Learning and knowledge interchange: a draft approach for the transdisciplinary study towards the third culture

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The Doctorate in Education with specialization in Pedagogical Measurement, should actually be called ***Doctorate in Third Culture***, as can be concluded from the courses of the stage (foundations, principles and values of the quantum Paradigm) that establish the framework for the courses in the second stage (pedagogy, art, health education). The third culture, must be understood as the natural result of surpassing fragmentation within subject areas, as advocated by Salvador Paniker and John Brockman in the book "*The New Humanists*: *Science* at the Edge[1]"

The location of the Third Culture´s subject is presented to us by John Brockman in his book "The Third Culture, beyond the scientific revolution". In 1959 Philips Snow published a book with the title "The Two Cultures" where he states that on one hand there were the humanistic intellectuals, and on the other, the science intellectuals. While humanistic intellectuals begin to call themselves "intellectuals" from 30's, all scientists, despite their eminence, were excluded from that group and remained invisible for many years.

In 1963, Snow published a second edition of the book in which he suggested that a Third Culture would emerge, without communicating with the scientists who are consequently, those who are speaking directly to the public. A public that begins to be familiar with concepts such as molecular Biology, artificial intelligence, theory of chaos, fractals, biodiversity, nanotechnology, genome, etc. A public that flees from old theological disquisitions, but begins to be excited with secularized questions such as: what is the origin of life? From where did the mind emerge? How did the universe begin?

Thus, this new humanism must be able to face all these issues from within a knowledgeable base, for it reaches the arsenal of metaphors provided by exact sciences. The new humanism, no longer has to be a classic humanism, but a new hybridization between sciences and humanism, with understanding that the gravitation of science over philosophy has always been crucial. Emile Bréhier points out that, during each age, and increasingly, the economic model of production,

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influences the astronomical image. It is the divorce between sciences and humanism that reaches its high point in the famous phrase of Sartre: “Science does not interest me”.

In 1991, in an article entitled “The birth of the third culture”, Brockman set up the following argument: “In the last years, the land hosting the game of American intellectual life has experienced a change, leading to the increasing relegation of traditional culture”.

Twelve years later, this fossilized culture has been essentially replaced by the “third culture”, which was the title of the essay by C.P. Snow, bringing forth his well known division of mind into two cultures: the humanistic intellectual and the scientific one. This new school of thought is represented by those scientists and creative thinkers of the empirical world, whom through their investigations and written material, would fill the emptiness of communication between the humanistic intellectuals and the scientists. But nowadays, the humanistic intellectuals still do not communicate, whilst scientists are already communicating directly with the public, who is becoming more and more familiar with quantum sciences, biodiversity, human genomes, etc.

The recent scientific bestsellers are surprising the intellectuals of the old school. It’s important to remind you that the official approval of this doctorate is a demonstration of this, because it had to emerge as a doctorate in education, although more than 80% of the doctorate syllabus is based on sciences of the emergent paradigm.

Many and many “guardians” of the system, have not yet taken consciousness that the new sciences of the quantum paradigm have become today culture of public knowledge.

We are living in a world in which the greatest change is in itself, the rhythm of that precise change. Thus, the constant reporting of scientific issues.

The most important subjects of the Third Culture are new: molecular Biology, theory of the chaos, neuronal networks, fractals, complexity, biodiversity, dynamic equilibrium, fuzzy logic, Gaia hypotheses, virtual reality, cyberspace – in reality, the subjects in which upon which the doctorate syllabus is based. This is a developing list, for based on the strength of the Third Culture and its need to allow for new features that must be accepted as new contributions of this cultural dimension,

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there cannot be a definite and finite list. From this point of view, the aim of the doctorate has chiefly to do with the change of activities, and not as much with the content areas to be covered in the syllabus.

It does not worry us that people know about the new issues. What is really important is that they think and if they question scientific foundations such as holism, complexity and the new life sciences.

The Third Culture is such a powerful idea that it cannot be continued to be ignored by universities, for there are such profound, fast and decisive changes at stake that we can no longer depend on superficiality and arrogance when assuring that the quality of education is the result of the improvement of education.

In order to improve education, this must be considered a high – priority, it requires a qualitative change that has to do, mainly with our mental models, and not as much with the changes of our teaching methods.

This does pertain to doing better, what we have done until now, for with this alone we can fine tune the system. This concerns responding creatively, and without submission to the demands of a system that needs to reproduce (give response to) the whole educational apparatus.

Richard Dawkins (philosopher-scientist), leader of the **Third Culture**, speaks of the same when talking about these socio-cultural stereotypes. To rid ourselves of these memes (cultural values/ patterns of behaviour), implies a gigantic mental adjustment, to which not everybody is prepared for.

