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Genealogy of creative thinking and its necessity in the university reality

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Abstract

This article reviews the founding literature on the development of thought in interaction with creativity as an essentially human activity, analyzed in a university context. The research addresses a global university environment in which creativity, on the one hand, is empowered by art and play, and on the other hand, due to globalized phenomena, innovation, economic productivity and marketing, among others, that modify educational reality. The relevance of the study is in a situation of generational impact, in view of the increasing difficulty of university professors in attracting students to knowledge, since they are currently seduced by contemporary hedonism and its social life.
The research had a mixed method, with a qualitative component and another qualitative one, which was developed in three stages;
i. A hermeneutic activity, ii. Structured interviews applied to specialized teachers who develop creative didactics, and iii. Two courses with teachers to put into practice the creative teaching proposal. As a main conclusion, it was argued that thought is developed in relation to the type of society from which it emerges, and in the university classroom it emanates from creativity. It is a dual activity, logical-emotional, and as a result of this interaction, knowledge flows as a social construction.

Keywords: Thought, creativity, university, neurology, university education.

Introduction

The genesis of thought as a human activity is established in the relationship that the neuronal function can have with language processes. Ontogenetically, we start from the understanding of the universe in which human beings interact. Gadamer proposes that "the entire experience of the world is expressed linguistically, determining from there a very wide concept of tradition that, certainly, is not as such linguistic, but it is susceptible of linguistic interpretation" (Gadamer 1998, 58). From a phylogenetic aspect, Vygotsky (1995) poses that the process of thought is a superior activity and appears with full maturity, when language mutates from speech, as a communicative event, to internal speech, and as a thought process, approximately at the age of seven, when one begins to read and write.

It can be established that the writing processes of the human being, at the beginning are more expressive than significant, that is to say, that they are closer to the symbols than to the signs, giving recognition to the forms from the ludic, that in the beginning of the history of the man attended to his basic needs, like for example the hunting, fishing, cultivations, harvesting and war, that accompanied the celebrations and social and cultural rituals. In addition, it could be affirmed that in the conformation of the civilizations, all the forms of teaching are compiling a heap of knowledge that give account of a inheritance beyond the physiological thing. Hence, it can be stated that the promotion of creativity is based on the understanding of human events and knowledge in the capacity of the educational space.

However, the development of thought at present is primarily in educational institutions. In them, fixed and technical knowledge is more valued than creative, giving great importance to authority, both of content and of the teacher. This This is a reality that occurs within the institutions and that safeguards their survival. Unfortunately, this occurs at the expense of the denial of the power of fantasy as a force generating realities, ignoring also the cognitive function performed by the imagination.

Within this context, Higher Education is framed in what we could call a global university project, which presents some similar characteristics that have been echoed in the Latin American educational system: the reception related to the design of competency-based curricula, a traditional type of content transmission, the increasing use of digital media, educational research focused on the operational issue and teaching applied to a socio-productive context. In conclusion, the global system, which we could describe as neoliberal in the contemporary world, proposes a type of education that serves the productive apparatus, but not the creation of solutions to its crisis, that is, it does not aim to generate people committed to their society.

Therefore, the pedagogical maneuver of the university professor is framed in this reductionist system, in which documents such as syllabuses, microcurricula, pedagogical letters, which are determined in the diverse curricular programs, are unfortunately far from the educational reality, since what is programmed is not what happens, since the heterogeneity of the students cannot be calculated in the same way that the objectives are programmed, furthermore, the evaluative processes do not produce the expected results, therefore, they do not offer reliable information regarding the educational processes, nor their context.

On the other hand, we have a generalized attitude of teachers resistant to change, in the so-called comfort zone, which is reflected in the classroom environment and in the context of learning, which is why we believe that creativity must be incorporated as a requirement in university education, which demands ingenuity,

which allows the dynamization and construction of knowledge, its retention and/or assimilation, its relevance, but above all the recovery of the enjoyment of knowledge. We therefore pose the following question that will guide this article:

Do teachers contribute effectively to an education that fosters the creative process of thought, the construction of knowledge and the search for a university relevant to the challenges of the contemporary world? This question is the basis of the objective set out, which was to analyze in depth the thinking process in order to conceptualize, from an emotional perspective, the basic foundations of creative thinking.

To this end, in its methodology the research presented two lines: one of reflection on the information collected and systematized on the objective, the object and the context of the same, which activated various theoretical perspectives and articulated diverse mechanisms of production and analysis of the material produced. Another, where the process constitutes the practice itself, creative, with social sense and sensitivity according to the social requirements that implies the same creative thinking with didactic pretensions, which is reflected in the raising of cases from the interviews, which present a deep understanding of the exceptional experiences and the search for favorable typologies with the object of study. And what we could call a validation stage, which consisted in the realization of two experimental seminars with university professors.

In front of them, a creative model based on art and play was experimented and at the end, some qualitative conclusions were presented, based on the application of a questionnaire that investigated the possibility of using a creative model in the university classroom. Finally, the teachers were asked to compare it with the other models that are being presented in the daily teaching work.

