

AN EXPERIENCE IN TRANSDISCIPLINARY FORMATIVE EDUCATION

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Abstract

This paper presents partial results of an action research on transdisciplinary formative education in a virtual environment conducted at The School of the Future of the University of São Paulo in 2005/2006. It was based on two courses i.e. Introduction to Transdisciplinary Thinking and Towards Cognitive References, both offered to public schools educators from 16 states in Brazil on the Telemar Educational Project Portal. The research points out epistemological, methodological and ontological procedures of decisive importance when conducting transdisciplinary co-formative and collaborative process on-line. Results indicate factors that favour and jeopardize the emergence of a transdisciplinary educator in distance education.

Key-words: transdisciplinarity; co-formative process, virtual learning community; multi-synchronous interaction.

Introduction

For the moment, prevalent pedagogic posture favours disciplinary, multidisciplinary and interdisciplinary approaches. To complement it Transdisciplinarity (TransD) has a contribution to make by addressing what lies *between* – across – and *beyond* disciplines. The courses *Introduction to Transdisciplinary Thinking* (TransD I) and *Towards Cognitive References* (TransD II), 35 hours each, were offered to the Telemar Education Project (TEP) in its virtual learning community (CVA)¹ and conceived with the aim to train educators that acquire basic TransD epistemological, methodological and ontological knowledge to be able to apply them in their educational work. It is worth remembering that TransD is not a new discipline. It is a view of nature and reality that proposes a new approach for individuals or groups to face old problems. To understand and integrate it into a person's way of being and doing it is a slow gradual process.

The activities developed in the TransD I and TransD II courses were aimed at elucidating aspects related to TransD *attitude – research – action*. They occurred dialectically in the articulation of participant's internal and external contexts. The TransD I course was offered on www.projetotelemareducao.com.br, via e-mail and *Messenger* (MSN) and TransD II on the Portal only. In both, interaction was multi-synchronous and offered participants basic TransD qualification to operate on the TEP, as a project permeated by TransD.

TransD I course explored Trans D basis and methodologies and their use. The main themes we focused were: Temporality and Formative Education [1]; Pillars of Transdisciplinary Methodology [2]; Transdisciplinary documents and Heuristic Tool: Exploration Transdisciplinary Matrix (ETM) [3]. The procedures used were: synchronous and asynchronous interaction; self-reflective reports on the experience; mediation and socialization of reflection. The product was the formulation of a project in ETM as to include diagnosis, planning and follow up. The course evaluation was procedural and conducted with the following tools: entry questionnaire; weekly self-reflective reports on a Blog, evaluation by category and rubrics; discourse analysis; exit questionnaire.

The TransD II course introduced a framework and guiding principles that contribute to devising the way of working within the school and the community. As a formative practice, it presented background and models to generate knowledge and wisdom. Also, it invited educators to rethink and ponder on the pedagogical practices in order to better understand the different players in education scenario and to seek for more coherence, relevance, efficiency in their personal and working lives. The main focus themes addressed were as follows: Auto-formative education as Cognitive Reference; Laws of the living organisms [4]; Learning, as an Interaction [5]; Eco-Hetero-Auto formative education [6]; Learning to Know. Procedures and evaluation used were similar to those for TransD I. The product was the registration of the personal formative process and its contextualization in interactive screens.

Tools

Tools for evaluation used in the courses were as follows: 1) Entry/Exit questionnaires: applied at the beginning of activities to find out participants' knowledge in relation to the so-called focal points of the course. At the end of the course, the questionnaire was reapplied which enabled us to compare the initial and final responses and consequently view the educator's evolving process. 2) Evaluation questionnaire by categories and rubrics: provided to educators at the beginning of course allowed them to learn from the outset the global reach of the course, its possibilities of application in the local community as well as the parameters that would measure its Goal → Performance and Goal ← Performance ; 3) Discourse analysis: carried out by coordinators, through the following qualitative rubrics: perception, meaning, explanation, interpretation, contextualization, self-reference and applied to entries on Chats, Blogs and Forums during the interactive process.

Data Analysis

Initially, 80 people were enrolled for TransD I as the Portal system did not close the number of enrolments, which was limited to 30 people; the number of enrolments was later reduced to 32 and of those 22 completed the course. 17 municipalities in 13 states of Brazil attended the course. For TransD II, 22 people were enrolled, for the former course was a pre-requisite for it. Out of the 22 people enrolled, 21 completed this process². The same municipalities were represented.

a) Positive Points

- ◆ the format adopted for the course which combined formal reasoning (concepts, contents and logical processes), experiential reasoning (living existence), and sensitive reasoning (imagination and feeling)
- ◆ the content selected;
- ◆ prior discussion held with those interested in the course as to its objectives and programme ;
- ◆ combination of optional synchronous and mandatory asynchronous activities;
- ◆ encouraging participants to post their subjective and objective reflections every week;
- ◆ articulation of theory and practice in the context of the participant's own environment;
- ◆ constitution of weekly Articulatory Triads (AT)³, in TransD II, responsible for the for the accompaniment and dynamics of the interactive process in course;
- ◆ the parameters of the evaluating process were made available and discussed with the participants in the first week of the course.

