provided. After identifying the samples, the necessary coordination was done and the textbooks were identified. The pilot instructor received the necessary trainings regarding the plan goals, importance, and how to manage the classroom based on the interactive management style. Then, with the presence of the researcher in the experimental class, the subjects were provided with the information about their assignments in the process of the plan execution and how to manage the classroom based on the interactive management style.

Then the pre-test stage was performed. In the first session, the level of the academic self-concept, academic adjustment, and the current mathematical anxiety of the participants in both groups were assessed by the academic self-concept, academic adjustment, and mathematical anxiety as the pre-test without giving prior notice to the learners.

In execution stage, Independent variable 's application was performed during six weeks. During these sessions, the lessons were administered for the experimental and control groups' subjects in the same teaching methods, but with different classroom management styles. The training procedures of the experimental group were as follows:

In that context, an interactive management style was used for the classroom management. Prior to the trainings, the teacher grouped the students in consultation with the students. He asked them for their opinion on how the class should be run. After presenting the materials, the instructor asked the students to discuss it in their group. He also asked them to pose some problems for the taught discussion and to present it to their classmates in the next session. Also, in conducting the assessment, the students were asked for the help in the assessment so that some groups planned some questions from other groups and the students solved the problems in groups. The papers were also corrected and graded by the students themselves. In

the event of indiscipline in the classroom, the offender was dealt with according to the rules previously designed by the students.

In the last session, the tests of academic self-concept, academic adjustment, and mathematical anxiety were performed again as the post-test stage, without giving prior notice to the learners.

First, Shapiro-Wilk test was used to check the normality of data for the dependent variables. The values of Shapiro-Wilk statistic for the variables of academic adjustment and mathematical anxiety were 0.97 and 0.98, respectively, and were not statistically significant ($P < 0.05$). Therefore, it can be concluded that the distribution of the academic adjustment and mathematical anxiety is not significantly different from the normal distribution and the hypothesis of data normality is confirmed.

In the descriptive statistics' section, mean, frequency, frequency percentage, and standard deviation were used; while, in the inferential statistics section, for removing the effect of pretest from posttest, UNIANOVA test was used to evaluate the differences in the total scores and MANCOVA test was used to examine the differences in the component scores between the experimental and control groups. In applying this method, pre-test scores in both experimental and control groups were used as covariate variables. In this study, the collected data were analyzed using SPSS 23 Software.

Findings

Hypothesis 1: An interactive classroom management style affects students' academic adjustment.

The findings obtained as a result of the analyses performed to find answers to the research questions are presented below.

Table 1. Investigation of the homogeneity of regression slope between experimental and control groups in the variables of Academic Adaption and Anxiety

Source of Change	Degrees of Freedom	Average Squares	Amara F	Sig
Academic Adaptation *Group	2	2.23	.415	.663
Math Anxiety * Group	2	12.23	1.04	.072

As seen in Table 1, the F-statistic is not statistically significant for the academic adjustment variable ($P > 0.05$). Therefore, it can be concluded that the hypothesis of the regression slope homogeneity was confirmed for the variables of academic adjustment and mathematical anxiety between the control and experimental groups.

Table 2. Descriptive dtatistics of Academic Adjustment and Anxiety (post-test) in control and experimental groups

Variables	Group	Frequency	Mean	Standard Deviation
Academic Adaptation	Experiment	27	60.96	.59
	Control	25	48.76	2.14
Math Anxiety	Experiment	27	39.41	1.02
	Control	25	44.28	.87
Academic Engagement	Experiment	27	40.07	.58
	Control	25	33.32	.53

Table 2 shows the descriptive statistics of the dependent variables after applying the interactive management style (post-test) in the experimental and control groups.

Table 3. UNIANCOVA Test results to investigate the effect of interactive Management Style on Academic Adjustment, Math Anxiety and Academic Engagement

Sources of Changes	Dependent Variable	Total Squares	Degree of Freedom	Statistical Value of F	Sig	Effect Size
Experimental and Control Group	Academic Adaptation	1872.73	1	30.55	.001	.384
	Math Anxiety	411.21	1	19.01	.001	.279
	Academic Engagement	582.51	1	63.89	.001	.566

As seen in Table 3, the value of F statistic that was used to examine the difference in the academic adjustment between the experimental and control groups is equal to 30.55 and statistically significant at 0.05 significance level. According to Table 3, it can be said that the academic adjustment of the experimental group is higher than the control group. Also, based on the value of effect size, it can be said that 38.4% of the academic adjustment variance is explained by the interactive management style.

