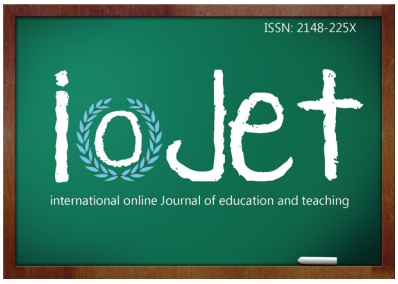

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LEARNING AND STUDY STRATEGIES INVENTORY (LASSI) AND ITS RELATIONSHIP WITH UNIVERSITY STUDENTS' ACADEMIC ACHIEVEMENT

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Abstract

Lack of learning and study strategies (LASS) is one of the most important reasons for frustration and academic failure in student, so learning and study strategies resemble a tool applied in solving academic problems, assisting the students to develop the skills required in their academic course. Identifying and enhancing these strategies helps the person go through college education successfully depending on their own capabilities, discovering and strengthening them. So, the aim of the present study is the use of Learning and Study Strategies Inventory (LASSI) and its relationship with university students' academic achievement. The study results did not show remarkable relationship between the three main LASS and academic achievement (AA) among students of Guilan University of Medical Science and levels of LASS are very low among these students. Concerning the criticality of the students' AA, the academicians of this university are recommended to take some measures in order to decrease academic failure and improve it via boosting the students' knowledge and skill.

Keywords: study strategies, students, academic achievement, learning

1. Introduction

Every year, a large number of the college goers enter universities and higher educational centers worldwide drop out or do not manage to complete their education within the due period. Besides, some other students deal with minor failures (Haghani & Khadivzade, 2009). For consecutive years, the instructors used to assume that the older and more experienced the learners become, the more their academic skills develop. Thus, newcomer students were expected to have knowledge about the novel efficient learning concepts and apply effective learning strategies. This issue is somewhat true but unfortunately most of the students lack such skill and will not acquire the skill until they get direct training (Salehi & Enayati, 2009). Learning strategy refers to the learner's behaviors influencing learning process (Iqbal, Sohail, & Shahzad, 2010). Some students have a clear-cut image of their educational and career future and know for sure that they have strived for their best academic activity at school or university to achieve their academic and professional goals in the future. Unlike them, another group being less future-obsessed value their educational activity less. Also, the students with more engaged in academic and career prospects possess, have the best learning

model (de Bilde, Vansteenkiste, & Lens, 2011). Psychologists and educators are highly in accord with the importance behind self-regulation and motivation and its role in realizing academic accomplishments (Ning & Downing, 2010). Nowadays, problem-solving strategy is recognized highly critical as a metacognitive skill in the students' learning and study effectiveness (Javadi et al., 2011). Perceiving the relationship between learning, study strategies and academic proficiency can mark out learning obstacles and create some strategies to boost the students' learning experiences (Schutz, Gallagher, & Tepe, 2010).

Due to lack of LASSs, most of the students run into disappointment and academic failure. Learning and study strategies resemble a tool employed to resolve educational issues and help the students develop the skills needed during education course. To identify and enhance these strategies helps one successfully pass academic years relying on their potential, discovering and strengthening them (Murray, 1998).

Learning strategies involve any thought, behavior, belief or feeling facilitating fresh knowledge and skills acquisition, perception and their subsequent transfer (Haghani & Khadivzade, 2009). The conducted studies pinpoint that LASSs improve the students' performance via facilitating their learning process (Salehi & Enayati, 2009). The vitality of the strategies as the ones to promote the education level has been fully recognized (Hosseini Shahidi, Atarodi, & Moghimian, 2005). The findings imply that all of the three main learning and study strategies hold meaningful relationship with academic achievement and these three main LASSs differ among various educational groups of the students and also, the LASS profile of female and male students have been different in several areas (Salehi & Enayati, 2009).

