Expansion of human Agency through Complex Educational Scenarios

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Abstract

Amartya Sen contends that the overall perspective of his capability approach may be understood as a "freedom centred" approach being shaped by the opportunity aspect and the process aspects of freedom or the effectiveness reason in which "the achievement of development is thoroughly dependent on the free agency of people" "as major engine of development" (Sen, 1999:4) given that "the claim is not only that human lives can go very much better and be much richer in terms of well-being and freedom but also that human agency can be deliberately bring about radical change through improving societal organization and commitment" (Sen, 2005a:vii), demanding principally, "for respect on the part of institutions and individuals" (Crocker, 2006) because and like Sen has fruitfully argued through his approach, we live and operate in a world of institutions and our real capabilities more than we could enjoy at a theoretical level depend on "which institutions exist and how they function" (Sen, 1999).

Therefore the human agency can be directly attempted and enacted through the role of institutions in expanding our real capabilities towards its focus as a major engine of development throughout interconnections of instrumental freedoms. As a result it is dealt with the definition of process principally as an intertwined process dimension based on the relationship between these components.

The above mentioned describes briefly the scenario of agency or the "process aspect of freedom" (Crocker, 2006) in which education, as a social opportunity, could contribute to development and expansion of human agency mainly because the former can be situated in "empirical linkages that tie the distinct type of freedom together"

(Sen, 1999:38) focusing its own instrumental dimension towards its process aspects and consequently being positioned as a mean of development more than an end in itself.

The latter situates the attention on education as "a social factor" (Drèze & Sen, 1995) of intrinsic and instrumental importance within social opportunities acknowledging in this sense the contributions that the Capability Approach has in broadening educational perspective going beyond their productive value: "placing the human capabilities in the space of evaluation with the intention, that what is informed as justice, be made on our capabilities" (Walker, 2006).

Nevertheless this acknowledgment is built up bearing in mind that the Capability Approach (CA) does not constitute a theory that can explain education, instead it provides a theoretical framework where we can conceptualize and evaluate education as a constitutive and instrumental capability or freedom. However and according to Robeyns (2004) and Unterhalter (2003a) it also needs other complementary theories because and like Unterhalter (2003b) has emphasized, the capability approach does not constitute a theory, it is an approach.

The latter addressed on one hand the acknowledgment of wide scope and under specification framework of Sen's approach, following to Robeyns (2006) and on the other the recognition of its own interdisciplinary view as a nuclear requirement when the capability approach is situated in the field of social sciences, specifically in the field of education. In this sense then the claim of complementary theories in Sen's approach could be seen as an underlying principle in attempting a landscape of complexity in the capability approach.

The development of this scenery of complexity is concerned with its own normative acknowledgment that is, it is based on the recognition of human beings as complex adaptive systems whom are able to adapt their "own capacity of learning" (Senge, 2006) and where it can be seen as their principal route of adaptation. Furthermore it is involved in methodological aspects because it is focused on providing via the sciences of complexity a new view concerning on one hand in understanding how the agency or the process aspect of freedom is taking place and on the other in addressing, within this view of complexity, the role of education, in particular in proposing how education may contribute to the expansion of human agency? And which conditions may education take into account?

Both intertwined questions could be engaged in their own development towards a new educational narrative where education would be able "to explain the reality like the reality is happening" (Colom, 2006) and to focus on how the human beings are being and doing in it. Therefore the education that approximates the CA has to take note that this framework thinking is an approach about human beings whom constitute a complex adaptive system. In other words it has to deal with their complex rationality towards a proposal of complex educational process as a theoretical framework of instrumental dimension of education.

In assessing the latter assumptions this paper has been structured in three sections. The first section defines the notion of complexity, going beyond the idea of complexity addressed by Chiappero Martinetti to the Capability Approach (2004) and consequently embracing a definition of complexity which "is concerned with a wide range of living phenomena – cells, organisms, human language, economies, ecosystems and so on – that resist the reductive and analytical explanation offered by traditional western science" (Mc Murtry, 2006). Therefore this definition is attempted to the theoretical framework thinking of the CA, proposing that its scenario of complexity can be drawn through the notion of human diversity that Sen has emphasized as a central aspect in the space of capabilities and functioning, where the human beings "cannot be understood independently from the active system in which they participate" and "the social matrix" which they belong to, according to Engestrom (2000, quoted in Mc Murtry, 2006).

As a theoretical exercise it situates the human diversity within a notion of co-evolutionary feedback process drawing the attention on adaptive preferences and social norms as learning transformation processes more than aggregative and focuses its development on proposing the nuclear aspects that education, as an instrumental freedom, may take into account when it is focused on strengthening human agency.

The second section develops the proposal of Complex Educational Scenarios as an analytical framework of the instrumental role of education, addressing through its development the second question: How education may contribute to the expansion of human agency? Its development has been focused on highlighting at least two ideas proposed by framework thinking of the CA: firstly its bottom approach and secondly the role of human diversity, in particular the role of institutions, like contextual factors, in expanding our real agency more than we could enjoy at a theoretical level. Both aspects are intertwined in their own development with the complex landscape addressed to the Capability Approach, focussing its development on highlighting and situating education within a definition of process.