Hypothesis 2: An interactive classroom management style affects the students' mathematical anxiety.

As seen in Table 1, the F-statistic is not statistically significant for the mathematical anxiety variable ($P > 0.05$). Therefore, it can be concluded that the regression slope homogeneity for the mathematical anxiety between the control and experimental groups is confirmed.

As seen in Table 3, the value of F statistic for examining the difference in the mathematical anxiety between the experimental and control groups is 19.01 and statistically significant at 0.05 significance level ($P \leq 0.05$). According to Table 3, it can be said that the mathematical anxiety of the experimental group is less than the control group. Also, based on the effect size, it can be said that 27.9% of the mathematical anxiety variance is explained by the interactive management style.

Hypothesis 3: An interactive classroom management style affects the components of students' mathematical anxiety.

Table 4. Wilkes lambda multivariate statistic to examine the significance of differences in Math Anxiety and Academic Engagement components between control and experimental groups

	Wilkes lambda	Statistical Value of F	Degree of Hypothesis Freedom	Degree of Error Freedom	Sig
Math Anxiety	.714	9.41	2	47	.001
Academic Engagement	.412	21.38	3	45	.001

As shown in Table 4, the value of Wilkes Lambda is 0.714 and statistically significant at 0.05 level ($P \leq 0.05$). This means that there is a significant difference in at least one component of mathematical anxiety (math test anxiety and math nature anxiety) between the control and experimental groups.

Table 5. Intergroup effect test of control and experiment in terms of variable components of Mathematical Anxiety and Test of effect between control and experimental groups in terms of variable components of academic engagement

Sources of Changes	Dependent Variable	Degree of Freedom	Average Squares	Statistical Value of F	Sig	Effect Size
Components of Mathematical Anxiety	mathematical test Anxiety	1	103.31	10.18	.001	.175
	Anxiety of Mathematical nature	1	102.41	14.21	.002	.228
Components of Academic Engagement	Ability	1	45.37	27.17	.001	.366
	Obligation	1	100.04	38.15	.001	.448
	Absorption	1	43.18	21.77	.001	.317

As seen in Table 5, the value of F statistic for examining the differences between the experimental and control groups regarding math test anxiety and math nature anxiety is statistically significant ($P < 0.05$). According to the results of the descriptive data, the means of math test anxiety and math nature anxiety in the experimental group were 19.67 and 19.74, respectively, lower than the means of 22.20 and 22.08 in the control group. Also, based on the effect size, 17.5% of the variance of mathematical test anxiety and 22.8% of the variance of math nature anxiety were explained by the interactive management style.

Hypothesis 4: An interactive classroom management style affects the students' academic engagement.

As seen in Table 3, the value of F statistic used for examining the difference in the academic engagement between the experimental and control groups is 63.89 and statistically significant at .05 confidence level ($P \leq 0.05$). According to Table 2, it can be said that the academic engagement of the experimental group is more than the control group. Also, based on the the value of the effect size, it can be said that 56.6% of the academic engagement variance is explained by the interactive management style.

Hypothesis 5: An interactive classroom management style affects the components of the students' academic engagement.

As shown in Table 4, the value of Wilks-Lambda statistic is 0.412 and statistically significant at 0.05 level ($P \leq 0.05$). It means that there is a significant difference in at least one component of the academic engagement (empowerment, commitment and absorption) between the control and experimental groups.

As shown in Table 5, the value of F statistic used for examining the differences between the experimental and control groups in terms of empowerment, commitment and absorption is statistically significant ($P < 0.05$). According to Table 2 (descriptive statistics' table), it can be said that empowerment, commitment, and absorption in the experimental group is more than the control group. Also, based on the value of effect size, 36.6% of the empowerment variance, 44.8% of the commitment variance, and 31.7% of the absorption variance are explained by the interactive management style.

