University strategy for transdisciplinarity and complexity

También en Català

Gaston Pineau

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The strategy occurs during the action, changing, as the occurrence of events or the reception of information, the desired behavior. Strategy involves: uncertainty), b) ability to modify the development of action depending on the opportunity and news.

Edgar Morin

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Introduction

Good afternoon to everyone. First of all I want to thank the organizers of this meeting: Mr. Eduardo Espinosa Herrera, Rector of CEUARKOS, Mrs. Ana Cecilia Martinez Espinosa Deputy Director of the same university and my colleague, Pascal Galvani, my research colleague in university strategies to deal in the transdisciplinary treatment of the complex post-modern reality. Without them we wouldn't be here today.

As you can hear, I don't speak Spanish well, I apologize for that and count on your patience and your patience with me as a young learner of this sunny language.

Before I begin, I want to comment on the first slide of my presentation that gives us not only the conference title, but also gives us the main context. The arches shown are a symbol of the city and the university, and I find it very important because the city and this university are one of the rare places in the world that have both a transdisciplinary policy and strategy, which must be emphasized.

We will be holding the conference in three parts. The first will bring historical focus to the transdisciplinary approach. The second will present four presentations of transdisciplinary research, and the third part will highlight three key points in the development of university strategies.

Transdisciplinary movement as an attempt to respond to the division of courses and external pressure of non disciplinary problems

Firstly we will present the transdisciplinary approach through two frameworks.

Historical Evolution of university strategies in the division of complex reality used in the western world

5thCenturyA.C.) -18th Century Pre-Modern Strategy	**18th Century–20thCentury Modern Strategy**	**21stCentury PostModern Strategy**

Greco-Latino Period	*Subject division of separated theoretical objects*	*Emergence of Research on relationships,*
The art of the word	Exact Sciences	Action, Interaction,
Trivium: Grammar,	Physics, Chemistry,	transaction,
Dialectics , Rhetoric	Biology , zoology	Administration
The art of numbers	Social Sciences	Education
Quadrivium:	sociology, psychology,	Communication
Astronomy,	Anthropology,…	Ecology
Geometry	Political Sciences and	From the notion of
Mathematics, Music	Económical	hierarchy to network
Medieval Universities		
Theology, law, medicine		

First historical focus. This framework focuses on three main historical periods that are characterized on one hand, by the type of society (pre-modern, modern and postmodern) and on the other, by the university strategy that divides complex reality for its treatment. We can see and read that this table includes more than 20 centuries. It would take much time to describe it in detail, but I think it briefly provides us with some interesting references.

The first point: contains only 3 periods of university division, only 3, but very extended over time. To such an extent that each of the periods overlaps into the others. The Pre-modern period ranges from the IV century BC to the X and XI; the second period: modern society which starts in the XVIII, XIX; and the third period: seemingly emerging with post-modern society.

For example, we can see that law, theology and medicine comes from the medieval university, and the mathematics and music from the Greeks, and for each period of time there is almost a hierarchy of divisions.

Within the pre-modern society, theology is the prevailing discipline. We can say that the modern period is born with the modern disciplines in the early XIX century. We see that there are disciplines, but we need to define them. UNESCO defines a discipline as “a specific set of knowledge that has its own characteristics within standards of educational planning, training, methods and subject content”.

Modern society was founded on the creation of disciplines that defined the fields of knowledge and theoretical fields, with exact sciences, physics. Physics being considered the most important subject which must serve as basis and provide a framework for all others. The philosopher Auguste Comte said that to learn the social reality one needs social physics. This bringing forth a large division of

disciplines, dating from the XIX century and which presently is the basis of our institutions.

It seems that the end of the XX century brought the emergence of a research movement on the relationship between disciplines, which also considers that there are sources of knowledge that are not necessarily within the disciplines, thus considering that each person can be one source of knowledge in him/herself. Thus, transdisciplinarity is set within this rather wide historical movement, which shouldn't be forgotten.

I will present the second framework. There are several names: pluri, multi, inter, transdisciplinary which are composed of prefixes: inter, pluri and trans. We speak of multidisciplinary when there is merely overlap between the disciplines, and there is no interaction. When there is interaction we can talk about interdisciplinarity. But when there are mutual relationships, we can use the prefix 'trans', which means: in, through and beyond. Therefore, you can see how the movement was born. It is not fixed. It is in movement. (See table 1).

