

**Brain control and teaching methods in the educational process
"theoretical study"**

التحكم في الدماغ وطرق التدريس في العملية التعليمية: "دراسة نظرية"

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Received: 01/12/2024 Accepted:18/01/2025Published:01/02/2025

Abstract:

This study is based on understanding the patterns of half-sovereignty of the brain or how students learn since it is an important part of the process of choosing learning strategies, so the need to understand the learning styles of students is increasing in light of the trend for group learning within the classroom as well as among teachers because of their role in the effectiveness of teaching strategies and methods, and studies confirm that the educational process depends directly on the activity of the brain on its right and left sides as it has a fundamental role in the processes of thinking and learning at all levels.

Keywords: brain dominance, teaching methods, educational process.

ملخص:

تقوم هذه الدراسة على فهم أنماط السيادة النصفية للدماغ او كيفية تعلم الطلبة بما أنها جزء مهم من عملية اختيار استراتيجيات التعلم لذلك فإن الحاجة لفهم أنماط التعلم لدى الطلبة تتزايد في ظل التوجه للتعلم الجماعي داخل الفصول وكذا لدى المعلمين لما لهم من دور في فعالية استراتيجيات وطرق التدريس، وتؤكد الدراسات أن العملية التعليمية تعتمد بصورة مباشرة على نشاط الدماغ بجانبه الأيمن والأيسر باعتباره أن له دور أساسي في عمليات التفكير والتعلم بجميع مستوياته.

كلمات مفتاحية: السيطرة الدماغية، أساليب التدريس، العملية التعليمية.

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1. Introduction

The God Almighty has endowed man with the grace of reason that distinguishes him over other creatures and the mind is the main element in the brain. And that part that drives thinking and behavior, where the brain is a very complex organ that performs complex and intertwined mental processes, and the brain is in control of all human organs and God Almighty has made it a sign in creativity, consisting of millions of cells and made each cell or group of cells a special function that directs human movements and dwellings, there are special cells for hearing, touch, smell, taste, movement, balance, learning and memory... Studies confirm that the learning and teaching process depends directly on the activity of the brain on its right and left sides because there is a unified agreement among neuroscientists that the human brain is affected by the signals transmitted by neurons from the human senses and that the human brain translates those signals To concepts and information can be understood or excluded or judged in terms of the error of that information or its validity The treatments that occur in the brain are through a side interaction according to the quality of information and concepts that the neurons deliver to the brain The process of learning and teaching are mechanically linked with the mechanism of brain work and affect the course of human behavior, especially when the learner provides certain facts, concepts and information consistent with the experiences stored in memory in his cognitive structure.

And still mystery covers a large part of the things associated with the idea of brain control and its mechanisms and a lot of scientific studies are being conducted to research the secrets of the human brain that is still little known about it despite the huge amount of scientific production in this millennium, the subject of the brain received research and investigation by researchers as a study to try seriously to understand the thinking styles and skills that individuals rely on in their treatment of the knowledge, skills and emotions they learn, as the nineties of the last century witnessed a flow of knowledge Significant in brain research and processes related to the learning and teaching processes, and therefore many theories have emerged

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that frame the work of the brain in the learning and teaching processes, including the theory of learning based on brain characteristics and brain control.

Despite the different names of these theories, they invite everyone to understand the process of the brain mechanism in the learning and teaching processes, and they are integrated with each other in order to find appropriate methods and strategies aimed at developing the different thinking skills of the learner, all of these things call for the need to pay attention to the teacher and his thinking pattern because of his role in the effectiveness of strategies and teaching methods, as well as providing an enhanced classroom environment for learning and preparing students for learning by organizing the classroom environment that supports learning, which It develops deep understanding, mental flexibility and various thinking skills.

Problem statement:

Despite the multiplicity of factors attributed to the success of the educational process, such as the curriculum, various means and facilities, the environment surrounding students and others, the actual teaching practices inside the classroom and carried out by the teacher are what determine the success of achieving the teaching goals, and from this point of view, the main test in preparing the teacher has become based on his ability to achieve educational goals in their various aspects and dimensions, so the teacher must enjoy efficiency, as well as the teacher and the learner alike Their awareness of cognitive processes during educational situations and experiences is very important, as this helps him to gain insight and understanding of himself and his abilities, and moves him from traditional learning that depends on indoctrination and what must be learned and done to learning that is based on learning methods and cognitive strategies that suit each individual so that he can be a positive and active participant effectively to achieve educational goals.