During the development of the investigation, as a conclusion, it was possible to verify that thought is an exclusive mental activity of the human being and that it has a dual, logical and emotional character, which shapes science as a product of the accumulation of knowledge, and the spiritual generated by magic, the sacred, passions and feeling. Thought is also linked to another mental activity which is language, dual in another sense: physiological, since language exists in all its forms, oral, written and symbolic, produced as a result of the evolution of skills and physical habits of the human being, but also with a meaning that emerges from the cultural compilation of the species. We can affirm that thought is articulated with language in meaning. Finally, it was revealed that the cultural act is a social construction consummated by individuals who exercise creativity, for which a dose of imagination is necessary that increases with the particular experience, fruit of the experiences of man.

We conceived this analysis from the study of passions from Descartes and Spinoza to Vygotsky and Damasio, who historically sustained that reason and emotion are part of the same spiral that shapes knowledge. And education is the result of the creativity that emanates both from affections and feelings and from intelligence and rationality. Thus, the university classroom cannot be separated from this historical process, especially in a world where pleasure and fun play a predominant role in the formation of culture.

If we want teaching to continue generating opportunities to increase knowledge, it has to provide new tools, at the risk of being changed by technologies that seek a world of virtual sages, which do not favor the needs of a context where new and creative answers come, now, a new world.

An ontological vision of thought in man

To study thought, it is necessary to discriminate it in two orders, one behavioral, for its social aspect, which implies the cultural transcendence that transfers habits and customs along generations, and another physiological, which supposes a physical and organic structure, product of the genetic inheritance that evolves in the species. Based on this distinction, we can affirm that four systems of thought have been differentiated during the evolution of man: primitive, religious, modern and contemporary.

Thought of the primitive man

To explain the thought of primitive man, the studies of two anthropologists are reviewed, one British, Bronislaw Malinowski (1884-1942) and another French, Claude Lévi-Strauss (1908-2009). Malinowsky (1982, 28), states that in his beginnings man fixed his techniques, capacities, daily activities, work and rituals, in his wisdom and rigorous knowledge, the result of a mixture of mysticism and rationality. The type of thought that accompanied his actions was usually linked to magic, since one has a set of known conditions that one faces with knowledge and work, but there were possible adverse circumstances for which it was necessary.

A psychic corpus is inferred in the logic and experience embodied by material achievements that give shape to a social and cultural organization, which poses mental and concrete components, which undoubtedly evidence the beginnings of science, which not for rudimentary could give superior progress of reflection, which proves the existence of a systemic thinking. It is possible to deduce a logical thinking supported by a mythical symbolism that organizes cultural life, a creative mind that develops rudimentary technologies with which it produces tools used in agricultural, hunting and military work. It is foreseeable that an articulated language will form the basis of an evolution of his psychic system.

Levi-Strauss (1988) states that the mind is the same in all human beings, no matter their condition "of savage or civilized". The creation is a social event and even more it does not depend even on the most immediate community, but on the contrary they are questions that go beyond geography and time and acquire a historical cultural context that enriches human action permanently, that does not constitute an individual act, but belongs to the social being, the thought emanates from a deep need of the clan or human group.

Religious thought

The religious thought has to do with the cult to the spirits, to the ancestors or in some cases to the dead, it is a cultural phenomenon that has its origin in the myths and in some civilizations it is called mythology. The Greeks incorporated the divine, the humanization of the gods and the evolution of religious thought. The Romans created the so-called household gods, of course conceived in a collective rather than personal sense, the idea of family founded the social structure above the grave and possessed an immortality that the individual did not attain.

In *La Rama Dorada* [The Golden Bough: A Study in Magic and Religion], James George Frazer states that, "religion tended to become the confession of man's entire and absolute dependence on the divine; his former free behavior is transformed into the most abject prostration before the mysterious invisible powers, and his most appreciable virtue is to submit to them his will" (Frazer, 1981: 82). The first religions consisted in discovering and revealing the personal elements in what was called the holy, the sacred, the divine, and he had to go a long way to find this religious thought, from the individual form to a social principle, but "he did not find this principle in abstract thought but in action" (Cassirer, 2012: 148).

For Thomas Aquinas "The entity is the first thing that falls in the conception of the understanding; that conceives it, as the most notorious and

and in what all its concepts resolve" (Canals, 2009: 12), which can be explained in that the thought is reflected in the truth, which constitutes itself in a religious, supernatural and supra-rational but not irrational truth. As Cassirer argues, for Kierkegaard, these are arguments between darkness and incomprehensibility, religion "pretends to be in possession of the absolute truth, but its history is the history of errors and heresies. It brings us the promise and perspective of a transcendental world, situated far beyond the limits of our human experience, and remains human, all too human" (Cassirer, 2012: 114). Seen in this way, it is a type of dogmatic thinking, where ethical ideals are scarcely reconcilable and strongly divergent, yet cohesive in a symbolic and unitary way

Finally, Bergson tells us about the kind of intellectual thought that generated monotheistic religion, with the following words: "We have here a dynamic religion coupled, no doubt, with a superior intellectuality but different from it. The first form of religion has been infra-intellectual... The second was supra-intellectual" (Bergson, 1977: 139). We thus pass from an epoch of magic to one that forbade and condemned it, breaking the indissoluble bonds that had been present throughout human life, thus converting the sense of human freedom into an ethical morality. Creating the foundations for the subsequent epoch, which we can call, of modern man.