Conclusion

Examining and analyzing the difference in the academic adjustment between the experimental and control groups, which was obtained from the results of UNIANCOVA test, it was found that the difference in the academic adjustment between the experimental and control groups is statistically significant. That is, the mean value of the academic adjustment in the experimental group was higher than the control group after applying the interactive management style. Therefore, there is a difference between the experimental and control groups in terms of academic adjustment. In a comparative study on the results of this hypothesis with previous studies, no research was found that directly examined the effect of classroom management style on the students' academic adjustment; but, given the emphasis on the factors such as academic

achievement, motivation, environmental satisfaction, and relaxation in the educational environment as the components of the academic adjustment, it can be said that the results of this hypothesis consist with the findings of Kayıkçı (2009) research in which there was a relationship between the dimensions of classroom management skills of the teachers and the students' interdisciplinary. This result is also consistent with the results of Amin & Ali (2008) in which it was found that the students of interactive teachers have higher metacognitive skills compared to the students of intervening teachers. Theoretically, it can be said that in addition to the role of academic achievement in the motivation to learn, the ability to plan to achieve practical activities, having clear goals, a sense of commitment, duty or perseverance in the educational and vocational affairs, appropriate mental and physical health, and overall satisfaction with the educational environment and climate are also emphasized in the definition of academic adjustment today (Abdullah, Elias, Mahyuddin, Uli, 2009). Given that interactive management style requires having a range of abilities in dealing with the students in such a way that they give up their abnormal behaviors and play a role in the class process, the student finds this feeling in the classroom that he has been noticed and a part of his emotional-social needs are met and this improves his academic adjustment.

Examining and analyzing the difference in the mathematical anxiety between the experimental and control groups, obtained from the UNIANCOVA results, it was found that the difference in mathematical anxiety between the experimental and control groups was statistically significant. That is, the mean value of the mathematical anxiety in the experimental group was less than the control group after applying the interactive management style. Therefore, there is a difference between the experimental and control groups in terms of mathematical anxiety. Also, by examining and analyzing the difference between math test anxiety and math nature anxiety between the experimental and control groups, obtained from the results of MANCOVA, it was found that the difference between math test anxiety and math nature anxiety between the experimental and control groups was statistically significant. That is, the mean value of math test anxiety and math nature anxiety in the experimental group was less than the control group after applying the interactive management style. Therefore, there was a difference between the experimental and control groups in terms of math test anxiety and math nature anxiety. In a comparative study of the results of this question with previous research, it was found that the results of the present study are consistent with the results of Khezri (2014) in terms of the impact of classroom management style on reducing mathematical anxiety. Also, the findings of this question are in line with the findings of Lavasani, Hejazi, and Smiling (2011) in terms of the effect of classroom management style on reducing mathematical anxiety. According to the theoretical foundations that applying the interactive management style gives the classroom climate the features such as the suggestion of daily activities by students, the participation of teacher and students in setting lesson objectives, curriculum, and organization of teaching materials, self-assessment of the students' learning, organizing groups with the students' opinions, solving disciplinary issues in a negotiation process, the importance of group interactions, teacher-student participation in determining classroom rules, and students self-judgment about their behaviors, it can be said that applying an interactive management style can play a significant role in providing the desired climate in the math classroom, providing the conditions for the math anxiety reduction. Therefore, the application of an interactive management style reduces math anxiety levels in the experimental group.

Examining and analyzing the difference in the academic engagement between the experimental and control groups, which was obtained from the results of UNIANCOVA, it was found that the difference in the academic engagement between the experimental and control groups is statistically significant. That is, the mean value of academic engagement in the experimental group was more than the control group after applying the interactive management style. Therefore, there is a difference between the experimental and control groups in terms of academic engagement. Also, by examining and analyzing the differences in the components of academic engagement (empowerment, commitment, and absorption) between the experimental and control groups, obtained from the results of MANCOVA test, it was found that the difference in empowerment, commitment and absorption was statistically significant between the

experimental and control groups. That is, the mean value of empowerment, commitment, and absorption in the experimental group is more than the control group after applying the interactive management style. Therefore, there was a difference between the experimental and control groups in terms of empowerment, commitment, and absorption. In a comparative study of the results of this question with previous studies, it was found that the results of the present study are in line with the results of Mohammadi Baghmalai & Yousefi (2018), Ruzek et al. (2016), Cadima, Doumen, Verschueren and Buyse (2015), and Reyes et al. (2012), suggesting that the teacher-student interaction improves academic engagement.