1.1. Purpose and Importance of the Study

The aim of this study was to implement the Learning and Study Strategies Inventory (LASSI) and its relationship with university students' academic achievement. About the necessity of this study among Guilan students' community, it deserves mentioning that the current study can pave the ground for the information on major LASSI components, the students' academic achievement relationship being accessible and this way, it will be viable to lead the students towards the direction that is ultimately effective and useful for their academic achievement and professional development while increasing their LASS. So, considering the importance of using study strategies in academic achievement and having no accurate statistics of these methods application in Guilan University, we have decided to investigate the association between the main components of LASSI and the students' academic achievement in Guilan University. According to the aim and context of the study, five research questions have been generated in accordance with the theoretical framework of the study:

1. What is the amount of average and standard deviation of study and learning strategies components in Guilan students?

2. Is there a relation between study and learning strategies and students' academic achievement?

3. Is there a relation between the study and learning strategies and students' academic achievement (in students with high GPA)?

4. Is there any difference in ten areas of study and learning strategies in terms of gender?

5. Is there any difference in the main components of learning and study strategies in terms of the colleges?

2. Methods

2.1. Model

The research aimed at implementing the Learning and Study Strategies Inventory (LASSI) and its relationship with university students' academic achievement. In this survey descriptive-correlative method has been employed.

2.2. Study Group

The present study was conducted with a total of 447 students of Guilan University of medical sciences in 2014-2015 academic year.

2.3. Data Collection Process

The statistical community consists of all students of Guilan in 2014-2015, announced as 3802 students according to the statistics. To set the sample size according to Morgan table, 351 subjects have been determined and selected based on relative stratified sampling. The inclusion criteria are: studying at the time of conducting this research and being willing to participate in the study; the exclusion criteria involve: not completing or having questionnaire filled in an impaired way. Out of 500 distributed questionnaires, 447 was completed and collected, thus among 447 statistical community subjects, Medical school students (n=110), nursing and midwifery (n=61+22=83), health (n=41), paramedic (n=57), dentistry (n=23), pharmaceutics (n=8) and the international department (n=29) have been picked up.

2.4. Data Collection Tool

The instruments used for this research was the Learning and Study Strategies Inventory (LASSI) questionnaire. The original version of the LASSI, which was published in 1987, is designed for students who are currently enrolled in college. The high school version was developed in response to the need to assess skills that are critical for academic success at the high school level, but that is also instrumental for making a successful transition into a college setting. The LASSI-HS is a diagnostic and prescriptive measure that assesses student thought processes and behaviors that affect studying and learning (Weinstein & Palmer, 1990). The mentioned questionnaire covers three main components as skill, will and self-regulation in ten areas:

1-The LASSI scales related to the skill component of strategic learning are: 1- Information Processing (These scales examine students' learning strategies by the items 58, 50, 44, 27, 23, 15, 11, 3) and 2-Selecting Main Ideas (These scales examine skills and thought processes related to identifying, acquiring and constructing meaning for important new information, ideas and procedure by the items 73, 68, 64, 57, 53, 24, 21, 10), 3-Test Strategies (These scales examine how they prepare for and demonstrate their new knowledge on tests or other evaluative procedures by the items 63, 52, 45, 38, 26, 19, 5, 2).

2-The LASSI Scales related to the will component of strategic learning are: 1- Attitude (students' being interested in college and university; the scale measures it by the items 76, 70, 51, 48, 41, 36, 17, 6) and 2- Motivation (perseverance, self-regulation and willingness to work hard in doing tasks; the scale measures it by the items 80, 65, 59, 42, 39, 30, 22, 14) and 3-Anxiety (the degree to which they worry about their academic performance; the scale measures it by the items 78, 46, 72, 43, 69, 35, 61, 29)

3-The LASSI Scales related to the self-regulation component of strategic learning are: 1-Concentration (focusing their attention and maintaining their concentration over time; the scale measures it by the items 75, 67, 55, 49, 32, 16, 8, 1), 2-Time Management (how students manage, or self-regulate and control the whole learning process through using their

time effectively; the scale measures it by the items 79, 62, 59, 31, 28, 13, 7, 4), 3-Self-Testing (checking to see if they have met the learning demands for a class, an assignment or a test; the scale measures it by the items 75, 60, 47, 37, 25, 18, 9) and 4-Using Academic Resources 5- Using Study Supports (such as review sessions, tutors or special features of a textbook; the scale is measures it by the items 77, 71, 66, 54, 40, 34, 20, 12).