I think that this should suffice in contextualizing our focus, and we will now look in more detail at the work involved in the four research investigations, which may be considered as transdisciplinary.



Dr. Gaston Pineau during his conference in CEUArkos

Four transdisciplinary investigations

We understand that the transdisciplinary approach stands at the crest of a movement among the disciplines that project themselves through and beyond, or even beyond the beyond. Let us look at this research of the possible beyonds.

The table reports on the four investigations:

a. Intersection of knowledge: When the fourth World and University think together;
b. On the air. Essay on ecotraining;
c. Socio-ecological transactions and development of

d. Medical practices, training; training and transdisciplinarity.

Table 1
Representation of uni-, pluri-, inter-, transdisciplinary motion according to opening and disciplinary interaction grading

Opening and disciplinary interaction grade	**Name of motion**	Examples
0.“ Specific set of knowledge that has its own characteristics in terms of education, training, methods and subject content”. (UNESCO 1972)	**Uni – disciplinarity**	University disciplines: – “Exact” number based (mathematics, astronomy, physics, chemistry, biology). – “humanities” the letters (theology, philosophy, law, literature, history, sociology, psychology).
1-Juxtaposition of various disciplines that deal with the same subject	**Pluri Disciplinarity multi**	Example: Pluridisciplinary exploration of the same problem, issue. Educational Sciences, history, law, ecology (8) Fighting against poverty.

2- Interaction between one or more disciplinary elements: subject content, methods, objectives, concepts. Inter-relationship with equivalence, prevalence, dependence.	**Interdisciplinarity** – centripetal (sponge procedure 1) – centrifugal **Co-disciplinarity** – Links between disciplines and co-construction of meaning from the same problem.	
3- **Transaction through and beyond disciplines**. 3.1 As a starting point, the opening of elements including non-disciplinary (problems, methods, knowledge). 3.2 During the process, receptiveness to meta-disciplinary reflections. 3.3 Finally, opening to pos-discipline units (epistemology, methodology, field). New paradigm	3- **Transdisciplinarity** 3.1 Socio – interactive Transdisciplinarity between experts from disciplines and social actors and 3.2 **Reflexive Transdisciplinarity**: Questions about the frameworks of thought and 3.3 **Paradigmatic Transdisciplinarity** paradigmatic attempt to build a new unifying paradigm.	knowledge for action

We will return to each one of these and see the authors, objectives, epistemology, methodology and problems. Let’s start with the problems, because what makes us see them as transdisciplinary research, is first and foremost because they address social and cognitive transdisciplinary problems.

The first research problem is the fight against extreme poverty, secondly the fight against pollution, thirdly the fight against social exclusion and the fourth questions a medical experience – classical opposition between scientific medicine and modern medicine.

Consideration of problems which are not exclusively disciplinary, is key in qualifying these research investigations as disciplinary. All four focus on research problems that go “beyond” the disciplines themselves, whilst maintaining a focus on the disciplinary dimension. During the referred period of 15 – 30 years, in which the

research was developed, these problems have crossed the border of the normal and usual objects of study and research, thus imposing itself on the disciplines, thanks to teacher researchers, groundbreakers in these disciplines, or through personal investigation in PhD research.

Now we will see each investigation.



Gaston and Pascal Pineau ₃ Galvani with members of Taller Transdisciplinary CEUArkos

Of the four investigations, two doctoral investigations are individual and two investigations are collective, one with a European dimension on the fight against poverty, and the other, with a French-quebequois dimension about the fight against pollution. The problem of transdisciplinary research is therefore, not maintained by a same social base, this which determines the objectives and the development of knowledge very different.

Intersection of knowledge: When the fourth World and University think together.

The first investigation is called “Intersection of knowledge: When the fourth World

and University think together". This research presents a wider social and heterogeneous base. The collective author "Research Group of Fourth World – University" consists of 32 agents – authors who belong to three different subgroups.

- One group, the university collaborators: 12 researchers and teachers representing 8 disciplines: law, economics, educational sciences, medicine, physics, criminology, history and sociology.
- Another group, the agents – authors: 15 people who live through the experience of a direct and daily struggle for survival in conditions of extreme poverty. In 'Help All in Distress' (O Angustia) – Fourth World (ATD – Q-Monde), these people are called militants.
- A third group, permanent-volunteers from the ATD movement: 5 people who voluntarily commit themselves to several years in combating poverty and the misery of those who live under these circumstances.