Thought of modern man

Modern thought can be located from the time of the Renaissance, in which the break with theocentrism is presented as an explanation of the world, of nature and of human reality and for the rescue of reason as an explanation of that reality newly situated in nature. Descartes (Descartes, 1981: 44) then proposes the passage from a speculative philosophy to one based on actions that allow us to become owners and possessors of nature, he equates thought with existence, a proposition also defended in religious thought, but now proposed as a natural event of the human being; he affirms that "thought exists, and cannot be taken away from me; I am, I exist: it is manifest. But, for how long? Undoubtedly, as long as I think, since it could still happen, if I stopped thinking, that I would cease to exist at all" (Descartes, 1986: 37).

This return to the rational discourse is posed by Rene Descartes in *El Discurso del Método* [Discourse on the Method], and incorporates an explanation of thought as a human activity differentiating man from other beings. His basic definition of man is, "a thing that thinks, that doubts, that knows, that affirms, that denies, that wants, that rejects, and that imagines and feels" (Descartes 1981, 13). "I will imagine, to know more clearly who I am", thus affirming that imagination is a form of thought and by the reflective law, the imagination is proof of the existence of being. Therefore, in that faculty of imagining, or in the activities of feeling, is the essential complement of thought. In this way, one specifies the conditions for a modern thought based on objectivism, positivism or the possibility of prediction, derived from the formation of laws.

Thinking from a contemporary perspective

The organ where thought is concentrated is the brain, and Phrenology, founded by Franz Joseph Gall is the science that studied its activity. In the middle of the 19th century, there were two trends for the explanation of its functioning: one, which stated that the psychological functions were found in a specific region, and the other, which located them in specialized regions. Damasio makes a recognition of this pioneer of neuroscience, to whom he acknowledged that "he intuited, correctly, that there were many parts in that thing called the brain, and that there was specialization in terms of the functions that those parts performed (Damasio, 2011).

At the beginning of the twentieth century, in his work *Pensamiento y lenguaje* [Thought and Language], Vygotsky correctly points to the relationship between language, neuroscience and thought, based on the interaction between emotions and rational thought. He stated that "In the word only its external aspect is recognized. However, it is in its internal aspect, in its meaning, where thought and speech join in verbal thought" (Vygotsky, 1995: 52), he affirms here, that the meaning of words is related to a specific context, constituting a generalizing thought in social interchange, which in the first months of life responds only to the emotional aspects of the mind; it is a dynamic, significant, affective and intellectual system. Situation that can be explained in his own words:

> "The existence of a dynamic system of meaning in which the affective and the intellectual are united. It shows that each idea contains a transformed affective attitude towards the portion of reality to which it refers. Furthermore, it allows us to discover the path from the needs and impulses of a person to the concrete direction taken by his thoughts; and the inverse path, from his thoughts to his behavior and activity" [our translation] (Vygotsky, 1995: 55)

It is in this sense that affections play a fundamental role in the development of thought and provide the scaffolding for cultural exchange that is so necessary in shaping the thoughts of individuals.

Thinking process

It will be approached taking into account the laws of universal grammar, the mental operations of the human intellect and the cultural development of life in society.

Origins of the study of thought

At the end of the 19th the panorama of the study of thought was dominated by the Behaviorist School, which defended the hypothesis of human behavior as a complex chain of simple and muscular responses, which could not be observed, nor measured. It was at the beginning of the 20th century when the science of behavior was founded, and those who first debated the issue of thought were Jean Piaget (Piaget, 1972), who proposed that thought is built in stages, each one acquiring a greater complexity; Noam Chomsky (November 29, 2002), from linguistic genetics, argued that its conformation is from language and that thinking man comes genetically configured, in which, the development of thought occurs in contact with the environment; and Lev Vygotsky (Vygotski 2001, 12), who experimentally proved the psychological nature of internal speech and its relationship with thought, thus forming the thought.

Developmental stages in the child's mind

The Swiss Biologist Jean Piaget, proposes that the development of the child's mind is configured in four stages: sensorimotor, symbolic or intuitive, concrete operational and a final of formal operations. He considers "the connection between thought and word as a merely external association" (Piaget, 1991: 16), freeing thought from all emotional ties. He assures that language, originates the representation and the schematization, its explanation conforms signs and symbols that affect the actions and the perceptive forms, it is what is called thought. Then, the symbolic function extends beyond the language that encompasses it and is the source of thought, which is explained by the formation of representations. Consequently, language and thought are independent processes. Finally, he affirms that establishing their connection is a useless problem, assuring that thought precedes language, which is a particular form of symbolic function, since its use is not a necessary condition for the existence of thought.

Children's thinking cannot be isolated from education or from the influence of adults, identifying that there is also a syncretic thinking that links logic and symbolism that allows the mental activities of intelligence and imagination, which being different act in the same sense, imagination solves problems that intelligence verifies. Finally, in the words of the Swiss thinker, he plans that "between language and thought there is also a genetic circle such that one of the two terms is necessarily supported by the other in a formation of solidarity and in a perpetual reciprocal action. But both depend, in the end, on one's own intelligence which, in turn, is prior to language and independent of it". (Piaget 1991, 124)

Vygotsky (1995, 34), objects to this assessment and proposes three types of thought: an initial one called autistic, which is subconscious, strictly individual, that does not manifest itself directly through language but through images and the individual uses it to communicate his feelings. The second, directed thought, "is conscious, and pursues objectives present in the mind of the subject who thinks them, is intelligent, that is, adapts to reality and tries to influence it" (Vygotsky, 1995: 34). The third is logical thought, when the individual begins to read and write developing in him the scientific concepts.

