

## Original Article

# The Relationship between Learning and Study Strategies with Students' Academic Performance

Roohangiz Norouzinia M.Sc.<sup>1</sup>, Marzieh Seidabadi M.Sc.<sup>2</sup>, Rohollah Mohammadi M.Sc.<sup>3</sup>, Mahmoodreza Ghadimi Ph.D.<sup>4</sup>, Maryam Aghabarari M.Sc.<sup>5\*</sup>

1. College of Emergency Medical Services, School of Paramedical, Alborz University of Medical Sciences, Karaj, Iran

2. Imam Hassan Mojtaba Hospital, Alborz University of Medical Science, Karaj, Iran

3. Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran

4. Dept. of Statistics and Information Treatment, Social Security Organization, Tehran, Iran

5. Dept. of Nursing, School of Nursing & Midwifery, Alborz University of Medical Science, Karaj, Iran

\* Address for Correspondence, Department of Nursing, School of Nursing & Midwifery, Alborz University of Medical Science, Karaj, Iran, Zip-code, 31497-7453, Tel. +989126104684, Fax: +982632563325, Email: m\_ghabarary@yahoo.com

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## Abstract

**Introduction:** Learning and study strategies are considered to be among the factors affecting students' performance and also are essential for appropriate educational interventions. This study was conducted to determine the relationship between learning and study strategies and academic performance of students in Alborz University of Medical Sciences.

**Methods:** In this descriptive, analytical, cross-sectional study, 215 students at Alborz University of Medical Sciences studying in various majors in 2012-2013 were enrolled through stratified random sampling. The 10-scale, Learning and Study Strategies Inventory (LASSI) assessment device of Weinstein was used to collect the data. The obtained data were analyzed by SPSS-19 software using descriptive statistics and inferential statistics.

**Results:** The median scores of sub scales of LASSI inventory were 28 (attitude), 25 (motivation), 25 (time management), 29 (anxiety), 26 (concentration), 26 (information processing), 29 (selecting main idea), 24 (study aids) and 23 (self-testing). The performance of the students was very unfavorable in terms of using learning and studying strategies in attitude and motivation areas. The results showed that among learning and studying strategies sub-scales, the effects of motivation ( $F=3.95$ ,  $P<0.05$ ) and test strategies ( $F=7.75$ ,  $P<0.01$ ) on the students' performance were positively significant.

**Conclusion:** The results showed that the use of learning strategies in Alborz University of Medical Sciences was low. Since the use of learning and study strategies to increase the learning capacity and improve the educational quality of students is effective, education officials can use these results to improve students' academic performance.

**Keywords:** Student, Learning and study strategies, Academic performance

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## Introduction

Hilgard and Marquis define learning as a process of relatively sustainable changes in the individual's potential behavior (1). According to another definition, learning strategies include all the mental methods which are used in a particular situation by the individual in order to gain knowledge and ability (2). Learning and study strategies include: thoughts, behaviors, attitudes, motivation and beliefs related to successful learning, and can be enhanced through educational interventions. Learners, via learning strategies, will actively participate in the learning process, will link newly learned materials with their previous information, and will continuously monitor their learning procedure (3). Many studies have examined the correlation between learning and studying strategies with academic performance (1, 4-6). In West and Sadoski's study (2011), a strong relationship between time management and self-assessment with the educational performance in the first semester was found (6). Sleight and Mavis also depicted that those students with higher scores than weak or average students would gain higher scores in motivation and concentration (5).

Moreover, the results of the study conducted by Schutz et al. (2011) confirmed that areas of anxiety, concentration, choosing the main idea, and test strategies were significant predictors of the National Board of Chiropractic Exam (NBCE) scores (4). Since the individuals' educational performance is the base of success and progress in each educational level, therefore, its' improvement is one of the main goals of educational centers (7). Academic failure not only leads to creating psychological problems and increasing probability of deprivation from further education but also can hinder optimal exploitation of scientific principles to train labor force and human resources, which results in social dissatisfaction (8). The proficiency in learning and study skills can adjust or decrease a lot of possible inadequacy in learning environments or even defects in the educational motivation and physical-psychological health that can have undesirable effects on the academic performance. In addition, numerous studies have shown that lack of skills in learning and study strategies can negatively overshadow the entire benefits of a good learning environment, intellectual capabilities, and personal physical-mental health (7).