The project's double objective: to produce common knowledge about the fight against poverty, through sharing this knowledge for the development of team action in research – action – training through a triple alliance: University – professionals – public.

The achievement of these two ambitious objectives on behalf of the 32 agents-authors was motivated and supported by a pedagogical team 6 people and also a Scientific Council of 7 people.

The Franco – Belgian project was established for 5 years, from 1993 until 1998, with European funding, and has become a work which some people describe as historic, mainly due to its methodology and epistemology of transdisciplinary social – interaction, which was developed and tested.

In the chart you can see two books that were produced ("Le croisement of savoirs. Quand le Quart Monde et l'Universite pensent ensemble"; "The merging of knowledge, people in poverty and academics thinking together") Pascal Galvani, is a great architect and engineer of this programme of research-action-training. It is the program with greatest social base.

Intersection of knowledge: The Fourth World and University thinking together

Authors	**Investigation group of *Universidad Cuarto Mundo*. University: 12 (8 disciplines); Professional – trainers 5; People CM: 15**
Objectives (axiology)	Building of auto-emancipation social process with triple alliance
Epistemology	-Open Epistemology: plurality of knowledge (formal, of experience and of action) -Constructive Epistemology, building new knowledge (through common writing)
Methodology	– Investigation – Action – Training – Alternating socio – training of cross fertilization of knowledge
Problems	Fight against poverty

On the air. Essay on ecotraining

The second project has a special title: “About the air, on the test eco-training.”

This is a first research programme on environmental education. This research is more personalized to the level of authors – developers.

There are 9 students in 7 disciplines and seven people who give their testimony. The contribution of non-disciplined consists of two short reports of peak experience. And experts of disciplines have produced separately their own chapter, some of them even without having seen or read others. This is why the social base is multidisciplinary and inter, in what concerns pluridisciplinarity, but not inter with regard to transdisciplinarity.

I would place transdisciplinarity at the level of a combining systemic framework that can strongly, newly and synergically relate these contributions, while generating a vital chain of air behaviours. A systematic framework identifies five behaviors in the air: breathe, gasify, inhabit sky and earth, streamline. The structure is the closest to the farthest. These five behaviours to be learned ecologically structure the book.

About air
Essay on Eco-education

Authors	**Gaston Pineau and colleagues. Academics: 9 of 7 disciplines. People – testimonies: 7**
Objectives (axiology)	Build the environmental education
Epistemology	Systematic and symbolic Epistemology
Methodology	Collective research through individual production of identity and processing problems – Systematic structuring
Problems	Fight against atmospheric pollution

The laborious “team work” of structuring led to Metadisciplinary reflections; which will lead me to qualify these reflective-transdisciplinary investigations, questioning the frameworks of thought to build others, better suited to the problem. This corresponds well to the development of education for the environment that supports the effort to build environmental learning (ecotraining).

This construction requires the learning of an extreme sensitivity to different material influences. Epistemology and methodology developed in this first initiation to eco—training continue at present, within a research group on Eco-training (GREF). A second book is already completed, *“Las aguas ecoformadoras” .* A third text is being prepared focusing on land Eco-pedagogy. Fire is yet to be dealt with, because this research group GREF considers the four elements, which we will talk about tomorrow.

Transactions socio-ecological development and training, research, training pluri-actives transhumant shepherds in the Atlantic Pyrenees.

We can see the third investigation. The first two were group investigations. The last two are for doctoral research, carried out by a single author.

In my opinion, this designation of the reflexive transdisciplinarity, also ties in to the doctoral research of Dominique Bachelart (199) entitled *Transacciones socio-ecológicas y* formación-desarrollo. Investigación-formación con pastores trashumantes (nómadas o errantes) *pluri-activos en los Pirineos-Atlánticos* (Transactions-ecological and socio-development training. Research-training with transhumant pastoralists (nomadic the wandering) multi-active at Atlantic Pyrenees). Titling the first chapter: ‘Trashumancia: la lenta marcha hacia lo trans’.(Transhumance: idle towards the trans). And finishing with emphasis on the

long-ranged project that represents the acquisition of a transversal and multi-referential epistemology.