Thought is genetically structured and develops in contact with the environment

Noam Chomsky, an American philosopher born in 1928, in his publication *Nuestro conocimiento del lenguaje humano* [Our Knowledge of Human Language] (Chomsky 2002), states that language satisfies two conditions, one descriptive, which gives a full account of the properties of language and what the speaker knows tacitly, and another explanatory, in which each particular language is derived from some limiting circumstances imposed by experience. It further states that the development of human thought occurs natively, that is, it comes as a result of a genetic process in which the human mind provides everything concerning thought as an innate package, affirming that the development of the brain is equal to other organs. This position is contrary to Piaget and Vygotsky, who argue that the brain "does not need a building activity from the child, nor other social or cultural contributions" (Chomsky 1975).

For Chomsky, language is separated from other ways of thinking and is located in another part of the brain that matures at its own pace, where thought is an external determinant of the faculty of speech, since it is a genetic issue. For him, the architecture of the mind is given by cerebral devices that make up our system of thoughts, which work with inputs and outputs, like a computer system.

Thought and language: A sociocultural perspective

Vygotsky starts from the analysis of Piaget's research and matures his theory with his empirical studies (Vygotsky, 1989: 43). He manages to conclude that social experience in human development is of vital importance in children, which causes changes in the internal structure of their intellectual operations. Furthermore, he affirms that thought and language are found in the meaning of words, and he maintains that, "all the fundamental systems of the child's psychic functions depend on the level reached by him in the development of the meaning of words. Whether it is a meaningful perception, orthoscopic or syncretic, will depend on the individual's level of development of word meaning" (Vygotsky 2001, 400).

It concludes that the child's psychic development, in terms of attention, memory and thought, is based on the evolution of his or her behavior and on his or her own interests throughout life, which guide his or her behavior. According to Vygotsky, the concepts are formed in adolescence and are the key to the whole development of thought; it is a stage of brain

maturation, which are not observed because they are internal, structural and intimate changes (Vygotsky, 2006: 58). This mastery of concepts makes the individual free of thought and action, releases his creativity and imagination and makes him a subject of work, thanks to the appropriation of activities. "This new form of accumulation of phylogenetic (or, more precisely, historical-social) experience arose because the specific form of man's activity is productive activity. That is, the fundamental activity of man is work" (Leontiev, 2011: 85).

Therefore, it is coherent to affirm that the mental development of the child occurs in a humanized world, where he or she does not adapt to the world of humanized objects or their phenomena, but appropriates them. This is "the transmission to the individual of the conquests of the development of the species" (Leontiev, 2011: 86). In this process the child also appropriates language and specifically human functions, speaking, understanding, hearing and articulating spoken language. This situation generates specific superior processes and therefore essential cerebral organs are formed which in turn generate new formations of mental development. This explains the exclusively human capacity to perceive quantitative and logical spatial relationships. This leads to the creation of brain systems derived from the socio-cultural experience of individuals, since according to Vygotsky, the thinking process and the ways of knowing do not differ in the adult from the child, only in the complexity of the concepts, but not in the process.

Symbolization: A process of apprehension and creation of worlds

Language is an instrument that communicates and facilitates the use of objects, but it also controls human behavior. The process of symbolizing becomes a social mechanism, although, at the individual level, it allows the interiorization of meanings. This mastery of symbolism makes the child turn to himself instead of the adult. Thus, "The history of the process of internalization of social language is also the history of the socialization of practical intelligence" (Vygotsky, 1989: 53). Thus, language guides, determines and dominates action, that is, it reflects the external world in thought.

We then place the symbol as a mental activity that serves as an instrument of thought to internalize the environment and to dominate human actions and behavior. The symbol as a mental tool enables its socialization which allowed the human being to construct signs that built a socio-cultural thought, which first was mythical, then religious, later rational and now is a material that belongs to a brain system. The symbol, as a common representation, is the mental entity that favors such integration and constitutes the source of creation of realities. Thus, they recreate the physical world in its own symbolic image. In other words, reality is a creation of man that becomes comprehensible in the representation that he imagines of his environment through the symbolization.

A contemporary perspective of thought

Antonio Damasio, a neurosurgeon of Portuguese origin, director of the Institute for the Neurological Study of Emotion and Creativity located in California, defines thinking as the process by which the ability to order internally represented images is advanced. He explains it this way: "My idea, then, is that possessing a mind means that an organism forms neural representations that can be converted into images, be manipulated in a process called thinking, and eventually influence behavior by helping to predict the future, plan accordingly, and choose the next action" (Damasio, 2011: 139).

Thus, decision-making is the main function of the brain in which thought makes the individual act accordingly. Damasio, states that reason, feeling and emotion act at different neuronal levels, but combined and simultaneously through signals that converge in the hypothalamus and the brain stem, which interact with the cerebral cortex. He textually says:

> The lower levels in the neural building of reason are the same as those that regulate the processing of emotions and feelings, along with the body functions necessary for the survival of the organism. In turn, these lower levels maintain direct and mutual relationships with virtually all body organs, directly placing the body within the chain of operations that generate the highest capacities of reasoning, decision-making, and by extension social behavior and creativity. Emotion, feeling and biological regulation play their role in human reason [our translation] (Damasio, 2011: 34).

