Relationship between classroom structure and academic achievement: The mediating role of academic stress

Mohamad Javadi Pour, Marzieh Dehghani, Reza Ali Tarkhan, Marzieh Abdolvahabi

1 Faculty member at the University of Tehran, Iran
2 Faculty member at the University of Tehran, Iran
3 Department of Education and psychology, Tehran University, Tehran, Iran
4 Department of Education and psychology, Tehran University, Tehran, Iran
*Corresponding author's Email: r.a.tarkhan@gmail.com

ABSTRACT: The purpose of this article investigate the mediating role of academic stress in relationship of classroom structure and academic achievement. To select sample size, 1,04 student (76 males, 28 females) were chosen with randomly sampling method. And completed the classroom structure scale of Blackburn (1991) and academic stress of Gadzella (1991). Reliability of these questionnaire with Cronbach Alfa method were (0.47) for structure classroom and (0.87) for academic stress. Then data analyzed with path analysis. The results showed that academic stress had mediating role between structure classroom (Motivating tasks, Autonomy support, and Mastery evaluation) and academic achievement. Structure classroom with mediating role of academic stress could predicate 34% of academic achievement.

Keywords: Motivating tasks, Autonomy support, Mastery evaluation, academic stress, academic achievement

INTRODUCTION

Research in academic learning environments is rooted deeply in the psychological aspects of the social environment, which in recent years as a tool for evaluating the educational process has been introduced. Classroom studies makes the convincing evidence about perceptions of learners of the classroom environment and their learning efficiency. In other words, when learners’ perception of the classroom is positive, learn better and the relationship about the role of perceptions of the classroom environment is arisen to predict the mental efficiency of the learners (Larocque, 2002).

Stress as one of the most important psychological concepts maybe is the most common problem in everyday life human (Hoveyzi, 2007). Despite psychological pressures in all stages of life, the man in young age is under the more pressure in the face of sweeping changes. These pressures are causing excitement, emotional and sometimes mental problems (Khalilian et al, 2011). Research shows that family and educational issues are the major causes of mental stress during adolescence. Learning environments have different conditions so kind, causes, extent and consequences of stress will vary. Academic stress as one of the main causes of academic failure can play a pivotal role in learner performance. (Shahni et al, 2009)

Academic stress notes the growing need for learner and simultaneously the individual's perception of not having enough time to acquire the knowledge. (Mori, B. M. & Baloglu, 2007) focus on fivefold stressful factors (frustrations, conflicts, pressures, and self-imposed stress) and fourfold reactions towards these factors (physiological, behavioral, cognitive, and emotional) are emphasized. Carveth, J. A., Geese, T., & Moss (1988) in description of the stressor factors during student life emphasize important role student's experience
and time constraints, students have access to extensive knowledge. Abouzari (4991) Kalam and Farazar (1981, quoting Misra, Castillo, 1981) noted that students at some point in every semester, for example, when the exam and compete with friends to reach higher scores report more stress. Lee, M, & Larson, R (1997), Ang, R. P. & Huan, V. (1997) focus on differences between academic stresses experienced among Asian students. Academic stress influence mental - physical health of the learner and their ability to do school work effectively (Akan, S. & Ciarrochi, J., 1997). High stress levels leads to the psychological, emotional and physical negative results like a little sleep, weakening the immune system and disease. (Solberg, S., & Torres, J., 1991)


As can be seen, several studies focus on the relationship between academic stress and poor academic performance. Accordingly, Felesten and Wilcox (1997) also showed that there is a significant negative relationship between the levels of students’ stress and their academic performance. In another study that Struthers et al (1997) reported that high levels of academic stress is associated with lower grades. In general, the findings emphasize the destructive effects of academic stress on academic performance.

Evidence shows that the students in tracking their educational goals are faced with many challenges. When such experiences are considered negative, influence destructively their motivation and performance (Viner, 1997; quote of Struthers et al, 1997; Amir khan, 1998). In the other word, some studies on impact of the effective intrapersonal and interpersonal resources on education performance of the learners emphasize the important role of education emotion including academic stress as a source of interpersonal (Pekrun, R., Goetz, T., & Titz, W., 1997), while the studies like study of Aems (a 1997, b 1997), Aems & Archer (1997) and Hejazi, Naghsh and Sangari (1997) suggests indirect effects external sources such as perception of class structure (motivational tasks, support autonomously and mastery evaluation) on the education progress.(Hall, 1997) believes that classroom and transactions in it would be effective on personal characteristics of students in terms of effects on their attitudes and behaviors of learning. Indeed, our assumption that stress is one of the most important students’ emotional experiences are related to perceptions of the classroom environment is based on cognitive-social theory, value-control Pakran (1997, 1997) about academic emotions.

