

Thinking styles and learning patterns and their relationship to lateral performance

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Abstract

The current research aims to identify the the level of university students' learning patterns. It also examines the level of university students' learning patterns. The level of lateral performance among university students and the extent of the contribution of the independent variables (thinking styles and learning patterns) in predicting the dependent variable (lateral performance) are also explored. To achieve the goal of the research, (4th the students of Al-Mustansiriya University (200 students for each gender category) were recruited from the research community, College of Basic Education. Three tools were used, namely (Thinking Styles Scale, Learning patterns Scale, Lateral Performance Scale). The statistical and psychometric properties of the three scales were extracted as tools for data collection according to the correlational research method. The most prominent results indicate that University students have thinking styles (conservative, external, internal, local). The students have also learning patterns (realistic, routine), and University students enjoy the right-left university performance. There is a relative contribution to each of the independent variables, methods of thinking, in favoring the lateral performance. It reached (beta), (0,222), which is a significant contribution with a T-value of (4,457). As for learning patterns, its contribution is weak in favoring lateral performance, as its value reached (0.037), which is a weak contribution given that the T value of it, which is (0.743), is not significant.

Keywords: Thinking Style, Patterns, relationships, Performance

Introduction

Many scholars, such as believe that the only way to develop diverse students' academic abilities is not only to acquire knowledge, information and facts in various fields, but also to teach them how to think and train them on their various skills, and the first step to achieve this is to formulate an entrance or a way to understand their thinking

styles. Sternberg (1997, p. 20) has demonstrated that our success or failure in life, especially in the field of work or school, does not arise from our basic models or our ability level. Rather, it arises from the compatibility and suitability of our thinking methods with the requirements of the model in the environment in which we live, or

the context in which we work. This means that putting the individual in the appropriate job requires knowledge of his/her methods of thinking that are characteristic of him/her and that are commensurate with the requirements of the required work.

The results of a study by Yarkandi (2003, pp. 90-106) indicated that 79% of the sampled principals of primary, middle and secondary schools sampled in the study suffer from the ability to apply aspects of educational leadership in their administrative work. Namely, these are objectivity and ability to see positions, problems and things from a general view. This is to change, develop and understand plans and also to understand others, their ideas and knowledge of communication principles and transfer of ideas to others in an appropriate way. It seems that this may be due to the lack of appropriate thinking methods, and the study of Cheng (2000) has found a relationship between the methods of thinkers and their methods of leadership (Al-Dardeer, 2003, p. 32).

The professional competencies required for university teachers from students' point of view centered on six dimensions some of which on activities and evaluation. Professors must encourage their students on innovative and criticize them during their discussion in a constructive manner and ask questions that encourage them to think as well as those that are interested in tests and face individual differences between them (Al-Hakami, 2004, pp. 42-48).

Despite this, the current interest in school education focuses on intelligence and raising the level of mental abilities, with a lack of attention to the qualitative impact of the content of study or training programs and their duration and the level of education of the individual on his/her thinking styles (Shalaby, 2002, pp. 114-115).

Sternberg (1997) referred to four important variables that contribute to the composition and formation of individuals' thinking styles. The culture of the community is one of these variables, and it means where, what, and how they learned? (Shalaby, 2002, p. 90). The results of Zhang & Sachs (1997) also demonstrated the effect of the social and cultural environment on the thinking styles of its members. Also, the type of profession and work that an individual performs has an impact on his/her thinking styles. This is what was also shown by the results of Hommerding's study (2005) on distinctive thinking styles and their impact on library heads and managers, doctors and accountants.

Some of those interested in the educational field claim that Arab educational institutions have failed to develop students' learning abilities. This claim is based on several foundations. These include exposing students to educational methods of their abilities and preparations, and ignoring their teaching methods because of teachers' ignorance of learning patterns and their lack of knowledge of how to deal with each

pattern in a way that enables them to achieve educational goals to the fullest extent that students' abilities and potentials can identify appropriate teaching methods, which can only be achieved by recognizing students' learning patterns.