These findings can be related to socio-cultural psychology by establishing a relationship between the sign as an image (rational element) and the meaning of words (elements of emotion and feelings), since the changing context favors the evolution of the meaning of words. Vygotsky states that, "from primitive generalizations, verbal thought rises to the most abstract concepts. It is not simply the content of a word that changes, but the way in which reality is generalized and reflected in a word". (Vygotsky, 1995: 199) Of course, the relationship between thought and word also changes.

This scenario of permanent evolution can be explained in the way we create images and bring them to consciousness at the moment of need; words, like all sensory signals captured by the organism, "are formed in various sensory modalities. The images thus formed are called perceptual images" (Damasio, 2011: 147).

which then appear in future circumstances of individuals in a process that can be explained as follows:

> Any of the thoughts are constructed with images, regardless of whether they are mostly constructed by shapes, colors, movements, tones or spoken or unspoken words. These images, which appear when the individual evokes a memory of past things, are known as recalled images... which are forged by a complex neural machinery composed of perception, memory and reasoning" [our translation] (Damasio, 2011: 148)

Images that are organized topographically in the sensory cortexes, which when brought to consciousness, every time we need them we obtain them, but not as a reproduction, but as an interpretation, that is, as a finished reconstructed version of the original (Damasio 2011, 153). In this way the thought is configured, that every time it acts it does it to create new possibilities, that is to say that in reality the thinking is a creative action. That is, the permanent reconstruction of reality is done through signs, images, symbols and representations, this is the language of the brain.

Dispositional representations exist as potential patterns of neuronal activity that act in small groups that Damasio calls "convergence zones" that "trigger dispositions related to rememorable images that are acquired through learning, and therefore we can say that they are constituted in memory" (Damasio, 2011: 155). Having clarified the process that explains the way in which images occur in thought, it is understandable that meanings evolve, specifically because they are not static but dynamic.

From this explanation of the dynamism of thought, it is easier to understand "the formation of concepts as a creative process, not mechanical or passive, which arise and take shape in the course of a complex operation aimed at solving problems" (L. Vygotsky, 1995:

119). Added to this creative condition is the function of words, without which their creation is impossible, since "the main factor in the formation of concepts, and their generative cause, is a specific use of words as functional instruments" (Damasio 2011, 155).
But on the other hand there is the internal language that is not a specific social communication, but a realization of thought. Moreover, it can be considered with all certainty a different plane of verbal thought.

> Internal speech is, to a great extent, thought for pure meanings. It is an unstable, changing and dynamic reality, which oscillates between the two components, to some extent stable and defined, of verbal thought; the word and the thought. Its true nature and role can only be understood after analyzing the next plane of verbal thought. The only one that is more internal than the internal speech... This plane is the thought itself... each thought creates a connection, performs a function, solves a problem [our translation] (Vygotsky, 1995: 223)

The epistemology of thought is expressed, which unlike speech is not composed of separate units; it is one. Thought is not expressed in words, but rather is realized in them and expressed in separate words; moreover, it can also be established that our language always has a hidden thought, that is, a subtext. With which we can affirm that thought is mediated externally by signs, but it is also mediated internally by the dynamic meanings of words.

Neuroscience and education

Since knowledge is the fruit of the construction of ideas and these come from the thought of individuals who in turn come from the relationship between language and reason, these have the risk of being correct and incorrect. In this regard Morin suggests that the risk of error may be due to different feelings, which can obscure us, because the development of intelligence is inseparable from affectivity, which can suffocate or strengthen it and the faculty of rationing can be diminished by a deficit of emotion (Morin, 2011: 29). Even so, it is clear that scientific knowledge is the most accurate in detecting errors and that no scientific theory is immune to errors, history is full of them, so it is the fundamental duty of education to devote itself to identifying the source of errors, illusions and blindness.

In order to connect the shaping of knowledge as an educational process, it is necessary to explain three theses of Damasio in this regard. The first one states that thought obeys to several brain systems working in an integrated and unison way according to a neuronal organization and not as it is traditionally stated that it is found in a single brain system: "a great part of that knowledge is remembered in the form of images in many places of the brain and not in only one (...) probably, the relative simultaneity in different places connects the separate parts of the mind among them" (Damasio, 2011: 132).
A second thesis responds to the explanation of feelings, which contrary to traditional claims are not located on an object, person or event, but include a series of brain structures that map and integrate signals from the body.

> A feeling is a momentary vision of a part of this landscape of the body. It has a specific content: the state of the body and the specific neural systems that support it: the peripheral nervous system and the brain regions that integrate signals related to body structure and regulation [our translation] (Damasio, 2011: 25).

The feelings, are in relation with some other thing that is not part of the body, that end up being qualifiers of that thing, this corporal state

that is designated in any part of the body, organs, muscles or peripheral system, sends signals to the brain where they are processed by the cerebral systems, that solve them in form of pain, pleasure or in another type of feelings, in such a way that these are sensors of the fit or the lack of it between the nature and the circumstance. In short: "Feelings are neither intangible nor elusive. Contrary to traditional scientific opinion, feelings are as cognitive as other perceptions. They are the result of a very curious physiological disposition that has turned the brain into the body's captive audience" (Damasio, 2011: 26).