One thing is intellectually identifying the interest in emancipation of the binary representation of the world and the logic of the third excluded, on the other hand, it is more difficult to educate within a contradictory logic and be guided by the compression movement of potentiating of the update phenomenon and through the consciousness of our contradictions- extending towards a feeling of unity of the antagonisms (p.463).

As the author undertook his research in collaboration with five groups of agents who belong to agricultural, professional, political, training and less organized youth organizations, this is reflexive and social-interactive transdisciplinarity. Converting this complex social and transdisciplinary base into heuristic led to the development of a process of training and development that correlates research-phased diagnostics, research and participation in research – action – existential. This investigation lasted 10 years.

Socio – ecological transaction and training -development

Authors	**Dominique Bachelart** 5 groups of agents in collaboration
Objectives (axiology)	Build an open training – development of natural environment, socio-professional and local
Epistemology	Cross Epistemology transaction by formative multi-polar triangulation
Methodology	Progressive articulation: – diagnostic investigation Investigation of an existential action
Problems	Re – linking the training of youth with the evolution of jobs and development of local sustainability

Medical practices, training and transdisciplinarity. Contribution to building a bio-cognitive model for individual development

This fourth research, as the previous one, is also a doctorate research, doubly, because its author, Paul Patrick, is also a medical doctor. Thus the term transdisciplinarity used in the title, indicates the explicit centrality of

transdisciplinarity in this investigative research project.

This 'trans' is present in all levels (axiological, epistemological, methodological and praxiological) in the construction of a bio-cognitive model of interdisciplinary training of a person.

The fact that Patrick Paul is the only physical agent -author of this research project, should not let us forget that he is already a medical doctor and he wishes to perform a new thesis in educational sciences. The breadth and vigor of the discussions with his director of research (himself) indicates that cognitive transactions are not only interdisciplinary but also, above all, *trans*. For each one, is bound to go "beyond" their disciplinary boundaries and towards the genesis of the model of constant training throughout their 20 years of medical practice.

Medical Practice, Training and transdisciplinarity

Authors	**Patrick Paul**
Objectives (axiology)	Build bio-cognitive model (TD) of individual development
Epistemology	Epistemology TD: of paradoxal complexity – of 3rd included – of different levels of reality
Methodology	History of life: professional and imaginary
Problems	Medical experience that questions the classic opposition between the scientific tendency, monistic and materialistic tendencies; traditional tendency, holistic, vitalistic

The methodology will be particularly original. Paul based his life story on events and imagination to figure out how twenty years of professional experiences and existential – daytime and night – contributed to its bio-cognitive development. This methodology was made possible by the register of his dreams in writing from the age of 20, which allows for analysis of his imagined story of life. He has completed a story of professional life and a story of his imaginary life, to see if there was a link between the two.

Epistemologically, the model is built with the "three pillars" of transdisciplinarity which increasingly reinforce the "levels of reality, the logic of a third party included,

and the complexity” (Nicolescu B. 1996. P.68).

III. Network strategies in action research- training

In the third part we will present three transdisciplinary research experiences.

The first concerns a new theorization for training. The second will present three forms of transdisciplinary research and the third, which I have already mentioned will delve into network strategies capable of reaching into other distinct fields of training.

a) First acquisition: The self-training

This self-training consists of two periods of training: formal and informal or experiential) and three movements: personal, social and ecological training.

The breadth of learning throughout all sectors of life calls for the need to stray from classic educational theories that reduce education to the action of the adult generations (parents/teachers) upon youth. This recognition of the necessity of permanent education to train the human being is what MORIN (2003) calls “the revolution of education”. This revolution has to be understood in two ways. On one hand, education is presented as the main factor in human training, supplanting the genetic or social factors, previously seen as predeterminations. On the other hand, education is seen as a recursive, reflective movement.

To understand this revolution within education, the three pillars of transdisciplinarity have proven to be particularly important in departing from the pedagogical-positivist paradigm of education, and beginning the construction of a paradigm, which we have called anthrop-training (the training of the human), around the learning that should be considered.