On the other hand, the high rate of school drop by dropout, layoffs and stop education is associated with a lot of damage in the cost of higher education in our country and the rest of the world each year (1). Ineffective learning, in addition to economic losses, would lead to problems such as corrosion, low self-esteem, inferiority,

depression, and thus prevents the full development of individual talents and abilities (7).

According to available studies, academic performance is affected by the type and amount of learning and studying strategies being employed by students. To identify and improve these indicators, we need to be aware of students' use of these strategies and its relationship with academic performance. Also, due to lack of enough studies in this field in Iran, this study was aimed to determine the relationship between learning and study strategies and students' academic performance in Alborz University of Medical Sciences in 2012-2013.

## Methods

In this descriptive, analytical, cross-sectional study, the sample included 225 undergraduate students of Alborz University of Medical Sciences in associate and bachelor degrees as well as medical students (second semester and after that) in the academic year 2012-2013. Participants in this study were students in different majors, including medicine, health, nursing, surgical technology, and nurse anesthesia selected through stratified random sampling. The method of data collection was self-report, and the collection tool was the second edition of the 10-scale Learning and Study Strategies Inventory (LASSI).

The Learning and Study Strategies Inventory (LASSI) is a self-administered and self-scored assessment advice which has been used in higher education on a large scale through which students' study and learning strategies are measured. This inventory is used in various educational fields (3-9). This questionnaire was developed in 2002 by Weinstein and Palmer consists of three components of strategic learning: skill, will and self-regulation (12). The LASSI is a well-known and well-respected instrument for assessing students' knowledge and usage of various skills and strategies for achieving learning in an academic environment (14). In total, the LASSI consists of 80 question items organized into 10 separated scales comprising of 8 items (9, 13).

The Likert items refer to the degree to which a statement is perceived as typical of the respondent, with 5 representing the highest ("very much typical of me") to 1 representing the lowest ("not at all typical of me") degrees of agreement. Only the anxiety subtest is reversely scored, meaning that the higher the score, the less anxiety is reported by the subject (13).

The performance profile consists of ten scales; anxiety, attitude and motivation relating to the will component, information processing, selecting main idea, and test-taking strategies are related to the skill component, and

finally concentration, self-testing, study aids and time management have to do with the self-regulation component of strategic learning (9). The scales generally range from the low-teens to 40 and are scored on a percentile basis. The general interpretation, for each individual student, is that a score on a particular scale of 75-percentile or above indicates a relative strength in that area. A score of 50-percentile or lower is generally construed to be a relative weakness (14).

Validity and reliability of instrument have been approved in previous studies (9). Therefore, this questionnaire was an appropriate tool to measure learning and study strategies. In this study, the alpha reliability ranged from 0.71 to 0.85, and for the total instrument was 0.89. The obtained data from 215 completed questionnaires were analyzed by SPSS-19 software. To investigate the relationship between different areas of learning and study strategies and students' performance, one-way ANOVA, Scheffe's post-hoc tests, regression, multivariate analysis (ANCOVA) and Pearson correlation coefficients were used.

## Results

215 out of 225 distributed questionnaires were completely responded (95.6%). The average age of participants was  $21.60 \pm 3.30$  and their GPA was  $17.30 \pm 1.46$ . Of all the students, 139 (64.7%) were female and 76 were male (35.3%). The break-down by major was 64 (29.8%) for health major, 80 (37.2%) nursing anesthesia and surgical technology, 13 (6%) medicine, and 58 (27%) nursing. Also, 40 (18.7%) students were in the second, 102 (47.7%) in the third and 72 (33.6%) were in the fourth semester or higher. As many as 9 (4.2%) students had a history of probation.