A third hypothesis revolves around the concept of the mind; there is the interaction of the organism (body and brain) with the environment, taken as an evolving system, related also to many other real or imaginary things. In this sense "the body, as represented in the brain, can build an indispensable frame of reference for the neural processes that we experience as the mind" (Damasio, 2011: 27), which articulates our external reality as the basis for the explanations we make of the world and for the interpretation of our subjectivity present in our experiences and, "that our most refined thoughts and our actions, our greatest joys and our deepest sorrows use the body as a yardstick" (Damasio, 2011: 27).

Explaining these types of interactions supports a series of empirical demonstrations in which neuropsychological processes depend on the integrity of the brain systems. To achieve this, they are posed about a complex social environment that requires a wide base of knowledge and reasoning strategies to operate thought, which includes knowledge about objects, people and situations of the external world. In addition, because personal and social decisions are inextricable to survival it includes facts and mechanisms referred to the regulation of the organism as a whole. This knowledge is recovered in a segregated manner in the form of images that are manipulated over time. This memory is continuously recalled and tends to be unconsciously diminished.

The educational process must consider that when it sends these signals (images, auditory, somatosensory or other), it forms the basis of our mind, offering internal responses to environmental circumstances. The signals transferred by the brain stem to different cortexes momentarily and furtively construct the images, which we can interpret in the initial sensory cortexes, organize them as concepts and classify them into categories. We can acquire strategies to reason, make decisions and we can select a motor response from a menu available in the brain.

It is necessary that education assigns a new role to emotions and feelings in a development of mental environments built between students and teachers, so that the brain is able to create concepts, images and representations from educational activities. Furthermore, Damasio states that memory is the basis of our behavior and ensures that all this complex and extraordinary scaffolding develops the expected evolution in educational processes (Damasio, 2011:144). It works through the dispositional representations that act as an "organ" of information and government that, both innate knowledge and that acquired through experience, which is transformed into knowledge, is stored as input for our thought.

Process of concept formation

Vygotsky states that there are three phases for the formation of concepts (Vygotsky, 1995), one called syncretic, another complex and finally that of the concepts themselves:

In the syncretic phase there are the first subjective perceptions that are installed in the hypothalamus and create diffuse images that correspond to the words used by adults. In the complex phase, words for facts or things with a higher level of reasoning emerge in the infant, when he or she communicates with adults, but does not determine concepts yet. They require an interaction with the neocortex because they are logical functions of the brain. "The history of language clearly demonstrates that complex thought, with all its peculiarities, is the very foundation of linguistic development. (Vygotsky, 1995: 141) Its main function is to establish links and relationships.

Concepts develop the function of abstracting and singularizing, where similarity is substituted by grouping based on an attribute that facilitates generalization, this is the foundation of the true concept. Vygotsky states that there are two types of concepts, some spontaneously acquired in experience and others scientifically systematized in the classroom. This determines different attitudes towards the object of study and different ways of representing it in the consciousness, which does not prevent them from constantly interacting and influencing each other. "They are parts of a single process: the development of concept formation, affected by variable internal and external conditions, but which is essentially a unitary process" (Vygotsky, 1995: 161).

For Damasio, concepts are "the interpretation of the signals provided by the initial sensory cortexes in an organized and categorized way" (Damasio, 2011: 143), which the brain builds from the organism itself and "that one can know for sure that they are real for oneself, and that other beings form comparable images... it seems that they are forged by means of a complex neural machinery composed of perception, memory and reasoning" (Damasio, 2011: 143).

The purpose of educational processes is to develop thinking, they favor the processes of reflexive, critical and creative knowledge, but at the same time they benefit the relations with the other and encourage divergent thinking, which corresponds to fit the cultural feeling and the emotion in the trace of the reasoning.

The idea of promoting a motivating culture of knowledge, which can allow the construction of a classroom concept for the development of creative and critical mental processes, must be directed towards the understanding of emotional stimulus. This point is achieved by designing and generating activities that allow the encounter with the contents from the generation of favorable feelings towards the educational process, turning what today are spaces of knowledge transmission into spaces for coexistence. On the other hand, teachers would find a better attitude in the achievement of their purposes and desires to establish the dignity of a noble and altruistic profession. We can enumerate the grounds of this proposal:

a. Rational activity is not separated from emotions and feelings.

b. The mind is built from the creation of referential frameworks put in common by individuals who share a historical and social reality.

c. Concepts are images that are stored in neurons that allow us to accumulate experiences that should be enriched in the classroom.

d. Teachers must become aware of and promote spaces for reflection about neural activity and its connections in order to improve the teaching experience.

Creative thinking

The creative condition is a capacity that develops the human being to understand the environment and modify it for his service or the

social group to which he belongs. Creativity is a process that develops the organism and of course emanates from neural activities. This analysis is based on the fact that it is a capacity that all people develop, and not only some talented ones:

> "Man is creative by nature, he tends to grow, to develop in ways that are not given to him, to manifest himself freely through science, art or simply through the actions that he develops in his daily life ... it is something that we all possess and can develop, and not just a gift mysteriously granted to a few notable and different people" [our translation] (Barrena, 2008:15).