Focusing on the “ismos” “unicausales” of the disciplines so that these can be replaced by prefixes, which serve to recognize the paths that attempt to bring meaning and form to the different levels of reality, including third parties and paradoxes that must be treated. For example, there is a prefix, “self” in the word self-training that recognizes the pole of the subject, self-training has to do with the development of the person, by the person and for the person. Pascal Galvani has written a very interesting article called “La autoformación, una perspectiva transpersonal, transdisciplinaria y transcultural” (Transpersonal, transdisciplinary

and transcultural perspective).

Another word with a prefix is eco-training that has appeared progressively with the reinsertion of a third issue that has long been excluded (eco) – this is the case presented in the research carried out with nomadic transhumant shepherds (by Dominique BACHELART, which was pointed out in the 2nd part of the seminar).

We also focus on the co- and **hetero**-training (social pole of development, particularly focused on in the European action-research- training that regroups the representatives of the *Fourth-World* and university students (Pascal GALVANI, "Fertilización cruzada de saberes e ingeniería de alternancia socio-formativa" (Fostering crossing of knowledge and design of partner-training rotation).

Summing up, the self-training concept has been developed in order to understand the paradoxical centripetal movements that try to unify these movements of socialization, ecologization and personalization of strong centrifugal tendencies. This movement of postmodern and transdisciplinary paradigmatic construction of self-training is, historically, related to the first great pre-disciplinary philosophical modifications, such as Plato's myth of the cavern. Frequently, the knowledge of the first pre-modern period has been very useful to develop this postmodern theory. Plato's myth of the cavern has inspired me a lot.

The concept of anthrop-training, chapter 10 and Subject, self-training, anthrop-training and levels of reality by Patrick PAUL

b) Second acquisition: Three forms of transdisciplinary research to synergize the long way towards "*trans*"

Because, as we have said, one thing is to recognize the limits of the transdisciplinary approaches and another one is to eliminate them, and to construct new and improved approaches. (D. BACHELART, page 53)

These disciplinary recognitions – *pluri*, *inter*, *trans* – consist more or less of evolutionary and revolutionary transitions, and demand multi-forms of education. These last ones generate personal and professional paths of research, positioned in society, time and space, are complex, wide-scoped, and laborious. These paradigmatic courses of education can take several forms, depending on focus: practice or theory, empiricism or abstraction, induction or deduction or even transduction. This is the reason why transdisciplinary research doesn't seem to be

complete, whilst on the contrary, it seems rather to be under a complex process of development and this can be enlightening for other areas.

This process development can be classified in three types.

- The first type is **the socio-interactive type of extra-disciplinary social base**:

  This type gathers collective research on the ties with the action, the training, the development and the intervention. In the field of the training, attempts are even made to build a double link between research, action and training. The development of these links demands the overcoming of disciplinary gaps between investigators and social actors, which may be professional or not (the basic population that is more or less excluded from the classic activities of research: users, clients, beneficiaries, outcasts and excluded people).

  An example of this type of socio-interactive social base would be the “Transdisciplinary Fair” that took place at the CEU Arkos in December of 2008. (It deals with transdisciplinary experience developed by this university, which led to dialogue building with people from different fields and knowledge, approaching different dilemmas that concern the participants at a social and personal level, where participants were not only people from the university, but from the community in general, leading to an open forum between academic, artistic and popular knowledge…)

  As another example, we also have the research with populations in situation of extreme poverty (the Cuarto Mundo-Universidad action- research- training programme), where Pascal GALVANI explains the specific design of alternative socio-training developed to achieve a cross referencing knowledge; and the ten year socio-ecological research with transhumant shepherds (Dominique BACHELART).

- The second type is called **the reflective form of questioning the disciplinary marks**.

  This reflective type develops a meta-cognitive work of interrogation on the thought processes and mobilizing action in the previous type. As Jean Piaget says, this development is not always possible, but its possibility develops a

superior level of lucidity by reflective and reflationary abstraction, leading to cognitive, critical consciousness (Paulo Freire).

Examples of these university strategies of transdisciplinary reflection, include workshops and transdisciplinary round tables held by this university (Arkos).

On the other hand, we have as examples the following four research projects:

- – Towards transdisciplinarity and The imaginary and transdisciplinarity between the universal and the singular, both by Patrick PAUL.
- – The meaning of the meaning by Gaston PINEAU.
- – Tripolar Rotation and experiential reason in light of Peirce's semiotics by Noël DENOYEL.

- The third type is **the paradigmatic form of transdisciplinary development**.