Study of perception of the classroom environment rests on the assumption that a student's perception of the environment is linked to his personal and background characteristics, and this influence the way that he think about his social world and his approach to the surroundings (Patrick et al, 1997) Accordingly, Students’ perceptions of learning environment influence their participation in class activities and well as establishing relations with their peers (Hejazi and Naghsh, 1997).
(Vang, Hartel & Valberg, Wang, Haertel & Walberg 1992, Miller, R. B., & Brickman, 1992) define the class structure as constitutes the whole of psychological - social dimensions of the class include common interests and pursue a common goal, this through a coherent and well-organized lessons is available. Learning environment of the class refers to the setting or situation in which the learner and teacher interact with each other and use the different tools and information resources to further learning activities, the interactions are at multiple levels the interactions of the teacher - student interaction, student - student and the general mood in the class (Gazzle, 2002, quoted Nikdel, 2002). Generally, can be considered two general aspects to a classroom environment and one of them is physical aspect of a classroom and other is the human side of it. The physical aspects of the classroom including tables, chairs, lighting, how be sorted learning appliances etc. Human side of the classroom refers to the emotional - social environment of the class, most of the research, focus on the recent aspect of the learning environment and show that this aspect is more effective on the learning. The aspect, namely, the psychological environment is the same aspect that the teacher as a facilitator of learning can have a major and also persuasiveness role in student learning to learn. Emotional environment which the teacher provides in the classroom can affect students’ learning. The relationship between teacher and student, relationship between students with peers, teachers' attitudes regarding the education of students, etc., can all influence the amount of their learning (Aemes, 1992). Actually the classroom learning environment more than the physical structure of the classroom include learning opportunities such as education process, relation of teacher – student, relation of student - student and student attitudes (Brophy, 1992, Fraser and Wahlberg, 1991, Moos, quoted in 1993 as saying Hejazi and Naghsh, 2002). Learning environment can be conceptualized in terms of observable characteristics such as school buildings, equipment used for teaching and observable relations between the teacher and learner. In another form a learning environment can also be conceptualized as subjective perception of the teacher or student of their learning situations.

Therefore, to predict and assess cognitions, emotions and behaviors of students need to pay attention to how students' sense to classroom experiences and percept them. A study on perception of the classroom environment rests on the assumption that the student's perception of the environment is linked its personal and underlying characteristics, and this affect the way he thinks about his social world and to the environment (Patrick Et al, 2002).

Structure of Class is formed based teacher’s goals and values, but how its effect on learners’ excitation and performance depend on their perception of class structure. What could be understood by the theories affected by cognitive -social perspective is that students are active participants who each enter into the class with a wealth of different features of inner and personality, educational background, age and gender, are affected by environment and influence the environment. Absorb information actively and process in their mind and every one according to his conception form a unique perception of the environment in their minds (Eiser, 1992, quoted by Aemes, 1992).

Ames (1992) introduced the structure of the class including tasks (Motivational tasks), evaluating (mastery Evaluation), and authority (autonomous authority): motivational tasks is one of the essential component of classroom learning, design tasks and learning activities. Students' perceptions of their tasks not only is effective on their learning but also on how use of their time (Good, 1987). Participating in classroom tasks and activities influence students' judging on their abilities, efforts and satisfaction, in a way, a variety of activities and tasks which lead to the involvement of students in classroom tasks, will help them to learning, will cooperate the
students with each other and will have to select appropriate targets to learning and understand the reasons for their activities (Brophy, 1981; Korno and Rokamber, 1980; Leppr and Hodell, 1984; Meck, 1991; Nichols, 1985 quoted from Aemes, 1991). In mastery evaluation, evaluation methods of students is one of the important factor of the class that can affect motivation of students. The issue is not only whether students are assessed or not, or what is the content of evaluation. But the more important issue is the evaluation of student perceptions (MacIver, 1984 quoted by Aemes, 1991). Brophy (1984 quoted Hejazi and Naghsh, 1989) says in result–centered schools, attention to the activities of students is done without proper attention to the quality of their learning, while in the process–centered schools is emphasized on the not mistake and the success of students. Aemes (1991) proposes the aspects of assessment that have a dangerous effects on the students’ motivation include: comparing students together, identifying the specific time for the submission of assignments, judgments about students and their activities, which leads to anxiety and negative stress in the students. Introducing the highest and lowest scores and prepare charts from the scores of students in the class and to display the selected sheets, are all examples of social comparison during the evaluation that can influence the perception of the students and lead to the low effectiveness, application of superficial learnings strategies and a higher stress and lower risk.