As Klem & Connell (2004) showed, the quality of the student-teacher interaction is essential to understanding the students' academic engagement with the school. In explaining this role, it can be said that teacher-student interaction provides a supportive environment for the student to become interested in class and education and feel involved in class activities (Wang, Eccles, 2013). This support and intimate relationship with the teachers forms a positive academic attitude in the students, leading to the school satisfaction (Klem, Connell, 2004); as a result, the student will feel confident and positive about the class and school. These feelings lead to the further growth, academic motivation, and student engagement. In other words, students' interests are a big step towards forming their will and the skill that drives them to work and be active (Lawson, Lawson, 2013). The created conditions make a positive climate in the classroom that leads to the senses of belonging, joy, enthusiasm and respect in the students. Thus, such a class is an important predictor of the academic engagement (Reyes & et al, 2012). In this way, students are encouraged to play a more effective role in doing the homework. In general, the students' exploration and spontaneity causes them to be involved in the educational processes. Another point is that the student's low academic engagement is usually attributed to the student himself and therefore, he is blamed for that. Although academic engagement can be attributed to the individual differences to some extent, the findings of this study suggest that it is highly dependent on the teacher-student interaction. Therefore, the present study shows other evidence for the important role of the teachers in influencing academic engagement and, consequently, academic outcomes.

The goal of classroom management is to create an environment in which students act not out of avoidance motivation, to avoid punishment, or simply to gain encouragement, but in a sense of responsibility and eagerness to learn. Creating such an environment requires giving importance and being responsive to the cognitive, social, and emotional needs of students (Hamidi, Ibrahim Damavandi, Dehnavi, 2012, p. 7). Therefore, it can be expected that the correct classroom management and the selection of the appropriate style based on the circumstances will create a calm climate away from anxiety about learning the lessons.

Today, motivation to learn, the ability to plan to achieve practical activities, having clear goals, a sense of commitment, duty, or perseverance in the educational and professional contexts, appropriate mental and physical health and overall environmental satisfaction with the educational environment are also emphasized in addition to the academic achievement in the definition of academic adjustment (Abdullah, Elias, Mahyuddin, Uli, 2009) and considering that the implementation of the interactive management style requires a series of abilities in dealing with the students in a way that they avoid abnormal behavior and play a role in the class process, the learner in the class feels that he or she is being taken care of and a part of his/her emotional and social needs are being met in the classroom, leading to his/her academic adjustment. Given that the application of interactive management style causes the classroom climate to have the features such as suggesting daily activities by students, teacher and student participation in setting lesson objectives, curriculum, and teaching materials, students' self-assessment of learning, organizing groups with students' opinion, resolving disciplinary issues in a negotiation process, highlighted group interactions, teacher-student participation in determining classroom rules and students' self-judgment about their behaviors, it can be expected that applying an interactive management style play a significant role in providing a favorable climate in the math class, providing the conditions to reduce math anxiety. That is why applying an interactive management style reduced the level of math anxiety in the experimental group. It should be noted that the support and intimate relationship with teachers form a positive academic attitude in the

students, which in itself leads to the school satisfaction the created conditions make a positive climate in the classroom that leads to a sense of belonging, joy, enthusiasm, and respect for the students. Thus, such a class is an important predictor of academic engagement.

The above research faced limitations that can be mentioned as follows: The statistical population of the research is limited to the sixth grade students and as a result, it is difficult to generalize the results to the students of other courses. The data of the present study were collected only through a questionnaire . According to the obtained results, the following suggestions can add to the richness of further research in this field .Considering the teachability of how to apply management style in the classroom, appropriate and targeted educational programs should be designed and implemented for teachers. Familiarity with classroom management styles and the ability to use interactive style should be considered as one of the criteria for assigning teachers to classes. The ability to apply different styles appropriate for different subjects and the ability to apply interactive management style in the math classroom should be considered as a criterion in selecting individuals for the teaching job. In behavior management, focus on group interactions, engage with students in setting classroom rules, and allow students to judge their own behavior.

