

How to Cite

Ruperti, M. J. B., Albán, W. E. M., Tumbaco, D. E. S., & Martínez, M. E. M. (2019). Characteristics and functioning of brain on learning process. *International Journal of Humanities, Literature & Arts*, 3(1), 1-6. <https://doi.org/10.31295/ijhla.v3n1.99>

Characteristics and Functioning of Brain on Learning Process

María José Briceño Ruperti

Pontificia Universidad Católica del Ecuador, Portoviejo, Ecuador

Corresponding Author Email: magito1788@hotmail.com

William Ecuador Martínez Albán

Pontificia Universidad Católica del Ecuador, Portoviejo, Ecuador

Email: wilanjose@hotmail.com

Dubal Edison Salvatierra Tumbaco

Pontificia Universidad Católica del Ecuador, Portoviejo, Ecuador

Email: dsalvatierra2012@gmail.com

María Elena Moya Martínez

Pontificia Universidad Católica del Ecuador, Portoviejo, Ecuador

Email: mmoya@puce.edu.ec

Abstract---Research refers to the topic “brain and learning in education” with the purpose of determining the characteristics and functioning of the brain in the learning process of the students of the Millennium Education Unit “Replica Manta” of the city of Manta. Through this work, a conceptual analysis of the influence that neurosciences have as a contribution in education, stimulation as an influential factor to activate memory, multiple intelligences as abilities to solve life problems and motivation as interest are presented that students have for their own learning.

Keywords--- neurosciences, learning, multiple intelligences, motivation, brain.

Introduction

Understanding the process of how the brain learns is a contribution to the new learning strategies of this century because the traditional teaching models were left behind. This traditional method has become obsolete and it is time to look for alternatives in neuroeducation, and learning manages to recognize general elements about the functioning of the brain.

Just 30 years ago there was a lack of knowledge and it began to be questioned: How did the brain work? But this did not last long because through advances in Medicine and very particular in neurosciences, began to study neurons and understand brain activity.

At present, thanks to the neurosciences that constitute research fields on personality, human behavior, language thinking, and conscience, in addition in this century teachers have to promote an active change, in other words, teachers have to be agents of changes in society, in that sense, educational institutions must assume and implement new pedagogical, curricular and didactic models ([Mendoza et al., 2019](#)).

On the other hand, emotions play an important role in learning, this means that they are responsible for moods that can range from calm to anger, from love to hate, it should be mentioned that stimuli are also important in student learning since teachers have to stimulate methodological strategies through games.

Finally, there is a very interesting topic that needs embroidery is that of Gardner's multiple intelligences, in this theory he reveals the 8 types of intelligence and that in this way you can know the different learning styles and is the engine for That students can build their own knowledge ([Vasquez et al., 2019](#)).

Materials and Methods

Bibliographic research was conducted on the topics of brain, learning, neurosciences, stimuli, emotions and multiple intelligences, where several authors contributed their opinions for the analysis of the research. The inductive and deductive method was used to analyze the brain and the development of multiple intelligences in the learning and teaching process.

Results and Discussions

The brain and its characteristics

Through a number of scientific investigations it has been determined that the brain is the most amazing, mysterious and complex organ in the human body that means that no one has managed to fully understand it since each person has a different reaction in their behavior, the brain is responsible for controlling mental activity as unconscious processes that range from breathing to more elaborate philosophical thoughts, on the other hand, [Ormrod \(2005\) & Chávez et al., \(2019\)](#), argues that the human brain is a complicated organ to understand and that scientists should investigate why it doesn't work at all well.

The brain is divided by the lower brain, where the basic physiological processes are involved, the middle brain, hearing, and vision are supported in this part, finally the upper brain, which is divided into two cerebral hemispheres, according to [Parker \(1977\)](#), these occupy most of the skull, 80% constitute weight and 70% are neurons. The right hemisphere is related to nonverbal expression, studies have shown that spatial orientation, perception and emotional behavior are located in this part.

The left hemisphere is responsible for mathematical calculation and language, neither of the two hemispheres can work alone and are always connected to each other, according to [Levy \(1974\)](#), argues that the right hemisphere synthesizes space, while the left one analyzes in time. On the other hand, [Jensen \(2004\)](#), states that the brain consumes 20% of energy and that the main source is blood, in addition the brain absorbs 36 liters of blood per hour and it is necessary 8 to 12 glasses of water per day for proper operations.

