CULTURAL TENSIONS IN ELEARNING ENVIRONMENT DESIGN

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Résumé: L'article présente le modèle conceptuel IFeLTs (Informal and Formal eLearnig Transactions) et dresse un portrait des tensions émergentes entre l'environnement de changement des enseignants et les espaces et territoires d'apprentissage. L'analyse préliminaire des données de nos recherches permet d'exposer les principaux défis auxquels font face les programmes de la formation des maîtres.

Mots clés: Paradigme de l'Apprentissage enLigne, les Espaces et Territoires d'Apprentissage, Apprentissage Informel, Apprentissage Formel, Programmes de Formation des Maîtres.

Summary: In this paper, we present the conceptual model for Informal and Formal eLearning Transactions (IFeLTs) and portray the emerging tensions between teaching change environment and the learning space/territories. Preliminary data analysis of our current research allows us to expose the main challenges facing teacher education program.

Keywords: eLearning Paradigm, Learning Space/Territories, Informal Learning, Formal Learning, Teacher Education Programs.

Cultural tensions in eLearning environment design

Elearning technologies are both a tool and an affordance context for a new mode of accessing and interacting with information and content; envisaging new modalities of interaction among actors and resources, and dealing with new modes of co-authoring to build knowledge and sense of meaning. When learners interact with the nowadays elearning environments, they take a major role in structuring the discourse, expressing their preferred learning profiles, theirs values and theirs respective experiences, and norms. Learning in this perspective is no more a simple acquisition of knowledge, based mainly on processing information, but a process of acquiring skills and competencies to deal with more complex dynamic interaction among objects, agents, and actors. Recent innovation in information and communication technology (ICT) has transformed the learning environment into hyper-interactive context of flow of transactions and actions, leading to a shift from transmission metaphor of learning to participative metaphor. Elearning environments create spaces of convergence where learners from diverse cultures and quite distinct values and referents, interact and learn sharing common resources and accessing to the same expertise. This access to a mosaic of cultures offers opportunities as well as it raises several questions about the rapport that education should establish with the increasing intercultural context of learning. This questioning remains largely vastly understudied even if many reports UNESCO and OCDE highlight the importance to consider cultural diversity when designing e-learning environments. Even if the question surrounding the rapport between e-learning design and culture is not yet a question of debate in education, it seems that its latent implications will baffle instructional technologists in short future.

Indeed, some researchers from computer sciences have begun recognizing society and culture in computational concepts and applications, introducing the concept of ethnocomputing (Tedre et al, 2006). Others researchers are questioning the theories and personal experiences that could bring an open dialogue concerning people's embodied diversities (Galanakis and Oikarinen-Jabai,

2006). Researchers urge the importance of studying the increasing societal diversification of the learning patrimonies (POLE, 2004) and highlight the relevance to question, our approach to this emergent phenomena. However, still little analysis is devoted to the examination of the learning exchange and interaction dynamic that occur among learners in multicultural e-learning environments. Little work is done to explore the resources that may support learner to deal in valuable way with the others learners' background (values, norms, personal experience and expectations, etc.) and to inquire how learners deal with those parameters.

Many elements are challenging researchers in resolving those educational concerns. First, because little interest was paid up to present to the cultural dimensions whilst designing for elearning environment, there is a quasi-total lack of the knowledge body regarding this problematic. Thus, education does not possess a well establish pedagogical principles that could orient the design process neither for scaffolding learning, not for recommending specific teaching interventions. Second, most off the sophisticated and powerful elearning environment focus, mainly on knowledge management. Rare are functions or applications that permit analysing and diagnosing the exponentially complex patterns of interaction are offered, and hence, limit the refinement of the process of design. Elearning environment design still more a craft than technology (Clark and Estes, 1999, 2001) and innovative experiences are rarely transformed in design knowledge.