References

- Abdullah M. C, Elias H, Mahyuddin R, Uli J. (2009). "Adjustment amongst first year students in a Malaysian university". *European Journal of social sciences*, 8(3):496-505.
- Aghapour M, Abu al-Ma'ali al-Husseini K, Asgharnejad Farid A. A. (2018). "Comparison of the effectiveness of teaching coping strategies and help-seeking strategies on the academic adjustment of high school girls". *Research in Educational Systems*, 12 (42): 39-58.
- Ahmadi S, Ahmadi M. (2011). "Relationship between mathematical anxiety and students' learning styles". *Knowledge and Research in Educational Sciences*, 2 (31): 89-102.
- Alamolhodayee S. H. (2000). "Math Anxiety". *Journal of Psychology and Educational Sciences*, 5 (1): 99-119.
- Amin Y. S. A, Aali, A. (2008). "The effect of classroom management styles on the development of students' metacognitive skills". *Educational and Psychological Studies*, 1 (9): 90-73.
- Amiri L, Ebrahimi Moghadam, H, Babakhani N. (2019). "Structural model of predicting academic conflict based on cognitive ability and socio-economic status mediated by academic, motivation in students". *Journal of Psychological Sciences*, 18(74): 215-222.
- Ardalan E, Hosseinchari M. (2010). "Predicting educational adjustment based on communication personalities mediated by self-efficacy beliefs". *Educational Psychology*, 6 (17): 28-1.
- Arem, C. (2010). *Conquering math anxiety*. Nelson Education.
- Bardestani O. (2004). Investigating the effect of religious beliefs on altruistic behavior and academic adjustment in final year high school students. Unpublished master's thesis, Shiraz University, Shiraz.
- Bi X, Zhang L, Yang Y, Zhang W. (2020). "Parenting Practices, Family Obligation, and Adolescents' Academic Adjustment: Cohort Differences with Social Change in China". *Journal of Research on Adolescence*, 30(3): 721-734.
- Cadima J, Doumen S, Verschueren K, Buyse E. (2015). "Child engagement in the transition to school: Contributions of self-regulation, teacher-child relationships and classroom climate". *Early Childhood Research Quarterly*, 32: 1-12.
- Clark W. W, Thorpe L. P, Tiegs E. W. (1953). *California test of personality*, 1953 revision. Forms AA and BB, Primary, Elementary, Intermediate, Secondary, Adult levels.
- Credé M, Niehorster S. (2012). "Adjustment to college as measured by the student adaptation to college questionnaire: A quantitative review of its structure and relationships with correlates and consequences". *Educational Psychology Review*, 24(1): 133-165.
- Deci E. L, Ryan R. M. (2012). "Motivation, personality, and development within embedded social contexts: An overview of self-determination theory". *The Oxford handbook of human motivation*, 85-107.
- Evertson C. M, Weinstein C. S. (2006). "Classroom management as a field of inquiry". *Handbook of classroom management: Research, practice, and contemporary issues*, 3(1): 16.
- Friedlander, L. J., Reid, G. J., Shupak, N., & Cribbie, R. (2007). "Social support, self-esteem, and stress as predictors of adjustment to university among first-year undergraduates". *Journal of college student development*, 48(3): 259-274.
- Ganal N. N, Guiab M. R. (2020). "Teaching Strategies and Social Support on Students' Mathematics Achievement, Attitude, and Anxiety". *ATIKAN*, 10(1): 1-22.
- Hamidi F, Ibrahim Damavandi M, Dehnavi E. (2013). "Relationship between teachers' cultural intelligence and computer literacy with their classroom management style". *Information and Communication Technology in Educational Sciences*, 1 (3):26-5.
- Janes F. R. (1995). "Interactive Management". In *Critical Issues in Systems Theory and Practice*, 51-60. Springer, Boston, MA.