The third section explores from the proposal of Complex Educational Scenarios the process of expansion of human agency carried out by the Learning Workshops (LWs) and Making Networks (MNs), two communitarian educational experiences developed in Chile and Uruguay respectively. It is significant to highlight at this point that the main objective of this exercise has been the enhancement of the proposal of Complex Educational Scenarios that in itself has been built up with the aim to offer a new view about how we can asses the process of expansion of human agency from the perspective of complexity and highlight that the instrumental role of education in the expansion of human agency can be understood as a process of complex rationality, as a central grammar within a new educational narrative.

Introduction

Amartya Sen contends that the overall perspective of his capability approach may be understood as a "freedom centred" approach being shaped not only by the opportunity aspect but also by the process aspects of freedom or the effectiveness reason where "the achievement of development is thoroughly dependent on the free agency of people" as the "major engine of development" (Sen, 1999:4), as "the claim is not only that human lives can go very much better and be much richer in terms of well-being and freedom but also that human agency can be deliberately bring about radical change through improving societal organization and commitment" (Sen, 2005a:vii), demanding principally, "for respect on the part of institutions and individuals" (Crocker, 2006) because and like Sen has fruitfully argued through his approach, we live and operate in a world of institutions and our real capabilities more than we could enjoy at a theoretical level depend on "which institutions exist and how they function" (Sen, 1999).

Therefore the human agency can be directly attempted and enacted through the role of institutions in expanding our real capabilities throughout interconnections of instrumental freedoms. As a result it is dealt with the definition of process principally as an interdependent process dimension based on the relationship between these components.

The above mentioned describes briefly the scenario of agency or the "process aspect of freedom" (Crocker, 2006) in which education, as a social opportunity freedom, could contribute to the development and expansion of human agency mainly because education could be also addressed to "empirical linkages that tie the distinct type of freedom *together*" (Sen, 1999:38), being positioned as a means of development more than an end in itself within its instrumental dimension.

Nevertheless the Capability Approach (CA) does not constitute a theory that can explain education, instead it provides a theoretical framework where we can conceptualize and evaluate education as a constitutive and instrumental capability or freedom. However and according to Robeyns (2004) and Unterhalter (2003a) it also needs other complementary theories because and like Unterhalter (2003b) has emphasized, the capability approach does not constitute a theory, it is an approach.

In this sense then the claim of complementary theories in Sen's approach could be seen as an underlying principle in attempting a landscape of complexity in the capability approach.

The development of this scenery of complexity is in addition concerned with a normative dimension that is, it is based on the recognition of human beings as complex adaptive systems who are able to adapt their "own capacity of learning" (Senge, 2006) and where this capacity can be seen as their principal route of adaptation. Furthermore it is involved in methodological aspects because it is focused on providing via the sciences of complexity a new view relating to on one hand the understanding of how the agency or the process aspect of freedom is taking place and on the other in addressing to this scenery of human agency the role of education, in particular how it

may contribute to the expansion of human agency? And which conditions may it take into account?

Both intertwined questions could be engaged in their own development towards a new educational narrative where education concerning the human agency would be able "to explain the reality like the reality is happening" (Colom, 2006) and to focus on how the human beings are being and doing in it. Therefore the education that approximates the CA has to take note that this framework thinking is an approach about human beings whom constitute a complex adaptive system.

In assessing the latter assumptions this paper has been structured in two sections. The first section defines the notion of complexity, going beyond the idea of complexity addressed by Chiappero Martinetti (2004) to the Capability Approach and consequently embracing a definition of complexity which "is concerned with a wide range of living phenomena – cells, organisms, human language, economies, ecosystems and so on – that resist the reductive and analytical explanation offered by traditional western science" (Mc Murtry, 2006). Therefore this definition is addressed to the theoretical framework thinking of the CA, proposing that its scenario of complexity can be drawn through the notion of human diversity that Sen has emphasized as a central aspect in the space of capabilities and functionings, where the human beings "cannot be understood independently from the active system in which they participate" and "the social matrix" which they belong to, according to Engestrom (2000, quoted in Mc Murtry, 2006).

The second section explores the Educational Scenarios in the expansion of human agency carried out by the Learning Workshops (LWs), a communitarian educational experience developed in Chile during the seventies and eighties. Its development has been focused on addressing through its development the second question: How education may contribute to the expansion of human agency? as well as in highlighting at least three ideas that are coming from the capability approach: (1) the complex rationality of this economical approach; (2) its bottom up approach and (3) the role that institutions, like contextual factors, play in the expansion of our real freedoms more than we could enjoy at a theoretical level These aspects are focused on highlighting and situating education within a definition of process, to be more precise as a complex rationality process.

1. Which conditions may the education take into account?

a) Towards a landscape of complexity in the Capability Approach

Sen (2005b:6) recognizes in relation to the ambiguity within the conceptual framework of the Capability Approach (CA) that "if an underlying idea has an essential ambiguity, a precise formulation of that idea must try to capture that ambiguity rather than attempt to lose it. Even when precisely capturing an ambiguity proves to be a difficult exercise it

is not an argument intended to forget the complex nature of the concept and seeking a spuriously narrow exactness".

