Journal of Pedagogical Research
Volume 7, Issue 5, 2023
https://doi.org/10.33902/JPR.202323615

Research Article

An analysis of learning and study strategies among undergraduate students

Najwa Abbaas B. Alhameedyeen[1] and Rahmeh Abbaas B. Alhameedyeen[2]

[1]*Najran University, Saudi Arabia (ORCID: 0009-0006-2985-6007)*
[2]*The World Islamic Science & Education University, Saudi Arabia (ORCID: 0000-0002-8859-8064)*

This study aimed to reveal the level of learning and study strategies, which represent an important element of the effective study elements for learners, and the differences between these strategies according to the level of achievement, the academic year, the type of college and gender in a sample of undergraduate students. The study adopted a descriptive analytical approach to answer the research questions. A total of 426 undergraduate students participated in the study. As part of the study, the Learning and Study Strategies Scale - third version (LASSI-3) was used, and means and standard deviations were calculated. The different levels of achievement, academic year, college type, and gender were also analyzed using the dependent multivariate analysis of variance (MANOVA) and analysis of variance (ANOVA). Based on the results, it was found that learning and study strategies had medium to high prevalence, and that learning and study strategies differed statistically significantly at achievement levels (Attitudes, Concentration, Information Processing, Motivation, Self-test, Test strategies and Using Academic Resources) in favor of high achievement. In both Motivation and Test Strategies, the graduates' learning and study strategies differed statistically significantly according to the academic year. In terms of five dimensions of learning and study strategies (Anxiety, Concentration, Motivation, Selecting Main Ideas, and Test strategies), there were statistically significant differences at the level of the type of colleges attributed to scientific colleges. In terms of learning and study strategies, the results did not show statistically significant differences by gender. As a result of the results, a number of recommendations were developed, including that students need to be educated about the importance of learning and study strategies in general and self-regulation strategies, skills, and will in particular. Moreover, there is a need to educate and train those in charge of the educational-learning process including faculty members, counselors and parents about the importance of studying and teaching strategies for their children and practicing them during the learning process.

Keywords: Self-regulation; Learning and study strategies; Achievement

Article History: Submitted 15 July 2023; Revised 12 September 2023; Published online 1 October 2023

1. Introduction

Students are considered one of the most important human resources with a national return. Because of their energies, preparations, and capabilities that can be used in building societies and advancing the nation, the tracker of the goals of the Kingdom's Vision 2030 notices the recent trend of research to study the characteristics and attributes related to the learner. He forms the focus of

Address of Corresponding Author

Najwa Abbaas B. Alhameedyeena, PhD, Najran University, King Abdulaziz Rd. 1988, Saudi Arabia.

✉ naalhmydeen@nu.edu.sa

How to cite: Alhameedyeen, N. A. B. & Alhameedyeen, R. A. B. (2023). An analysis of learning and study strategies among undergraduate students. *Journal of Pedagogical Research, 7*(5), 81-96. https://doi.org/10.33902/JPR.202323615

the learning-educational process, where the focus is on studying learning strategies, learning methods, and learning processes, and study processes and so on to develop the independent personality of the learner, enhancing his self-confidence, providing him with the necessary expertise, and prepare and prepare him to enable him to safely move to the subsequent stages.

The educational learning process in our present time is no longer centered around the teacher, who was considered for a short time the focus of the educational learning process. However, the educational outlook soon changed and transformed, except that the actual focus of the learning process is the student himself. Recently, the importance of the educational material being appropriate to the student's cognitive and intellectual abilities has been asserted. The student takes into account his previous experiences, tendencies, and trends and is keen to meet his individual and unique requests for educational goals effectively and to achieve the best results. The focus shifts from an activity-based approach to a results-based approach, that is, the focus shifts from activities and inputs to a focus on outputs and outcomes measured by key performance indicators.

Learning and study strategies have attracted the attention of many researchers and scholars in educational psychology, but the essence of this interest focused on emphasizing the importance of the learner's access to an educational state in which he is active, proactive, and vital. Learning helps him acquire new information or knowledge structures (Weinstein & Palmer, 2002). Weinstein et al. (1989) see that the successful learner can acquire strategies that enable him to integrate and use new information, ideas, and skills, but this is not always the case, as there are learners who know what they need to learn but do not know how they learn it most effectively. Therefore, the student must know more than the facts he knows and must learn ways and strategies to build relationships between his previous experiences, learning materials, and objectives. The student's knowledge of strategies helps him to have self-confidence for the student to learn successfully. Also, it assists him in having the motivation to become a strategic learner who necessarily has self-knowledge of his time management, the use of learning resources and strategies, the application of new learning, and building strategies in ways that help him to become a better strategic learner by learning how to learn, how to remember, how to think, and how to move. It pushes him to succeed and makes him a responsible person looking for multiple sources of success (Weinstein & Palmer, 2002). These characteristics of the strategic learner necessarily lead us to positive academic outcomes and high academic achievement.