To measure each area, 8 items are applied. Each of the skill and will components has three areas. Thus these two components can get the score range of 24-120 and since self-regulation itself has 4 components, they can get scores of 32-160. Because a questionnaire is a diagnostic tool to find out learning problems in 10 distinct areas, its total score is not calculated. Meanwhile, to define the areas' cut-off line: percentile below 50 means poor learning skills requiring educational consultation, between 50 and 74 signifies good learning skills, and over 74 implies excellent skills (Salehi & Enayati, 2009). In this research, the questionnaire's validity has been verified via content validity after being converted into Persian and being translated and analyzed by the specialists in terms of the expressions' comprehension potential and its reliability by referring to the study and the reliability coefficient has been estimated as 0.76 to 0.88, and for Anxiety (α=0.76), attitude (α=0.78), concentration (α=0.77), data processing α=0.88), main idea selection (α=0.85), self-administering test (α=0.88), study manual (α=0.77), test strategies (α=0.83), time management (α=0.76) (Salehi & Enayati, 2009). It is worth mentioning that this inventory does not have total reliability coefficient; rather each area has its own reliability coefficient (Serin, Serin, & Şahin, 2009).

2.5. Analysis of Data

After gathering the questionnaires and extracting the inserted data information, ultimately to describe the data, the descriptive statistics (mean and standard deviation) and to statistically analyze and compare the data, t-test, variance analysis and to discover the correlation between the two study variables, Pearson correlation coefficient at significance level ($p<0.05$) have been employed using SPSS Version 16.

2.6. Ethical Considerations

It has been announced to the educational groups' students and authorities that the information gained have been merely for their learning and study strategies improvement. Since this research is of descriptive–correlative types and usually in such studies, the ethical codes including keeping the information confidential, not inserting names, the individuals' voluntary and informed participation and accurate report presentation are of the noteworthy results; consequently, in the current research, the researchers have been obliged to observe these codes in all stages related to carrying out the research and presenting the findings.

3. Findings

Out of 447 students, 153 (34.2%) were male and 294 (65.8%) were female. The students' distribution based on the college has been as follows: medical 105 (23.5%), dentistry 51 (11.4%), nursing 115 (25.7%), paramedic 110 (24.6%), health 29 (6.5%), pharmaceutical 8 (1.8 %) and the international department 29 (6.5%) respectively.

In the research, an answer to question "What is the amount of average and standard deviation of study and learning strategies components in Guilan Students?" was searched for. The results suggested that the maximum mean has been assigned to information processing (26.14±4.36) and motivation (26.01±3.87) and the minimum mean to test strategies (21.68±4.46). Besides, self-regulation has got the highest mean out of the three main components. The results were given in Table 1.

Table 1. *Mean and SD of study and learning strategies components among Guilan students*

Main components	Area	Mean	S.D	Min	Max
Skill	Information processing	26.14	4.36	9	40
	Main idea selection	22.96	4.02	12	34
	Test strategies	21.68	4.46	11	36
	Total	**70.78**	**9.01**	**41**	**98**
Will	Anxiety	23.45	5.49	8	39
	Attitude	23.05	3.71	14	34
	Motivation	26.01	3.87	13	39
	Total	**72.50**	**8.89**	**45**	**103**
Self-regulation	Concentration	24.67	3.73	12	36
	Self-administering test	23.87	5.19	8	60
	Study guide	24.24	3.70	15	36
	Time management	24.98	3.48	15	35
	Total	**97.73**	**10.60**	**61**	**136**

*p<0.05

In the research, an answer was sought for the question "Is there a relation between study and learning strategies and students' academic achievement?". To investigate the relationship between the main learning strategies (skill, will and self-regulation) and educational attainment, Pearson correlation test has been applied and Table 2 depicts three correlation positions among learning and study strategies and students' attainment. The correlation analysis results display that no significant relationship exists between any of the components and educational attainment ($p<0.05$).