In addressing a landscape of complexity, this paper acknowledges "the multidimensionality, the lack of narrow and predefined boundaries" (Chiappero Martinetti, 2004) in Sen's approach, focusing on them as its major strength for many disciplines in the field of social sciences, rather than its weakness. Nevertheless it is going beyond Chiappero Martinetti's complexity overview in the CA situating a meaning of complexity derived from the Santa Fe Approach[1].

As a science then it is focused on addressing and analyzing the fundamental properties of nonlinear-feedback networks and particularly of complex adaptive systems (CASs) like any human social group- based endeavour within a cultural and social systems such as political parties or communities and that in Stacey's opinion can operate in a way that constitutes learning.

According to Stacey (1996) the CASs are "networks of large number of agents who interact according to schemæ that contain both dominant and recessive parts" That is they are constituted by legitimate and shadow networks, conceptually distinguishable and operatively intertwined that allow human systems being situated within a notion of nonlinear feedback networks that is, "individuals, groups, organizations and societies that nest within each other to form a highly complex whole" (Stacey, 1996).

These kinds of systems "[…] are creative only when they operate in what might be called a space for novelty. This is a phase of transition at the edge of chaos, that is, at the edge of system disintegration. It is a paradoxical one that is both stable and unstable at the same time, driven by contradictory dynamics of competitions and cooperation, amplification and constraint, exposures to creative tension and protection from it" (Stacey, 1996:49), operating from principles of emergent order and self-organization.

This principle of emergent order is also linked by Sen (1999) when he argues that the unintended consequences can lead to "reasoned and intentional advancement" (Sen, 1999:254). His argument is based on Adam Smith's thought that the course of the market is driven by "an invisible hand" that allows human beings to "advance the interest of society" […] "without intending it, without knowing it". In his proposal Sen has defended the idea that the unintended consequences may be understood in terms of *anticipation* (his own emphasis) of important but unintended consequences as basis for a rationalist reform that is the consideration of all possible scenarios (own emphasis)

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[1] The Santa Fe Approach was developed by Santa Fe Institute (SFI). It is focused on disseminate the complexity science, in particular they coined the term Complex Adaptive Systems (CAS) That is a subfield of a systems sciecnce or systemic, which studies the common properties of systems considered complex in nature, society and science. It is also called complex systems theory, complexity science, and study of complex systems and / or sciences of complexity. See http://en.wikipedia.org/wiki/Complexity_sciences

and where "the learning by doing can be seen as a great ally of the rationalist reformer" (Sen, 1999:255).

Likewise Sen has emphasized that the anticipation can be seen resting on the confidence of each party in the maintenance of such market relations upon the ability to predict by themselves the many consequences in their relationships. The latter assumption expresses a property of complex adaptive systems like human beings where they can *predict and recognize archetypal behaviour* (Stacey, 1996) (his emphasis) based on their own capacity of associative memory:

Thus, one kind of prediction requires us to know a cause-effect link, whereas another form of prediction relies on past experience of the general form of behaviour produced by a particular system. This latter kind of prediction depends on pattern recognition ability, the ability to reason by analogy and intuition, rather than on analytic reasoning (Stacey, 1996:104).

Then the central meaning of complexity that this paper develops is precisely the notion of learning as a vehicle that allows the capacity of adaptation of human beings, as a property of living systems which operates within their environment in an open condition and where the relation established between both is also constitutive of the system itself. In fact the capability approach also addresses the attention on this capacity of adaptation and learning when it focused on the dynamics of "human diversities and the environment and how the latter can pervasive positively or negatively influence our achievements and our possibility to achieve our overall freedom, via the conversion factors" (Chiappero Martinetti, 2004).

However this theoretical exercise is not focused on highlighting the paradigm of complexity mainly because it recognizes the dissemination of theory of complexity by the Santa Fe Institute through numerous complexity institutes and departments around the world: The CCS and CSCS at the University of Michigan, The CSE at UC Davis, the NECSI and so forth.

Certainly it is based on these views and concerned with the development of a new way of understanding the aspect process of capabilities or freedoms because in addressing their empirical dimension we have to consider according to Walker (2006) that capabilities are a combined process of freedom and rationality, in particular focusing on dealing with to them as a learning process dimension.

b) Drawing a landscape of complexity through human diversity

In addressing a learning process to capabilities we have to bear in mind human beings and their thoughts are embedding in their own "social matrix" (Engestrom, 2000, p.302). The latter focuses the diversity as a crucial point in the complex adaptive systems, because "the complex systems have a history […]" (Cilliers, 1998), strengthening the scenario of human diversity not only as a "fundamental aspect of our interest in equality" (Sen, 1992: xi) but also emphasizing "what are the significant diversities in *this* context" (Sen, 1992:117) (his emphasis).

Then in drawing a landscape of complexity of CA we would consider that properties of CASs could be also developed through the concept of human diversity of Sen's approach which delineates these properties through open interaction among three kinds of factors which influence the election and conversion of commodities into functionings within a set of capability (See Figure 1.1). It can also be understood as a network of people, "where individual agents interact with each other and with agents of other organizations that constitute their environment" (Charan, 1992; Mueller, 1986; Nohria and Eccles, 1992).