Learning and study strategies are a set of behaviors, actions, attitudes, or ways of thinking that facilitate the coding process in a way that ensures that new information has been combined with previous information and can be retrieved when needed. They are ideas that aim to influence how information is processed by the learner and used to complete a task. Their main purpose is to teach learners to be self-reliant and independent and can monitor themselves and use the appropriate strategies and situations so that they monitor their success, take responsibility for it, and be motivated to perform such operations. We seek to create a self-reliant generation that bears the consequences of its actions, manages its time and affairs, achieves self-satisfaction in the learning process, and enhances its self-confidence (Weinstein & Mayer, 1986). High-achieving students are characterized by high motivation and self-management of learning while low-achieving students struggle with low motivation and cannot manage their learning (Mckeachie et al., 1985). Also, the outstanding students follow sound study habits (Suleiman, 1988). In addition, there is a relationship between learning and recall skills and academic achievement, intelligence, and learning motivation among pre-university students. Besides, it was found that skills, motivation, and intelligence explain about 84.1% of the sample variance in their academic achievement (Al-Khudari & Riyadh, 1993). Moreover, there is a significant and positive relationship between academic achievement and the skill of selecting basic ideas (Time management, Using Academic Resources, Test strategies, diligent search for knowledge, and organization). They can contribute to the academic average for the total sample while the skills of work methods, information processing, and time management have contributed to the academic rate for the sample of literary disciplines (Al-Khulaifi, 2000). Al-Zawahra (2006) revealed a negative relationship between

academic achievement and exam anxiety among school students in Jordan. In the same vein, Hoveland (2006) showed a high and positive correlation coefficient among students with grades LASSI and academic achievement in terms of information processing and motivation. Likewise, Salloum and Mahmoud (2006) revealed the effect of using the LASSP learning and study strategies program on the achievement of middle school students. Students were provided with some effective learning and studying strategies, which improved their levels of achievement. In the same context, Tahseldar (2007) showed factors, such as a good IQ, motivation for achievement, and other cognitive characteristics are strongly associated with learning strategies according to the (LASSI) model. Bishara and Al-Ghazou (2008) found a positive connection between the importance of learning and study strategies and their practice among school students in Jordan. Al-Masry (2009) looked at the level of possession of learning strategies by the students of the Faculty of Educational Sciences at Al-Israa University and indicated a link between the possession of learning strategies and achievement (high, low) on the learning motivation strategies dimension in favor of the high level of achievement. Yip (2009) showed that self-regulation and the will component are more important among high achievers than the skills component among university students. Aniza et al. (2010) found that the relationship between LASSI learning and study strategies with academic achievement was high among Malaysian school students. Jadeed (2010), who examined the relationship between learning styles and exam anxiety and their effect on the degree of academic achievement for school students in Syria showed a significant negative correlation between learning style and test anxiety and a significant positive correlation between learning styles and academic achievement scores. In the same context, Gallagher et al. (2011) found a relationship between high achievers and low achievers in the use of the sub-dimensions (Anxiety, Attitudes, Concentration, Motivation, Test strategies, and Selecting main ideas) in favor of the high achievers. Low achievers depend on using the sub-dimensions (information processing, self-testing, Using Academic Resources, and time management). Alkhateeb and Nasser (2014) revealed differences between learning and study strategies according to the achievement of the following dimensions: Anxiety, Attitudes, Concentration, Motivation, self-testing, and selecting main ideas. Finally, Taheri et al. (2017) showed significant differences in information processing, attitudes, concentration, self-testing, and use of academic resources in favor of high achievers.

The studies focused on applying learning strategies with different names in the different stages, starting from the basic stage (Al-Khudari & Riyad, 1993; Al-Zawahra, 2006; Anisa et al., 2010) to the secondary stage (Al-Bikai, 2005; Abdul Rahman, 2008; Bishara & Al-Ghazou, 2008; Hammoud, 1999; Suleiman, 1988) to the undergraduate level (Al-Khulaifi, 2000; Al-Khatib & Al-Nasser, 2014; Al-Taher et al., 2017; Fatim, 1989; Hovland, 2006; Makashi et al., 1985; Schutz et al., 2010; Yip, 2009). This is commensurate with the global proposition and modern trends of modern educational literature. Many researchers have focused on studying the students' learning and study skills at various academic levels and their relationship to academic achievement to improve and develop the educational process and directing students to pay attention to developing their skills and abilities to enhance sound strategies for studying. Most studies found a positive correlation between learning, study, and recall skills with academic achievement. Some studies showed that study and study habits are affected by the difference in specialization and gender, while others showed that they are not affected by any of these variables. What distinguishes this study from previous studies is that it dealt with a new topic, the detection of the level of learning and study strategies (LASSI-3). It represents an important element of the effective study elements for learners, and the difference of these strategies according to the level of achievement, the academic level, the type of college, and the gender of undergraduate students. The current study has been not examined yet in the context of the current study to the researchers' best knowledge.

1.1. Statement of the Problem

The problem of the study is to reveal the reality of learning and study strategies, which constitute an important element of the effective study elements for learners and help us draw up a plan for

the correct educational advancement that takes into account human capital. The problem of this study can be determined by answering the following question:

RQ) What are the common learning and study strategies among undergraduate students?

1.2. Objectives and Questions of the Study

This study aims to reveal the reality of the common learning and study strategies among a sample of undergraduate students and their differences according to a number of variables, such as the level of study, achievement level, gender, and college. To achieve this goal, the study questions will be answered, which are:

RQ 1) Are there statistically significant differences ($\alpha < .05$) in the learning and study strategies attributed to the level of achievement (high achievement, low achievement)?

RQ 2) Are there statistically significant differences ($\alpha < .05$) in the learning and study strategies attributed to the academic level (first-year, graduate students)?

RQ 3) Are there statistically significant differences ($\alpha < .05$) in learning and study strategies attributed to the type of college (scientific, humanities)?

RQ 4) Are there statistically significant differences ($\alpha < .05$) in learning and study strategies due to gender (male, female)?

1.3. Significance of the Study

The study examines an important topic, learning and study strategies, and differences in the LSSI scores attributed to the academic level, level of achievement, and gender of the college. Therefore, the results will help understand the academic difficulties facing some students and develop counseling plans and programs to raise their levels of possession of these strategies. Also, the study will assist in improving their study skills to become able to transfer and develop them and help educational planners work hard to develop these strategies if they have not been developed through the teaching methods currently used. Finally, the study provides researchers with a theoretical framework for the Learning and Study Strategies Inventory (3rd Ed) (LASSI-3).