Many scholars of education and psychology have highlighted the importance of the teacher regulating the learning conditions related to the surrounding environmental conditions. These conditions include the learner's mental and physical abilities, his/her social and emotional conditions, personality and thinking style, and what provokes his/her motivation and attention and makes him/her in a state of mental readiness conducive to learning. This indicates the need to identify the methods of learning the ball and try to organize it within specific patterns that are easy to deal with by the teacher and to identify appropriate learning methods. This is what all societies need under the new world order, in which competition in the field of science and creativity constitutes a fundamental pillar of urbanization and national sovereignty (Al-Fuqahaa 2002, p. 1).

Therefore, the research problem can be formulated in answering the following question: "What is the nature of the relationship between thinking styles and learning patterns and their relationship to lateral performance preference?"

2. Research Importance:

The relationship between comprehensive development and

education is an organic one. The more education is related to life and the demands of development, the more it is able to contribute to development in a more effective and positive manner. The integration of the human element with the material element is the basis that controls the development process because it is one of the most important factors of production, and this depends on the skills, experience and information that it has acquired (Tanash, 1996, pp. 239-240).

Therefore, Habib's study (1996) recommended that the teacher should use no more than a method and a way of thinking in accordance with the requirements of the situations and problems he/she is going through. This should also be commensurate with his/her training and the development of higher thinking skills among his/her students such as: decision-making skills and problem solving, critical thinking and innovation. This seems to require the teacher to be aware of his/her thinking styles so that he/she can do so. Sternberg (1997) stated that teachers' thinking methods lead to different types of teaching methods in attitude and educational context to know the nature of their thinking styles makes them diverse and thus affects their behavior and motivations for education (Al-Dardeer, 2003, p. 33). This was confirmed by the results of Zhang & Sachs (1997) study, which recommended a varied and rich education in the classroom, and that teachers should be more innovative.

Agor's (1991) study also referred to the relationship of thinking methods

with business management explaining that administrative achievement avoids making mistakes at work, and that the integration between innovative management methods and skills on the one hand and traditional management methods and skills on the other leads to gaining more benefits and advantages Zhang & Sachs (1997).

The importance of thinking methods in the field of work appears when individuals find that the methods that have been rewarded during the years of study are not partly or wholly related to the methods required by the work they are doing. Therefore, some psychology researchers believe that individuals should be encouraged to work in a particular field when their thinking methods are consistent with the same work, not just professional and academic preparation for this work. In fact, there are some graduates from high school, colleges and university institutes who have similar thinking methods that are not the requirements of specialization or work they want, but they are not encouraged to join it because they get full or low marks in the subjects that qualify for their work.

Sternberg believes that this phenomenon is still widespread (Osman, 2005, pp. 55-57). The goal of university learning is to create a scientific mentality and a proper way of thinking and to form desirable trends. University life has a great impact on refining the personality of students through the educational process and also has an important and prominent role in intelligence and

informing young people of belonging to it (Essawi, 1985, p 92).

Another aim is to raise the level of achievement and achieve proper psychological compatibility as higher educational achievement for students is one of the indicators of scientific excellence and a central goal that universities and educational policies seek to achieve among students. Hommerding's study (2002) aimed to reveal the preferred thinking methods of the Florida state librarians using Sternberg & Wagner's list of thinking methods and showed statistically significant differences between all the thinking methods of the sample members and the ability to develop legislative and global thinking methods and without preference for the methods of anarchist, judgmental, hierarchical and local thinking.

As for the Al-Subaie's study (2002), it aimed to reveal the preferred thinking styles of a sample of (109) directors of government departments. It aimed to determine the relationship between thinking styles and decision-making ability, as well as to determine the differences between the methods and decision-making ability according to age, qualification, academic specialization and level of experience. It also aimed to determine the differences in the ability to make decisions in different thinking styles. The results showed the sample's preference for the analytical and then idealistic thinking styles, respectively. It also revealed a preference for one-dimensional thinking for the ideal and

then analytical thinking, followed by the analytic-ideal-realistic, and there are no differences according to the variable of age, qualification, academic specialization and experience.

