



Research Article

THE BRAIN AND LEARNING

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Article History

Submission: August 12, 2020

Revised: August 12, 2020

Accepted: August 12, 2020

ABSTRACT

This research aims to point out the relationship that the brain has in the teaching-learning process of the human being, is capable of developing macro skills within the cognitive process. Different bibliographic sources will be analyzed where various researchers contributed ideas and knowledge related to the brain and its relation to learning. The research, exploratory and qualitative work will be used as a method for research, where it was concluded that the brain is the most important of the human being, it depends on the vital functions that the body performs; that allows to obtain knowledge throughout life. In the learning process, the role of the brain is indispensable, exogenous and endogenous factors together with the experience that allows us to be aware, evaluate and value external reality.

Keywords:

Brain, Learning Teaching Process, Cognitive Process, Exogenous and Endogenous factors

Abbreviations: NIL

INTRODUCTION

The brain is the main organ of the nervous system, it performs functions of self-control, planning, reasoning and the development of abstract thinking. It is made up of two cerebral hemispheres, the left and the right; They are connected by various nerve fibers that started the study between the brain and learning.

According to science, it is the left hemisphere that processes things partially and sequentially; Left-handed people generally use the right hemisphere largely for language. While right-handed people their gross motor function "big movements" are controlled by the right hemisphere; This has the ability to immediately recognize negative emotions, while the left controls fine motor skills and is activated by detecting positive emotions (Jensen, 2003).

Each of the hemispheres aims to process information differently (Davidson, 2010). The hemisphere controls half of the opposite side of the body. In most people, the left hemisphere of the brain is transcendental in language processing, and the right hemisphere is largely responsible for visual-spatial information and emotions, just as

there are hemispheres or Lobes are also the cells that are neurons (10%), and neuroglia with (90%) that are part of the brain, each fulfilling important functions in relation to learning.

Although neurons are in the minority, they are best known and studied for being in charge of transmitting information because they are connected to each other; emitting signals repeatedly from one cell to another. The higher the level of connections the more efficient the communication, if the signal emitted on arrival stimulates the neuron it will be activated. The information itself moves through the inside of a neuron through electrical impulses and is transmitted through the synaptic gap by chemical components known in science as neurotransmitters (Jensen, 2003).

Learning is a function of neurons and cannot be carried out individually, but requires a number of neurons interconnected with each other (Bedoya, 2019), comments that learning is any modification or change in synaptic networks, product of new stimuli from the outside world produced by various factors such as experiences, new information, novel events, having the ability to produce changes in the behavior of the individual and generating new responses to the same stimulus.

MATERIALS AND METHODS

In the methodology of this study, bibliographic, desk research, exploratory and qualitative research was used to analyze and increase the overall effectiveness of the research with the criteria of several researchers who have contributed arguments on the close relationship between the brain and the learning.

RESULTS AND DISCUSSIONS

The analysis obtained from the different criteria sustains the capacity of the human being to learn everything that is proposed, this learning originates from the time man is born until he ceases to exist. The brain is influenced by exogenous and endogenous factors, allowing learning from the simplest to the most complex through experience. It is a stimulus receiving station that allows the development of macro skills that are the basis for understanding the world. Memory and attention are activities that allow human beings to process knowledge, remember it and use it when needed.

BRAIN CAPACITY

The brain is capable of storing information in an unlimited and moldable way according to the age and the environment in which the learner operates, the brain organ is capable of learning influenced under genetic and environmental conditions. Endogenous and exogenous factors influence the development of mental macro skills: acquire, train, preserve, remember, deduce, induce (Pherez, Vargas, & Jerez, 2018).

The brain has the ability to build a path for learning, it is gradual so that it starts from the simplest to the most complex. The sensory pathway assimilates information masterfully and is capable of absorbing knowledge through emotions (Martha, 2012). Figure 1 shows the different learning pathways according to sensory classification.

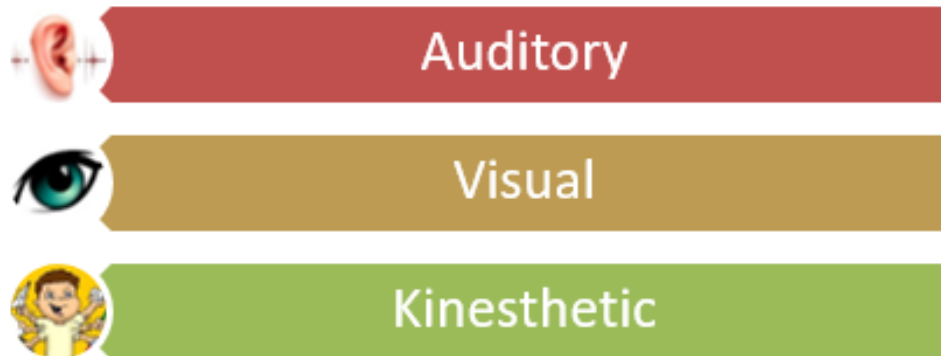


Fig. 1. Sensory learning pathways

Source: Made from (Martha, 2012).

For researchers (Pherez, Vargas, & Jerez, 2018), the learning process involves the connection of the body and the brain, “acting as a stimulus receiving station and is in charge of selecting, prioritizing, processing information, recording, evoking, emit motor responses, consolidate capabilities, among thousands of other functions” (p.3). Among the brain processes involved in learning that are set in motion when man observes, reads and listens are: perception, attention, thought, memory and language.

The man all the time is learning, attending, thinking and using memory and language (Fuenmayor & Villasmil, 2008), explain that cognitive processes such as reading, social understanding and beliefs play a fundamental role in the daily life of the human being and are the basis for understanding the world. The action of learning is the effect of uniting or linking the information provided by our senses, giving rise to new knowledge.