2. Method

The study followed the analytical descriptive survey approach, as it is the most suitable for such types of studies.

2.1. Research Design

This study is based on using the descriptive approach for its suitability for the current study and related purposes. It aims to identify common learning and study strategies among undergraduate students in light of several variables.

2.2. Population and Sample of the Study

The study population represents all the students at the university in the Kingdom of Saudi Arabia for the second semester of the academic year 2021/2022. The study sample was selected according to the sample selection table from the study population in a simple random way estimated at (426) male and female students, as shown in Table 1.

Table 1 shows that the number of participants with high achievement reached 299 (70, 2%) whereas those with low achievement were 127 (29.8%). Also, 136 (31.9%) students from the first level participated in the study compared to 290 (68.1%) in the last level. In addition, 178 (41.8%) students in the humanities colleges enrolled in the study compared to 248 (58.2%) students from the scientific colleges. Moreover, the study included 125 (29.3%) males and 301 (70, 7%) females.

Table 1
Distribution of the study sample according to demographic variables

Variables	*n*	*%*
Achievement		
High	299	70.2
Low	127	29.8
Academic level		
First	136	31.9
Last	290	68.1
College type		
Humanities	178	248
Scientific	41.8	58.2
Gender		
Male	125	29.3
Female	301	70.7
Total	426	100

2.3. Instrument

The LASSI-3 ED by Weinstein and Palmer (2002) is one of the most recent scales in modern educational literature, as shown in Table 2, was used in the study.

Table 2
Strategies that make up the LASSI model

LASSI Components (Adjustable Properties)	*Component sub-strategies*	*Number of items*
Self-regulation component	Concentration	6
	Self-testing	6
	Using academic resources	6
	Time management	6
Skills component	Information processing	6
	Selecting main ideas	6
	Test strategies	6
Will component	Anxiety	6
	Directions	6
	Motivation	6

Table 2 shows that the LASSI scale consists of three main domains: self-regulation component, skills component, and Will component. Self-regulation has four sub-strategies: concentration, self-testing, using academic resources, time management. Skills include three sub-strategies: information processing, selecting main ideas, test strategies. Will component contains three sub-strategies: anxiety, directions, and motivation. The total number of items in the LASSI scale is 60.

The tool was applied to students in the form of an electronic questionnaire (five-point Likert). The responses were converted into grades so that it is very much typical of me= 5, fairly typical of me= 4, somewhat typical of me= 3, not very typical of me= 2, and not at all typical of me= 1. Accordingly, the values of the means the study reached were dealt with according to (the upper value - the lower value of the answer alternatives divided by the number of levels). In addition, students' level of achievement was classified based on their general average at the end of the second semester (2021-2022) into high achievement above 4.5/5 and low achievement less than 3/5.

2.3.1. Validity of the LASSI scale

The researchers contacted the publishing house responsible for the scale, which was applied in a number of foreign universities, and permission was obtained to access the scale in its new version.

The publishing house thankfully sent a username and password to obtain the electronic version to use the scale for scientific research purposes. It is worth noting that the first and second versions of the scale are available in a number of foreign studies on the site and in scientific journals. The learning and study strategies scale was initially Arabized by the researcher, and then it was presented to two specialists in English, and then a reverse translation was made to ensure the correctness of the translation and to ensure that its suitability and the extent of its linguistic integrity for the target age group.

Validity. After preparing the initial image of the scale, the scale was presented to (5 experts) at university to express their opinions on the veracity of the content, the belonging of the items to the scale, the extent of their suitability for measuring what it was set to be measured, and the degree of their clarity. Then, the appropriate amendments were suggested, and the standard (80%) to indicate the validity of the item. Based on the experts' opinions, some items were modified in terms of wording to increase their clarity. As a result, the scale retained its number of items consisting of (60) items distributed over ten main dimensions.

Reliability. To calculate the reliability of the study tool, correlation coefficients were calculated between each of the items in the scale using Cronbach's alpha coefficient. Table 3 shows the test results.

Table 3
Reliability coefficients for the items of the study tool using Cronbach's alpha test

Study variables	*Stability coefficient using Cronbach alpha*
Anxiety	0.754
Directions	0.880
Concentration	0.889
Information processing	0.714
Motivation	0.753
Selecting main idea	0.882
Self-testing	0.827
Test strategies	0.791
Time management	0.810
Using Academic resources	0.725
The tool as a whole	0.907

Table 3 shows that the values of Cronbach's alpha coefficient for the sub-dimensions of the scale ranged between (0.714 - 0.889), and the value of the reliabity coefficient using Cronbach's alpha for the total score of the scale was (0.907), and it is considered an acceptable coefficient to conduct this study.

2.4. Study Variables

The independent variables in the study were achievement, academic level, type of college, and gender. The dependent variables: learning and study strategies of undergraduate students, which are (anxiety, attitudes, concentration, information processing, motivation, selecting main ideas, self-testing, test strategies, time management, and using academic resources).

2.5. Data Analysis

The quantitiative data was analyzed using SPSS version 23. A number of analyses were used to answer the research questions, nameely, means, standared deviations, Pearson correlation, Cronbach’s Alpha, and MANOVA, and Scheffe’s test.

3. Results

Means and standard deviations were extracted to identify the responses of the study sample on "common learning and study strategies among undergraduate students in the light of several variables". The following are the answers to the study questions.

3.1. Results Related to the First Question: What are the common learning and study strategies among undergraduate students?

To answer the research question, means and standard deviations were extracted to identify the study sample's responses to the learning and study strategies common to undergraduate students. Table 4 shows the results.