Studies show whether the class atmosphere is empty of stress and anxiety, and strong human and social relationship be established between professor and students and also between students with other they find a better attitude toward the learning. Doubtless system evaluation governing the class is not neutral in making such atmospheric (Rouhani and Maher, 1991). But autonomous authority is a responsibility that the teacher identify and specify in the classroom for students, in a way that push them toward independence, autonomous authority is defined (Deci, Schwartz, Sheinman & Ryan, 1985 quoted by Aames, 1992).

In the classroom where is teacher’s autonomous authority, the teacher give to students right of choices and decisions, and the support there really is when an equal choice give to them and the choice is on the basis of their interest. Support should be along with preserved feelings of students and prevent their failure (Ryan, 1980, quoted from Aemes, 1992).

Empower students to carry out their duties and learning methods is a way of give responsibilities to the students. Giving the authority and responsibility to students for long-term planning and completing the assignment becomes effective when teachers guide and support them in selection, design and application (Crono & Rokomper, 1980, quoted from Aemes, 1991). Educational life is a most important course of a person’s life that influence productive and successful education and learning of the person, and merit and capabilities are realized and scientific advances are resulted. But in daily education life, students face with types of special challenges, barriers and pressures of the period (including: low scores, stress levels, threat to confidence as a result of performance, reduction motivation and interaction etc.). Some students in encounter with the barriers and challenges is successful, but another group of students is failed. Accordingly, in order to inform of effect of internal and external factors influencing academic performance of students this research has been done. Briefly, the aims of the research was to investigate the intermediate role of the academic stress as a interpersonal factor in regard to the class structure as an intrapersonal factor (motivational task, autonomous authority
and mastery evaluation) with performance of education. According to the subjects discussed, the study seeks to answer the research questions stated below:

**Conceptual Model**

One of the indications of the effectiveness of each educational system is academic achievement. Accordingly, many studies have been done on the factors responsible for the improved academic achievement. The emphasis of this study was to identify the classroom factors that are variable and have an important role in academic achievement.

According to the findings presented, the main hypothesis in the conceptual model of this study is that the perception of the class structure as exogenous factors affect the academic stress and indirectly explain changes in educational attainment.

![Conceptual model of the research](image)

**MATERIAL AND METHODS**

This research in terms of purposes, data, nature and type of data is practical, quantitative and correlative because without manipulating the independent variable we examined its effects on the dependent variable.

The population, sample and sampling method: The population consists of all undergraduate students in the third year at Faculty of Psychology and Educational Sciences of university of Tehran. To select a sample group by simple random sampling, a sample of 444 subjects (96 males and 348 females) were selected.

Measurement tool: to collect data, following tools have been used.

- Scale of perception of the classroom: to measure perceptions scale of the classroom structure, the Blackburn's questionnaire \(^\text{1991}\) has three subscales: motivational task, autonomous authority and mastery evaluation. Motivational tasks with 8 items, scale to scale of autonomous authority with 5 items and scale of mastery evaluation with 5 items are measured (some of the questions of the questionnaire in the present analysis were removed after exploratory factor analysis). Direction of all questions is yes, and the Cronbach's alpha obtained in the study conducted by Blackburn \(^\text{1991}\) for motivational tasks \(\text{0.58}\), autonomous authority \(\text{0.66}\) and mastery evaluation \(\text{0.68}\). Cronbach's alpha obtained for the components in this study are \(\text{0.37}\), \(\text{0.96}\) and \(\text{0.67}\), respectively. It indicates reliability of the questionnaire and showed suitability of fitness indices (RMSEA = \(\text{0.17}\), AGFI = \(\text{0.9}\), GFI = \(\text{0.69}\)) in the confirmatory factor analysis of the construct validity of the questionnaire.