The results of the comparison of means showed that the mean of Grade Point Average (GPA) between males and females and also among different majors ( $P < 0.001$ ) and among different semesters ( $P < 0.001$ ) was statistically significant. Also, the mean scores of selecting main idea and test-taking strategies ( $P < 0.025$ ), and time management scales ( $P < 0.012$ ) showed significant differences between male and female students. Also the mean score of attitude scale showed significant differences among different semesters ( $P < 0.048$ ).

**Table1. Distribution frequency of learning and study strategies among students of Alborz University during 2012-2013**

Scales of study and learning strategies	Freq.	Mean	Standard deviation	Median	Min.	Max.
Anxiety	208	28.17	5.20	29	13	40
Attitude	207	28.24	4.88	28	14	40
Concentration	210	25.70	4.74	26	12	37
Information processing	211	26.67	5.01	26	14	39
Motivation	210	25.17	4.62	25	10	38
Self-testing	212	23.05	4.47	23	17	35
Selecting main idea	211	28.97	4.32	29	11	38
Study aids	211	24.11	4.73	24	11	37
Time management	211	24.79	4.85	25	9	37
Test-taking strategies	209	28.98	4.37	29	18	40

Table 1 shows distribution frequency of learning and study strategies among students. In comparison with percentile of American norm samples, the median score of students in test-taking strategies scale was equivalent to the 10 percentile, in scale of attitude between the 15 and 20 percentile, in concentration, information processing, study aids, time management and self-testing equivalent to the 40 percentile, in scale of test-taking strategies equivalent to the 45 percentile, in selecting main idea scale equivalent to the 55 percentile, and in scale of anxiety equivalent to the 65 percentile (Figure 1).

In examining the relationship between the age of students with students' performance and LASSI scales using Pearson correlation coefficient, the correlations between age with attitude, information processing, motivation, selecting main idea and study aids were found to be direct and significant ( $P < 0.05$ ), so that their values also increased with age. Although this correlation was weak. (Table 2).