The assumption mentioned above is principally based on Stacey's work, in particular the social approach of complexity that he brilliantly achieved to address to social groups and organizations. In this sense, Stacey's work develops the social perspective of complexity focusing on drawing the attention on the internal structures and dynamics of human beings that deal with the learning of capabilities and the collective and individual human agency. In other words, his approach is occupied with the processes that delineate our own capacity of learning and adaptation. The latter has a direct relevance to Sen's approach because this framework thinking is also occupied in scrutinizing in the expansion of our capabilities "the context in which economic production and social interactions take place, and whether the circumstances in which people choose from their opportunities sets are enabling and just" (Robeyns, 2005:99).

These multiple interactions among the conversion factors are shaped in a "nonlinear form in which feedback on the consequences of behaviour are used to construct models of the world from which rules of conduct or schemas are extracted" (Stacey, 1996:21). Then the notion of human diversity as an open system can engage with the concept of coevolutionary feedback process.

It can be negative when human agents or systems "Have some prior intention or target and then compare the outcomes of actual behaviour against the target feeding the information about deviations back into the discovery-choice-action loop in order to remove the deviation" (Stacey, 1996:35) It is positive when "agents or systems, feed back information into *discovery-choice-action* loop in a way that amplifies and destabilizes it" (Stacey, 1996:37).

Therefore and following Stacey's approach, these personal, environmental and socio-cultural factors could be embedded in "networks of large number of agents" constituted by two "conceptually distinguishable and operatively intertwined subsystems" which delineate the way in which the whole system learns and the nature of relation that it establishes with their surrounding environments (See Figure 1.1)

Then, the legitimate network engages current reality through behaviours that are characterized by links of uniformity, conformity and repetition based on a dominant schema that all the agents share and that remains constant for lengthy periods. This subsystem is focused on performing "what is judged by the most powerful or the majority to be the organization's primary task – what the members of an organization

need to do in sustaining the support of others outside the organization at a given time" (Stacey, 1996:24). Its long-life term is delineated through linear links where "one and only one response is permitted for any given stimulus, any outputs are proportional to inputs and the system is not more or less that the sum of its parts" (Stacey, 1996).

However, the links are also spontaneous and informally established in the course of interaction in the shadow networks with the legitimate system. It could also be seen as a shadow of legitimate network where the agents are able to develop their own rules of interaction that would be shared in collective and small groups within a whole system or at an individual level, remaining "specific to individual agents" (Stacey, 1996). It is focused on leading the tacit task that is, the repertoire of thoughts, perceptions and behaviours that are potentially available to an organization but are not currently being utilized for its main purpose. In other words, it is addressed to rules that are no part of the officially and sanctioned culture or ideology according to Stacey's approach. Furthermore this subsystem shapes nonlinear links where there are many possible responses to any given stimulus that are originated from many sources applied by agents and which of them vary from one occasion to another, leading to *unexpected actions* (own emphasis).

The local interaction is shaped in legitimate systems by a set of rules which govern how people in an organization jointly carry out the current primary task of their organization as its central purpose and where their boundaries are clearly defined: "either particular agents are members or they are not" (Stacey, 1996:26). However in the shadow networks the agents decide what to do by consulting an external table of rules, either group-specific or system-wide no officially sanctioned, or by following their own tables of rules and the interactions are characterized by the diversity, expressed through flows of emotion, friendship, trust and other qualities that are additional to the flows of information, energy and actions. Their boundaries are permeable, allowing that it can be seen as the most probable "route for interaction between organizations simply

Figure 1.1 The Human Diversity as a Coevolutionary Feedback Process
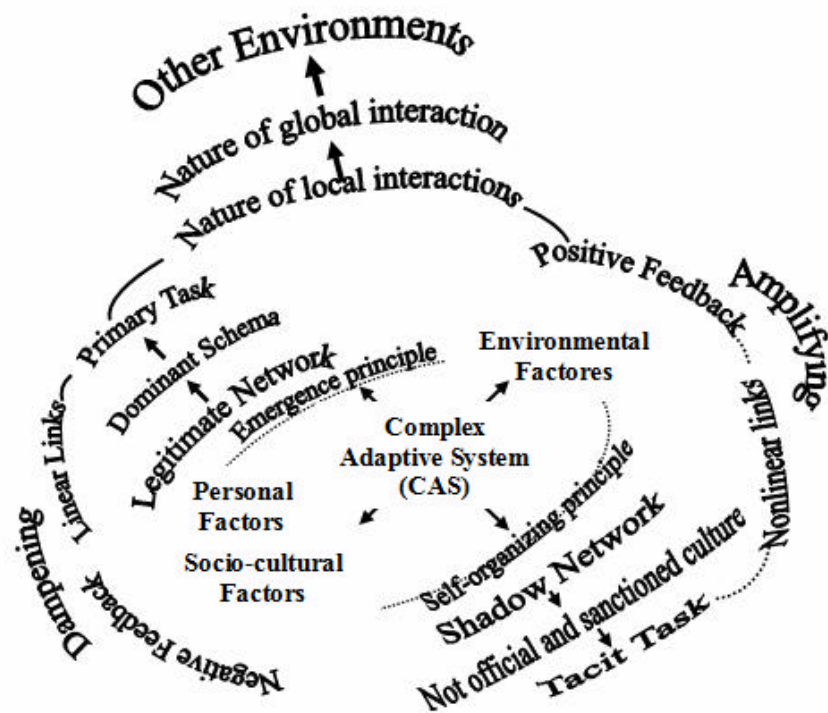
Source: Own Construction

because they have sufficiently porous boundaries" (Stacey, 1996:27) (See Figure 1.1).