b) Challenges and difficulties

- ◆ coordination failed to conduct prior research with prospective participants to define target audience;
- ◆ educators, on the whole, were not used to reading the programme carefully before starting;
- ◆ the majority of the educators are not acquainted with the culture of inquiry ;
- ◆ the virtual network system frequently broke down or interrupted connection;
- ◆ participants were not used to posting on Blogs and Forums;
- ◆ participants lack of familiarity with EaD;
- ◆ the educator's impulse to do the product before discussing difficulties;
- ◆ educators thought they knew something when they have not yet understood it;
- ◆ educators took time in understanding evaluation as a co-formative process ;
- ◆ educators took time in understanding the meaning of Self-Reflective Reports, as a practice to look at their own experience, scope and purpose.

It is worth pointing out that during the course various challenges and difficulties were overcome to a greater or lesser extent, except the first one because it was only detected when the course was already under way. The process resulted in TransD evolution of the educator as shown by the qualitative and quantitative analysis and crossing of collected data object of the article *Case Study on Formative Transdisciplinary Education in Virtual Environment*. [7]

c) Testimonials related to the learning process

We transcribe here some testimonials to shed light on the learning process experienced by participants. For the sake of anonymity, we used letter (P) to refer to a participant and letter (I) to his interlocutors. Each posting that follows indicates the date and the virtual environment where it was posted, i.e.: Chat (C), Blog (B), Forum (F). To characterize the learning process of these educators, even if minimally, we have selected some postings on TransD I and TransD II which are grouped here by the following rubrics: a) *Perception*: the posting revealed that the participant understood the scope of TransD⁴; b) *Meaning*: the posting revealed that the participant captured the meaning of the course themes; c) *Exposure*: the posting expressed the subject and/or concepts clearly; d) *Interpretation*: the posting has an original personal opinion and can present evidence; e) *Contextualization*: the posting contextualized what was learned to personal or local reality and presented examples; f) *Questioning*: the posting had questions that might prompt developing personal understanding and dialogue between participants; g) *Self-reference*: the posting clarified the participant's personal formative process.

Perception: (P) 15/09/05 B This FP⁵ enabled us to take a stride toward integral education of the human being in the search for meaning. TransD view, thinking and attitude enabled us to understand our inner selves, beliefs, values as well as taking into consideration the human being in his complexity and different levels of reality. Undoubtedly it will be a rich process of co-education. (P) 26/09/05B I might even be mistaken, but I see TransD as something big in reach... (P) 10/10/05 F After reading the TransD Chart, I felt TransD ...does not mean merely concepts or definitions but also that it touches on the essence of people. (P) 19/10/05 BP The transdisciplinary view includes the interior space of each person, the space of another human being and nature.

Meaning: (P) 27/03/06 F The course objective is to introduce guiding principles to structure our acts. Based on interaction, we will put into practice the process of shared learning through participation and collaboration of knowledge that will emerge from all. As to evaluation, it will enable us to analyze, by reflecting on our own experience, our goal during the whole course. (P) 12/04/06 BP When we understand the auto-formative process as a personal production of meaning and knowledge organized by reflection of the person based on his own experience, directed by and for the person in connection with others; it is essential to understand the three dimensions of learning and meaning ... I see it as a way of being in contact with the dimensions of learning and meaning, because it makes us reflect on our informal knowledge changing into formal knowledge from the moment we are in contact with texts and context, making self-reflective report that enables us to think again and become aware, that is, transformation. (P) 31/05/06 B. ...This instigating course that stirs us inside and takes us to moments of constant reflection and questioning, making us increasingly more committed to quality in education.

Explanation: (P): 05/04/06 BP According to Galvani, auto-formative process will always involve the three dimensions of knowledge and meaning: 1) the didactic dimension of formal knowledge (meaning as signification), 2) the practical dimension of interaction knowledge (meaning as guidance) and lastly 3) the symbolic dimension of existential knowledge (meaning as sensibility). Sensibility screens take us to the main dimensions of auto-formative process, according to Pascal Galvani, which cannot be dissociated, but is not equitably present. (P) 01/05/06 F "We were born to learn", "Living is to relate, we are relational beings". I read a passage from a book by Helène Trocmé *the Knowledge-Learning Tree*, where the writer explores some new concepts, which she called dynamic learning operators and represented them in a tree. They are: ...The search for the balance point to be found between give and receive, and between potentialization and actualization established by Stéphane Lupasco; ... The emergence of meaning, *autopoiesis* and self-organization, according to Francisco Varela's terms; ... Mediation and accompaniment in the help relationship; ... Questioning, or the ability to open space inside oneself, to self-question, to self-position and to self-evaluateIn relation to the term *autopoiesis*,...*auto*, means "one self" and refers to the autonomy of self-organizing systems and *poiesis* – which shares the same Greek root of the word "poetry" – meaning "creation", "construction". Therefore, *autopoiesis* means "self-creation".