  This type regroups research that studies the axiological, epistemological, methodological and praxeological evolutions and revolutions directly, and in such a way, that they appear linked into the preceding forms. This is the maximum form that is frequently imagined when talking about transdisciplinary investigations. Nevertheless, reducing transdisciplinary research to this unique, very epistemological and very acute form, leads to an important risk of abstractive escapes, and socio-interactive base reduction. To distinguish it without eliminating the others has been operative in consideration of the force of every single form, and in optimizing the desirable synergy provided by this triad. As example of this paradigmatic form of transdisciplinarity construction, we have taken the logo from The III Congress on Transdisciplinarity, Complexity and Eco-training that took place in Brasilia (2008).

  Some examples of these paradigmatic type investigations are:

  - "Self-training and ternary approach" (Gaston PINEAU)
  - "The self-training: a transpersonal, transdisciplinary and trans-cultural perspective" (Pascal GALVANI)
  - The concept of self-training" and "Subject, self-training, anthrop-training and level of reality" (Patrick PAUL)

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c) Third acquisition: Strategies of transdisciplinary investigation in mutual training networks

With the last conference I want to demonstrate the necessity of mutual training networks. As I have mentioned, a single strategy of mutual training networks has allowed the two preceding acquisitions. Due to the present transitional dynamics in the development of transdisciplinary investigations, it seems useful to propose this strategy, because of the lack of central institutional policies. Due to its transitional emergent state, the acquisition/development of transdisciplinarity cannot be reached as more than in action, and within action, by means of interactions with others. There is no trans without inter.

These others are not always the closest. To a large extent, the disciplinary representatives still occupy the central posts of education and investigation. The transdisciplinary agents-investigators are still emergent and very disperse. In the experience, the means of mutual(transversal) training in networks is considered a means of a great heuristic value. The network is the agile form of transversal social organization to convert the training distances. With this flexible form of transversal social organization, it seems right to experience and to verify the relevance that Marylin FERGUSON has called “the institution of our time”: “The network is a matrix of personal exploration and group action of autonomy and relations. Paradoxically, a network is simultaneously intimate and extensive. Contrary to vertical organizations, it is possible to be maintained when it extends its personal and local quality. It is not necessary to choose an individual in a community or one at global scale. It is possible to have both.” (1981, P. 161).

This is the reason we find the proposal of the congress of Locarno timely, in order to connect the workshops on transdisciplinary research (ART), and the units of transdisciplinary research development (UFRT) by means of networks (Cf. Basarab NICOLESCU, 1998).

Conclusion

In conclusion, we verify that after the disciplinary division, which is always necessary, it seems also necessary to develop an approach that considers the relations between the disciplines and the knowledge sources of each person. It is a great historical adventure. The arches (that appear in the first slide of my speech) are the symbol of Puerto Vallarta and of this university. “The arches symbolize the union and identification between citizenship and the institution” (Scartascini, 2005,

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P. 87). The origin of the word “arc” is *arkhe* that means the matrix of the emergent movements. This is the reason why we are here to build the future on this site and with other sites. Thank you for your attention.

Question and answer session

Question: What do you mean when you say the fourth world?

Pineau: It is the world of the great poverty that does not belong to any world. It is a term to designate the people who live in extreme poverty. It is not related to a physical place or to a country, but to the social problem of extreme poverty.



Question: Since when has transdisciplinarity been studied?

Pineau: For almost 30 years with Piaget, who was the first to use the term and later it was developed by Morin with his work *The method* that focused on complexity. Other, current conceptions include Basarab Nicolescu, stemming from quantum physics, and Morin whose approach extends from a more sociological vision. Nicolescu works the epistemological perspective, developing the 3 pillars of transdisciplinarity. And now we have witnessed The III Conference in Brasilia (2008), The II Conference in Victoria (2005) and the first one in Portugal (1994). At the moment, the IV Conference (February of 2010 in Costa Rica) is being prepared. It is

quite a young and interesting approach, because it is in permanent motion.

Question: In relation to the present stance on transdisciplinarity, what is the relationship between theory and practice?