Neurosciences and neuroeducation in the learning process

Neurosciences is the study of the structure, function, development of the nervous system play a fundamental role in learning, although this term is somewhat recent, its current implementation is due to the need to contribute in different areas of scientific research and clinical sciences According to [Martínez \(2008\) & Alava et al., \(2019\)](#), it states that neuroscience does not have two autonomous brain systems, but that the cognitive system as the affective system is only one and explains that affective states influence processes Cognitive

Neuroscience in education refers to the fact that there is a learning environment that is balanced and at the same time motivating, students will be building their own learning based on the social, physical and emotional environment.

Neuroeducation suggests that the connection with nature is fundamental in the first years of a child's life since it is that age. That builds colors, shapes, depth, movement and in the end, they will form new concepts, these concepts will contribute in a way it activates the formation of new neurons, and in this way the brain will have new experiences; between the ages of 10 and 12. The brain is receptive and learns through aptitudes and it is at this moment that it begins to reason and understand different topics, instead In adolescence the brain is actively emotional and differs in learning.

The stimulus and the emotions

What the brain does best is to learn this is due to stimulation, when there is a stimulation in the brain a process is released, this can be internal, for example, to assemble a puzzle after said stimulus is distributed to several levels, finally contributes to the formation of a potential memory, this means that at the end of this process the memory is easily activated.

In the same way emotions are fundamental in learning, these were evolving with the passage of history since at first they were not considered, later in investigations such as those of [LeDoux \(1996\) & Damasio \(1994\)](#), argue that they are inherent and that the body, the brain, and the emotions constitute a unit that cannot be disintegrated, in this way the emotion and the cognition are related, are potentiated and they are molded reciprocally.

Therefore, Goleman (2000) & Suarez *et al.*, (2019), describes emotions as something more sensitive than reason and alludes that emotional intelligence as a form of conscious for feelings in this way can be defined as emotional intelligence as the skill that concentrates on the process of emotional information, grouping emotions and reasoning, reflecting intelligently on emotional life.

According to Bisquerra (2008), it establishes that there are contents for emotional education, but these may vary according to who they are intended for and can serve for teachers and students, on the other hand, emotional education follows a practical methodology focused on games, group dynamics, self-reflection, and is intended to help develop certain emotional skills.

Multiple intelligences

In fact, it can be argued that the brain learns in different ways or styles: the first visual style, the need to see something, can be through images or in a written form. The second auditory style is the need to listen and learn through verbal instruction and the third is the kinesthetic-tactile style is the need to dramatize being on the move, also the psychologist, neuroscientist, and professor at Harvard University, Howard Gardner, He dedicated himself to studying the development and cognitive aptitude of the human being.

And it is that Gardner (1993) & Tuarez *et al.*, (2019), defines intelligence as the ability to solve life problems or confront conflicting environments in a coherent way and to design a product valued by a certain cultural or community context. Gardner also classified intelligence into 8 types.

Linguistic Intelligence has the ability to use written and oral language in an effective way, for example, journalists, writers, novelists. Logical Intelligence - Mathematics possess the ability to calculate, reason to solve abstract operations, has the ability to use logical thinking, for example, scientists, mathematicians, accountants, engineers. Space Intelligence has the ability to imagine shapes, spaces, and colors, for example, architects, sculptors, surgeons, surveyors (Reina, 2019).

Musical Intelligence has the ability to compose, express, interpret through music, for example, conductor, singers, and composers. Physical Intelligence-Kinesthetic develops fine and gross motor skills, transform and manipulate objects expressed with the body, for example, dancers, actors, craftsmen. Naturalist Intelligence, respect, care for and enjoy nature have the ability to recognize patterns of nature, for example, botanists, environmentalists, agronomists.

Interpersonal Intelligence perceives and understands the feelings of other people, for example, teachers, vendors, politicians. Intrapersonal intelligence has the ability to connect with themselves, recognize their inner states, for example, psychologists, therapists, philosophers.