The current research is an attempt to set the features of a general framework for distributing students according to their learning patterns, which is positively reflected on the efficiency of the educational process. Teachers' understanding of the nature of their students and their ability to distinguish between their learning patterns facilitates the possibility of evaluating and implementing effective educational programs. Successful teachers employ their knowledge of the learning patterns of their students in coordinating the educational strategies they follow, their choice of educational content, and setting specific goals and ways to achieve them. It must be noted that teachers' knowledge of their students' learning patterns is a standard used in professional and psychological counseling clinics (Malcolm, 1981, p. 2).

Since each student has a special education style to study different subjects, and the owners of the same style have a fixed entrance to interact with the new educational experiences included in the curricula, it is important to identify the intensity and direction of the relationship between learning patterns and intelligence of university students because of the importance of determining the achievement level of students and their education pattern. This is in order to

enable the educational process operator to plan the development of educational methods commensurate with their learning pattern and mental level to contribute to the development of their educational and mental abilities together, and because the operator is able to measure the educational patterns of his students and benefit from them in the culmination of his/her teaching processes.

The relationship between mental abilities and the control of one aspect of the brain has aroused a good deal of interest, as some studies have indicated that some cases of aphasia are related to the control of one aspect of the Al-Subaie(2002) was not just speculation or theoretical research. Rather, it was supported by many studies such as (Vernon, 1971) clearly indicated that there is a link between dyslexia and cerebral lateralization as it was noticed that there are no symptoms associated with dyslexia that attract more attention than brain attraction. The apparent failure to form skill in one hand or to show stronger performance of a particular hand leads to dyslexia. Studies have shown that right-handed individuals had higher performance with statistically significant differences in some field of visual-spatial achievement compared to their left-handed colleagues (Ajaj, 2000, p. 133). Previous research has indicated that watching others and observing their experiences is one of the best ways of learning. The study also revealed that a specific region of the brain contributes to learning through watching and that this region is completely "separate"

from the learning regions by experience. This is given its role is limited to watching and interpreting social cues. Watching others' experiences and being able to learn from them gives a huge advantage in surviving without having to risk the experience itself.

Other researchers examined the brains of mice while observing another mouse receiving an electric shock after a specific tone was emitted, and noticed that mice that did not receive any electric shock freeze in fear upon hearing the sound of the tone. Once the researchers demonstrated that mice learned from the experience of receiving an electric shock, they set out to find out how the observing mice learn. By examining their brains, the researchers recorded electrical activity in the basal lateral amygdala area, and by conducting an analysis of neural activity, they detected the release rates of electrical signals in the neurons while learning behavior. They concluded that mice learn through monitoring and transmit information through neural pathways exclusively dedicated to social interaction (Ajwa, 1999, pp. 34-45).

Zhang's (1999) sheds more light on one of the most important social processes that occur between living organisms, as the process of learning by observing others is one of the most important evolutionary processes. For example, humans do not have to put their hand in fire to test their ability to burn the skin, which reflects how observation and accumulated experiences are important to ward off

the risks that direct experience may bring. The discovery of neural pathways and cells responsible for observational learning may contribute in the future to understanding and improving one of the most important processes that occur within the brain, which contributes to improving the learning process from the experiences of others (Zhang, 1999).

The study of Habib (2010) compared the learning patterns of males and females. It showed that there is a clear difference in the field of learning patterns between the sexes while males showed a preference for dealing with numbers and learning through direct experience. While females preferred to deal with concrete things by listening and preferred the organized educational environment, males showed indifference to it, and females showed superiority over males in the field of achievement and performance expectations.

Harrison's research (1996) titled Factors affecting internal control in community colleges in Jordan, indicated that the difference between males and females in learning patterns, level of achievement and performance expectations is due to parents' practices in raising children, as the parent's tasks vary by sex in different social circumstances.