Furthermore, social computing and the powerful and creative tools that ICT provide for elearning environment, bring to the field of education, new concerns and problematic. Because it allows new media for expression and alternative ways of thinking, permits great provisionally, experimentation, random access and multiple usages, those modes and modalities are transforming the way knowledge is conceptualized by the digital native, and force knowledge to be redefined in education (Williams, 2007, Lankshear and *al*., 2001). The subject-based curriculum, in schools as well as in higher education, start to

be identified as a limited approach and recommendation for more competence-based curriculum and student-centred curriculum are increasing (Bayliss, 2003, Tigelar, and *al.*, 2004).

In addition, the complexity of the interaction process observed with today elearning technologies is not limited anymore to the technological aspects of the environment. Interaction is among divers actors-users, belonging to diverse cultures, referring to distinct personal experiences and repertories, acting and establishing rules and norms, and thus taking control on the environment. Interaction is about a process and patterns that allow learners to create and remodel tools and medium, and therefore, refine and redefine theirs functionality. All those facts are questioning the way elearning should be apprehended, what teaching should be in elearning context, and which designing approaches should be privileged for elearning conception. Those questioning is fundamental, mainly in teacher education program. In fact, responsible of the program, as well as teachers and instructional designers, start recognizing the existence of a tension among three organizational cultures:
1. An emerging culture of elearning
2. One well established culture of teaching
3. The culture of design.

The motivation of this work is to provide teachers, as well as instructional designer and program developers, with an integrative view, via a conceptual model, that may help them to understand the complex constraints surrounding their intervention and, the necessary professional adjustment they should to be involved in.

This article aims to portray the dynamic that is governing elearning environment. It attempts to refine both our comprehension of the existing tensions among three distinct cultures (learning, teaching and design) and highlight the kind of transactions that may allow respective evolution toward an enrichment of the elearning environment. As the literature considers interaction as the key element of any act of learning, this concept is central in our assumptions about the dynamic of evolution of elearning environment and the considerations and constraints surrounding its process of design.

In the following paragraphs, first, we expose a brief portrait of how interaction is apprehended in the field of education. We underline how interaction has served more the culture of teaching and some designing approaches than learning purposes. Second, we present our conceptual model and highlight the tendencies and the respective constraints and limits of each domain. Finally, we expose some implications of the conceptual model and propose how it could be used as a tool to develop a constructive relationship between teachers and instructional designers.

Since it is our purpose to explain our conceptual model than to report the finding of our currents research that are serving to validate and refine the model, we will refer to some preliminary data to only illustrate particular facets of the model.

1- THE INTERACTION ROLE IN ELEARNING ENVIRONMENT DESIGN

1.1- Interaction and learning

For many researchers, interaction is explicitly tied to learning. Interaction among peers and expert is often regarded as an important value, crucial for knowledge acquisition and skills development (Sutton, 2001; Dewey, 1938; Vygotsky, 1978). Interacting with others means to be involved in a process of explanation, verbalization, articulation and cognitive challenge facing others' perspectives and point of view, with the aim of knowledge refinement and restructuring, so thus learning (Andersron & Garrison, 1995, Hillman and *al*, 1994; Hafner & Stewart, 1995; Kuhn, 1991). It is interaction that offers learners the necessary exchange context that makes messages comprehensible to all participants, acting as a process of codification and interpretation of two information sources (subject and the environment) (Cole & Engeström, 1993; Davis & Sumara, 1997; Beateson, 1984; Pea, 1994).

Moreover, interaction permits the transformation of the structure of the discourse as well as the change of its content. It is a complex process that distributes the communication by giving each participant -via the interaction with all kinds of resources- the power to change the course of the process (Pea, 1994, Wertsch, 2001, 1991). In fact, each participant in social interaction creates some meaning that emergent from interaction due to

the involvement of the subject in mental operations (Newman and *al*, 1989; Pea, 1992b). Interaction supposes a process of reaction-adaptation aiming a dynamic equilibrium via a dynamic dialogue (Romizowsky, 1988). Interaction, in the context of learning, is more close to social phenomena, a dialogue, an inter-subject communication, and mental activities, driven by cognitive and meta-cognitive engagement of each participant.