A common and a very ominous meme, but certainly very present one, occurs when comparing teaching with education. Good teaching will be compared to good education. But practice shows that this meme is not correct. We boast that in Costa Rica, from the XIX century we have lay, free, universal and compulsory education. But in fact, what we have is a free compulsory state school that does not teach, does not promote learning, and consequently, does not educate.

The promotion of learning should be the concern of the educational institutions of the **Third culture**. For that reason we maintain the doctorate thesis focusing on “the necessity to progress from a teacher society to a trainee society”. For with the education that we have, we place the destiny of humanity at risk.

When demonstrating the scientific grounds of the Third culture, contemporary philosophers of science like Dawkins, Dennett and John Brockman want to show the necessity to include the educative processes in scientific terms. From the quantum dimension they make us see the reasoning of science, and the reasoning behind Gell Mann's historical contingency, who calls for plectics or the study of simplicity and of complexity, not only in the nature, but also in the phenomenon of the life, such as language, economy education, of course. It does not merely concern the study of thought processes, but also life itself. This experience is the essence of the educational process.

There are encouraging indications that the **Third Culture** currently includes humanistic scholars that think in the same way as scientists do. Like their scientist colleagues, they believe that there is a real world that needs to be understood and explained. They examine their ideas based on logical coherence, the explanatory capacity, and in conformity with empirical facts. They do not limit themselves to the opinion of the intellectual authorities: they are pre-disposed to question every idea, and from this challenge they thus develop understanding and knowledge. They do not limit the humanities to a series of biological and physical principles, because they firmly argue that Art, Literature, History and Politics – all the repertoire of humanistic interests – need to pay attention to the scientific field.

The arts and sciences have begun to be united in a single culture: **third culture**. Those who participate in this development, from the both ends of the C.P Snow's spectrum, are presently at the centre of intellectual action. They are the new humanists.

John Brockman's book about the third culture takes us to other creative thinkers, such as Richard Dawkins and David Dennet, who have reflected on the reasons of science and on the historical contingency that is related to Plectics (the study not only of thought, but also of complex behaviour), this which for Dee Hock (*Birth of the Chaordic Age*), raises the expectation of the transformation of consciousness, culture, society and the institutions. He wonderfully synthesizes it in one phrase: *"The 21st century is going to be an extraordinary period and it is time to imagine where the birth of humanity can lead us to".*

It is important to consider the historically renowned cases of this approach between the two cultures. I make reference, even if very briefly, to the testimony of Goethe, the scientist-poet, who was the first modern figure who was able to experience science, to feel it and to express it.

"*Thinking synchronously with reality*, he says, *is to locate the act of thought about the world in such a way that it does convert to a judgement about thing, but rather an instrument of things".*

Understanding of the "Third Culture" reinforces some of the main practices of the doctorate. I will highlight those with most worth and importance. It is obvious that presently, it is not necessary to go to university to learn, nor even to receive information (to be taught).

The same was said some years ago about school, when the first printed books appeared. Nowadays, with the widespread use of computer systems and laptops, it is not necessary to go to university to learn. The best way to help others to learn is to give those who are interested (creative and sensible people), total freedom, so they can learn what they want, with their own methodologies and technological means.

The transfer of the information cannot be reduced to the act of teaching. As pointed out by Nicholas Humphrey "*The teachers are too routine and a little too rational with a lot of faith in didactics, which minimizes approaching the trainee."*

In doctorate slang, we would say that to be a good teacher requires one to have a dose of craziness, in order to be able to go beyond the established norms. Rupture is a required condition for opening up to new outlooks, for it is not commonly possible to modify established norms. Reform proves to be insufficient.

In this line of thought, and referring to his friend Francisco Varela, Dawkin Dennett reflects on the following: "Francisco and I have many things in common, although we are friends and colleagues in some way I am his worst enemy, because he is a revolutionary and I am a reformer. As a good revolutionary, he thinks that it is not necessary to change the established order, with its control and norms, but to eliminate it in its entirety. It is better to start with a clear slate… we speak about the same issues, but I try to maintain many things that Francisco excludes because they obstruct."

What obstructs and what must be eliminated? Without contemplation, each person and each institution will have to eliminate everything that obstructs the promotion of learning. What is truly obstructive is the control and the rules that frequently annul and deny the established aims. Understanding and attaining the Third Culture blossoms from the imagination, thus risk and rupture are necessary for that radical

transformation, to which Kaku often alludes to as an embracing and fascinating transformation movement – the results of the crossing fertilization of three crossed revolutions:

- The quantum revolution disemboweling the secrets of the particle.
- The biomolecular revolution disemboweling the molecule of the life.
- The computer science revolution.

According to Dee Hock (author of the book *El Nacimiento de la Era Caórdica (The Birth of the Chaordic Age*), these three revolutions presuppose the transformation of the consciousness, culture, society and institutions.