Table 2. *The correlation between study and learning strategies and students' attainment*

Component	Skill	Will	Self-regulation	Academic achievement
Skill	-			
Will	0.628**	-		
Self-regulation	0.596**	0.678**	-	
Academic achievement	-0.067	-0.025	0.005	-

*p<0.05

In the research, an answer to question "Is there a relation between the study and learning strategies and students' academic achievement (in students with high GPA)?" was searched for. The results indicate that in the students with high GPA, a meaningful relationship is seen in terms of information processing out of the components skill, attitude and motivation out of the components as will, concentration, self-administering test and study guide out of the component self-regulation (Table 3).

Table 3. *The correlation of the study and learning strategies and the students with high GPA*

Area	Information Processing	Attitude	Motivation	Concentration	Self-administering test	Study guide
High GPA	0.191**	0.143*	0.198**	0.161**	0.201**	0.157*

*p<0.05

In the research, an answer was sought for the question "Is there any difference in ten areas of study and learning strategies in terms of gender?". The results denoted that there is no meaningful difference in two female and male groups in terms of learning strategies (skill, will and self-regulation) (Table 4). Since in the component known as skill and self-regulation, the mean scores of the female students have been higher than those of the males, it is concluded that the female performance has been better than that of the males in these areas.

Table 4. *The mean difference in ten areas of study and learning strategies in terms of gender using t-test*

Component	Gender	No.	Mean	SD	t	Sig.
Skill	Female	153	71.66	10.089	1.497	0.136
	Male	294	70.32	8.381		
Will	Female	152	72.48	9.676	-0.082	0.080
	Male	294	72.52	8.478		
Self-regulation	Female	153	98.28	11.75	0.784	0.433
	Male	294	97.45	9.95		

*p<0.05

In the research, an answer was found for the question "Is there any difference in the main components of learning & study strategies in terms of the colleges?". In order to analyze the difference in the study and learning strategies among the educational groups, variance analysis and post hoc Tukey test have been applied as described in Tables 5 and 6. As observed in Table 6, in the two main components of will and self-regulation, there has been a meaningful difference among the colleges.

Table 5. *Analyzing the main components of learning and study strategies in terms of the colleges using variance analysis*

Component	Variance analysis	Square sum	Freedom degree	Mean Square	F	Sig.
Skill	Intergroup	707.729	4	176.932	2.201	0.680
	Intragroup	35523.3544	442	80.370		
	Total	39231.074	446			
Will	Intergroup	1311.282	4	327.820	4.267	0.002*
	Intragroup	33882.209	441	76.830		
	Total	35193.491	445			
Self-regulation	Intergroup	2599.603	4	649.901	6.051	0.000*
	Intragroup	47469.247	442	107.396		
	Total	50068.850	446			

*p<0.05

Regarding the results in Table 5, skill in the study colleges revealed no remarkable difference (p=0.680), while there has been a significant difference in will and self-regulation. Therefore, using Post hoc Tukey test, the subgroups have been compared in pairs to determine which groups differ in will and self-regulation in pairs (Table 6).The results of Post doc Tukey test suggest that in the component of will, a meaningful difference has been observed between the medical and dentistry colleges and also between the dentistry and paramedical colleges, and the performance of the medical and dentistry group has been higher. In the component of self-regulation, the mean of the medical and dentistry colleges has been better than that of the nursing and paramedical colleges.

Table 6. *Tukey test results to separately compare the means of three components LASSs in terms of college*

Component	College		Means difference	Sig.
Will	Medical 1	Dentistry 2	5.923	0.001
	Dentistry 2	Paramedic 4	-4.314	0.029
Self-regulation	Medical 1	Dentistry 2	7.528	0.000
	Dentistry 2	Nursing 3	-6.289	0.002
	Dentistry 2	Paramedic 4	-8.033	0.000

*p<0.05

For comparison, the percentile of the LASSs used by the female and male students and of the Guilan students with the normal sample of the strategies applied by the American college goers have been used.