1.2- Interaction and design

Learning is not only defined in terms of interaction and in how interaction affects learning outcomes, knowledge building and acquisition. The learning process is favored, enhanced and improved, in the way learners are interacting with available resources conceived and developed to make fruitfully educational intervention. Consequently, interaction is apprehended to assume different aims and functionality to enrich learning environment, by making communication easier and powerful, involving learners in more constructive process of learning via pertinent activities and deep patterns of subjects exchange, and allowing subjects to interact with diverse and well designed tools. As cited by Hirumi (2002), interaction in the literature, serves different aims: 1) establishing communication, mainly among actors and objects (student-student, student-teacher, student-content, and student-interface, 2) serving purpose by according to interaction some functions: confirmation, pacing, inquiring, navigation, and elaboration, 3) enabling pertinent activities that favor critical thinking, creative thinking, and cooperative learning, 4) permitting the development and the usage of tools that allow immediate and delayed feedback, remote access and delayed collaboration tool, real-time brainstorming and conversational tool, real-time text, multimedia and hypermedia collaboration tool. In this perspective, interaction is the product that we aim to generate because it is central, crucial, and critical to the learning process.

However, as a product, interaction is understudy and less considered. Interaction is generally confined, limited, or confounded to the interactivity of the learning system. For this reason, it is important to look into the distinction made by Wagner (1994) between

two concepts: interactivity and interaction to really apprehend the limited view of interaction in elearning design.

For Wagner (1994), interactivity should be dissociated from interaction because they are distinct concepts. Interactivity refers to the characteristics and attributes of technology. Interaction, for its part, is a complex product controlled and generated by actors' engagement in mental operations and dialogic communication process.

Little attention was paid to the interaction than the interactivity of the elearning system. In fact, e-learning environment design is principally technology-driven, and the interactivity of the system is designed without great understanding or concerning regarding the interaction that it may generate. Some researchers expose how the hyper-interactivity of the system may be, disadvantage the quality and potential of the interaction (Chou & Liu, 2005). It is also observed that many learners have difficulty managing theirs interaction among the others actors and agents due to the incoherence of the discourse sequence, difficulty to interact in a context of collaboration, difficulty to understand the fuzzy and diffuse model of thinking that characterizes today e-learning environments (Nielson, 1990; Herring, 1999; De Laat & Lally, 2004; Chou & Liu, 2005). Furthermore, the nature and the quality of the interaction with and among actors and agents may as well stimulate as inhibit the creative thinking observed with some independents users (Swan, 2001; Hopper, 2003). Few research, investigates on how interactivity of the system impacts on the learners' cognitive interaction and what are the necessary skills that enable learners to exploit the opportunities and the advantages of those environments.

It is all the more difficult to understand the questioning surrounding interaction, since there is no conceptual framework that represents it as product, neither that permits to analyze the interaction as emergent process. In fact, most of the research works still focuses on how the interactivity of the system may help the process of communication, and how we can establish a technical framework to design an interactive system (Woods & Baker, 2004). Even more, the information processing models of learning, heavily influenced by the

computer metaphor of cognition, still dominating the field of design in the way learning and instruction are thinking (Wilson & Myers, 2000). Many elearning environments are still designed following the process and the spirit of software engineering protocol and information-processing theory. Furthermore, the process and activities that generate elearning resources to support teaching interventions still deeply based on systematic principles of design closed to the computer program (Parrish, 2004).

Divergences and ambiguities about discourse and practice theoretical assumptions, oversimplification facing complexity, create some kind of malaise in teachers and instructional designers. The urging necessity to portray the teacher environment of change seems an important step toward elements of solutions. Without a deep understanding of the existing tensions between the learning tendencies and teaching orientations, and between elearning environment's actors and the underlining flow of transactions that regulates interaction, elearning environment

design will not success to achieve its educational aspirations.

It is our aims that the conceptual model of Informal and Formal eLearning Transactions (IFeLTs) that we present in this article, may bring a more holistic view and comprehension of the cultural tensions that exist in designing elearning environment in the field of education.