Then this notion of human diversity would be **situated behind at** the scenario of capabilities. Nevertheless in understanding how the process aspect of freedoms is led we have to focus on the kind of learning that it is able to lead to. It also implies to address these ways of learning to the formation of adaptive preferences and social norms mainly because "the learning occurs at the level of system or collective" (Mc Murtry, 2006).

c) The way of learning of capabilities from adaptive preferences and social norms

Following Stacey's approach the capabilities from the development of adaptive preferences and social norms would be addressed to simple and complex learning processes that characterize the way in which the CASs evolve. Then, the deviations between desired and actual consequences are dampened by taking corrective action. This application of negative feedback is "simple, single-loop learning" (Stacey, 1996:36), where the planning is learning done prior to action being as well espoused to Learning Model I where the people "engage in group interaction in order to win and not to lose; retain unilateral control of any situation to avoid embarrassing others or being embarrassed themselves and to contain the fear of failure; and restrict the effective participation in decision making to as few people as possible" (Stacey, 1996:139).

Nevertheless the complex learning (Bateson, 1972; Piaget, 1953; Argyris and Schön, 1978) arises when the schema's driving behaviour is altered in the light of the responses that the behaviour provokes. "This is the learning in real time, reflection-in-action (Schön, 1987), and it clearly involves positive feedback in some way because behavioural consequences must be amplified to provoke changes in the schema. The schema is destabilized in that part of it is replaced" (Stacey, 1996:36). It is espoused to the Learning Model II, in which the people "should cooperate and in a search for win-win solutions; gather the facts; generate the options; and creating spaces for public discussion; keep open their mind in the light of this process and without using power or hierarchical position to obstruct the cooperative process" (Stacey, 1996:138) (See Figure 1.2)

We may also connect these ways of learning to the idea of endless feedback process that "an organization develops over time […] in which individual agents within it: discover, choose and act" (Stacey, 1996:28). Then the learning is linked to the result of loops of discovery-choice and actions that are developed in an intertwined process between the agents' individual schemas (behavioural scripts, mental model, operational rules and evaluation rules), their internal structures and the shared schemas (hierarchical rules, bureaucratic rules and cultural and ideological rules). The meaning of endless is provided through the changes that the learning (individual schemas) and dialogue (shared schemas) are accomplishing. That is, they are generating consequences that influence the loops of discovery - choice – action in an endless feedback process. (See Figure 1.2) Both mechanisms of learning are engaged in the internal structure of agents and the dynamics derived from them simply as the self-organizing principle in CASs "cannot be externally determined or explained in terms of straightforward causal inputs and outputs" (Mc Murtry, 2006).

As a result the capabilities are engaged to a definition of learning focused on an aspect of transformation more than aggregative within the formation of adaptive preferences and social norms.

For example, the capabilities could be placed within a definition of complex learning, specifically as a process of endless feedback process from an holographic principle which delineates its constructive meaning in the expansion of other capabilities mainly as they can be defined as valuable beings and doings but also becoming (Comim, 2003) (See Figure 1.2). In this sense Walker (2006) approximates this notion of endless feedback process through the concept of education as a valuable capability in itself that affects the development and expansion of other capabilities by learning processes that are "seldom linear and immediate; it is more often recursive, new learning builds on existing knowledge, past experience and pupil identities" (Walker, 2006:177).

But also the capabilities could be situated within a definition as a primary task, especially when they are defined as basic capabilities to meet the basic needs (Alkire, 2002). This conceptual relation is sustained fundamentally through the nature of results that both are shaped through lineal links.

For instance, in developing the primary task the agents determine what they do, consulting a set of shared rules, external and universally applicable to all of them and defining how the agents jointly carry out the primary task. Similarly the basic capabilities (Alkire, 2002) are defined with respect to the harm more than to the desires or biology keeping out its relativity following to Wiggins (1998:10)[2] and where the links are lineal like it happens in the primary task in the sense that "one and only one response is permitted for any given stimulus" (Stacey, 1996:25) if the organization is trying to survive.

Nevertheless the common scenario establishes at the same time a difference in relation to the processes that the notion of capabilities involves, that is the freedom to participate and choose which basic capabilities are being relevant, something does not seem to lead the consecution of primary task within formal subsystems.

Furthermore the meaning of capabilities and functionings as an *endless feedback process* is developed in an open condition. Then it is regarding the processes and how these are developed, allowing the incompleteness that Sen has defended by his rejection of a fixed and final list of capabilities could be seen from the complexity as a fundamental condition of capabilities. In other words it would be addressed to an endless feedback process, like a spiral, where the capabilities as valuable beings and doings and also becomings are evolving by actions of agents influenced by their individual and shared schemas and modified through *learning* and *dialogue* (See Figure 1.2). The latter could be strengthened by Sen's argument concerning that "a fixed forever list of capabilities, would deny the possibility of progress in social understanding and also go against the productive role of public discussion, social agitation and open debates" (Sen, 2005c:160).