Table 4
Means and standard deviations of the study sample's responses to "Common Learning and Study Strategies among undergraduate students" arranged in descending order

No.	*Common learning and study strategies*	*Mean*	*SD*
5	Motivation	3.89	0.65
4	Information processing	3.75	0.70
2	Attitude	3.62	0.57
7	Self-testing	3.32	0.52
3	Concentration	3.25	0.70
10	Using academic resources	3.20	0.69
6	Selecting main ideas	3.14	0.70
8	Test strategies	3.10	0.65
9	Time management	2.98	0.64
1	Anxiety	2.49	0.82
	The scales total score	3.27	0.68

Table 4 shows that the means of learning and study strategies common to undergraduate students ranged between (3.89 and 2.49). The range is (4) for each of the ten strategies. The maximum value was (5), and the minimum was (1). Also, it turns out that the length of the period $= (5 - 1) \div 5 = 0.8$, and when distributed into five categories, it is distributed as presented in Table 5.

Table 5
Estimating Strategies Spread

Strategies within the category	*Grade*	*Categories*
No strategies	weak	1.00-1.79
Anxiety	Accepted	1.80-2.59
Time management / test strategies / selecting main ideas /using academic resources /concentration / self-testing	Medium	2.60-3.39
Attitudes / information processing / motivation	high	3.40-4.19
No strategies	Very high	4.20-5.00

As shown above in Table 5, the common learning and study strategies are motivation in the first place, followed by information processing in the second place, and then attitudes; all of which are at the high level, whereas time management, test strategies, selecting main ideas, using academic resources, concentration, and self-testing at an average level from fourth to ninth. Finally, anxiety ranked tenth at an acceptable level. This result indicates that the strategies, in general, are not very high.

3.2. Results Related to the Second Question: Are there statistically significant differences in learning and study strategies attributed to the level of achievement (high achievement, low achievement)?

To answer this question, means and standard deviations were calculated to identify the common learning and study strategies of undergraduate students with different levels of achievement. The results were as follows.

Table 6
Means and standard deviations to identify common learning and study strategies among undergraduate students according to the level of achievement

Achievement level	*Low*		*High*	
	Mean	*SD*	*Mean*	*SD*
Anxiety	2.39	0.88	2.52	0.79
Attitude	3.43	0.55	3.70	0.52
Concentration	3.11	0.65	3.30	0.71
Information processing	3.63	0.70	3.79	0.69
Motivation	3.65	0.65	3.98	0.62
Selecting main idea	3.04	0.62	3.18	0.72
Self-testing	3.23	0.55	3.35	0.50
Test strategies	2.90	0.62	3.18	0.64
Time management	2.89	0.57	3.01	0.65
Using academic resources	3.07	0.72	3.25	0.67

It is noted from Table 6 above that there are apparent differences in learning and study strategies due to the level of achievement. To verify whether these differences are significant, the dependent multivariate analysis of variance (MANOVA) was used in Table 7.

Table 7
Results of the dependent multivariate analysis of variance (MANOVA) to study the effect of the level of achievement on the ten strategies

Variables effect		*Value*	*F*	*Hypothesis df*	*Error df*	*Sig.*
Achievement	Hotelling's Trace	0.09	4.01	10.00	415	.000

It was found that the variable of achievement had differences in LASSI scores (F (1, 415) = 4.01, $p < .001$). To find out which of these differences is significant, the results of the analysis of variance were extracted as shown in Table 8.

Table 8
Results of the analysis of variance for the ten strategies according to the level of achievement

Variation source	*Strategies*	*Squares*	*df*	*Mean squares*	*F*	*Sig.*
Achievement	Concentration	3.31	1	3.31	6.86	.009*
	Test strategies	6.98	1	6.98	17.33	.000*
	Information processing	2.36	1	2.36	4.90	.027*
	Attitude	6.43	1	6.43	20.77	.000*
	Time management	1.39	1	1.39	3.45	.063*
	Self-testing	1.29	1	1.29	4.81	.029*
	Selecting main ideas	1.78	1	1.78	3.70	.055
	Using academic resources	2.92	1	2.92	6.15	.013*
	Motivation	10.07	1	10.07	25.27	.000*
	Anxiety	1.50	1	1.50	2.22	.137

Note. *$p < .05$.

Table 8 shows differences in the means of the individuals' scores on each of learning and study strategies attributed to achievement. It was found from the results of the dependent multivariate

analysis of variance that the variable of the level of achievement is statistically significant. It was shown that the participants who had high LASSI scores in the strategies of motivation, information processing, selecting main ideas, anxiety, attitudes, concentration, self-testing, time management, using academic resources, and testing strategies showed a high level of achievement.

3.3. Results Related to the Third Question: Are there statistically significant differences in the learning and study strategies attributed to the academic level (first year, fourth year and above)?

To answer this question, means and standard deviations were calculated to identify the common learning and study strategies of undergraduate students according to their level of achievement, and the results were as follows.

Table 9
Means and standard deviations to identify common learning and study strategies among undergraduate students according to the academic year

Academic year	*First*		*Graduate*	
	Mean	*SD*	*Mean*	*SD*
Anxiety	2.50	0.87	2.48	0.80
Attitude	3.55	0.66	3.66	0.52
Concentration	3.19	0.64	3.28	0.73
Information processing	3.75	0.69	3.75	0.70
Motivation	3.77	0.65	3.94	0.64
Selecting main idea	3.06	0.69	3.18	0.70
Self-testing	3.32	0.55	3.31	0.50
Test strategies	2.97	0.67	3.17	0.63
Time management	2.90	0.59	3.02	0.65
Using academic resources	3.17	0.74	3.22	0.67

According to Table 9, there were apparent differences between the values of the means concerning the common learning and study strategies of undergraduate students due to the academic year and the dimensions (anxiety, attitudes, concentration, information processing, motivation, selecting main ideas, self-testing, test strategies, time management, using academic resources). To verify whether these differences are significant, the dependent multivariate analysis of variance (MANOVA) was used, as shown Table 10.