2- INFORMAL AND FORMAL eLEARNING TRANSACTIONS MODEL (IFeLTs)

The interconnected model for Informal and Formal eLearning Transactions) (IFeLTs) (Fig. 1) aims to communicate some aspects of the tensions surrounding the elearning environment design. The model has been elaborated upon currents exploratory research on interaction in informal learning environments (work in progress) and, our report on teachers' practice communities structure and discourse and instructional designers' approach to elearning environment design.
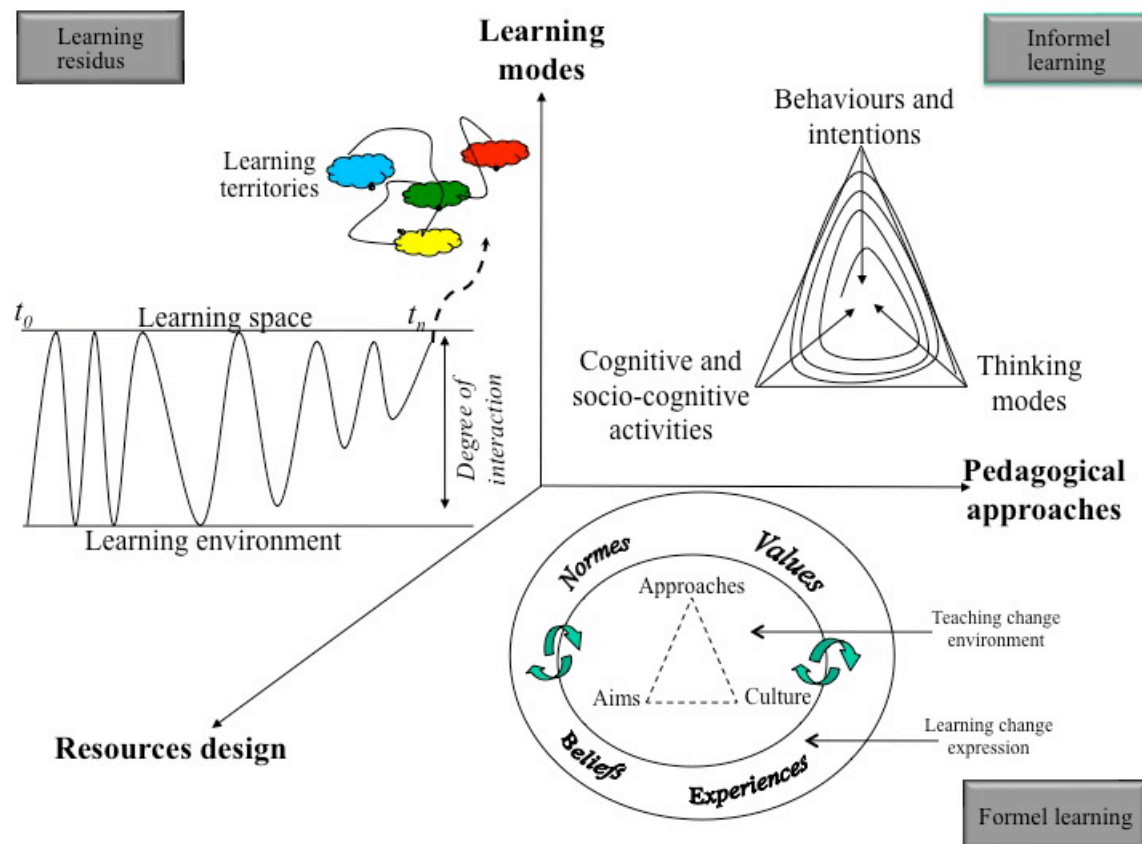

Figure 1: Interconnected model for Informal and Formal eLearning Transactions (IFeLTs).

The model (as show in Fig.1) groups together and juxtaposes the dynamic of three cultures:

informal learning, teaching within formal learning context, and elearning resources

design. The tensions among the three cultures occur when the structure, discourse and communities of each culture challenge, confront or dysfunction the mechanism of the adjacent culture. The three cultures are specific domains articulating activities and mechanisms along respective main axes: learning modes for informal learning, pedagogical approaches for formal learning, and resources design for elearning environment. For the purpose of explicating the model, we distinguish each domain by their conceptions of knowledge and/or learning, and conceptions of community.