The need to study brain patterns has emerged after the transformation that occurred in the lives of individuals and societies due to technological development, economic transformation, and the desire of individuals to

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compete, which called for the need to create knowledge, and increased the need for researchers to obtain knowledge and interpret different thinking patterns (Harypursat, 2005)

By studying the educational process and its success factors, the integration and interaction between the different cognitive mental processes, individual differences and the impact of all of that on each other are usually researched and studied, and in this area it is necessary to refer to the responsibility of learners for their learning, as well as to a basic pillar in the process of learning and thinking and their continuation, which is the patterns of half sovereignty of the brain (Al-Aghdaf, 2018).

Here, the social cognitive school in learning confirms that learning is not a process of acquiring information, but rather an effective process in which the learner builds information and skill, which contributes to improving the level of production he has, and that is his self-awareness in terms of the way he receives and processes information and his learning patterns.

The subject of learning and its strategies, thinking and patterns in the field of cognitive psychology has recently become one of the important topics at the educational level, with the aim of enabling students to identify learning and its strategies, brain and patterns and use them effectively, as students in general face multiple situations that require skills and strategies in learning and patterns of thinking and their relationship to each other in order to reach effective teaching methods and curricula in the educational process, hence the goal of the study, which is to research the extent of interdependence patterns Midterm sovereignty and teaching methods appropriate for the success of the educational process?

2. Procedural definitions

- **Brain control:** Torrance definition: Paul Torrance) defines it as "an individual's tendency to rely on one hemisphere of the brain more than the other to process the information received" and this term is used to denote a person's tendency to think and act according to the characteristics of one side or half of the brain more than the other

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(McGee, 2000, p. 23).

This concept also procedurally refers to the use of one or both hemispheres of the brain (right or left) or both together (integrated) in the mental processes of information processing and processing (Youssef, 2008, p. 27).

- **Educational process:** The educational process leads to the transition from the stage of non-knowledge to the stage of knowledge, thanks to the acquisition of students a set of information and practical skills to reach certain goals, and it tests the general and private knowledge of the material in educational, psychological and social ways and methods, and it includes a set of elements that are based on interactive relations, to form an integrated educational system aimed at reaching the goals of the educational system, the most important of which are: The teacher, learner or student, method, and content. (Kamal and Said, 2000, p. 377).
- **Teaching methods:** Teaching methods refer to the behaviors and means used by the teacher to communicate or receive information from learners. (Kaplan & Kies, 1995, p.29)

Teaching methods are also a pattern of needs, beliefs and behaviors shown by the teacher in the classroom, and guide his way of presenting information, interacting with students and guiding them, that is, teaching methods refer to the multiple roles of the teacher that he performs in the classroom, which are affected by the teacher's beliefs, cultural background, teaching experiences, job satisfaction and the nature of the subject (Hussasien, 2012, p. 122-123).

3. Half sovereignty of the brain

The nervous system is one of the main organs controlling the body's systems, to regularly adjust, adapt and regulate the vital processes necessary for life, and the nervous system is divided into two parts: the peripheral nervous system, which contains all the nerve cells scattered in the body, usually the brain and spinal cord, and its main function is to transfer information between the central nervous system and the organs of the body such as the senses, skin, stomach, etc., and the central nervous system,

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which consists of the brain and spinal cord (Abdul Baqi, 2004).

Among the common terms that have been associated with brain functions: the concept of cerebral dominance or hemisphere of the brain, and by studying the history of the beginning of research into brain functions in the hemispheres, it is clear that the concept of brain control is due to the neuroscientist "Jackson" with his idea of the leading side of the brain (Attal, 2017).

3.1 The concept of cerebral sovereignty:

There are many names of the half-sovereignty of the brain with the multiplicity of theoretical frameworks that dealt with it and their differences, including: brain control, or learning and thinking styles, information processing methods, cerebral gravity, brain specialization. The main idea of brain control revolves around using one hemisphere of the brain (left, right) more than the other, and is therefore called the "dominant half" or "leading half", because it directs human behavior to use one or both and the integrative pattern is predominant (Qaddoumi, 2010).

3.2 How to determine cerebral dominance:

Scientific references related to brain control indicate that the pattern of brain control in individuals can be determined through two scientific approaches:

1- Application of biological tests such as:

- Torrance test to measure brain control.
- McCarty test to measure brain control.
- The "Heraan" instrument to measure brain control.

2- Radiography techniques such as the Positron Emission Tomography device, which is usually abbreviated as PET, and the functional device for magnetic resonance imaging (Functional Magnetic Resonance Imaging) and symbolized by FMRI, and the NMRI machine.