- Academic stress: To assess students' academic stress Gadzial Stress Scale \(^\text{1991}\) was used. Cronbach's alpha obtained \(\text{0.84}\) indicates reliability of the questionnaire and suitability of fitness indices (RMSEA = \(\text{0.17}\), AGFI = \(\text{0.9}\), GFI = \(\text{0.69}\)) in the confirmatory factor analysis of the construct validity of the questionnaire.

- Academic achievement: to measure student achievement, their GPA is used.

Findings of the research

Before presenting the findings of the research, the descriptive characteristics of the sample group (indices of mean, standard deviation, minimum and maximum scores) are presented.
The correlation matrix of the variables has been shown in Table 2. Pairwise correlations between research variables can be seen in the matrix. In order to predict the "academic achievement" the proposed conceptual model was tested using path analysis. The method of maximum likelihood for the estimated model, and the chi-square index (2χ), index of the chi square to degrees of freedom (χ2/df), Goodness of fit index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA) were used to fit the model. Values of these parameters are summarized in Table 2.

Indicators cannot be considered alone cause of the fitness, but they should be interpreted alongside. Indicators of Chi square (χ2), the chi square to degrees of freedom (χ2/df), Goodness of fit index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA) were used to fit the model. Values of these parameters are summarized in Table 2.
Mean Square Error of Approximation (RMSEA) were used to fit the model. Values of these parameters are summarized in Table 3.

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>Degrees of freedom</th>
<th>Chi-square ratio to freedom degree</th>
<th>Significance level</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AGFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>44.4</td>
<td>17/8</td>
<td>7.15</td>
<td>&gt; .05</td>
<td>.06</td>
<td>.86</td>
<td>.85</td>
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In general, to evaluate the fitness of the model, there are several characteristics and here ChiSquare, Goodness of fit index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA) were used to fit the model.

Value of Goodness of fit index (GFI) and adjusted goodness of fit index (AGFI), which from zero to one swing and whatever this index is closer to one, goodness of fit of the model is more. The root mean square error of approximation (RMSEA) should be as small as possible and values less than .05 show quite right fit, to .05 to .1 indicates a proper fit and to .1 or greater show a poor fit. As shown in the above table fitness indices for the model indicate a good fit of the model.

**DISCUSSION**

Identify factors influencing student achievement has always been the area of interest to researchers. They are trying to identify the factors and predictors of academic achievement and to examine the relationships between variables, identify how to communicate these variables with each other and their effectiveness on educational attainment. The aim of this study was to examine the mediating effect of academic stress on the relationship between the perception of the classroom structure (motivational tasks, autonomous authority and mastery evaluation) and the progress. Significant positive correlation between perceptions of classroom and achievement is in line with the findings of (Moos and Trickett, (1984, Quoted by Davis, 1998) And Makraby and Fraser, 1993; Moos (1984, Quoted by Miller and Brikman 1991). The negative relationship between perceptions of the classroom and the academic stress is consistent with the findings of Frenzel, A. C., Thrash, T. D., Pekrun, R., & Goetz, T. (1997), and Pakran (1997). Research findings about the significant negative correlation with academic stress and academic achievement is consistent with studies of Becker (1997) Aramsoy, Glimly and Genchoz (2000), Clark and Riker (2000, quoted by Akgan and Siaroshy, 2000), Lin and Zipa (2000, quoted by Akgan and Siaroshy, 2000).

Based on the findings, there is significant relationship among the factors of motivational tasks, autonomous authority and mastery evaluation and their academic stress and academic achievement. Given this finding, it can be said that when the student perception of the classroom is in a way that know diverse and challenging its assignments and duties and understand classroom as an environment where helps strengthening the independence of them and when see evaluation as their mastery and accordance with the objectives, experience less stress in the class and progress will be higher. The overall findings indicate that the conceptual model is a good fit with the data in a way that perception of threefold variables of class structure influence by the academic stress on academic achievement and explain 43% of the variation.

The results of this model indicated that students' perceptions of their educational attainment is negatively correlated with the class. This finding indicates that the design and delivery of homework significantly and usefully on student achievement from one hand and students use of strategies and educational authorities should be note this important.
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