By illustrating each component of the model, we hope to both explain the model and underline the challenges facing the field of education, mainly in teacher education program (pre-service and in-services teachers).

2.1- Informal learning

Informal learning as observed in some forum, blogs and wikis seems to be articulated around three interactive process: manifestations of behaviours serving explicit or implicit intention, expression of thinking modes, and involvement in sociocognitive and cognitive activities as arguing/negotiating (see Fig. 2).
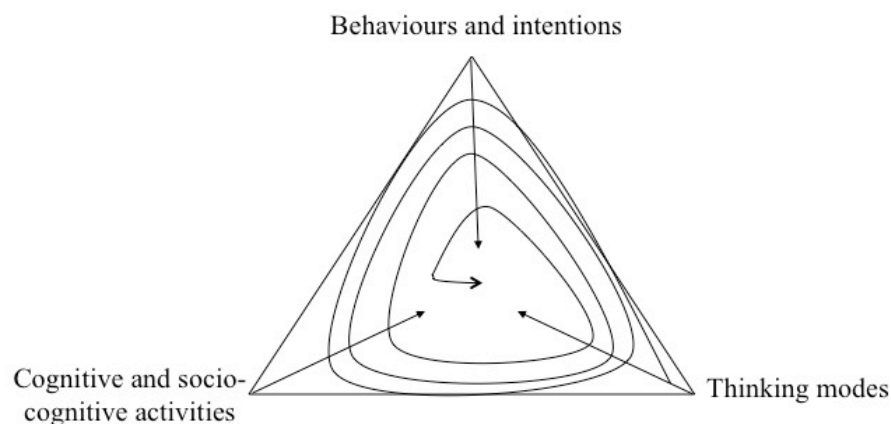

Figure 2. : Process and mechanisms regulating informal learning process as observed in some forum

The learning is mainly self-directed or inquiring projects. Procedural in its form, knowledge is in action and totally embedded in situation, aiming solving specific problem or performance achievement. Referring to Gibson's and *al*, (1994) classification, it is about a problem-solving knowledge and/or performance knowledge.

There is no predetermined content in those informal learning spaces, but an inquiring or questioning that initiates a fuzzy discourse and emergence of community that is a learning organization. Learning in this space is: *«...about dialoguing in matters that we need to understand; with those than can challenge "us" and provide different perspectives, ...communities are learning organizations».* (Hung & Chan, 2001, p.10). By clarifying and altering theirs beliefs, emerging and provisory members of the community attempt to make sense with, and for each other's. The divergence or the incongruence of the subjective dimensions of the discourse

generates frictions that are manifested by overjustification, some aggressive or provocative comments and feedback. The participants progressively are involved in framing problems in ongoing activity, and thus creating sociomaterials resources, validated by diverse forms of thinking modes. It is a symbiotic community involving in what Eraut (2004) qualify as implicit learning: learning from experience and non-taught or deliberated learning.

The interaction among participants illustrates diverse patterns of learning methods as described by (Marsick and Vople, 1999): trial and error (learning from mistakes or from experience), reading pertinent materials, observing examples (models of peers). The member of the community provides support, supervision, guiding and unequally assume the four functions of the discourse (Swales, 1991): knowledge constitution, language, knowledge production, and regulation of the discourse's evolution movement.

The discourse generated by the interaction among participants, progressively provide a flexible and dynamic structure that is a set of individual and collective patterns and movement of interaction. The members of the community are implicated in a series of step that closely resembles to the problem-solving solutions process that involve framing the context, responding to trigger to a potential learning experience interpreting the experience, examining alternatives solutions, choosing learning strategies, producing alternatives solutions, assessing intended and unintended consequences and evaluating lessons learned.

From informal learning space (forum) to informal learning territories (some blogs and wikis), the structure of the discourse is more directed and governed by the establishment and redefinition of interaction norms, behaviours, and rules.

In informal learning context, learning occurs (Fig. 2) for each participant via a "fuzzy implicit strategy" of epistemic tasks: describing, explaining, predicting, arguing, critiquing, evaluating and defining, axed on needs and goals.