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[2] (i) I need (absolutely) to have **x** if and only if; (ii) I need (instrumentally) to have **x** if I am avoid being harmed if and only if**;** (iii) it is necessary things being what they actually are, that if I avoid being harmed then I have **x** (Wiggins, 1998:10).

This lens of complexity provides a landscape concerning how the process aspect of capabilities or agency takes place. The latter has a direct relevance in addressing the institutional role in the expansion of our real capabilities based on the acknowledgment of property of learning and adaptation of human beings as CASs as well as in facilitating the environmental conditions that allow the management of permanent tension that characterizes the learning and adaptation processes of CASs. (See Figure 1.2)
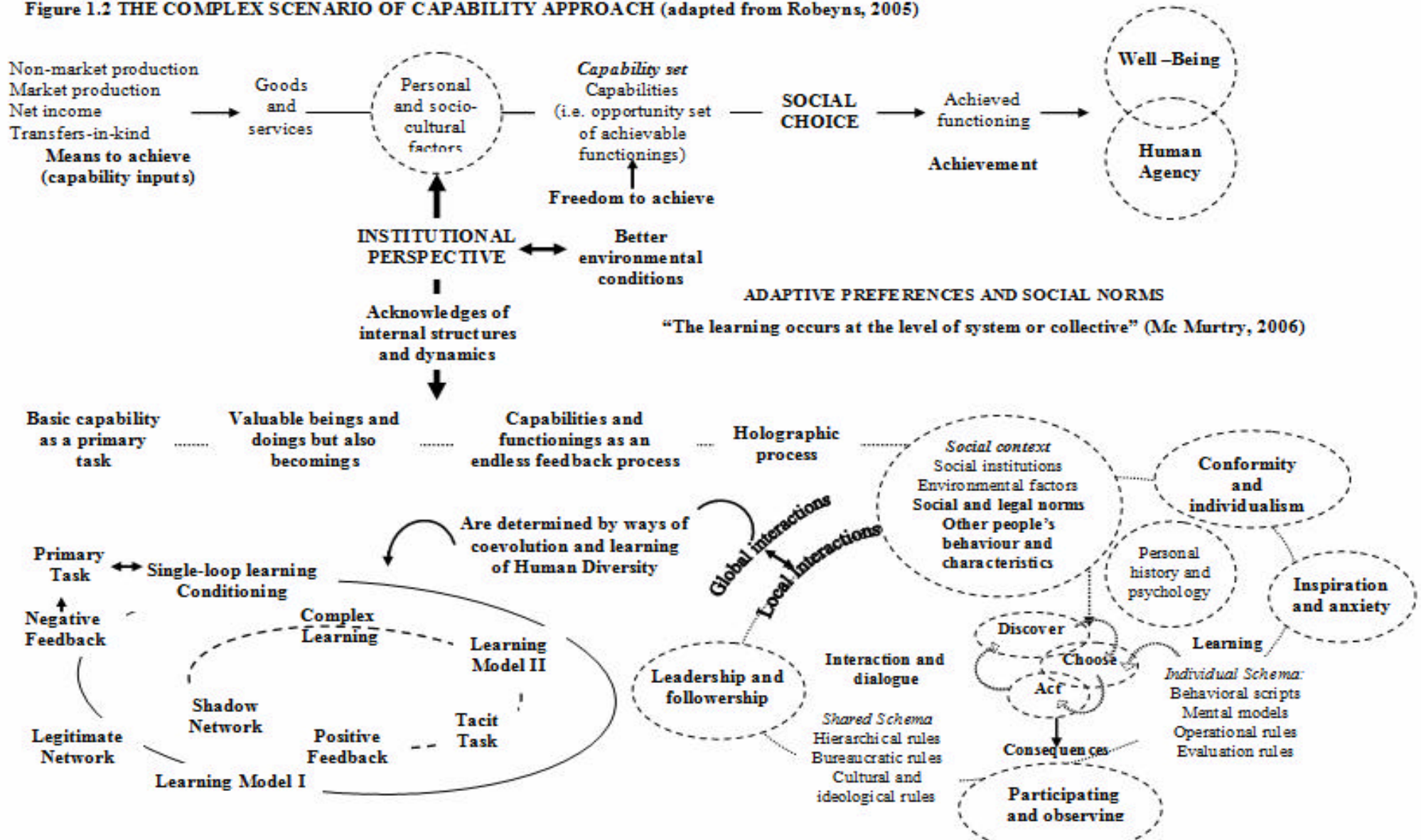
Figure 1.2 THE COMPLEX SCENARIO OF CAPABILITY APPROACH (adapted from Robeyns, 2005)

2. The Learning Workshops: Complex Educational Scenarios of Human Agency

The question as to how *education may contribute to the expansion of human agency?* is addressed through description and analysis of Learning Workshops (LWs) a communitarian educational experience developed in Chile during the seventies and nineties.

It is important to emphasize at this point that human agency is linked to a notion of participation, which is expressed through self-determination and empowerment "supporting a specific freedom of agency – the freedom of participants to express their own opinion and if the consensus is achieved, act upon them" (Alkire (2002:131) and that education within a notion of process is addressed to the instrumental role that it has in expanding, connecting and transforming other capabilities.