As for the studies that focused on the preference for lateral performance, KDe Bono's study (2001) on lateral preference and its relationship to cognitive styles, the study sample consisted of (70) university students, including (50)

males and (209 females), and an intelligence test was applied to them. Also used was a preference questionnaire with right and left performance (2.7%) of the sample, and the comparison was made in their perceptual methods. No statistically significant differences were found between the two groups.

As for the study of Nouman and Al-Soufi (2001) about the lateral performance and mental development of Iraqi children, the research sample consisted of (48) children with ages ranging from (6-13) years. Half of them were from the right-wing group and the other half from the left-handedness side. Lateral performance was determined after applying the test, which is designed to determine the performance aspect. This test consisted of (15) tasks. The Walker test was applied to measure mental development, and the results showed that there were no statistically significant differences between the two groups.

1. Research Objectives

The current research aims to identify:

- 1- The level of learning patterns of university students.
- 2- The level of learning patterns of university students.
- 3- The level of lateral performance among university students.
- 4- The extent to which the independent variables (thinking styles and learning patterns) contribute to predicting the dependent variable (lateral performance).

2.1 Research Limitations:

The research is limited to undergraduate students of the College of Basic Education (morning studies) for the academic year 2020-2021.

2.2 Defining Terminologies:

2.2.1 Thinking styles

These can be defined as follows:

- 1- Harrison & Bram: The preferred way or thinking styles are also not abilities, but more than that. They are ways of how to use or exploit the abilities that we possess. (Ajaj, 2000, pp. 27-28).
- 2- Sternberg (1997): It is the way an individual prefers when he uses or expresses one of his abilities

1.2.2 Learning patterns.

These can be defined as follows:

- 1- They are cognitive, affective, and physiological traits that serve as relatively stable indicators of how individuals perceive the learning environment, interact with it, and respond to learning in it (Adas, 1999, p. 105).
- 2- (Golay, 1982): thinking styles are the intermediate abilities that determine the way the individual perceives the world around him/her, and determines his/her interaction with the surrounding environment and the extent to which he/she benefits from the experiences and experiences he/she is going through, as well as identifying learning patterns in the light of

personality patterns identified by Kersey theory (Golay,1982, p. 36).

- 3- Ossimitz (2003): They are subjective ways that individuals use to process information by learning new concepts and principles.

1.2.3 Lateral performance.

This was defined by Sabatino & Becker (1979) as the tendency to use a single left or right hand, ear, or eye.

2. Theoretical Background

3.1 Thinking styles

3.1.1 Thinking styles Theory:

Mental self-control theory: This theory was presented by Sternberg and it is summarized in the individuals' need for a set of ways and methods of mental control and self-regulation to organize and direct their activities in life, school or work Using methods of thinking that vary with mental flexibility in the process of self-control and different attitudes and contexts in which the individual is present, the required degrees of control, the change in the demands of life and work as well as the change of time and society and its development.

3.2 Types of Thinking styles:

A- In terms of the job:

- 1- Legislative style: It depends on the legislative function of the mind, which is concerned with ideas, deduction, imagination and planning, and those with

this style are characterized by the tendency to create their own rules, enjoy doing things in their own way, prefer complex and unprepared problems.

- 2- Executive style: It depends on the executive function of the mind, which is concerned with actual implementation and completion according to known procedures. It is distinguished by two characteristics: implementation with a tendency to follow existing rules and roles, and a tendency to use known and pre-existing methods.

- 3- Judgmental style: This style depends on the function of the mind that is concerned with judgment, evaluation, analysis, comparison, which are characterized by a tendency to evaluate rules, laws and procedures as well as a tendency to judge existing things, preference for activities that teaches criticism and mental control.

B- In terms of shape:

- 1- The royal style: this depends on the existence of one goal or a dominant or controlling way of doing things, so the royal style has the lack of the ability to focus mentally on one goal or need all the time, the ability to go directly towards the goal without paying attention to obstacles or putting them aside.
- 2- The hierarchical method: this allows for multiple goals with

different degrees of preference and characterized by motivation through a pyramid of goals, knowing and realizing the extent of their differences and preferences.