The creative act is the one exercised by people so that they can dispose, create or discover different possibilities to face the world of life, it chains the old and modifies the future, it takes the trace of the events and combines the possibilities of improvement of the thought and the activities of the culturally associated human beings. It is not an act of brilliance, but of solidarity and a successful vision for society. It is clear that there are some individuals who are more creative than others, in the same way that some civilizations become more creative than others, in which there are cycles of boom and bust, which favor the apogee and improve the standard of living of their members, or present options to solve their problems.

Now, in the words of David Bohm

> The challenge facing humanity today is unique, since it has never faced its own destruction, or at least its own way of existing. Clearly, a new wave of creativity is needed to meet it, which must include not only a new way of doing science, but also a new approach to society, and even more, a new kind of knowledge [our translation] (Bohm, 2007: 230).

There is resistance in our societies to achieve change, especially the abandonment of the so-called comfort zone of many people who are influential in the economic and political destinies of the capitalist reality. In fact, we cannot define society as being torn between growth and decline, but rather between creativity and destructiveness. A situation that leaves us with frightening possibilities in the face of the power of global destruction that leaves no corner of the planet that can refrain from facing this situation. Hence, "not only is a new creative wave needed, but a new order of creative wave, an order that extends to science, culture, social organization and knowledge". (Bohm, 2007: 233).

Consequently, and taking up again the conception of a creative thought inseparable from the material processes of the brain, the nervous system and therefore the body, we must relate it to the sensations and the intention. Neuroscientists state that knowledge is "the epiphenomenon of the brain" and therefore is a material process that can be scientifically studied, it is not disembodied, although it is called a mental process, it can be understood as the interweaving in which mind and matter are two separate but interrelated currents.

Creative thinking is a mental, subtle and material process, manifest. There has been a change in conception, from "what is known in total" to "what the individual knows in total", "this change of meaning accompanies the change in the order of society, in which the individual has become increasingly important" (Bohm, 2007:236). (Bohm, 2007:236) This variation is important in the face of the conception of consciousness that individuals have and that takes on validity in the face of the possibility of a total destruction of life as we know it. In the case of the study of creativity, "consciousness means "care" or "attention", which makes us evoke the image of an extremely attentive or perceptive person, and therefore willing to respond to subtle impressions of all kinds". (Bohm, 2007: 236).

This marked sensibility responds to differences, similarities and subtle relationships in the impressions of the sensory organs. It is also the source of information that gives rise to the perception and apprehension of forms, orders, structures, and in general everything that has meaning in conscious knowledge, which means that it is flooded with a sensibility to the immediate processes of the environment, the body and the mind. In this sense Bohm affirms that only in this state does creativity arise, and it occurs as a libertarian act, in his words:

> ... the free movement of consciousness and attention has no inherent restrictions, and is limited only by the needs of the moment and by the permanently rigid features of the knowledge infrastructure. This free movement of consciousness and attention is closely related to the free play of thought. In fact, creativity needs both forms of freedom, which in essence are only one" [Our translation] (Bohm, 2007: 240).

But for conscious knowledge and sensitivity to become creative thinking, imagination and socio-cultural memory are necessary, as well as circumstances that provoke it and an intentionality that encompasses it. In situations such as these, it is to be expected that students must face the real world, and the ability to face new facts with good judgment will depend on the efficiency with which they do so:

> "in such conditions, the importance of creativity is unquestionable, since it favors flexible and integrating thought processes, granting greater openness and audacity towards the new, increasing the capacity of response, and therefore, control of reality." [our translation] (Cheng, 2000: 36).

Thus, creative thinking is put to the test every time it is necessary to respond to a human need or when a problem to be solved is found, it emanates from sensitive knowledge and mental flexibility. Then we have that, in great part, in every moment that individuals exercise creativity they generate a learning through the discernment of attributes, which develops new concepts.

Creativity in the university classroom

It is important first to situate the context of the university in Colombia. It begins in the 17th and 18th centuries. First, of a confessional nature, "from religious communities ... today several of these universities still exist, as is the case of the Pontifical Javeriana University and the San Buenaventura. (Tobon, 2007: 26). This colonial university, says Tobón, was dedicated to forming the Creole and Spanish elite, initially by training lawyers and priests. The clergy administered the universities, predominating the method of scholastic philosophy. Then the modern university inspired by Bolivar and Santander emerged, which "raised the importance of promoting the study of agriculture, mining and commerce, as a condition for the development and modernization of the country; this idea would take more than a century to be interpreted by the ruling classes" (Maldonado, 2006: 110); but it is the French university, composed of professional schools and faculties, which finally forms the university of North American influence, organized by departments of the same discipline.

In the 1960s all kinds of institutions of official and private order proliferated in which there were great ideological confrontations, which sought to criticize political influence and dependence on economic and social class interests. Finally, in the 1990s, with the search for quality and internationalization, a system of basic and higher education was created that left behind methods based on memorization and the transmission of data, and gave way to an education focused on problem solving, in which a field of research fundamentally linked to the productive apparatus was developed.

The university was then placed in the sights of the global market, which determined that within it were woven a number of strategies from which it is difficult to separate, and any analysis goes through first understanding the forces that influence its government.

In this order of ideas, the teaching that takes place within it is not alien to the dynamics of the market. On the contrary, it is shaken by institutional pressures to establish an instrumental leadership that goes through the development of the higher education system based on the dissemination of the official parameters of Science, Technology and Innovation. These are the basis for the public policies induced by an economic development that determines the creation of a market for university services. On the other hand "the affirmation of the autonomy of the universities occurred at the same time with the privatization of higher education and the increase of the financial crisis of the public universities" (De Sousa Santos, 2005: 14), which outlines the generalized opening of its commercial exploitation, materialized "as a market for university management, curricula, diplomas, teacher training, and evaluation of teachers and students" (De Sousa Santos, 2005: 17).