Central in the analysis of Complex Educational Scenarios (which I will hereafter refer to simply as CES) is the acknowledgment of complex rationality that characterizes the learning of freedoms as well as the idea education is understood as a complex educational praxis because it belongs to human beings whom constitute complex adaptive systems, acknowledging their intrinsic capacity of learners as an essential tool of their own adaptation and survival.

The Learning Workshops (LWs) was an educational initiative developed by the Nongovernmental Organizations (ONG) Interdisciplinary Program for Research in Education (PIIE) (Santiago de Chile). It was focused on helping children from economic and social deprived areas with a high level of educational failure through the acknowledgment and strengthening of the educative role of their own communities and its synergic function by addressing the improvement of children's educational failure, within a political-historic context characterized by the absence of guarantees of political freedoms and human rights and a strong support from the Catholic Church to poor and dissident communities during the Chilean dictatorship.

The primary goal of LWs was "reshaping of the social fabric" (Bengoa, 1988) through participatory educational methodology that is based on "dialogue, group learning and valuing the participants' experience as the foundation for further learning and knowledge" (Magendzo, 1990:50). The latter has a direct significance in addressing the next three assumptions in the analysis of LWs:

In the acknowledgment of education as an instrumental freedom, it would be addressed within a process of transformation of other capabilities rather than an aggregative one.

The human agency would be also understood as a learning process that emerges when an agent, group or community are able to develop an honest self-reflection about the whole system that they constitute, that is that they are able to develop a systemic thinking.

The latter assumption was addressing to environmental conditions as a fundamental aspect in developing human agency. Then the honest self-reflection and systemic thinking were possible within conditions of trust, respect and collaboration.

The assessments of these assumptions were developed through analysis of the article which described this experience: *Transference and Appropriation in Popular Educational Interventions: a Framework for Analysis.* It is developed acknowledging that its analysis is "better explained hermeneutically and narratively than deductively or through the application of covering laws" (Juarero, 1999: 252) mainly as complex systems are "so fundamentally rooted in their environment and history" (Juarero, 1999: 223).

a) The environmental conditions of Learning Workshops

In assessing the learning of Human Agency through CES held by LWs we previously need to draws the attention to the environmental conditions that delineated the education as a constitutive and fundamental freedom. In this sense the Chilean context was characterized by an increase of poverty in which the proportion of population living in that condition risen from 28, 5% in 1969 to 48, 5% in 1984 (Pollak y Uthoff, 1986 quoted in Vaccaro, 2007)[3]. In fact the LWs were implemented in 1977 focusing on accessing to "popular sectors" or "slum areas" […] where the people were socially and politically excluded from the Chilean mainstream" (Vaccaro, 1990). For example, the LWs were implemented in poor areas with different contexts (See Table 2.1). At the same time they were surrounded by educational policies focused on the formation of individuals as a mean of economical production, within an educational system based on values of mass media and under a "subsidiary role of the state in the field of education" (Garcia-Huidobro, 2003).

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[3] This reference corresponds to the information in one of the chapters of the Doctoral Thesis of this investigator, who shared this information for the complementation of the article *Expansion of Human Agency through Complex Educational Scenarios,* presented in the Workshop Children's Capabilities (University of Florence & Thematic Group Children's Capabilities, Florence, 18th -19th April, 2007) However it was not possible to have further information about this Thesis. That is why it is not cited within the bibliographic references.

Table 2.1 The environmental conditions of Learning Workshops (1977-1990)

City/community	Population	% Poverty	Employments	
Santiago/Pudahuel	300.000	60% (1980)	Builders, street vendors, technicians and vendors in fruit and vegetable markets	**T O T A L**
Valparaiso/Cerro Los Placeres	Large families live in wooden shacks without connection to a sewage system	70%		**C H I**
Chañaral, Copiapó and Vallenar	Large families live in wooden shacks without connection to a sewage system		*Pirquineros* (miner) who works using primitive methods and with insufficient resources	**L D R E N**
Curanilahue	The children must work to help their families	30% (1987)	Many miners work in the *pirquenes* (holes opened up in the hills to extract coal)	**BY 1988** **10.0000**

Source: own construction

b) The route of expansion of human agency in the Learning Workshops.

In assessing the expansion of human agency we would draw the attention on the bottom-up strategies led by educational scenarios of LWs and how they incorporated the diversity of their informal networks through educational participatory strategies that acknowledging on one hand "the educative potential of the community, as a process of development and collective improvement," (Vaccaro 1990:65) and on the other the ability of these networks in managing the capacity of resiliency as a creative process in leading the problems of survival which affected them daily.

It was a participatory process that allowed an educational relationship among monitors or popular educators, children, families and community which was based on the acknowledgement of their educative role and the potential of their own identity as an educational resource to improve the children's educational failure.

For example, an educator recognized: "The work brings learning not only from the workshop to the family, but also from the family to the workshop, because it means sharing experience and information" (Vaccaro, 1990).

As an educational experience based on a participatory methodology, the LWs proposed a "pedagogy of commitment", expressed as "a positive educational relationship between monitors and children, a social commitment to solve problems in the community and a political commitment to coordinate efforts for a long-range process of social transformation" (Vaccaro, 1990:72).