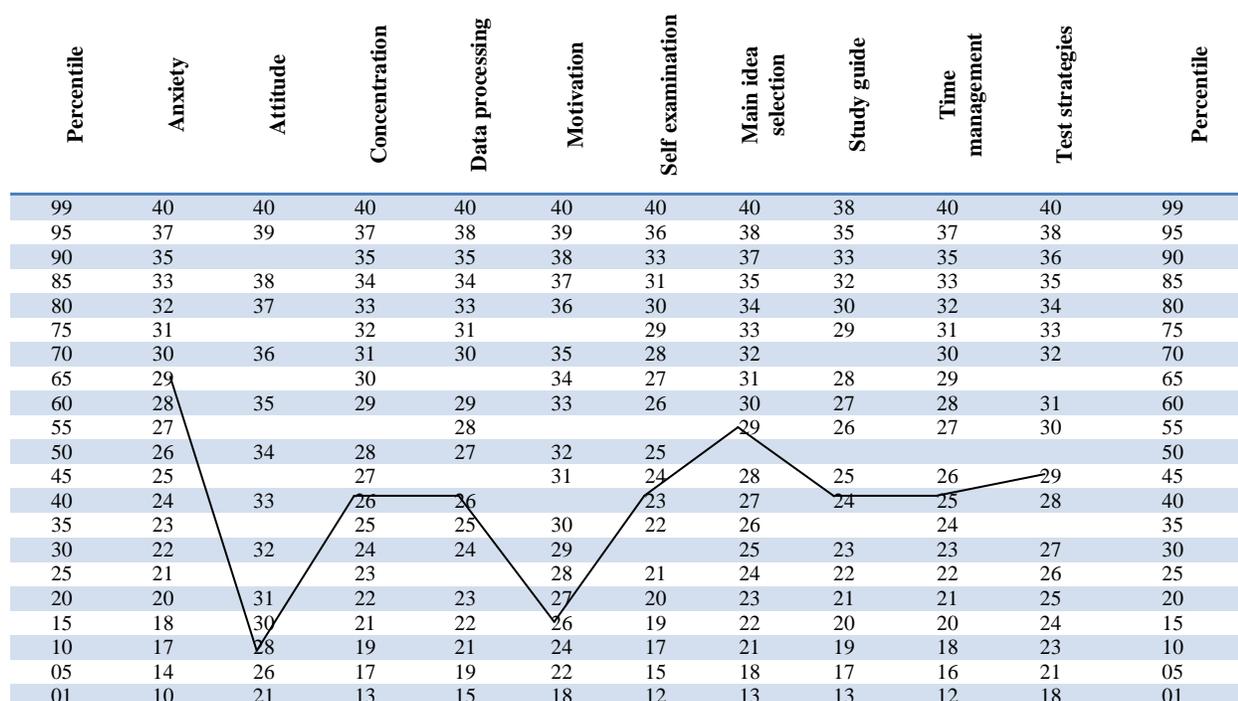


Figure 1. Comparison of estimated 50 percentile of learning and study strategies for students of Alborz University versus norms of American students

Note: The scores of 50 to 75 percentile indicate good study and learning skills, and scores above 75 indicate excellent. Students who gain scores less than 50 percentile, need counseling services.

Table 2. The relationship between age of students with students' performance and LASSI scales

	Grade Point average	Motivation	Attitude	Anxiety	Test-taking strategies	Selecting main idea	Information processing	Self-testing	Study aids	Concentration	Time management
<b>Correlation coefficient</b>	0.032	0.064	0.134	0.081	0.136	0.145	0.116	0.160	0.177	0.083	0.027
<b>P value</b>	0.64	0.36	0.050	0.24	0.048	0.039	0.097	0.022	0.011	0.23	0.69

Examining the relationship between the students' performance with will component using Pearson correlation coefficient revealed that the correlation between students' performance and motivation scale was significant ( $P < 0.05$ ) (Table 3). To examine the relationship between the students' performance with will

component while controlling the effects of other components through using partial correlation method, the correlation between students' performance and scales of will component was investigated which turned out to be insignificant.

Table 3. The relationship between students' performance and will component with and without controlling the effects of other components

	Anxiety	Attitude	Motivation
<b>Correlation coefficient (without)</b>	0.082	0.088	0.176
<b>P value</b>	0.24	0.21	0.011
<b>Partial correlation coefficient (with)</b>	-0.083	-0.044	0.076
<b>P value</b>	0.26	0.54	0.29

In order to examine the relationship between the students' performance with skill component by use of Pearson correlation coefficient, the correlation between students'

performance and selecting main idea scale was calculated, which was significant ( $P < 0.05$ ) (Table 4). Examination of the relationship between the students' performance with

skill component while controlling the effects of other components through the use of partial correlation method

yielded a significant correlation between students' performance and test-taking strategies scale ( $P < 0.01$ ).

**Table 4. The relationship between students' performance and skill component with and without controlling the effects of other components**

	Information processing	Selecting main idea	Test-taking strategies
<b>Correlation coefficient (without)</b>	0.059	0.155	0.30
<b>P value</b>	0.39	0.025	0.001
<b>Partial correlation coefficient (with)</b>	-0.005	0.064	0.27
<b>P value</b>	0.94	0.38	0.001

To explore the relationship between the students' performance with self-regulation component, Pearson correlation coefficient was used, and the correlations between students' performance and concentration scale ( $P < 0.05$ ) and time management scale ( $P < 0.01$ ) were found to be significant (Table 5). The relationship

between the students' performance with self-regulation component while controlling the effects of other components was calculated through the use of partial correlation method; the correlation between students' performance and scales of self-regulation component were not significant.