The attention mechanism allows to process the relevant stimuli, thoughts or actions, this originates when the receiver selects what he perceives from the environment according to his needs. The human being has the ability to effectively perform more than one cognitive task simultaneously; Attentional mechanisms also include a hierarchy of processes, ranging from the most general and nonspecific levels of brain activation to the most concrete and differentiated, such as those involved in tasks of alternating or divided attention (Bernabéu, 2017).

Memory is the ability to store and remember perceived data of the environment or mental conception. It means that memory is the faculty by which the past is retained and remembered, it is the capacity by which knowledge about something is stored and the interpretations that are made of it (Fuenmayor & Villasmil, 2008).

The studies carried out show that emotional processes are inseparable from cognitive ones. Positive emotional contexts facilitate learning and memory, by activating the hippocampus; what does not happen with the negative stimuli since these activate the amygdala, making learning difficult. This implies providing positive emotional climates in the classroom that help improve learning.

Indeed, feelings and emotions have a vital role in learning, motivation allows there to be a direct relationship between the ability to pay attention and learn. Learning, working memory and attention can be sabotaged when one's feelings are ignored.

The various activities of our brain are part of the learning process, among these activities we can name attention, perception, association, analysis and synthesis (de la Fuente & de la Fuente, 2015), in addition (Meneses, 2019), explains that education produces profound changes in the brain that contribute to improving the subsequent learning process and the general development of the human being. The individual from the moment he is born is in continuous learning until he ceases to exist; their conscious knowledge in the world is diffused with the permanent process of classifying and subclassifying. Through all these learning and the changes, they cause in his brain, human beings can constantly change their behavior and their thinking.

The functional and structural part of the brain is responsible for allowing learning to take place, it must carry out a variety of complex actions that facilitate the person to obtain that knowledge, so that this process is executed properly, it is necessary that the information be of External origin with certain characteristics that help to overcome all barriers, for example, it is necessary that the information is provided in a novel, didactic and dynamic way (Bedoya, 2019).

It is in this context, it is where the teacher takes an essential role in the development of the learning of his students, being the protagonist of the teaching, imparting content to his students, the brain is in charge of processing and storing the information so that what is learned is memorized and remembered at any stage of life. Memory is linked to student learning, achieving high school performance.

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APPRENTICESHIP CLASSES

Studies of the brain show that previous learning is the basis for the construction of significant knowledge (Saavedra, 2001). Fig. 2 shows the significant learning classes.

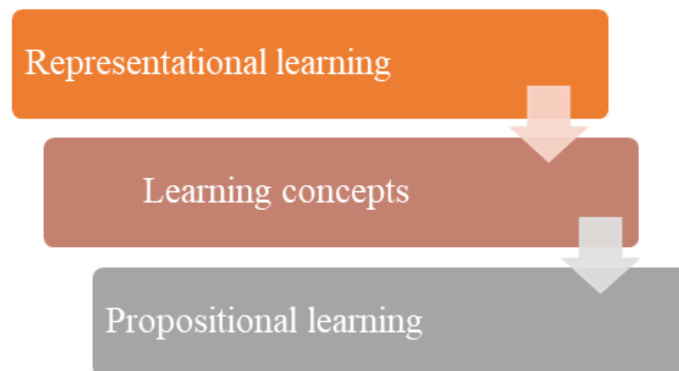


Fig. 2. Class of significant learning.

Source: Made from (Saavedra, 2001).

Representational learning is defined as being totally basic, since it allows assigning meaning to symbols or explicit words, directly identifying symbols related to objects, concepts or events.

Regarding concept learning, definitions represent regularities of events or objects, and are also represented by particular symbols or categories and represent abstractions of essential attributes, propositional learning which is the last type of learning where the main object is not to learn meaningfully what the words appear isolated or combined but to learn the meaning of the ideas expressed in a proposition (Viera, 2003).

Meaningful learning is required from the ordering, classification and rationality of concepts, ideas or arguments, without being assumed to the letter, as a simple transfer. Learning occurs when there is a relationship between what is facilitated, learned, contextualized and practiced (Tellez, 2016)

The brain possesses potentially advantageous properties to define efficient pedagogical tactics, which are the basis or guide to develop effective learning and to delineate school environments that provide it, the most common and accepted is brain plasticity, neurogenesis, the role played by emotions in cognition and being able to identify periods sensitive to certain learning (Pherez, Vargas, & Jerez, 2018).

According to (Ortiz, 2018), through emotions it is possible to awaken in the student the curiosity and interest to discover something new and learn, by conducting dynamic and participatory classes in which the student asks, reflects, stimulates the acuity of

learning through creative thinking. It is proven that learning is built with the use of good techniques and the desire and interest to learn from day to day. Emotions allow memory storage in a positive way.

Brain plasticity is another potential property that the brain possesses that provides the ability to modify predetermined habits or knowledge and thereby learn new things. (Aguilar & Caycho, 2016), indicate that the nervous system complies with a specific programming of genetically explicit variables, those changes that are generated in normal development, either by adverse factors and that affect the stability of the generation of new dendritic formations, Synaptic and other neural connections, which are preserved a posteriori, respond to behavioral principles and laws of learning, being the result of the brain's ability to counteract any congenital and / or acquired deficiency. This being possible thanks to neural plasticity.

CONCLUSION

The brain is related to the teaching-learning process of the human being from birth until it ceases to exist. There are several theories that exist related to the direct link of the brain organ with knowledge. This is designed to learn through the stimulations it receives from the environment in which it operates. Learning is a magisterial process in constant change that costs in a series of abilities and skills to be developed by the human being according to their interests, motivations and needs.

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