2.2- Formal learning

Since twenty years, around the world, teachers are being encouraged to adopt more socio-constructivist and constructivist approaches in theirs practice. This orientation had spread through professional education and teachers education program. It did not just challenge teachers' skills in terms of theirs abilities and competencies to managed group work and group interaction, in many cases, teachers are urged to act as moderator, to resolve more ethical concerns, in more delicate context of cultural diversity and heterogeneity of learners population. Teaching in shifting paradigm places teachers in very uncomfortable situations, because they have to readjust to new tendencies in learning with digital native generation, while they are experiencing resistance and questioning the foundations of theirs own professional community of practice. Teaching in today's social computing revolution confronts the applied practice and norms of formal learning to the emerging and idiosyncratic informal learning process and methods.

Formal learning, contrary to the informal learning, is a structured intervention to achieve aims. It is based on direct instruction which engages learners in lecture, discussions, simulations, role-pay and other structured activities, which are based on specific learning objectives and are designed to enable students to master predetermined outcomes. Knowledge in the context of formal learning is codified knowledge (Williams, 2007).

Holding silent distinct and divergent view on what does constitute valid knowledge and how acquiring knowledge could be manifested, teachers and learners are required to deal and function in struggle situation (see Fig. 3).
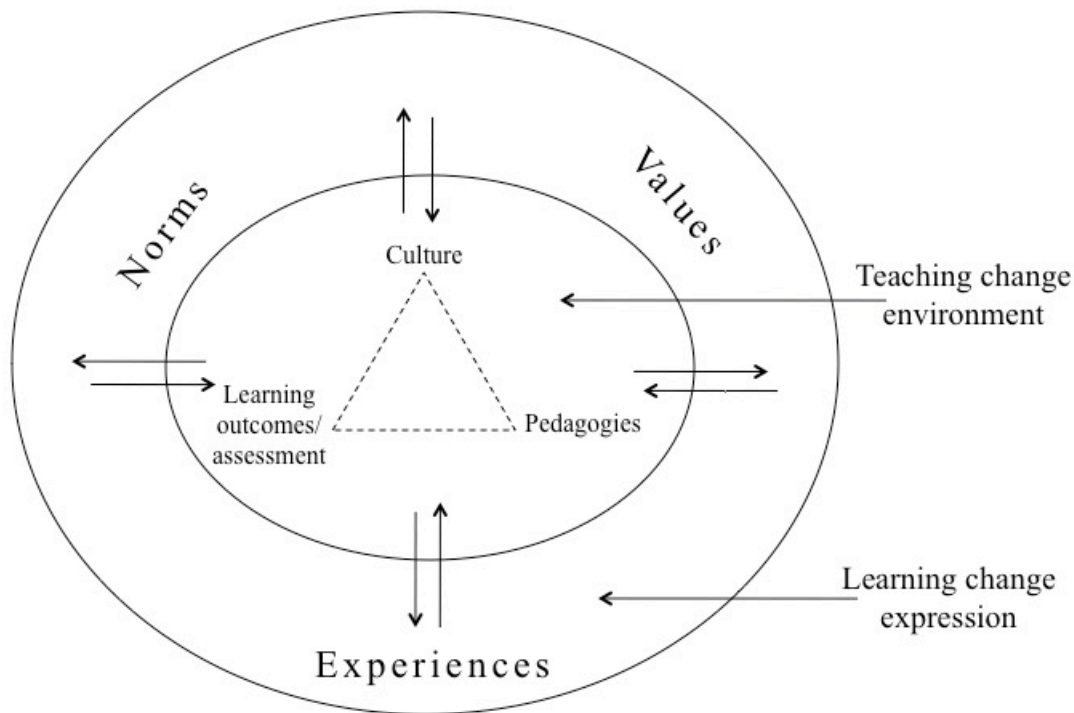
Figure 3: The teaching change environment and learning change expression surrounding teacher's intervention

In fact, formal learning context juxtaposes two systems:

1- Teaching change environment where teacher is: a- experimenting promoted pedagogical approaches (Problem-based learning, case studies, etc.) that structure and govern the dynamic of interaction among peers, learners, teacher and learning activities and resources, b- reflecting and acting with and on self-conception and beliefs about knowledge and learning outcomes and process, and hence questioning the assumptions of self-culture and the culture of his/her community of practice, and finally, c- enacting and observing the consequence of acts and intervention.