- 3- Minority style: in which the form of mental self-control differs here from the hierarchical style taking the form of the minority, which allows for multiple goals, but it is considered of equal importance to the individual. It is characterized by motivation through a multiple set of goals and their realization.
- 4- Anarchic style: in which mental self-control takes the random form in performing work or solving problems because of the dislike towards following established rules, procedures, or policies.

C- In terms of level:

- 1- The global approach: this is based on a holistic view of things and is distinguished by a preference for dealing with relatively large and abstract issues and topics.
- 2- The local style: this depends on focusing on details, one of its characteristics is the tendency to specific problems that require research in detail, and orientation towards practical situations.

D- In terms of field:

- 1- Inner thinking style: One of the characteristics of introverted or withdrawn individuals and lack of social relations with others.
- 2- Outward thinking style: Among the characteristics of its members: extraversion, openness to the outside world, and orientation towards others.

E- In terms of tendency:

- 1- Conservative thinking style: One of the characteristics of its members is showing commitment to existing laws and procedures, preferring what is familiar in life and work, and thus resorting to change at a minimum.
- 2- Liberal thinking style: One of the characteristics of its members is going beyond existing laws and procedures and resorting to the maximum possible change (Habib, 2010).

3.2 Learning patterns

These are intermediate abilities that include effectiveness, efficiency, possibility and skill in using the channels through which the human mind receives information. **Simon & Pyram (1977)** has developed a model for classifying students that was proposed by Carl Jung and accordingly dividing students based on their learning patterns into four types:

- Feelers - Thinkers - Sensors - Intuitors.

David Merrill (1979) identified four social patterns for students as follows: -(Amiable), (High Achiever), (Leader) and (Expressor).

Keith Golay has described four basic learning patterns that correspond to the four personality styles identified by David Kersey's theory based on temperament styles into:

- Sensory personality style versus realistic learning pattern
- The pragmatic style corresponds to the realist learning pattern interested in theories and their applications
- The rational personality style contrasts with the conceptual learning pattern that is interested in reflective and informational ideas
- The idealized personality style is matched by the conceptual learning pattern concerned with overarching categorized emotions.

3. Research Methodology and Procedures:

To achieve the objectives of the research, the descriptive correlative approach was used to find the relationship between the independent variables (Thinking styles and learning patterns) and the dependent variable (preference for lateral performance).

4.1 Research community:

The research community consists of the students of Al-Mustansiriya University, College of Basic Education, for the academic year 2020-2021 (morning studies). The number of students is (7806) male and female, with (3867) for the former category and (3939) for the latter.

3.2 The research sample:

The researcher chose the research sample by the equal stratified random method according to the variables of gender, i.e. (5%) of the research community. The researcher chose (400) students equally divided by male and female, i.e. (200) for each category.

4.3 Research tools:

4.3.1 Thinking Styles Scale:

The revised list of Sternberg (1997) includes (13) styles, and consists of (65) items with an average of five items for each style, with a five-response scale (does not apply at all, does not apply to a large extent, I don't know, applies to a large extent, applies completely). The scores are given as follows (1, 2, 3, 4, 5), the degree of each of the sub-scales in the list is dealt with separately, that is, the list does not have a total degree, and the following is the distribution of the paragraphs on the methods of thinking as shown in Table (1).

Table (1): Distribution of the paragraphs of a list of Thinking styles

Methods	Items	Methods	Items
Royal	9, 22, 35, 48, 61	Global	4, 17, 30, 43, 56
Hierarchical	8, 21, 34, 47, 60	Local	5, 18, 31, 44, 57
Chaos	11, 24, 37, 50, 63	Liberated	6, 19, 32, 45, 58

The minority	10, 23, 36, 49, 62	Conservative	7, 20, 33, 46, 59
Legislative	1, 14, 27, 40, 54	Outer	13, 26, 39, 52, 65
Executive	2, 15, 28, 41, 54	Inner 12, 25, 38, 51, 64	
Judicial	3, 16, 29, 42, 55		

Psychometric properties of the list of thinking styles:

A) The validity of the list: this was verified in two ways: The veracity of the arbitrators (apparent honesty): where the list was presented to a group of arbitrators (10 arbitrators) in the field of psychological and educational sciences, in order to verify the clarity of the paragraphs, their formulation and suitability for the purpose

for which they were made. Based on this procedure, it became clear that all paragraphs of the list of thinking styles are valid for measurement.