Table 10
Results of the dependent multivariate analysis of variance (MANOVA) to study the impact of the academic year on the ten strategies

Variables effect		*Value*	*F*	*Hypothesis df*	*Error df*	*Sig.*
Academic year	Hotelling's Trace	0.05	2.08	10.00	415	0.025

Table 10 shows that the responses of the study sample to the LASSI scale were affected by their academic year (F (1, 415) =2.08, $p < .001$). To find out which of these differences is significant, the results of the analysis of variance were extracted from Table 11.

As shown in Table 11, the variable of the academic year level is statistically significant. It was found that the motivation strategy and test strategy were statistically significant in favor of graduates. This result is due to the importance of the test experiences that the student is exposed to during the academic years at the university.

Table 11
Results of the analysis of variance for the ten strategies according to the academic year

Variation source	*Strategies*	*Sum of Squares*	*df*	*Mean squares*	*F*	*Sig.*
Academic year	Anxiety	.027	1	.027	.040	.842
	Attitude	1.125	1	1.125	3.497	.062
	Concentration	.626	1	.626	1.279	.259
	Information processing	.000	1	.000	.000	.987
	Motivation	2.925	1	2.925	7.038	.008*
	Selecting main ideas	1.326	1	1.326	2.744	.098
	Self-testing	.009	1	.009	.033	.856
	Test strategies	3.583	1	3.583	8.718	.003*
	Time management	1.470	1	1.470	3.665	.056
	Using academic resources	.199	1	.199	.413	.521

Note. $*p < .05$.

3.4. Results Related to the Fourth Question: Are there statistically significant differences in learning and study strategies attributed to the type of college (scientific colleges, literary colleges)?

To answer this question, means and standard deviations were calculated to identify the common learning and study strategies of undergraduate students according to the type of college. The results are shown in Table 12.

Table 12
Means and standard deviations to identify common learning and study strategies among undergraduate students in different colleges

College type	*Humanities*		*Sciences*	
	Mean	*SD*	*Mean*	*SD*
Anxiety	2.38	0.78	2.61	0.84
Attitude	3.62	0.56	3.68	0.58
Concentration	3.10	0.73	3.30	0.76
Information processing	3.77	0.64	3.86	0.71
Motivation	3.86	0.64	3.92	0.66
Selecting main idea	3.05	0.72	3.23	0.69
Self-testing	3.29	0.47	3.34	0.51
Test strategies	2.96	0.61	3.14	0.68
Time management	2.94	0.67	3.03	0.65
Using academic resources	3.22	0.69	3.14	0.78

Table 12 shows that there were apparent differences between the values of the means concerning the common learning and study strategies of undergraduate students attributed to the college and the dimensions of (concern, attitudes, concentration, information processing, motivation, selecting main ideas, self-testing, test strategies, time management, using academic resources). To identify the significance of the differences, the One Way MANOVA variance test was used. The results are displayed in Table 13.

Table 13
Results of the dependent multivariate analysis of variance (MANOVA) to examine the effect of totality on the ten strategies

Variables effect		*Value*	*F*	*Hypothesis df*	*Error df*	*Sig.*
College type	Hotelling's Trace	0.05	2.12	10.00	415	0.02

Table 13 shows that the responses of the study sample to the LASSI scale were affected by their type of college (F (1, 415) =2.12, $p < .01$). To find out which of these differences is significant, the results of the analysis of variance were extracted from Table 14.

Table 14
Results of the analysis of variance for the ten strategies according to the type of college

Variation source	*Strategies*	*Sum of Squares*	*df*	*Mean squares*	*F*	*Sig.*
College type	Anxiety	5.484	1	5.484	8.296	.004*
	Attitude	.369	1	.369	1.136	.287
	Concentration	4.331	1	4.331	7.799	.005*
	Information processing	.840	1	.840	1.816	.179
	Motivation	.349	1	.349	.813	.368
	Selecting main ideas	3.369	1	3.369	6.842	.009*
	Self-testing	.235	1	.235	.968	.326
	Test strategies	3.662	1	3.662	8.678	.003*
	Time management	.795	1	.795	1.828	.177
	Using academic resources	.752	1	.752	1.356	.245

Note. *$p < .05$.

3.5. Results Related to the Fifth Question: Are there statistically significant differences in learning and study strategies due to gender (male, female)?

To answer this question, means and standard deviations were calculated to identify the common learning and study strategies of undergraduate students attributed to gender (male, female). The results are presented in Table 15.

Table 15
Means and standard deviations to identify common learning and study strategies among undergraduate students according to gender

Gender	*Male*		*Female*	
	Mean	*SD*	*Mean*	*SD*
Anxiety	2.50	0.83	2.48	0.82
Attitude	3.65	0.54	3.61	0.58
Concentration	3.24	0.65	3.25	0.72
Information processing	3.78	0.76	3.74	0.67
Motivation	3.91	0.64	3.88	0.65
Selecting main idea	3.16	0.69	3.14	0.70
Self-testing	3.33	0.51	3.31	0.52
Test strategies	3.09	0.60	3.11	0.67
Time management	2.96	0.65	2.99	0.63
Using academic resources	3.20	0.73	3.20	0.68

Table 15 shows that there were apparent differences between the values of the means concerning the common learning and study strategies of undergraduate students due to gender and all the dimensions. To identify the significance of the differences, the One-Way MANOVA variance test was used. The results are depicted in Table 16.