3- Amytal Sodium Test (Science, 2006).

3.3 Spherical hemispheres of the brain

The brain represents the pinnacle of the structural organization of the body's organs as the leader to which all organs of the body respond, controlling, managing, coordinating, planning, following and closely

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monitoring its sub-organizations (Al-Melian, Kamco, 2015).

- **Left Hemisphere:** It refers to the functions of the left hemisphere of the brain that the individual uses, which Torrance and his colleagues pointed out that the left-handed individual tends to be specific and prefer organized actions that enable him to discover systematically (Saadeh, 2003).
- **Right hemisphere:** Torrance and his colleagues say that an individual with a right-hand pattern tends to be indefinite and prefers unfinished work through which he can create.

Hemispheres of the brain: These are the functions of the left and right hemispheres of the brain, which the individual uses (Saadeh, 2003).

3.4 Functions of both hemispheres of the brain:

The property of the two hemispheres of the brain is used in many aspects, specializations, education and mental abilities, as explained by "Weights" and others, and the cerebral hemispheres can be identified as follows:

Left hemisphere: It is called the dominant hemisphere, and in the past, it was called the Aristotelian hemisphere in relation to Aristotle and logic, and the left hemisphere is known as an analytical verbal interested in logical and mathematical thinking and it tends and partially processed and analyzed (Ozan et al, 2012).

The right hemisphere: It is sometimes called non-dominant, silent or platonic hemisphere, in relation to Plato, while the cognitive hemisphere of the content of the information associated with it, which emerged from the results of experimental research in this regard, is characterized by simulation in the form of physical quantities, unlike the left hemisphere of the brain, which depends on programming information on a digital system, as well as the right hemisphere of the brain is dominated by processes of a creative nature (Yahya, 2013).

4. Theories explaining the patterns of brain dominance

There are many theoretical perspectives that explain how the cerebral dominance of each hemisphere occurs, and we find two main curves: the

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biological point of view and the psychological point of view.

Anatomical theory:

This theory focused on the anatomical differences observed on the cerebral hemispheres, and the differences of these differences according to the pattern of dominance, and posits that anatomical and structural differences in the hemispheres of the brain may explain the differences or functional asymmetries in the hemispheres of the brain (Abdul Wahid, 2008).

The theory of the two spherical hemispheres of the brain:

The theory of both sides of the brain goes back to the research conducted by "Roj Sprey" in the seventies of the twentieth century, in which he confirmed that each individual has great and equal potential, whether for the right or left half of the brain, and that all individuals have creative and mental skills but use them only partially, but if the full halves are used, their strength increases (El-Feki, 2018).

Integrative theory of the hemispheres of the brain:

This theory assumes that there is an integrative nature of the two hemispheres of the brain, and that one does not work in isolation from the other but acts as a super-integrated system, especially when processing two different types of information, each corresponding to a specific hemisphere, when the burden of processing and processing occurs between them.

5. Teaching Methods

5.1 The concept of teaching methods

The method of teaching means the set of actions that the teacher performs or makes students perform under his guidance and supervision in order to bring about learning for them.

Or it is a set of activities and procedures carried out by the teacher, which appear to have effects on what the student learns, and the method usually includes a number of procedures and activities, and procedures such as reading, discussion, recitation, observation, guidance, clarification, repetition, interpretation, silent and loud reading, and the use of blackboards and teaching aids, etc.

It can be said that the teaching method is what the teacher follows

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from the sequential and interrelated steps to achieve the goal or set of specific educational goals or is the means and methods used to organize the student's interaction in educational situations in order to gain educational and educational experiences

5.2 Standards of a good method of teaching

Due to the presence of different elements in educational situations, and the entry of many variables in the teaching and learning process, it is no longer possible to determine one of the teaching methods that is always the best, because the method that suits a certain subject may not suit another subject, and that which does not suit a certain level of learners may not suit a certain educational environment and may not suit another environment.

Therefore, a good method of teaching can be described as a method that achieves the goals of teaching with the least possible effort, time and cost, and there are a number of criteria if available in the method that can be described as quality

- To be able to achieve the goals of education with the least time and effort exerted by the teacher and the learner in the teaching and learning process.
- To suit the learners' abilities and preparations.
- Urge students to think well and reach results.
- To encourage students to self-learning and qualify them to rely on themselves in education
- To provoke the motivation of learners towards learning.
- To be possible to use in more than one educational situation.
- To be flexible and subject to change according to the variables of the educational situation.
- To be keen to move from the known to the unknown, from easy to difficult, from the whole to the part, and from the tangible to the abstract.
- To be linked to the objectives of education.
- The appropriateness of the method to the objectives of the lesson means that the choice of the professor is the appropriate method in

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light of the specific educational objectives of the lesson

- Shorten time and effort. It means whenever the teaching method achieves more than one of the learning goals in a short time and with reasonable effort and at a lower cost with the availability of the element of excitement.