B) Construct Validity: this was achieved by finding the correlation coefficients for the degrees of each domain of the list and the total score for the domain as can be shown in Table (2).

Table (2): The correlation coefficients of the degree of each field with its total degree

The Field	Paragraph Number	Correlation Coefficient	The Field	Paragraph Number	Correlation Coefficient
Hierarchical	31	0.264	Executive	5	0.339
	40	0.200		15	0.254
	50	0.476		22	0.473
	57	0.523		24	0.254
	60	0.463		58	0.387
Royal	8	0.473	Judicial	1	0.276
	18	0.344		9	0.594
	46	0.366		38	0.465
	52	0.573		41	0.254
	54	0.573		48	0.386
Minority	10	0.673	Legislative	4	0.487
	23	0.487		6	0.583
	26	0.622		12	0.511
	37	0.386		21	0.366
	47	0.397		32	0.674
Anarchist	29	0.555	Global	2	0.254
	34	0.275		11	0.333
	42	0.341		14	0.563
	56	0.473		39	0.672
	64	0.462		63	0.453

Inner	33	0.672	The local	13	0.600
	43	0.521		16	0.276
	59	0.743		30	0.266
	62	0.642		44	0.476
	65	0.472		49	0.500
Outer	17	0.377	Libertarian	3	0.711
	20	0.288		19	0.288
	35	0.386		25	0.472
	36	0.684		27	0.600
	61	0.700		28	0.473
			Conservative	7	0.286
				45	0.422
				51	0.750
				53	0.486
				55	0.511

4.3.2 Learning patterns Scale:

After the researcher reviewed the literature and previous studies that dealt with learning patterns, 16 paragraphs of the scale were formulated and five alternatives were developed to answer the paragraphs of the scale, so that each alternative refers to a pattern of the four learning patterns (realistic, routine, specific, and conceptual) The higher degree indicates the preferred learning pattern of the respondent.

A) The validity of the arbitrators (apparent honesty): To ensure the validity of the paragraphs of the scale, they were presented to a group of (10) arbitrators, to identify the appropriateness of the paragraphs to determine learning patterns. A percentage of 80% or more was adopted as a criterion for acceptance of the paragraph. After analyzing the

arbitrators' answers, all items were approved and the scale in its initial form consisted of (16) items.

B) Clarity of instructions:

To ensure the clarity of the paragraphs and instructions related to the scale, the scale was applied to a random sample of (20) students. According to the average time for answering the scale's paragraphs, it amounted to (10) minutes.

C) Statistical analysis of the learning patterns scale items:

- Discriminatory Power: in order to determine the discriminatory power of the paragraphs of the scale, the researcher used the two extreme samples method by applying it to a sample of (200) students. After correcting the forms and arranging them in descending order from the

highest degree to the lowest, 27% were selected with the highest scores and 27% of the lowest scores. After using the t-test for two independent samples for each item, it was found that all items

were significant, as the calculated t-value was higher than the tabular t-value 1.960 at the significance level of 0.05 and with a degree of freedom of 198.