Table 16
Results of the dependent multivariate analysis of variance (MANOVA) to examine the effect of gender on the ten strategies

Variables effect		*Value*	*F*	*Hypothesis df*	*Error df*	*Sig.*
Gender	Hotelling's Trace	0.01	0.20	10.00	415	0.005

Table 16 shows that there were observed differences in the means of males and females on learning and study strategies. The result of the multiple variations of the dependent variables shows that the gender variable was statistically significant (F (1, 415) = 0.20, p < .01). As a result, the results of the analysis of variance shown in Table 17 were extracted.

Table 17
Results of the analysis of variance (ANOVA) for the ten strategies according to the gender variable

Variation source	*Strategies*	*Sum of Squares*	*df*	*Mean squares*	*F*	*Sig.*
Gender	Anxiety	.018	1	.018	.027	.870
	Attitude	.100	1	.100	.310	.578
	Concentration	.009	1	.009	.017	.895
	Information processing	.113	1	.113	.231	.631
	Motivation	.089	1	.089	.210	.647
	Selecting main ideas	.045	1	.045	.093	.760
	Self-testing	.013	1	.013	.048	.826
	Test strategies	.049	1	.049	.117	.733
	Time management	.063	1	.063	.157	.692
	Using academic resources	.000	1	.000	.000	.988

Table 17 shows that the values of (F) were not statistically significant at the significance level of (.05) on all dimensions of learning and study strategies of undergraduate students according to gender. The differences between the values of the mean, if any, did not reach the level of statistical significance. This result indicates that the gender of the study sample did not play any role in their LASSI scores.

4. Discussion

The results showed learning and study strategies of motivation, information processing, and attitudes are of high levels, whereas time management, test strategies, selecting main ideas, using academic resources, concentration, and self-testing came at an average level from fourth to ninth. Anxiety ranked as an acceptable level. This result indicates that the strategies, in general, are not very high and can be attributed to the lack of access for students to counseling and guidance services that raise the level of the strategies used for them or provide them with the knowledge and skills necessary to study and succeed at the university level. Consequently, students need more training by faculty members and counselors on these strategies to create a productive, independent, and creative generation. Also, the result can be attributed to the nature of the curricula that do not care about learning and study strategies as required according to the Kingdom's Vision 2023. The qualification of teachers, counselors, mentors, planners, administrators, and parents can play a role in educating students about the importance of these strategies, acquiring them, and practicing them, especially if we know that these strategies need to be mental training and activity during the educational practices used in the university. In addition, there is a weak focus from the media and social media in general on the importance of students having the necessary strategies for excellence and success. There have become some - and not many - specialized educational channels directed to students to teach them to follow methods and learning methods that allow them the opportunity to participate and discuss freely within the permissible frameworks.

This result is consistent with that of Hoveland's (2006) study, which showed that information processing and motivation occupy the first ranks, and time management, self-testing, and using academic resources were the least prevalent strategies. Also, in line with the current result, Bishara and Al-Ghazou (2008) showed that the extent of students' awareness of the importance of learning strategies is medium, and there was a direct positive relationship between the feeling of the importance of learning strategies and their practice. In addition, the result is consistent with that of

Taher et al.'s (2017) study, which showed that motivation and information processing are the highest. The rest were of a lower standard. However, the result differs from that of Al-Khudari and Riyadh's (1993) study, whose results showed that the sample members do not have high skills in learning and memorization and that their level is average .

In addition, it was shown that the participants who had high LASSI scores in the strategies of motivation, information processing, selecting main ideas, anxiety, attitudes, concentration, self-testing, time management, using academic resources, and testing strategies showed a high level of achievement. In this regard, Weinstein and Palmer (2002) indicated that positive academic outcomes are the product of the learner's learning environment and showed that whoever possesses learning and study strategies is the student who seeks to develop himself through effective learning to become a strategic learner or an independent learner committed to developing self-learning that leads to succeed, excel, and process information into meaningful frameworks. Also, Weinstein et al. (1989) showed that students who get high scores on the LASSI scale are necessarily excellent and have strategies, methods, and tactics to deal with learning situations, and this helps them push themselves towards learning, concentration, develop their needs for achievement, and create a sense of enthusiasm for them to set their educational goals. In addition, they enable them to divide the learning tasks into sub-tasks and create the ability to schedule their time and avoid procrastination, delay, and procrastination. Moreover, they reduce anxiety and increase focus on the learning-education process, forming positive attitudes and a better understanding of the use of available resources and learning resources, to make learning meaningful and lifelong. This result may be attributed to the fact that high-achieving students are keen on competition and interest, have strong motivation and desire to excel, and follow appropriate strategies to understand and comprehend the subjects of study and discuss the difficulties they face with their teachers and mentors. Also, they can have positive self-concepts and feel confident in themselves while they are committed to implementing what is required of them and can do so. In addition, they may be more aware of the importance of these strategies and how to use them than low-achieving students. This result is consistent with those of Mckachie et al. (1985), Suleiman (1988), and Al-Khodary and Riyadh (1993), which showed that there are statistically significant differences between high and low achievers on learning and recall skills in favor of high achievers. It is also in line with that of Al-Khulaifi (2000), which indicated that there is a statistically significant relationship between the skill of selecting main ideas and cognitive motivation. In addition, the result accords with that of Hoveland's (2006) study, which showed a high and positive correlation coefficient among students between LASSI scores and academic achievement. Moreover, it agrees with those of Tahseldar (2007) and Al-Masry (2009), which indicated statistically significant differences in the level of learning strategies according to the level of achievement (high-low) in favor of the high level of achievement. Furthermore, the result meets that of Schutz et al.'s (2011) study, which showed that there were statistically significant differences in the use of the sub-dimensions (anxiety, attitudes, concentration, motivation, test strategies, selecting main ideas) in favor of high achievers. The results did not show any differences statistically significant on the dimensions (information processing, self-testing, using academic resources, and time management). Likewise, Jadeed's (2010) study indicated that the relationship between learning strategies and achievement was significant. Salloum and Mahmoud (2006) showed that the program used LASSP worked on evaluating and informing students of effective learning and studying strategies and improved their levels of achievement. This process is considered a reinforcement for students, as there is a correlation between the use of learning and studying strategies and academic achievement. Al-Taher et al. (2017) showed that there are statistically significant differences in the dimension but insignificant for the rest of the dimensions. Al-Khatib and Nasser (2014) showed that there are statistically significant differences in the dimensions of anxiety, attitudes, concentration, motivation, self-testing, and the selection of main ideas, and there is no indication regarding information processing and using academic resources. However, the result of this study differs from that of Al-Khulaifi's (2000) study, whose results