This business logic deals strong blows to the academic life of the university, making its work more precarious, reducing the professors to proletarians without vision, with meager salaries and forced to compete endlessly for a teaching position, who see the teaching quotas diminish more and more as the administrative ones increase. Another factor that depresses university quality is educational credits. In the same vein, Chomsky notes that "Student debt is a trap that young people will not be able to get out of for a long time. Credits work as a burden that forces them to move away from other matters", (...) "Maybe they did not arise with that purpose, but of course they have that effect" (Mendoza, 2014: 12).

This context includes an educational system where the incommensurable possibility of incommunicative information, the sense of communicational artifacts lacks background, radicalizing the superfluous and giving vigor to the emotions. The so-called real time mitigates the effectiveness, replaces the wonders of eternity, mutilates the past and cuts down the future forest, advancing the coveted contemporary landscape. Thus, the instrumental users find in this structure "the possibility of being born again, that is, of ceasing to be what one is and becoming another person who is not yet" (Bauman, 2008: 9).

That is why we find circumstances where students today are losing their identity and are heading in search of multiplicity, in which education must be reinvented, contextualized in the face of permanent change and provide parameters that are increasingly close to controversy, replication and agreement. A situation where the truth is less and less in force and the student is more and more a spectator of the varieties.

In conclusion, the global system, which we could describe as neoliberal in the contemporary world, proposes a type of education that serves the productive apparatus, but not the creation of solutions to its crisis. It does not aim to generate people committed to their society, reflected in the teaching attitude that resists change and is evident in a traditional concept of a closed classroom, lacking connection with the macro context from which it emerges. Now, unexpected behavioral changes are presented in the educational environment and more and more the classroom landscape is accompanied by technological devices, where the demand in university education requires that the ingenuity and creativity incorporate communication technologies to the learning process and thus energize and build knowledge, generating in turn better academic performance in terms of retention and / or assimilation of content and skills.

Consequently, in order to understand creative university thought, we must achieve an updated university in accordance with new means that involve a new education, relevant to the needs of the societies from which they emerge, where creativity is associated with new thinking and not simply with the use of new technologies. University creative thinking must be conscious in the Vigotskian sense, that is, it must adapt intelligence to reality and try to influence it, or, as Bohm puts it, it must mean thinking flooded by a sensitivity to the immediate processes of the environment, the body and the mind. We will therefore expect students and teachers to face the real world, with the efficiency and capacity to challenge new facts with good judgment.

Conclusions

Thought is an exclusive mental activity of humans, whose progress is planned in four stages that give rise to it: primitive, religious, modern and contemporary thought, each of them formed according to the behavioral habits of their historical period. It was evidenced that thought has a dual character, logical-emotional, which contributes to the formation of science and accumulation of knowledge, and to its spiritual character generated in magic, the sacred, passions and feeling. It is also linked to mental activity through language, which is dual in another sense: physiological, as it expresses itself in its oral and written forms, and symbolic, produced in the evolution of physical skills and habits of the human being, whose meaning emerges from the cultural inventory of the species. Thought allows the development of the species as a social construction consumed by individuals who exercise creativity, for which the imagination that is increased by the particular experience of the experiences of its members contributes in good measure.

Thought and speech are integrated as a socio-cultural experience that energizes the structure of intellectual operations. Language has two facets, one external, verbal, and the other internal, semiotic, thus determining that thought and language converge in the meaning of words. The individual in the game of free will appropriates concepts that are reached in his phylogenic and ontogenetic development that allow him to perform his psychic functions. It follows that imagination and creativity are related to experience, an indispensable premise for appropriating freedom of thought, action and knowledge, the use of language and specifically human functions such as speaking, understanding, hearing and articulating spoken language.

From a biological conception, thought is the capacity to order the images represented internally, and the mind forms these representations, which converted into images are manipulated by this brain activity, to influence future behavior, it is a conception of progress. This rational processing is united with the emotion and the feelings as basic functions for the survival of the human organism. Consequently, the body is part of a chain of operations that generate high capacities of reasoning and, by extension, of social and creative behavior.

The emotional has interference both in creativity and in the people who exercise it, and this subjective quality underlies the experiences that are related to affection, feelings and state of mind. Creativity is a process in which four skills are developed: fluidity, flexibility, originality and elaboration, which are combined in the resolution of problems or in the development of new ideas. It is also good to note that a positive emotional aspect is associated with a large number of interconnections in the memory that facilitate the multiplicity of ideas, ostensibly

improving creative thinking, capacities that favor cognitive flexibility and consequently academic performance.

When affection and creativity are associated, self-confidence and self-esteem are improved, generating responsibility and thought patterns capable of generating new ideas. In addition, the ability to abandon a normal sequence of thought for a different and productive one is developed. We have that every time individuals exercise creativity they generate a learning that ends with the creation of new concepts. We propose a type of creative thinking that does not cling to the intellect, that builds options and new proposals, orders and underlying structures, and thus, intellect, emotion and volition will be inseparable.

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