Figure 1. *Comparing the LASSs profile of Guilan Medical Science University students with that normal sample of the American students adopted from the 2nd edition of LASSI*

Skill			Enthusiasm				Self-regulation				
Percentile	Information Processing	Main idea selection	Test strategies	Anxiety	Attitude	Motivation	Concentration	Self-administering test	Study guide	Time management	Percentile
99	40	40	40	40	40	40	40	40	38	40	**99**
95	38	38	38	37	39	39	37	36	35	37	**95**
90	35	37	36	35		38	35	33	33	35	**90**
85	34	35	35	33	38	37	34	31	32	33	**85**
80	33	34	34	32	37	36	33	30	30	32	**80**
75	31	33	33	31			32	29	29	31	**75**
70	30	32	32	30	36	35	31	28		30	**70**
65		31		29		34	30	27	28	29	**65**
60	29	30	31	28	35	33	29	26	27	28	**60**
55	28	29	30	27					26	27	**55**
50	27			26	34	32	28	25			**50**
45		28	29	25		31	27	24	25	26	**45**
40	26	27	28	24			26	23	24	25	**40**
35	25	26		23		30	25	22		24	**35**
30	24	25	27	22	32	29	24		23	23	**30**
25		24	26	21		28	23	21	22	22	**25**
20	23	23	25	20	31	27	22	20	21	21	**20**
15	22	22	24	18	30	26	21	19	20	20	**15**
10	21	21	23	17	28	24	19	17	19	18	**10**
5	19	18	21	14	26	22	17	15	17	16	**5**
1	15	13	18	10	21	18	13	12	13	12	**1**

Male students ------ **Female students** –·–·–· **Students in total** _____

Figure 1 depicts that the LASSs used by Guilan Students dramatically differ from the profile of American college goers national normal LASSI (Weinstein & Palmer, 1990). The self-administering test areas correspond to percentile 45, information processing, anxiety, study guide and time management to percentile 40, concentration to percentile 35, main idea selection to percentile 20, motivation to percentile 15, rest strategies to percentile 10 and

attitude to percentile 5 of the American college students' norms. Therefore, percentiles obtained from the subjects of the research were lower than percentile 50 of American students' norms in all areas.

5. Discussion and Conclusion

As a result of the investigation of the relationship between three main components of LASSI and academic achievement of Guilan Students, it has been discovered that there is no tangible relationship between 3 components and academic attainment, that this is not compatible with research findings of Albaili (1997), Haynes, Comer and Hamilton-Lee (1988), Hosseini Shahidi et al. (2005), Salehi and Enayati (2009) in the component known as information processing and main idea selection. Regarding the students that have participated in the research and study in diverse medical majors and degrees from associate to professional doctor, it can be stated that one of the reasons behind the above mentioned result (no significant relationship) is the incongruence of the educational content size and the content type presented and the students' scientific fields, research and experiences in various majors and educational levels. Also, it can be concluded that most of students do not have enough information about this strategy and for this reason, despite all the time that they spent for studying, they do not have effective and stable learning (Hosseini Shahidi et al., 2005).

The study findings showed that in the students with high GPA (16 and over), a meaningful relationship has been obtained among the areas of information processing, attitude, concentration, self-administering test and study guide and their academic achievement; the results are consistent with those of Albaili (1997), Haghani and Khadivzade (2009), Hashemi and Hemmati (2008), which indicate a robust relationship between LASSI and academic achievement. Moreover, Yip's (2007) research showed a remarkable relationship between the two groups of the students with high and low GPA in LASSI in two areas of attitude and motivation. The two areas of motivation and self-administering test have meaningful correlation with the mean final grades of the students, which means the ones with lower GPA got lower scores in these two areas and vice versa (Salehi & Enayati, 2008). It appears that the students with higher GPA have outperformed the others and have higher analyzing power. In association with these findings, it can be said that attitude causes a relation between scientific action and their future life goals and it is a reflection of the feelings of students about school where they are studying at. So it is very effective in terms of their efforts for study, learning and GPA. On the other hand, processing information can help the students make a connection between what they know and what they try to learn. Use of this knowledge can help understand new information for success. Learning is incomplete without review and testing, so they are very important in incorporating and completing educational subjects.