Table (3): The calculated T value of the discriminatory power of the learning patterns scale items

	Senior Group		Lower Group		Calculated T-Value	Indication
	Standard Deviation	Arithmetic Mean	Standard Deviation	Arithmetic Mean		
1	0.513	3.666	0.535	2.549	2.567	Significant
2	0.477	3.854	0.513	1525	4.208	Significant
3	0.466	3,658	0.526	1.494	2.437	Significant
4	0.710	3.926	0.582	3488	4.272	Significant
5	0.744	3.926	0.677	3,630	2,635	Significant
6	0.765	3.932	0.643	3.512	3.643	Significant
7	0.728	3.784	0.693	3.711	2.411	Significant
8	0.706	3.932	0.699	3.654	2.501	Significant
9	0.655	3.846	0.597	3.580	2,677	Significant
10	0.810	3.907	0781	3.617	2.306	Significant
11	0.712	3.802	0.654	3.648	2.711	Significant
12	0.794	3.938	0.650	3556	3.337	Significant
13	0.899	3.222	0.866	2.333	6.712	Significant
14	0.835	3.111	0.881	2.268	7.209	Significant
15	0.925	3.148	0.901	2.305	6.779	Significant
16	0.885	3.101	0.836	1.861	10,584	Significant

- Relationship of the paragraph score with the total score of the scale:

The internal consistency coefficient is a correlation coefficient between the degree of each paragraph of the scale and the total degree of the scale. Therefore, the Pearson correlation coefficient was used to extract the correlation between the

degree of each paragraph and the total degree of the scale for the sample. It was found that All correlation coefficients are statistically significant when compared with the tabular value (0,139) at the significance level of (0.05) and degree of freedom (198), as shown in Table (4).

Table (4): the values of the correlation coefficient of the paragraph score with the total score of the learning pattern scale

Paragraph Number	Paragraph correlation coefficient for the total score	Paragraph Number	Paragraph correlation coefficient for the total score
1	0.566	9	0.776
2	0.503	10	0.637
3	0.492	11	0.557
4	0.500	12	0.512
5	0.654	13	0.600
6	0.6148	14	0.756
7	0.592	15	0.5728
8	0.484	16	0.506

- Scale Stability:

The stability of the learning patterns scale was extracted in two ways:

1- The split-half method: The reliability coefficient in this method was (0.75). After conducting correction by the Spearman-Brown equation, it reached (0.86), and this

stability coefficient is acceptable.

2- Cronbach's method: The stability coefficient was reached by this method (0.88), which is a high stability coefficient.

4.3.3 Lateral Performance Scale:

The Kashihara scale (Kashihara, 1979) was used, which consists of 27 items. It is designed to measure the

preference for lateral performance through a set of questions in front of which three options are given (the left is always given 1, the right and the left are given 2 and the right is always given 3). Thus, in theory, the highest score that the respondent can get is 81 if he/she always prefers the right lateral performance, while the lowest score that the respondent can get is 27 if he/she prefers the left lateral performance.

The psychometric properties of the scale were verified through the apparent validity, as the scale was presented to a group of (10) arbitrators to express their opinion about the validity of the scale's paragraphs. The arbitrators unanimously agreed on the validity of the paragraphs to measure the preference for lateral performance.

The researcher verified the stability of the scale by using the Cronbach method, after the scale was applied to the reliability sample, which amounted to (50) male and female students who were randomly chosen from the students of the College of Basic Education, Al-Mustansiriya University. As a result, the reliability coefficient reached (0.81) degrees.

4. Research Results:

Recall that the first aim of this research is to identify the level of learning patterns of university students.

To achieve this aim, the data of the basic research sample, which amounted to (400) male and female students, was analyzed, and the T-test was used for one sample. The results can be shown in Table (5).

Table (5): One-sample T-test results for learning patterns

Learning Methods	SMA	Deviation Normative	T value		Indication
			Tabular	Calculated	
Progressive	11,672	2.412	1.960	1.445	Non-Significant
Conservative	12,056	2.229	1.960	21,677	Significant
Outer	12,052	2.239	1.960	21,552	Significant
Inner	11,460	2.480	1.960	1.443	Significant
Local	11.788	2.553	1.960	17,262	Significant
Total	10.172	2.550	1.960	0.473	Non-Significant
Anarchist	10.176	2.547	1.960	1.004	Non-Significant
Minority	10,860	2.992	1.960	0.546	Non-Significant
Hierarchical	10,628	2.084	1.960	1.212	Non-Significant
Royal	12,096	2.374	1.960	0.665	Non-Significant
Judgmental	12.072	2.563	1.960	1.476	Non-Significant
Executive	12.348	2.255	1.960	0.645	Non-Significant
Legislative	9.648	2.796	1.960	0.756	Non-Significant