**Table 5. The relationship between students' performance and self-regulation component with and without controlling the effects of other components**

	Time management	Concentration	Study aids	Self-testing
<b>Correlation coefficient (without)</b>	0.225	0.172	0.044	0.052
<b>P value</b>	0.001	0.01	0.52	0.45
<b>Partial correlation coefficient (with)</b>	0.11	0.067	-0.018	0.022
<b>P value</b>	0.13	0.35	0.80	0.75

In the next step, by moderating the effects of some influential variables, the effect of learning and study strategies on students' performance was evaluated. To do so, first in a separate analysis, the effects of each demographic variable and learning and study strategies on students' academic performance were analyzed through simple linear regression. Then, independent variables with significance levels of less than 0.20, ( $P = 0.20$ ) were

selected and entered into the multiple regression model (Table 6). According to results of ANCOVA, the effect of gender, major, semester, and probation history variables on academic performance were significant. Also, among learning and study strategies, the effect of motivation and test-taking strategies on students' performance was positively significant.

**Table 6. The relationship between learning and study strategies and students' academic performance by moderating effects of demographic variables**

Independent variables	No.	$\beta$	SE	F	
<b>Gender</b>	<b>Female</b>	131	0.810	0.180	19.71**
	<b>Male</b>	69	0.000	0.000	
<b>Education major</b>	<b>Health</b>	57	-0.009	0.230	12.64**
	<b>Anesthesiology</b>	75	1.06	0.200	
	<b>Medicine</b>	12	-0.12	0.430	
	<b>Nursery</b>	56	0.000	0.000	
<b>Semester</b>	<b>Second</b>	38	-0.160	0.280	4.04*
	<b>Third</b>	95	-0.520	0.190	
	<b>Fourth and higher</b>	67	0.000	0.000	
<b>Probation history</b>	<b>Yes</b>	8	-0.960	0.44	4.79*
	<b>No</b>	192	0.000	0.000	
<b>Concentration</b>			0.008	0.023	0.13
<b>Motivation</b>			0.036	0.018	3.95*
<b>Main idea selection</b>			-0.030	0.025	1.43
<b>Time management</b>			0.022	0.023	0.89
<b>Test strategies</b>			0.065	0.023	7.75**
R2=0.399, Adjusted R2= 0.360			* $p < 0.05$	** $p < 0.01$	

## Discussion

In this study, the students gained the highest score in the scales of selecting main idea, test-strategies and attitude and the lowest for the self-testing scale. Salehi and Enayati (2010), showed in their study that students were excellent in attitude and information processing scales and poor in scales of selecting main idea, self-testing and test-taking strategies (15).

The comparison of learning and study strategies scores of studied students with the norm sample of American students scores showed that in half of the total scales including motivation, attitude, concentration, test-taking strategies and self-testing, median scores of studied students were lower than norms of US. These results are similar to findings of some previous studies (3, 7). The gained scores from the attitude and motivation scales reflected the students' interest and their tendency to work hard in academic tasks and to achieve their goals, respectively. The American students often believe that success and failure depend on the individual him/herself, and therefore they respect their efforts to reach the goals, more than anything else (2). But the results of Haghani & Khadivzade (2008) conducted on talented students were different, seemingly because of the different norms of talented students with other natural norms of students (16).

In the current study, female students' scores were significantly higher than male students in scales of selecting main ideas, time management and test-taking strategies. However, some studies reported no significant difference between males and females in case of learning and study strategies scores (3, 7). For example, Saheb Alzamani & Zirak (2011) stated that the mean scores of students in learning and study strategies did not show a statistically significant difference based on age, gender, marital status, occupation, place of birth, residence place and attendance in study and learning techniques classes (7). But in a study by Kesici et al. (2009) conducted in Turkey Educational College, the results showed that the use of cognitive learning strategies between females was significantly more than male students, particularly in relation to the sub-scales of outsourcing, analysis, and interpretation (17). Based on Serin et al. (2010), there were statistically significant differences between males and females in attitudes, motivation, anxiety, choosing main ideas and study aids with better performance of female students (1). In some other studies, the results showed that male students had significantly better condition on some scales (18, 19). This may be due to a greater females' interest in education than males, a higher

sense of competition, and the importance of higher grades among them.