Interpretation: (P) 13/10/05 B We are action beings, however, what changes reality is not intention but action. It does not suffice to change our practices, we must change our attitudes. (P): 24/05/06 BP ... It will emerge at different levels (Ref. Levels of Reality) and will make us realize that behind our truths there are illusions and only by interacting with other truths or formal concepts will we be creating new Meanings.

Contextualization: (P) 21/9/05 F As the PET is developed in local and virtual communities with different realities, chronos formative process will enable to reach excellency in actions developed because "temporality in formative process may contribute to make us aware that we are at the same time a multiplicity and a sole unique and unified space!", contributing to total satisfaction. (P) 20/11/05 F ETM is a facilitating tool in the school context and it enables us to diagnose and build projects that meet the needs of the community making dreams come true. (P) 24/05/06 BP As to working the Knowledge-Learning Tree at school, I believe it is indeed valid. We have to take information to teachers so they can rethink their practices, review and revisit their lesson plans. The Tree enables us to do this. (P) 31/05/06 B ... When I stop to think about Organizing, Creating Meaning, Deciding, Innovating and Sharing I get lost in the flowery words of many demagogues and find myself in a discrete fight with educators in the classroom trying to empower learners to transform their reality to improve their quality of life.

Questioning: (P) 21/09/05 BP Lack of commitment makes me think: how can I perceive others if I cannot yet perceive myself. (P) 28/09/05 BP Is the Third Included Middle, the formulation of a new logic? (P) 19/10/05 BP ... through questions: perhaps questions such as : What? How? Where? Why? What for? On behalf of what? On behalf of who? suggested by TransD we could be elaborating these "speaking portraits"? (P) It can be difficult sometimes because we change our view, but people around us are not touched ... Then what is the first step to engage these people who insist on remaining in their comfort zone?

Self-reference: (P) 23/11/05 BP I have realized I changed in relation to how I see content, I admit that when I was in the classroom I was very much content-oriented, but after I was in contact with this wealth of ideas, I realized that student formative process should take into account his personal life as well ... (P) 05/04/06 BP Then I am like images in the sensibility screen – to look inside ourselves which reflects what happens around us and makes us perceive ourselves again . . . everything is interconnected. When we observe the sensibility screens we become aware of something, a feeling that makes us go ahead, the texts are the basis of this look and as we move along on the forum and on the blog, we are developing the possibility of accompanying our process and then we have a self-reflective return to the path we followed – the auto-formative process ... This issue of experience (I), will direct us to inquiry, which is what you always say – Learning only occurs when we allow ourselves to do this, a problem based on something we are experiencing. ... building knowledge by inquiring will take us to signifying, to meaning.

Conclusions and Recommendations

More and more, we realize that all areas of knowledge have exponentially grown more complex and will continue to do so in the future. It is increasingly more evident that it is impossible to master a field of knowledge. Therefore, we must know thinking systems, cognitive references, which will enable us to understand, analyse, communicate, manage and anticipate more complex events and behaviour. We believe that the work conducted in TransD I and TransD II took a step in this direction. Course success was also achieved as a result of the themes being applied to local reality due to the development of communitary projects permeated by transdisciplinarity, or to the educator's observation of his activity so as to develop it taking into account the three pillars of the transdisciplinary methodology. The educator's transdisciplinary formative process though complex and procedural conveys a transforming and educational differential as can be seen by the few postings on the Chats, Blogs and Forums herein selected as example.

We believe that transdisciplinarity on the TEP must contemplate the articulation of sensitive reasoning; experiential reasoning and formal reasoning. We also believe that the educator's transdisciplinary formative process must go beyond the objectives of TransD I and II courses, so as to contemplate at least three more courses where themes like TransD and Management – Ethical Development – Logic in Reality may be addressed. We believe that some aspects of the methodology already developed in the previous courses could be used without restricting ourselves to them because we know that the very nature of the themes calls for new procedures, new strategies and new products. Last but not least, it is worth mentioning that TEP TransD dimension will evolve at the same pace as the co-formative process of the Team of the Laboratory of Investigation of New Scenarios of Learning (LINCA) of the School of the Future of USP (LINCA) evolves concerning epistemological, methodological and ontological aspects of TransD.

Transdisciplinarity on the TEP is not an end in itself. Its objective is to promote the articulation of levels of perception and reality, that is, of the subject and of the object of TransD, respectively and, thus, contribute so that people advance toward the direction expressed in the beautiful verses by Adonis, in Les Temps les Villes:

Tell your dreams to take the place of the
stars and hang in the sky
tell your thoughts to take the place of the
trees and become enrooted

¹ From 2000 until 2006, the Telemar Education Project was posted on www.projetotelemareducacao.com.br. In December 2006 its name changed to *Projeto Tonomundo* (I am in the world Project) and the site address became www.tonomundo.org.br

² This was so because one of the most active persons on the course died two weeks before its completion.

³ Articulatory Triads (ATs): they are made up of three people enrolled in the course who take it in turn to perform the following functions: make the interactive process dynamic, promote a careful observation of participants performance, guarantee clarification of central concepts; review the activities developed in the week and promote evaluation between peers.

⁴ We kept the postings as they were, without correcting any Portuguese

⁵ FP stands for formative practice

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