5.3 Modern teaching curricula

Teaching methods have evolved as a result of developments in all facilities of life, the role of the teacher is no longer limited to education and the transfer of information to the student only, but has exceeded what is deeper than that and has become a guide for them to discover strengths and weaknesses and know the nature of their personality and identify the individual differences of each of them by choosing modern teaching methods to arouse curiosity and interaction among them, and modern methods have exceeded the methods of lecture and discussion to include a range of different and sophisticated methods and methods, of which we mention

5.4 Brainstorming method

In it, the learners are divided into groups, each group includes five learners to ten, then each group is asked a question and the learners provide ideas and answers without providing any criticism because the aggressor of this method of education see that criticizing ideas when they are presented may frustrate the individual and prevent him from generating new ideas, and brain rain sessions depend on:

- A. Delay criticism until the completion of the generation of ideas
- B. Benefit from a large number of ideas
- C. Generating ideas characterized by originality and quality

Brainstorming training steps

- A. training group is selected that includes five to ten headed by a person who moderates the dialogue.
- B. The president defines the method of brainstorming when applied for the first time to the rest of the members of the training group.
- C. The president reminds the members of the group of the basic rules of brainstorming that they must take and may write them on a board

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displayed on the group, such as saying, for example: Express your ideas freely, and present the largest possible number of ideas.

- D. The president opens a space for individuals in the group to put forward ideas.
- E. When the ideas stop, the head of the group stops for a minute thinking and then listens to them and discusses with him until they reach a solution (Afanah Ismail, 1990, p. 33.).

How to solve problems:

It is one of the ways in which the student is the focus of the educational process, and the role of the teacher is limited to monitoring and guidance towards the desired educational goal, and John Deere has focused on the importance of the real and realistic situation in awakening the student's mentality and recommended that the student be exposed to realistic and real problems because it provides him with assistance in discovering the information required to solve the problem, and the problem is a new and distinctive situation faced by the individual and does not have a ready-made solution (Tarek Amrawi, 2000, p. 22).

Here we conclude that the method of solving problems is focused on the method of solution, procedures and strategy and how to discover it by the knowledge of students and the guidance of their teacher to them. (Walid Obeid, 1982, p. 15).

Elements of scientific thinking in solving the problem:

- Feeling and identifying the problem
- Collect information about the problem
- Develop appropriate hypotheses to solve the problem
- Verification of hypotheses by experiment
- Reaching results and two missed
- Application of results

5.5 Cooperative learning method

It is a strategy and a successful method in which small groups are used cooperative and includes each group of students of different levels of abilities, where they practice various educational activities to improve their

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understanding of the subject to be learned, and each learned member of the team is not responsible for what he must learn only, but he has to help his colleagues in the group, and therefore the students of each group work in an atmosphere of motivation, achievement and fun during learning (Bakr Samih, 2010, p. 34).

This method is known as a technique through which learners accomplish their work as partners in small cooperative groups by eating activities and work papers that help them in the process of learning the lesson to be learned, allowing learners to integrate and work in one group, so learning becomes the lesson to be learned, allowing learners to integrate work in one group, so cooperative learning becomes an assistant to learning and exchanging experiences and ideas (Sayyid Mohammed, 2004, p. 46).

Factors affecting learning based on brain control:

There are many factors affecting learning based on brain control, the teacher must know the type of brain control prevailing in him, and recognize the type of control prevailing for students to be able to choose the appropriate classroom practices and methods, the student does not come to school as a blank page and comes and has a lot of experiences gained in his early years, the learner's brain has been formed by multiple effects, but the most effective use of these influences to make brain learning meaningful More effectively, it requires knowledge of the factors affecting learning based on brain control, the most important of which are:

Tension and relaxation: When a person feels nervous, the adrenal gland releases many secretions that the body responds to, whether the person faces a physical or moral danger, so the teacher must during teaching that students feel completely comfortable to be able to deliver information to students in a proper way and to stay away from all the atmosphere of tension within the classroom.

Genetic factor: The genetics factor plays an important role in the process of learning and education based on the two-sided brain, as genetic genes affect the brain's abilities in terms of remembering, intelligence, thinking, and others.