Pineau: It is a good question because the difference between theory and practice comes from the second period of the 19th century: practice must apply to theory. Transdisciplinarity aims to change this situation, and is positioned within this revolution. There is an author in the United States, Donald Schön, who speaks of the science revolution applied to the reflective agent. I believe that for transdisciplinarity, practice is a source of knowledge and it is as important as the theoretical sources. That is why I like it. As the author on self-training said, in the training of adults, they are trained through life experiences, not through subjects to be studied or often against such subject areas. The transdisciplinary approach has given me the term “epistemological” to treat the adults as sources of knowledge.

Question: Did those conferences take place in private or public universities? I am asking in order to understand if the governments are interested in transdisciplinarity.

Pineau: The three conferences have worked with public and private universities. The first two were organized with the sponsorship of UNESCO. The movement is slowly being accepted by the public and international organizations.

Question: In the experiences that you mention, in the work that has been developed (for example, the social movements, such as the Fourth World about the fight against poverty and the work with the people from the street) is some type of political position taken? I would want to know if this current movement is blooming some type of political participation or positioning. Does the research process entail any political position?

Pineau: Yes, both of them. In the case of Nicolescu, we can say that the interest is mainly theoretical. However, Morin has a more social interest. But when I say that there are strong prospects for development, I am talking about the problems that we have to resolve, since subject areas tackle some problems, but create others that cannot be approached within each subject area. This is the reason why the great current problems of the fight against poverty, pollution, and the construction of a planetary identity mobilize us to tackle these problems not only disciplinarily, but the approach regroups people opening up to these problems.

Question: What practical effects contribute to the new vision of transdisciplinarity and where can we see them?

Pineau: In your daily life, in every moment of your existence you solve transdisciplinary problems, because we are physical, psychologically and socially concerned, and must conjugate these dimensions. This is why I mentioned the last research investigation (the one of the doctor) that fits into the research into life history. It shows that the author has worked his history of professional life and his history of imaginary life (with his dreams), daily life and night life, to gather these two types of lives that seem opposed. We must try and conjugate both of them.

Question (Galvani): Gaston, to build on the previous question, when you say that each person can be a source of knowledge, could you explain the effect of transformation in situations that occur with outcast or simple people, when doing investigation and carrying out their life history? Can you talk about this a little more?

Pineau: It is very important that each person can talk about their life, because it takes a form and conjugates several elements. We have created a collection called “Life and training histories” that have two parts. The first part is a narrative and offers people the opportunity for diffusion and expression of life. The other part is more reflective, this is why I highly believe in the power of the word, as a way to reflect and to develop.

Question: Could we say that human beings are born transdisciplinary but that the contact with formal education leads us to lose that characteristic?

Pineau: Exactly. I think the three historical periods that we showed at a collective level can be used in the time of life. It is important to learn to distinguish how the school teaches us, but it is also necessary to learn to connect, to relate. (And when I talk about birth, for example, I am nearer to death, and now I must consider the non-disciplinary realities, such as death, suffering and how to train when we are physically deformed; this is a big transdisciplinary problem).

Question: Nowadays we see disciplinary problems (economic, for example) that gather governments. Will transdisciplinarity achieve the capacity to unite international governments and institutes?

Pineau: Yes, the national and international governments are truly faced with

complex problems, and look for ways of resolving them. Often, these are international organizations that wish to develop transdisciplinarity, more than the national organizations, because they do not have the same responsibility (elections every 4 years)



Question: How many universities in Mexico work with transdisciplinarity?

Pineau: The Arkos University. I think that each university has professors, operations and investigations that work with transdisciplinarity. But there are only a few that are doing or wish to do it generally. If we can speak about this problem here, it is because the Arkos University has a policy to develop transdisciplinarity. Presently, the Sonora University also develops the Multiversity that works with the complexity of Morin, and at the moment, in Xalapa, they are initiating a Masters Degree with a transdisciplinary approach, which reflects the permeation of the transdisciplinary approach here, and also in Latin and Central America.

Question: Do you think this transdisciplinary trend can establish a new path on the map of higher education in the different countries of the world?

Pineau: Yes, for me it is evident. It is a new paradigm to deal with the postmodern problems.

Because modern society has been developed through subject areas, and these are always necessary, but they are not sufficient. There are new problems that surpass them. If the universities want to be developed, they must be open to this movement, in order to treat the relationship between the subject/content areas and exterior areas of study. But it will take time. The scientific revolutions takes some generations. We go from old models to new ones that emerge, but it is going to take several generations. However, for me that is interesting, because we need to construct and to generate the instruments for this development.

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