- Karababa A. (2020). "The reciprocal relationships between school engagement and self- esteem among Turkish early adolescents: A three-wave cross-lagged model". *Children and Youth Services Review*, 116: 105-114.
- Kayıkçı K. (2009). "The effect of classroom management skills of elementary school teachers on undesirable discipline behaviour of students". *Procedia-Social and Behavioral Sciences*, 1(1): 1215-1225.
- Khezri J. (2014). The effectiveness of participatory learning method on mathematical attitude, mathematical self-efficacy and mathematical anxiety of first grade high school students in Mahabad. Unpublished master's thesis, Teacher Training University, Tehran.
- Klem A. M, Connell J. P. (2004). "Relationships matter: Linking teacher support to student engagement and achievement". *Journal of school health*, 74(7): 262-273.
- Lavasani G. A, Hejazi G, Smiling F. (2011). Evaluation of the effectiveness of participatory learning method on mathematical anxiety and help seeking behavior. *Journal of Psychology*, 15 (4), 411-339.
- Lawson M. A, Lawson, H. A. (2013). New conceptual frameworks for student engagement research, policy, and practice. *Review of Educational Research*, 83(3), 432-479.
- Linnenbrink E. A, Pintrich P. R. (2003). "The role of self-efficacy beliefs instudent engagement and learning inthe classroom". *Reading & Writing Quarterly*, 19(2): 119- 137.
- Mahallati R, Abolmaali, K. (2016). "Comparison of dimensions of academic adjustment and academic performance in Iranian and immigrant high school students according to their nationality", type of school and gender. *Educational Innovations*, 15 (4): 99-118.
- Martín A. B. B, del Carmen Pérez-Fuentes M, Jurado M. D. M. M, Martínez Á. M, Márquez, M. D. M. S., Sisto, M., & Linares, J. J. G. (2021). "Emotional Intelligence and Academic Engagement in Adolescents: The Mediating Role of Self-Esteem". *Psychology Research and Behavior Management*, 14: 307-316.
- Mohammadi Baghmali H, Yousefi F. (2018). "Structural relationship between teacher- student interaction, academic engagement and students' adjustment to school". *Journal of Teaching and Learning Studies*, 10 (2): 75-92.
- Perkmann M, Salandra R, Tartari V, McKelvey M, Hughes, A. (2021). "Academic engagement: A review of the literature 2011-2019". *Research Policy*, 50(1): 104-114.
- Rahimi R. (2011). The structure of academic adjustment with students' identity styles. Unpublished master's thesis, Shahid Madani University of Azerbaijan, Tabriz.
- Raza S. A, Qazi W, Yousufi S. Q. (2020). "The influence of psychological, motivational, and behavioral factors on university students' achievements: the mediating effect of academic adjustment". *Journal of Applied Research in Higher Education*. <https://doi.org/10.1108/JARHE-03-2020-0065>
- Reeve J. Self-determination theory applied to educational settings. *Handbook of self-determination research*. 2002; 2: 183-204.
- Rekabdar Q, Soleimani B. (2008). "Comparison of Mathematical Anxiety of Different Types of Perfectionism of Middle School Students in Khorramshahr". *Knowledge and research in applied psychology*. 35-36 (10): 33-52.
- Reyes M. R, Brackett M. A, Rivers S. E, White M, Salovey, P. (2012). "Classroom emotional climate, student engagement, and academic achievement". *Journal of educational psychology*, 104(3): 700.
- Rodriguez S, Regueiro B, Piñeiro I, Estévez I, Valle A. (2020). "Gender differences in mathematics motivation: Differential effects on performance in primary education". *Frontiers in psychology*, 10: 3050.
- Ruzek, E. A., Hafen, C. A., Allen, J. P., Gregory, A., Mikami, A. Y., & Pianta, R. C. (2016). "How teacher emotional support motivates students: The mediating roles of perceived peer relatedness, autonomy support, and competence". *Learning and instruction*, 42: 95- 103.

- Samadi P, Rajaeipour S, Aghahsini, T, Qalavandi, H. (2008). "Explaining the effective learning atmosphere based on the components of classroom management in middle schools in Urmia". *New Educational Thoughts and Psychology of Al-Zahra University*, 4 (1 and 2): 155-175.
- Schaufeli W. B, Bakker A. B, Salanova M. (2006). "The measurement of work engagement with a short questionnaire. A cross-national study". *Educational and Psychological Measurement*, 66: 701-716.
- Seif A. A. (2019). *Modern Educational Psychology*, Seventh Edition. Tehran: Doran.
- Seif M. H. (2018). "Comparative causal model of academic burnout among students of the University of Medical Sciences and Payame Noor", *Iranian Journal of Medical Education*, 17 (2): 11-23.
- Shariatmadari A. (2014). *Educational Psychology*. Tehran: International Publishing Company (affiliated to the Islamic Propaganda Organization).
- Shokrani M. (2002). Construction and validation of students' math anxiety scale and review of some factors related to math anxiety. Unpublished master's thesis, University of Tehran, Tehran.
- Tajli F, Ardalan E. (2010). "Relationship between dimensions of family communication patterns and self-efficacy and academic adjustment". *Journal of Psychology*, 14 (1): 78-62.
- Tuan N. T. (2020). "Identifying Critical Success Factors through Interactive Management". In *MATEC Web of Conferences* (Vol.312). EDP Sciences. <https://doi.org/10.1051/mateconf/202031201004>
- Wang M. T, Eccles J. S. (2013). "School context, achievement motivation, and academic engagement: A longitudinal study of school engagement using multidimensional perspective". *Learning and Instruction*, 28: 12-23.
- Yulaini E, Rachmawati D. W., Putri D. N. A. O., Chayanti, N. T. (2021). "The Effect of Class Management on Economic Learning Motivation at SMA Negeri 20 Palembang". *International Journal on Advanced Science, Education, and Religion*, 4(1): 61-75.
- Zarei H, Mirhashemi M, Sharifi, H. (2012). "The relationship between thinking styles and academic adjustment in nursing students". *Iranian Journal of Medical Education*, 12(3): 160-166.