This research showed that there is no meaningful difference between the two groups of females and males in terms of learning strategies (skill, will and self-regulation). Maybe this is due to the difference in the learning environment and culture.

Since in this study, the female students' mean scores have been higher than those of the males in the component of skill and self-regulation, it can be concluded that the females have outperformed the males in these areas. The research by Salehi and Enayati (2009) also suggested that between the two female and male groups, there is a difference in the areas of information processing, test strategies, self-administering test and main idea choosing, matching the present study. Maybe the males' lower score than the females can be attributed to their worries for future and that education does not guarantee having the right career in the future. The females are less concerned than the males in this respect. Uncertain job prospects, the post-graduation joblessness probability and considering lost opportunities can be

influencing when taking the male gender role into account in their educational motivation decline compared with the female students.

The current research displays that the mean main components of LASSI differs in terms of the colleges and in two components of will and self-regulation. There has been a significant difference between the majors in various colleges, and the performance of the medical and dentistry groups has been better than that of the nursing and paramedical colleges. The study by Hashemi and Hemmati (2008) suggested that the level of the learning strategies used among the engineering students and primary education is different, which is in line with the current research. Analyzing this finding, it can be deduced that due to the short duration in undergraduate and graduate studies, this groups of students have less experience than general physics and dentistry students. Therefore, to increase their academic performance, they have a greater need to use the study guide, but the professional doctor students' use of their time management ability better. It means that with regard to more academic experience; they improved their knowledge about factors of a waste of time. So, they have an effective plan for completing their scientific tasks on time.

Moreover, this study extracted results about comparing Guilan Students' LASSI profile with the normal sample table of American Students, and disclosed some remarkable differences. The areas of self-administering test equal to percentile 45 while information processing, anxiety, study guide and time management correspond to percentile 40, concentration to percentile 35, main idea selection to percentile 20, motivation to percentile 15, test strategies to percentile 10 and attitude to percentile 5 of the American students' norm. Therefore, the participant students' percentiles in all areas have been lower than the American students' percentile 50. This study's finding is consistent with those gained by Salehi and Enayati (2009) and Hosseini Shahidi et al. (2005). That research finding show the scores in the areas of attitude, motivation, anxiety, concentration, information processing, study guide, self-administering test. LASS of Gonabad Medical Science students have been lower than those of the American students' normal scores. Salehi and Enayati's (2009) study demonstrated the scores in the areas of self- administering test and study guide as percentile 45, the main idea choosing as percentile 30, test strategies as percentile 20, motivation as percentile 10 and attitude as percentile 5, and these have corresponded to the American students' norm. Also the study by Tafazoli and Khadivzadeh (2002) suggested that the students' scores in the areas of attitude and motivation, time control, information processing, self-administering test and test strategies are lower than percentile 50 of the American students' normal table scores. They also reported that the students' scores in the motivational activities correspond to percentile 15 of the American students' normal sample. The current research results are in line with those discovered by Shih, Chiang, Lai and Hu (2009) regarding the students' percentile in the areas of attitude, motivation and self-administering test.

The present study results imply that the Medical Science University students have got lower levels in LASSI. With respect to the significance behind the students' academic achievement, it is recommended to take measures to lower the academic failure and boost it through increasing the knowledge and skill of the students and the educational practitioners in the university, holding educational workshops on training learning and study strategies. In many universities worldwide, training study skills and techniques when the students enter university is recognized as essential to improve their learning process (Feizipour & Zeinali, 2013). Regarding the limitations of the present study, we can mention high volume of data collection tools and the multitude of questions which lead to disinterest in students while completing the questionnaire. Also this study is limited to students in Guilan university medical sciences.

The following recommendations can be made as a result of the study:

1. To raise LASS utilization among the students;

2. To make the students familiar with learning strategies by offering an optional course in all majors;

3. To hold a course on learning strategies for all majors' teachers;

4. To equip the university libraries with scientific texts on learning strategies;

5. To make teaching learning strategies to the students one of the career priorities for the consultant teachers.

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