showed a positive statistically significant relationship between academic achievement, the skill of selecting main ideas, and cognitive motivation only. It did not show any relationship with the rest of the dimensions. It also showed that information processing and work methods can contribute to the average Academic. This result can help increase the success rate and academic excellence and reduce the problem of dropout and educational waste. The intensive focus on teaching students with low achievement important learning and study strategies should be increased. The students should also be helped to feel their importance and training them on practical aspects and not be satisfied with providing theoretical information. In addition, teaching models are to be adopted based on strategies proven to improve understanding and comprehension of the experience to be learned.

Moreover, the variable of the academic year level affected the LASSI scores; students' motivation strategy and test strategy were statistically significant in favor of graduates. This result is due to the importance of the test experiences that the student is exposed to during the academic years at the university. Research in the educational environment constitutes a more comprehensive field than the search for information that is gained through the diversity of question patterns that lead to the so-called cognitive processes. This result agrees with that of Weinstein and Palmer's (2002) study, which indicated that students who use test preparation methods and take advantage of test strategies acquire as much information as possible and facilitate its retrieval and application in study and exams. The skills component is a necessary element for learning but not sufficient without motivation to learn, as effective learning requires integration between the skills component and the will component of strategic learning. Increasing awareness among graduate students contributes to creating higher motivation for achievement and discrimination to engage in the labor market. As for the rest of the strategies, they were of close averages. Previous studies showed that undergraduate students have medium to high learning and study strategies on the dimensions of anxiety, attitudes, concentration, information processing, selecting main ideas, self-testing, time management, and using academic resources; however, they did not reach the level of statistical significance.

Furthermore, the result showed that the college variable of participants affected their answers to the LASSI scale. The differences came in favor of the scientific colleges in the dimensions of anxiety, concentration, selecting main ideas, and test strategies. This result is consistent with that of Taher al.'s (2017) study, which showed that there are statistically significant differences due to the type of college on the two dimensions of the component of will and self-regulation in favor of the College of Medicine and Dentistry at the expense of the College of Nursing and Allied Medical Sciences. However, it differs from that of Al-Khulaifi's (2000) study, which showed that work methods skills, information processing, and time management have contributed to the academic average for a sample of literary colleges. Hence, the university can adopt this tool to raise the level of counseling programs, vocational guidance programs, and developmental education to help through the assistive learning centers in the various colleges. It contributes to improving students' knowledge, beliefs, attitudes, and educational learning skills, especially in literary colleges, and helping students learn successfully and control their skills, cognitive processes, and how the learner processes information. Also, it reduces frustration and academic failure and enhances university education so that students can pursue education based on their abilities, and discover and evaluate them. This requires enhancing the skills of educational practitioners at the university and making it a professional priority for all participants in the educational learning process at the university.

Further, the gender variable did not influence the study sample's responses to the LASSI scale. This result is in line with previous research that the ability of male and female students is equal in these strategies, and both male and female students have strategies at similar levels. Hammoud (1999) showed that there are no statistically significant differences in study habits due to gender. Also, Bukai (2005) did not show any statistically significant differences due to gender, except for the memory dimension, in which differences were found in favor of females. In addition, Al-

Zawahra (2006) showed no statistically significant differences in the relationship between exam anxiety and achievement due to the gender of the students. Finally, Al-Masry (2009) showed that there were no differences between the sexes in learning strategies. Nevertheless, this study differs from that of Futtaim's (1988) study, which showed that sex is statistically significant in favor of females. Besides, Takhildar (2007) showed that females were superior to males in academic achievement and all factors and variables studied. Moreover, Abdul Rahman (2008) showed that gender is statistically indicative of attitudes, time management, focus, and test strategies in favor of females. Furthermore, Aniza et al. (2010) indicated statistically significant differences in favor of females. Since there are no strategies that are very high in general; therefore, males and females need higher and more intensive training on these strategies to feel their importance, and with time they can practice them. This can be through counseling programs and educational practices at the university.

5. Recommendations

Based on the study findings, the researchers recommended paying attention to educating students about the importance of study and learning strategies in general, and self-regulation strategies, skills, and will, in particular, through counseling and guidance. Also, there is a need to educate those in charge of the educational-learning process, including members, practitioners, counselors, mentors, and parents, of the importance of studying and teaching strategies to students and practicing them during the learning process. In addition, focus must be paid to teaching students learning strategies to understand and assimilate knowledge experiences. Moreover, it is necessary to enrich the curricula with some age-appropriate strategies and train teachers to use them so that they can transfer them to students in an appropriate, useful, and practical way. Furthermore, those in charge of the educational learning process must be directed to shift from student management to good management of the learning process, where the primary function becomes to determine what the learner must learn and motivate him to be the focus of the learning-educational process and to direct and monitor his work and use immediate feedback to enhance himself. Finally, the curricula must be enriched with specific activities that encourage students to use their effective learning strategies, and that these activities be the focus of attention for both the teacher and the learner.