The motivation in the learning process

Motivation in learning and the brain is essential for the emotional development of students. Learning and motivation have considered too closely linking since motivation drives a state of activation in people showing successes in learning.

Finally, Rodriguez (2016), states that in the educational field students should be stimulated so that they respond with criteria to real-life situations and events, this will allow them to cope and have mastery in emotions creating their own experiences in order that they can meet the objectives set. In Table 1, shows the analysis of the various authors.

Table 1
Analysis of the various authors

Author	Theme	Year	Result
Bisquerra, Rafael	Psychopedagogy of emotions	2008	Distinguish between a teacher-training program and a student program.
Goleman, Daniel	Emotional Intelligence	2000	Describes emotions in a sensitive way and claims that these emotions can have activated and deactivated, depending on the emotional and social environment in which they grow, and where they are educated.
Damasio, Antonio	Descartes Error: Emotion, Reason	1994	Proposes that reasoning develops as an extension of the emotional system, which allows decisions to be made for survival

	and the Human Brain		
Gardner, Howard	Multiple Intelligences	1994	Argues that intelligence is not one but as a set of multiple, distinct and independent intelligence.
Jensen, Eric	Brain and competences learning and educational implications	2004	Highlights the characteristics of the brain pointing out the difference between the cerebral hemispheres
LeDoux, Joseph	The emotional brain	1996	Presents the functional and biological dimension of emotions, emphasizing its decisive influence on human behavior
Martínez, Miguel	Epistemology and qualitative methodology in the social sciences	2008	Proposes that there is a dualism between the affective system and the cognitive system but that moods influence the cognitive process.
Ormrod, Jeanne	Human Learning	2005	Adds that the brain is one of the complex organs and that learning is a permanent change in behavior because of experiences.
Parker, Catherine	Anatomy and Physiology	1977	Highlights the anatomy and physiology of the cerebral hemispheres and their relationship with verbal and nonverbal expression.

Source: Different authors

In the research that was proposed demonstrates the analysis of each author and as a result it can be said that the development of the brain is fundamental for the teaching and learning process, therefore, neuroscience is fundamental in this process and that the stimulus is an element that influences the acceleration of memory, multiple intelligences as an aid to the skills and abilities obtained in the resolution of conflicts in life

Conclusion

The mastery of emotions, self-awareness, flexibility, tolerance, active listening, respect and acceptance of reality are the windows for everyone to reach their goals, as well as the understanding that every human being regardless of their Age can express its intelligence through different manifestations and not only through qualifications, scales or evaluations, where the logical-rational and cognitive model is set aside so that the new paradigm of the balance between Academic Intelligence and Emotional Intelligence





Finally, it is necessary involvement of the teacher about the incorporation of new methodological proposals that aim to mainly enhance the intrinsic motivation of the student and generate a favorable context of enrichment at all levels. In this way, in order to provide teachers with some specific resources oriented towards this new didactic paradigm.

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Biography of Authors

	<p>María José, Administration and accounting engineer, graduated from Universidad Laica Eloy Alfaro de Manabi, currently working in the millennium education unit Replica Manta, Manta-Montecristi, Jaramijo. <i>Email: magito1788@hotmail.com</i></p>
	<p>William Ecuador, Rector, Municipal Educational Unit “El Porvenir”, studied at the Universidad Laica Eloy Alfaro de Manabí, It has participated by providing and receiving different types of training. <i>Email: wilanjose@hotmail.com</i></p>
	<p>Dubal Edison, Administration and accounting engineer graduated from Universidad Laica Eloy Alfaro de Manabi, has held different administrative positions in the ministry of education. <i>Email: dsalvatierra2012@gmail.com</i></p>
	<p>Maria Elena, Master in Pedagogy, Master in Management and Educational Leadership, Specialist in Management and Educational Leadership, Diploma in Innovative Pedagogies, Bachelor in Chemistry and Biology, Director, Rector and Vice-Rector of important Educational Units of the city of Quito, teacher trainer at national level, Editorial Director and book writer for Senderos Ediciones. University professor, Director of Teaching and currently Coordinator of the Master Program in Innovation in Education and Postgraduate Director of the Pontificia Universidad Católica del Ecuador. <i>Email: mmoya@pucem.edu.ec</i></p>