Emotions: Emotional experiences accompanied by intense emotions

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affect the work of the brain in terms of the inability to focus, attention, remember and think.

Movement: The physical movement is an important movement for learning. Where it can stimulate the body to secrete natural stimulants in the body, which awaken the learner and increase his energy levels and improve the storage and retrieval of information, for example, the teacher must move during his explanation of the lesson in the classroom and make students move through classroom activities and scientific experiments.

6. Teaching methods compatible with the direction of brain control

Understanding how students learn is an important part of the process of choosing learning strategies, so the need to understand students' learning patterns is increasing in light of the trend of group learning within heterogeneous classrooms, the main benefit of learning styles is to look at them as a tool to consider individual differences, when you help students discover their own educational methods, increasing students' achievement and improving their attitudes towards learning is linked to the degree of compatibility between the teacher's education style and the students' learning style, and there is a set of Teaching methods that are commensurate with brain control, which are as follows:

Right side teaching methods:

- The teaching style is based on visual explanation.
- Address several topics simultaneously and in parallel.
- The topic is addressed in a holistic manner.
- Teaching activities based on composition and installation
- Teaching activities are based on practical performances, field visits and practical experiments.
- The learning activity is used with the specific senses.
- The metaphor is used (uniting a relationship between two things that have no relationship).

Teaching methods right side:

- The teaching method is based on verbal explanation.
- The information is addressed sequentially and sequentially.

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- The topic is dealt with in detail or in detail
- Teaching activities are based on analysis.
- Teaching activities based on verbal learning and theories.
- It uses direct questions that require simple cognitive recall.
- Uses realistic activities at hand.

7. Teaching methods commensurate with the type of brain control

David Colb has developed a model for identifying learning styles based on four abilities: mental abilities, observation and meditation abilities, conceptual abstraction abilities, and effective experimentation abilities.

McCarthy found (Macarthy) in the late seventies of the twentieth century that each of the two sides of the brain performs certain types of tasks, and my brand has linked the four learning styles in Kolb's classification of learning styles and brain control and called the resulting list the name (4mat system) This list classifies learners into four categories according to their learning styles, and these patterns are the integration of experience with self, the formation of concepts, practical experience and representation of experience, self-discovery, and many studies see that there are methods associated with learning based on brain control:

- **Coordinated immersion:** It is intended to create learning environments that immerse students in educational experiences, the teacher's role is to create learning environments that immerse students in realistic educational experiences.
- **Relaxed attention:** Try to remove the fear felt by the learner in order to preserve the environment. Learning with high specifications.
- **Active processing:** allowing the learner to acquire and analyze information by processing it in an effective manner.

Characteristics of teachers according to the direction of control:

Right side: they prefer direct scientific explanation, use mental images, prefer total learning, prefer to collect information related to reality, perform more than one work at a time.

Left side: they prefer verbal explanation, they use language and concentration, they prefer partial learning, they prefer to collect interrelated

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information that helps to form a total phenomenon, they focus on only one action.

The integrated aspect: they use direct scientific explanation, verbal and linguistic, they use language, focus and mental images, they use micro and macro education, they use interrelated information that has to do with reality.

8. Reflection of the thought of learning based on brain control in learning and learning

Reflected brain control and research that revolved around it in many educational fields, because of the vital role shown in the learning of students and the way they acquire knowledge and experience, and the effects of brain control many and extended, and the following educational areas that apply and reflect the effects of brain control:

- Curricula through which curricula are designed according to the interests of students.
- The learning environment must be active, and the study rooms are designed and equipped with rich experiences.
- The role of the teacher in the need to change the old trends of teaching due to the changes that have occurred in our society and change previous ideas about learning and the explosion of knowledge and how to employ the brain to acquire information (Mohammed Al Balushi, 2020, p. 24.25).

4. Conclusion

Finally, through what was presented earlier, we can say that the relationship between brain control and teaching methods in the educational process has been highlighted from a theoretical perspective, with the aim of understanding how brain processes affect learning and teaching methods and the teacher's role in stimulating the brain to facilitate the acquisition of knowledge, and this study has been based on scientific literature and cognitive theories that focus on the role of the brain in processing information and how this affects modern teaching strategies, as The importance of taking into account individual differences in the brain and ways to adapt teaching methods to suit the different mental abilities of

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students is discussed, and the study indicates that understanding this relationship can contribute to improving the effectiveness of education and providing a learning environment more compatible with the diverse needs of students.

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