In this study, the academic performance of senior female students in anesthesia and operating room majors was significantly different from other groups. One reason may be higher number of students in anesthesiology and operating room majors. Also students of these two mentioned majors had gained better scores in university entrance exam than the other groups except medicine. Better educational performance in higher semesters can also be due to environmental and academic adaptation of students and a low number of theoretical courses. A significant difference was observed among students of different semesters for the attitude scores. As in the higher semesters, the average of attitude scale scores declined. This can be attributed to students' awareness of their job prospect and a reduction in their interest. Since attitude reflects the feelings of students, education can affect motivation, attention and their effort to contribute effectively to success. Therefore, all activities which provide the collaboration and interaction between students and teachers and imply positive attitude between students should be encouraged (1).

In this study, students who had a history of probation scarcely use test strategies, and a significant difference was seen between this group and the rest of students. But the results of Khadivzadeh (2002) also showed that students who did not have a history of academic failure were less anxious, better understood the main idea of lessons, processed information more effectively, were using more of self-examination and testing strategies, and showed more motivation (2).

In evaluating the correlation between age and test strategies, results showed that age of students had a positively significant correlation, although weak relationship, with their attitude, information processing, motivation, selecting main ideas, and study aids. This may be due to greater student's compliance with university environment and learning more about the courses and the way to study them.

The findings of this study demonstrated that there was a significant correlation between learning and study strategies and students' performance in four out of ten aspects that were examined, namely: motivation, test-taking strategies, time management and concentration, though these correlations while controlling the effects of other components were significant just in test-taking strategies. But in a study by Zoysa et al. (2014) conducted in an Australian university, the results showed that learning and study strategies of low and high performing groups differed significantly in anxiety, attitude,

information processing, motivation, the ability to select main ideas, and strategies employed for tests (20). So, it can be concluded that the different usage of these strategies can affect the academic performance of students. Also, Slaybaugh found that the only predictor of learner success was the will component and the motivation scale of the LASSI-2 was the only significant contributor for will (21).

Among the scales of learning and study strategies, by controlling the effects of demographic variables and other scales, the effects of motivation and test strategies were significant on academic performance. According to other previous studies, time management and self-testing scales (6), motivation and concentration area (5), anxiety, concentration, selecting main idea and test strategies (4), and anxiety and test strategies (22) also showed a significant correlation with students' academic performance.

Results of many studies have shown a significant relationship between study habits and academic performance, meaning that by increasing the study habits score, the students' educational status also improved (3, 15, 23, 24).

## Conclusion

The results of this study showed that the use of learning strategies in Alborz University of Medical Sciences was low. Since the use of learning and study strategies to increase the learning capacity and improve the educational quality of students is effective, education officials can use these results to improve student academic performance. Because, improving the academic performance of students is related to identifying the strengths and weaknesses of learning and study strategies and also planning to eliminate obstacles and promote positive strategies. Therefore, carrying out studies to evaluate the effect of positive learning and study strategies reinforcement on the academic performance of students is recommended.