2- Learning change expression: as learners are cognitively engaged and are reflecting in action while struggling with ill-structured problems, they have more opportunities and space to express theirs proper experiences, beliefs and opinions. Belonging to a social computing generation (digital native), they are transferring to the formal learning the way they construct, valid and defend theirs points of view in informal learning environment; as well as what they consider as valid knowledge and

appropriate solution. They are self-directed subject, able to create themselves patterns and methods for learning and methods, constraining teachers' practice and culture. At the same time, teachers confess that learners usually abandon theirs suggested teaching approaches and ask for what teachers describe as idiosyncratic methods of learning and acquiring knowledge. They have the attitudes and the abilities of what Castells (1997) qualified as self-programmable workers. Additionally, many teachers express some frustrations because they feel like, they are changing theirs practice, but they are not impacting on students' learning achievement.

Our preliminary analysis highlight some hypothesis about the main elements of tension between the informal and formal learning, that are not only limited to pedagogical approaches, course structure, or learning activities. It is something more fundamental, something related to the learning finalities itself. If teaching, with its formal learning approaches, aims to the acquisition and the employment of well-established knowledge, learning in informal learning space and territories pursuit temporary and provisory goals: acquisition of a working-knowledge. In informal learning

context, learning, as individual or collective act, comes with a motivation: generation of the value-added extension of knowledge. In formal learning context, teaching aims to transmit a model of acquiring and using established and validated knowledge.

In the following paragraphs, we attempt to summarize what we assume that are the main factors generating tensions between informal learning and formal learning in teaching context (table1: 1).

Table 1: factors generating tensions between informal learning and formal learning in the context of teaching.

Informal learning	Formal learning
✓ Discourse ✓ Self-directed learning and inquiring projects ✓ Making-sense of experience, integrating a dialectic process of action/reflection while acquiring and building knowledge. ✓ Learning organization and /or learning community. ✓ Creating and extending sociomaterials resources validated by just-in-time experimentation.	✓ Content ✓ Specific-learning objectives and predetermined outcomes ✓ Acquiring conceptualized knowledge and working to re-extract their principles of application ✓ Conflicts and tensions between the structure of the community of practice and the discourse of the community of learning. ✓ Developing resources that enable learning activities management and achieving performance standard and criteria.

More works should be done to find how design could manage this process. For the moment, what we observe is that the degree of interaction and the nature of interaction that students develop with the elearning environments could be used as an indicator of the evolution of this movement (Fig. 4).
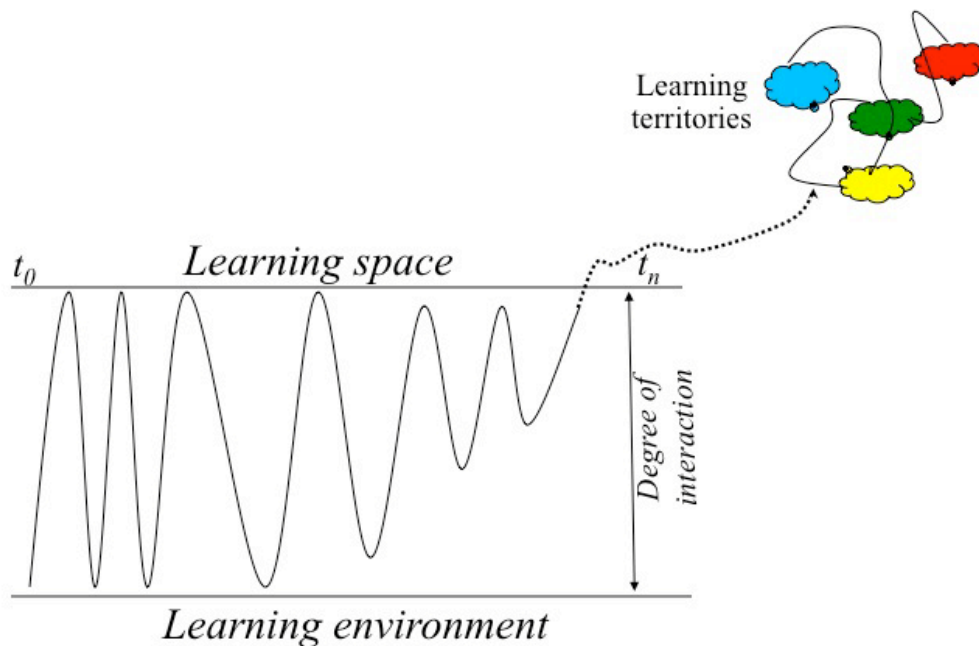