The second aim is to determine the level of learning patterns of university students. To achieve this aim, the data of the basic research sample, which amounted to (400) male and female students, was analyzed, and the T-test was used for one sample. The results can be shown in Table (6). Table (6): One-sample T-test results for learning patterns

Learning Patterns	SMA	Deviation Normative	t-value		Indication
			Tabular	Calculated	
Realist	9.596	2,499	1.960	3.770	Significant
Routine	9.512	2.109	1.960	3.837	Significant
Specific Conceptual	11,368	2.797	1.960	0.756	Non-Significant
Comprehensive Conceptual	10,824	2,620	1.960	1.045	Non-Significant

The third aim of this research is to determine the level of lateral performance among university students.

To achieve this aim, the data of the basic research sample, which amounted to (400) male and female students, was analyzed, and the T-test was used for one sample. The results can be shown in Table (7).

Table (7): Single-sample t-test results favoring lateral performance

Lateral Performance Preference	Student Numbers	SMA	T Value		Deviation Normative	Indication
			Tabular	Calculated		
Always Left	130	9.596	1.960	3.770	2,499	Significant
Right and left	50	11,368	1.960	13.386	2.797	Significant
Always Right	220	12.348	1.960	23,470	2.255	Significant

The fourth aim is to determine the extent to which the independent variables (thinking styles and learning patterns) contribute to predicting the dependent variable (lateral performance).

This is to identify the contribution of each of the independent variables (thinking styles and learning patterns) in explaining the variance in the dependent variable (preference for lateral performance). The results are shown in Table (8).

Table (8): Abstract multiple regression analysis of correlation coefficients and determination of relationship

Variable	Estimation error	Square of the multiple correlation coefficient	Correlation coefficient square	Multiple correlation coefficient

Thinking Styles	8.9611	0.049	0.054	0.233
Thinking patterns				
Lateral performance preference				

The results of the multiple regression analysis showed that the calculated t-value was (11.349), which is greater than the tabular t-value (3.02) with degree of freedom (379.2) at the significance level (0.05) as in Table (9).

Table (9): Regression analysis: thinking styles, thinking styles, and preference for lateral performance

Contrast source	Sum of squares	Degree of freedom	Mean squares	Percentage	Indication
Regression	18822.677	2	911.338	11,349	Significant
The rest	318789.713	397	80,302		
Total	33702.390	399			

Among the statistical indicators of regression analysis, it was found that there is a relative contribution to each of the variables, methods of thinking and in favour of the lateral performance, as it reached (beta) (0.222). This is a significant contribution in terms of the T value of (4.457).

As for learning patterns, its contribution is weak in favoring lateral performance, as its (beta) value was (0.037), which is a weak contribution because its T-value of (0.743) is not significant (Table 10).

Table (10): The contribution of the independent variables (thinking styles and thinking patterns) to the dependent variable (conductive to lateral performance)

Variables	Contribution	Beta	T-value	Indication
Thinking Styles	0.393	0.222	4.457	Significant
Thinking Patterns	0.603	0.037	0.743	Non-Significant

5.1 Recommendations

- 1- The learning patterns of the students of the College of Basic Education are centered around two patterns: the realistic and routine learning pattern, and this is a direct reflection of the approved curricula that are more appropriate to the students' learning patterns, their orientations and preferences.
- 2- Encouraging applied educational research that studies the impact of identifying learning patterns and the psychological and environmental variables that have a negative and positive effect on them.
- 3- Encouraging university students to use a variety of thinking methods according to the situation the student is going through

5.2 Suggestions:

- 1- study of the correlation between learning patterns and intelligence among the students of Al-Mustansiriya University.
- 2- studying the effect of some variables such as specialization and gender on learning patterns.
- 3- A study of learning methods by gender and specialization among students of Al-Mustansiriya University.

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