6. Suggestions

The study suggests studying the relationship between self-regulation and learning strategies as well as the relationship between skills and learning strategies. In addition, the relationship between willpower and learning strategies is suggested in future studies. Moreover, the impact of an educational learning program based on scholastic learning strategies and studying achievement or motivation for achievement should be researched. Finally, the relationship between self-organized learning strategy and critical thinking needs more investigation.

Author contributions: Both authors contributed all the processes of producing the paper, including conceptualizing, writing, analyzing the data, and reporting the results, and language editing.

Funding information: No funding source is reported for this study.

Declaration of interest: No conflict of interest is declared by authors.

References

Abdul Rahman, R. A. (2008). *The effect of self-concept and gender on the learning strategies used among tenth grade students in Jerusalem* [Unpublished master's thesis]. University of Jordan, Amman.

Alkhateeb, H. M., & Nasser, R. (2014). Assessment of Learning and Study Strategies of University Students in Qatar Using an Arabic Translation of the Learning and Study Strategies Inventory. *Psychological Reports*, *114*(3), 947–965. https://doi.org/10.2466/11.03.PR0.114k26w3

Al-Khodary, S., & Riyad, A. (1993). Learning and recall skills and their relationship to achievement, intelligence and learning motivation. *Educational Research Center, Qatar University, 2*(3), 35-62.

Al-Khulaifi, S. Y. (2000). The relationship of learning skills and cognitive motivation with academic achievement among a sample of female students in the College of Education at Qatar University. *Journal of the Educational Research Center, Qatar University, 9* (17), 13-43.

Al-Masry, M. (2009). The relationship between learning strategies and academic achievement among male and female students of the Faculty of Educational Sciences at Al-Israa Private University. *Damascus University Journal, 25*(3), 341-370.

Al-Zawahra, M. K. (2006). *The relationship between learned helplessness, exam anxiety, and academic achievement among a sample of ninth-grade students in the Directorate of Education in Mafraq* [Unpublished master's thesis]. Yarmouk University, Irbid.

Aniza, A. N., Mohd, J. Z., & Mohd, A. M. (2010). The Relationship between Learning Styles and Strategies with Academic Achievement Based on Gender and Type of School. *International Journal of Learning, 17*(10), 265-278. https://doi.org/10.18848/1447-9494/CGP/v17i10/47240

Bishara, M., & Al-Ghazou K. (2008). The extent of high school students' awareness of the importance of learning strategies and their practice thereof. *An-Najah University Journal for Research (Human Sciences), 22*(6), 1-28. https://doi.org/10.35552/0247-022-006-003

Bukai, H. A. (2005). *Cognitive learning preferences among a sample of secondary school students in the western Galilee region and their relationship to some variables*. [Unpublished master's thesis]. Yarmouk University, Irbid.

Fatim, L. M. (1989). The Relationship between Study Habits and Academic Achievement of University College of Bahrain Students. *Arab Journal of Human Sciences, 9*(36), 113-137.

Hammoud, M. (1999). Study habits of high school students: a field study in damascus public schools. *Damascus University Journal of Arts and Humanities*, *1*(1), 191-227.

Hoveland, C. (2006). *Relationships between Learning and Study Strategies and Academic Achievement in associate degree nursing students* [Unpublished thesis]. University of Wyoming, Wyoming.

Jadeed, L. (2010). The relationship between learning styles as a pattern of information processing and exam anxiety and their impact on academic achievement (a field study on a sample of second year secondary students in public schools in Damascus). *Damascus University Journal of Arts and Humanities*, *26*, 93-123.

Mckeachi, W. J., Pintrich, P. R., & Lin, Y. G. (1985). Teaching and learning strategies. *Educational Psychologist, 20*(3), 153-160. https://doi.org/10.1207/s15326985ep2003_5

Salloum, A., & Raed, M. (2006). The effect of using the learning and studying strategies program on the achievement motivation of middle school students and their attitudes towards studying. *Journal of the College of Arts, University of Mosul*, *73*, 30-85.

Schutz, C. M., Gallagher, M. L., & Tepe, R. E. (2011). Differences in Learning and Study Strategies: Inventory Scores Between Chiropractic Students With Lower and Higher Grade Point Averages. *Journal of Chiropractic Education, 25*(1), 5-10. https://doi.org/10.7899/1042-5055-25.1.5

Suleiman, S. M. (1988). *Study habits, problems, and their relationship to academic excellence.* Center for Human Development and Information.

Taheri, M., Asadi Louyeh, A., & Hosseini, N. (2017). Learning and study strategies ınventory (lassi) and ıts relationship with university students' academic achievement. *International Online Journal of Education & Teaching, 4*(3), 246–257.

Tahseldar, M. T. (2007). *Academic excellence and its relationship to learning strategies in secondary schools in Beirut and its suburbs* (English section) [Unpublished doctoral dissertation]. Saint Joseph University, Beirut.

Weinstein, C. E., & Mayer, R. F. (1986). The teaching of learning strategies. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching* (pp. 315-327). Macmillan

Weinstein, C. E., Ridley, D. S., Dahl, T., & Weber, E. S. (1989). Helping Students develop Strategies for effective learning. *Educational leadership, 46*(4), 17-19.

Weinstein, C., & Palmer, D. (2002). *LASSI User's Manual for those administering the learning and study strategies inventory*. H and H Publishing.

Yip, M. C. (2009). Differences between high and low academic achieving university students in learning and study strategies. *Educational Research and Evaluation, 15*(6), 561-570. https://doi.org/10.1080/13803610903354718