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## References

1. Serin NB, Serin O, Şahin FS. Factors affecting the locus of control of the university students. *Procedia-Social and Behavioral Sciences*. 2010; 2(2): 449-452.
2. Khadivzadeh T, Drakhshan A, Saif AA, Valae N. Relation between students' use of learning and study strategies and their academic and personal characteristics in Mashad University of Medical Sciences, 1999. *Iranian Journal of Medical Education*. 2002; 2(3): 35-37.
3. Hosseini Shahidi L, Atarodi A, Moghimian M. The survey of using learning strategies rate in students. *The Horizon of Medical Sciences*. 2005; 11(1): 53-60.
4. Schutz CM, Gallagher ML, Tepe RE. Differences in learning and study strategies inventory scores between chiropractic students with lower and higher grade point averages. *Journal of Chiropractic Education*. 2011; 25(1): 5-10.
5. Sleight DA, Mavis BE. Study skills and academic performance among second-year medical students in problem-based learning. *Med Educ Online*. 2006; 11(23):1-6.
6. West C, Sadoski M. Do study strategies predict academic performance in medical school? *Medical Education*. 2011; 45(7): 696-703.
7. Saheb Alzamani M, Zirak A. Students' learning and study strategies in Isfahan University of Medical Sciences and their relationship with test anxiety. *Iranian Journal of Medical Education*. 2011; 11(1): 58-68.
8. Chen ML. Influence of grade level on perceptual learning style preferences and language learning strategies of Taiwanese English as a foreign language learners. *Learning and Individual Differences*. 2009; 19(2): 304-308.
9. West C, Kurz T, Smith S, Graham L. Are study strategies related to medical licensing exam performance? *Int J Med Educ*. 2014; 5: 199-204.
10. Albaili MA. Differences among low-, average- and high-achieving college students on learning and study strategies. *Educational Psychology*. 1997; 17(1-2): 171-177.
11. Lobb WB, Wilkin NE, McCaffrey III DJ, Wilson MC, Bentley JP. The predictive utility of nontraditional test scores for first-year pharmacy student academic performance. *American Journal of Pharmaceutical Education*. 2006; 70(6): 128.

12. Weinstein CE, Palmer DR. Learning and Study Strategies Inventory (LASSI): User's manual. Clearwater, FL: H & H Publishing; 2002.
13. Schutz CM, Dalton L, Tepe RE. Learning and Study Strategies Inventory subtests and factors as predictors of National Board of Chiropractic Examiners Part 1 examination performance. *The Journal of Chiropractic Education*. 2013; 27(1): 5.
14. Griffin R, MacKewn A, Moser E, VanVuren KW. Do learning and study skills affect academic performance? An Empirical Investigation, *Contemporary Issues in Education Research*. 2012; 5(2): 109-116.
15. Salehi M, Enayati T. Relationship between the main components learning and study with academic achievement. *J New Approaches in Educational Administratin*. 2010; 2(3): 145-162.
16. Haghani F, Khadivzade T. The effect of a learning and study skills workshop on talented students' learning and study strategies in Isfahan University of Medical Sciences. *Iranian Journal of Medical Education*. 2009; 9(1): 31-40.
17. Kesici S, Sahin I, Akturk AO. Analysis of cognitive learning strategies and computer attitudes, according to college students' gender and locus of control. *Computers in Human Behavior*. 2009; 25(2): 529-534.
18. Mousavinasab N, Fahri A, Mohammadzadeh A. Medical Students' study skills and habits in Zanjan University of Medical Sciences. *Iranian Journal of Medical Education*. 2006; 6(1): 101-107.
19. Nourian A, Shah Mohammadi F, Mousavi Nasab SN, Nourian A. Study skills and habits of the students in Tehran Islamic Azad University of Medical Sciences in the academic year 2008-2009. *Strides Dev Med Educ*. 2010; 7(2): 104-111.
20. De Zoysa A, Chandrakumara P, Rudkin K. Learning and study strategies affecting the performance of undergraduate management accounting students in an Australian university. *Proceeding of the AFAANZ Conference*; 2014 July 6-8; Auckland, New Zealand. Australia: AFAANZ, 2014: 1-9.
21. Slaybaugh CE. Using the Learning and Study Strategies Inventory to predict learner performance in online and traditional educational psychology courses (Dissertation). Northern Arizona University; Arizona, United States, 2012.
22. Alkhateeb HM, Nasser R. Assessment of learning and study strategies of university students in Qatar using an Arabic translation of the Learning and Study Strategies Inventory. *Psychological Reports: Sociocultural Issues in Psychology*. 2014; 114(3): 947-965.
23. Fereidouni Moghadam M, Cheraghian B. Study habits and their relationship with academic performance among students of Abadan School of Nursing. *Strides Dev Med Educ*. 2009; 6(1): 21-28.
24. Hashemi A, Hemmati A. Application of learning strategies by successful and unsuccessful university students. *The Journal of Modern Thoughts in Education*. 2008; 3(2(10)): 133-146.