Figure 4: Learner dynamic interaction with elearning environment

As soon as the degree of interaction is decreasing, or the interaction is limited to informative inquiries, this means that only performance standard and learning outcomes criteria sill linking learners to the teaching acts. It could be one reason that could explain

the sentiment that many teachers had: learners still learning, but are they still teaching?

The factors cited in table: 1, could be directly or indirectly related to the missing considerations in designing and developing efficient resources for elearning environment.

2.3- Design of resources

Questioning the informal and formal learning process and activities could bring better use and integration of teaching platforms as Moodle.

How to conceive and how to observe learners behaviors, theirs thinking modes and sociocognitive activities, and hence be able to predict the learners' outward movement from learning space, is the coming challenge for instructional designer and teachers. As illustrated in table 1, observation grid are necessary to collect and note the movement generated by the interactivity of the elearning environment: a) allowing students to own a personal learning space, b) leading to the emergence of sociotechnological affordance, c) initiating a movement toward more learning territories (figure 1.3), and d) dissociating students from the elearning environment.

3- CONCLUSIONS AND SOME IMPLICATIONS FOR DESIGN

The preliminary data of our current research on analysing informal learning space on the Net and analysing and discussing with university teachers on concerns regarding online teaching practice and how they collaborate with instructional designers to conceive and develop theirs online course, have the potential to refine and explicit the existing tensions among culture of learning, teaching and designing. Some aspects of the Informal and Formal eLearning Transactions (IFeLTs) are under refinement, but have to integrate and consider some new promising approaches to elearning design. One avenue is the interaction design Reimann (2001) that propose more holistic and comprehensive way in apprehending elearning environment complexity recognizing the importance of the behaviours of its artefacts, its environment, and its systems. The other avenue is the potential of the current work on emergent design (Thompson and MacDonald, 2005) as a strategy for online teaching regulation as learners needs emergent and become better understood and articulated.

Finally, the analysis of the elearning environment design as a set of affordance: technological, social and education is pertinent. All those considerations should help to better articulate our conceptual model.

Integrating collected data from teachers, design and students interviews and from the analysis of the structure and discourse of the online courses will highlight how the IFeLTs could be used as design tools and interpretative tools for teachers and designer concerns and considerations. Which strategies could help teachers to interact with the tacit component of learner's knowledge in teaching context? How teachers could acquire the skills to capture, translate the tacit component of the learner's knowledge from what Tsonkas (cited by Williams, 2007) exposes as the component that could just be manifested in what we do? Lot of works should be done to clearly define the strategies and roles, and hence the skills, teachers should acquire to serve as conducts or sensors for learning (Salk and Simonin, 2003), and hence be able to manage and enhance the flows of knowledge in those more social learning structures. As Brown and Duguid (2001) expose: «… *effective sharing of the explicit component of knowledge requires that the tacit component be shared first*.» (p. 205) and this fact could explain why learners are so comfortable in acquiring knowledge in the informal learning spaces.

Informal learning is definitely the driven-motor for the next elearning environment and teaching platform design. Understanding how tensions among the three cultures (learning, teaching and design), articulated in terms of culture, practice and conceptions of learning and knowledge, could be a first step to establish strategy toward an effective designing approach to elearning.

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