Proposal for a self-organized and rhizomatic doctoral

Self-organization answers one of the fundamental principles of the doctorate, but in the last years self-organization was seen as a new science[2]. The truth is that during a long time, self-organization remained as a field of study which was not recognized by the system, because it was not one of the conventional disciplines. However, in recent years, scientific interest has led to new understanding of self-organization as a new science. This can be seen from the investigations of Fox Keller and Lee SEGEL about self – organization of the colonies of Fango mould.

The new science of self-organization demonstrates the possibilities adaptation of complex systems of new behaviours, from the laws of the emergency.

Initially, self-organization was attempted to be understood without considering the emergent consequences. At a later stage, it was proven that self-organization transcends known subject areas. Presently, science admits that in the origin of the collective behavior there are new results that occur and that were not known. In the process of developing and learning self-organization, it is important to work on these results. We are before subjects of great interest in the doctorate. More concretely, it is important to understand the complexity that arises from self-organization, which some authors identify as systemic complexity, which transcends the present models of comprehension which are non-organized realities.

Firstly, we have to recognize that within this new reality, which is the result of self-organization, new “patrons” come forth, some of them, even detained in the apparent chaos, which leads us to investigate the potential deriving from the resulting complexity of group self-organization.

There are four reference points that bring forth information about this new dimension of self-organization. According to Jane Jacobs' studies, it is really exciting to go through the self-organization of the carnivorous ant colonies studied by Devorah Gordon, as well as the self-organization of the urban districts of big cities.

Marvin Minsky research on the interconnections of the human brain would be of greater interest, because it concerns the daily results that occur in our own lives. A fourth reference point can be of major interest to those who within the computer science area, study self-organized communities on the web, which is really original and authentic.

Self-organization has been very present in the doctoral process. At the beginning of the doctorate in September (2003), we made clear that self-organization will be one of the essential characteristics of this doctorate.

Methodology

The methodology which enables the self-organization and rhizomatic process is based on reading, reflection, production and group interchange. Inspired by some authors, we propose a rhizome process as this is a most suggestive analogy for the methodology we aim to for. In the following discussion we want to share some ideas that have helped us to develop the rationale for our methodological process and practice.

We are working from the established principle that we will not repeat what has been already said in some fields of science and in the applications which have been put into practice. Our purposes are to innovate, to discover and to construct our own routes. If all of us are convinced that knowledge is born from an interactive process, we will have the courage to break with many routine and stagnant forms of transmission of knowledge. In this way, the voices are testimonies of connoted Latin American scientists, who will encourage us to tread new paths before it is too late.

Max Neef, from the realm of economy, states: *"Nowadays I feel categorically and deeply convinced that the way things happen, make heresy the most powerful element of conservation in life, and for a survival that is worthwhile."* (Max Neef, 1994, p: 70)

Payán, from the realm of medicine, assures us that: *"Our traditional form of thinking does not have to be imprisoned in schemes that explain our incapacity to find new*

ways. Only heterodoxy and vital disobedience can set us free from those deadly networks". (Payán, p: 35, 2001)

The attitude of Maturana is even more radical: *"I do not like the authoritarian situation because authority is formed in obedience. We cannot have authority, but we can receive other's obedience. When granting authority in obedience, we do not collaborate, but subordinate."* (Maturana, 1996, p: 35)

Recreating a collective learning methodology and knowledge interchange

"Education is the process of creation of possible relations, whereas schooling is the process of repetition of pre-established relations" states Calvo, p: 10, 2004. What we set out to do? To find a collective methodology of knowledge interchange. We aim to construct a path which is built within the process of construction. This pre-supposes an initiation built upon multiple initiations. Thus, we start from the lack of knowledge (voluntary) of pre-established structures, in order to promote dynamic, enriching, rhizomatic nomadic structures.

Rhizome is not linear, because logically, it does not cross these well-known spaces. One of its most important characteristics, is perhaps to have multiple entrances, footpaths, paths, with different junctions for escape, imperceptible, but often real.

It has to do with construction of our own paths with entries and different exits. This is the challenge that moves us in this direction. It is necessary to away with old ideas, customs, even with old companions. New things cannot be created if we do not make room for them.

Rhizome as analogy

Rhizome is a stem that grows horizontally, emitting buds that become aerial stems, usually producing roots and having its own organization, rich in possibilities, because of the abundant lateral and surrounding ramifications.

Rhizome has different forms, from a graft superficial extension, to connections in bulbs and tubercles from the root, especially from the multiplicity of secondary roots.

These significant attributes of rhizome, presume multiple initiations that give the

process unequal and unforeseeable force. It has been stated that the rhizome approach is developed through variation, expansion, acquisition, capture. Rhizome is done, created, organizing itself under construction. As a process, rhizome can be interrupted, and can even be broken, but it always recommences according to foreseen or unforeseen paths. It is a permanent reconstruction. Rhizome is made continuously and grown according to immanent lines of escape and with its own vital force.

The analogies of the learning process with life and with the development of rhizome are obvious. We will underline some of the rhizomatic principles that have to do with the pedagogical process of production and collective interchange of knowledge.

Connection Principle

Any part of rhizome can be connected and united to another part. This possibility of connecting, of uniting, of interlacing itself constitutes the foundation of the collective organization. Group construction makes the organization of the information and knowledge possible.

It is important to find network systems in order to avoid fragmentation and separation of knowledge. Rhizome breeds concrete realities as a result of the multiple possibilities originating in the established relationships.

The process of methodological recreation will be much richer and more productive, if it has better quality and greater interchange connections that occur between the participants. It is important to highlight that more and better relationships will provide more and better results. It is appropriate to state that the creation of possible relationships is based on the achievement of the methodological proposal that we strive for.

This search for new and significant relationships, pre-supposes a break with personal, group, institutional and social ties. At a personal level this rupture has to do with new outlooks, freedom and respect. In this way, the ethical relationships are fundamental, because as Maturana (1996) states, they make us view others as legitimate others. We cannot sow if we do not have the seed. The rupture at an institutional level, forces us to extend from a reality which is fragmented into parts and specialties, to a reality of complex relations that allow us to see that fifth dimension that unites us with the universe. (Payán, 2001)

Multiplicity Principle

Rhizome, unlike pre-established structures, has neither fixed points, nor positions, nor states, nor qualities, but possibilities and multiplicities. For Bateson the whole process must be understood as a set, a plot or a network of interacting parts. The multiple entrances, the different paths of escape, the significant combinations of rhizome, reinforce and justify the collective organization of the methodological process that we aim to recreate: "*An organization is truly the increase of dimensions in a multiplicity that necessarily changes the character, as it increases his/her connections*". (Bateson, 1993)

It is worth reinforcing that convergent and participating multiplicity, offers the methodological process as much consistency as it does, dynamic future. It does not have to do with the entirety of units, but with a synergic interaction that involves new forms of organization and actions: "The synergic process has such a singular and interdependent dynamics, whilst at the same time, it is so absent from our educational systems – formal and non-formal, that any proposal that we wish to bring forth, results in a pedagogical adventure". (Bateson, 1993)

The adventure, like dreams, needs to be shared because only in this way will we obtain that necessary synergic potential for this singular course. Payán with the poet Apollinaire whisper that the adventure also demands boldness and courage.

Opening Principle

Rhizome suggests the maximum connectable and susceptible openness in all directions, whilst being equally susceptible to receiving constant modifications. Rhizome does not have models to follow or to reproduce. A blocked rhizome is no longer rhizome, because it no longer exists. Avoiding the blockades will consequently be one of the considerations of the process. It is blocked when desires do not arise and they do not happen, given that the desires always take place and they move rhizomatically. Very frequently, the external blockades come from our internal blockades.

The openness has to do with creative and challenging experiences, from the new situations, going beyond, developing new methods, to drill in all senses. This investigating process is perfectly clear if we visualize freedom, persistence and challenge, as much from the root that stems vertically from force, as from the abundant lateral ramifications that are persistently drilling situations, to be able to

continue the path.

This dimension of openness, freedom, acceptance and challenge, creates a new type of knowledge, in which rationality and sensibility, science and the esthetic come together, along with ethics in multiple games of language, symmetries and asymmetries, chances and determinations, bringing new identities to the subject-objects.

Some conceptual suggestions

We must find agreement as to the key concepts we must foster in relation to the three focus points of the methodological process- the reading, the productive and the interchange reaction.

The reading must be deliberate, incidental, conditional and conditioner. What does this mean? That the reader and the circumstances have to condition the act of reading, and what is more important, is that the reading must influence the readers at all levels. On the other hand, the alternative dimension of education must be an assumption of the reading, always present and equally determining.

The production as a reaction to the reading must be creative, provoking and challenging. Being based on book expositions, or the reading of a document that represents stimulating and evocative suggestions. Positions, that manage to harmoniously conjugate meaning with the heart and reason.

As Morín would say, in a poetic dimension: “Prose makes us prosaic, only living in a poetical way living is truly living”. (2001, p: 38)

The Interchange must be open, synergic, circulating in a network or better- in rhizome, which creates a living and multiplying plot. A plot whose organizational head is naturally implicit, based on systemic thought, in terms of connectivity and organized complexity. Only in this way will we be able to create among ourselves, a world of possibilities, which at the moment cannot be fathomed, by our codes and closed channels of academic communication.

Notes

[1] The New Humanists: Science at the Edge. An edition by John Brockman. Kairós, Barcelona, 2007

[2] Emergent systems. Steven Johnson. FCE, 2003

Translation: Anabela Nobre