In this sense it allowed an educational climate based on attention, respect and trust improving the children's self-image and self-esteem: "I would tell other kids to come to the workshops because the monitors understand you and you trust them" (Vaccaro, 1990:69). As well as it reinforced the knowledge as a social phenomenon

through "values such as solidarity, respect, creativity, critical spirit and sense of sharing" (Vaccaro, 1990:70) like a child pointed out: "I have grown used to it, the workshop is wonderful, and I've made friends" (Vaccaro, 1990:70).

In a similar way this methodology allowed monitors to examine their personal experiences, reflecting collectively on them in order to learn from their lives in the communities. Then they developed an active learning process, which was considered to be a collective process taking place in a climate of democratic relationships and individual and collective freedoms, allowing them the achievement of valuable functionings like critical thinking and self-confidence and as a consequence an emotional comprehension (See Figure 2.1)

"I know my neighbour is hungry, but I don't become socially involved. The program helps me confront reality"

"When I was arrested they came to visit me. This motivates me and makes me want to keep on working. It has helped me personally […] now I have something" (Vaccaro & Sotomayor, 1987)

In the LWs was fundamental the process of Transference and Appropriation, a scenario where the attention was directed to the phase of negotiation, which according to Vaccaro (1990) conditioned the appropriation itself.

It allowed revising and valuing by communitarian organizations "the proposals worked out by the professional team", focusing on discussing "how the process of appropriation will take place, in other words, how the community will own the educative program" (Vaccaro, 1990:81) and the relevant aspects and actions for its implementation.

It was also a process of participation with monitors, within a phase of preparation and instruction of the curriculum which were used in the LWs, allowing it to be adapted to the needs and interests of each community through monitors' contributions and innovations to educational project.

Figure 3.1 Expansion of Human Agency through Complex Educational Scenarios

Source: own construction
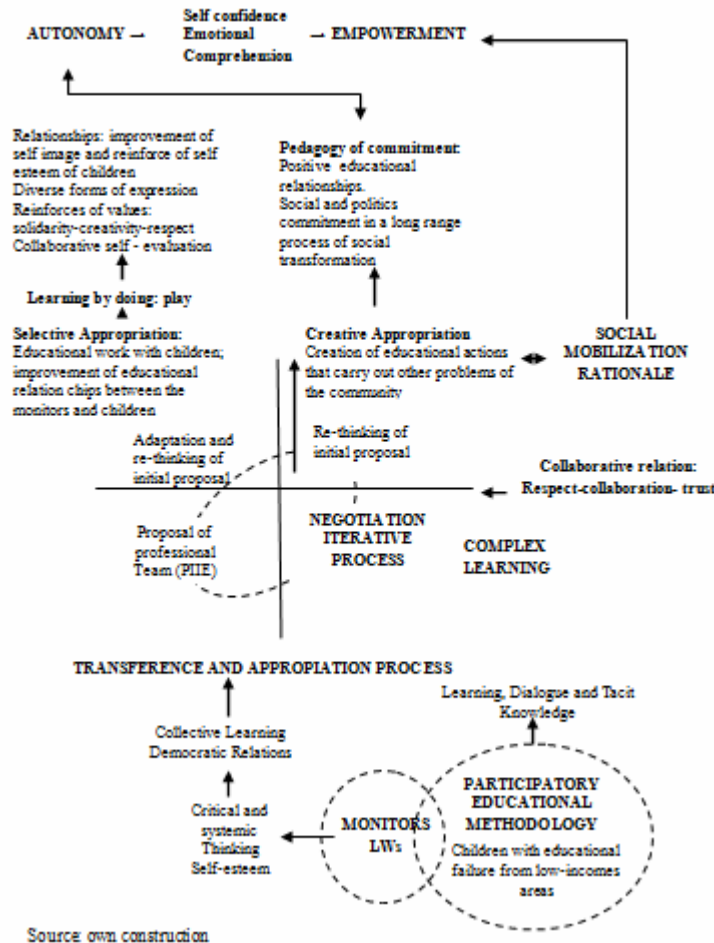
c) The expansion of human agency: the learning of participation

Based on a participatory educational methodology, the LWs delineated a set of conditions that allowed to *communities* co-evolved in the learning of its own capabilities, achieved valuables existences and activities and therefore expanding their own human agency.

Its co-evolution was characterized by an initiative which did not "follow pre-established models" being developed by communities "as an answer to its genuine problems". (Vaccaro, 1990), within conditions of reciprocal relations of trust, respect and collaboration that allowed the creation of tacit knowledge into explicit knowledge[4].

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[4] The *tacit knowledge* would be understood as one "[…] deeply rooted in an individual's action and experience, as well as in the ideals, values, or emotions that he or she embraces" (Nonaka & Takeuchi, 1995:8 quoted in Fullan, 2001). The *explicit knowledge* is referred to useful and shared knowledge that

Therefore its analysis is focused on the process of Transference – Appropriation which defined two scenarios of this participatory educational experience:

a) The process of Transference and Appropriation as a functional educative approach "centred on technical efficiency and measurable results" (Magendzo, 1990). It could also be interpreted as the primary task which the LWs developed in function of the requirements necessary to survive. In this approach, the primary task of LWs was focusing on the improvement of educational failure of children from low income areas.

For example, in 1977 a group of professionals began a workshop with a group of 64 children selected within the educative system as destined to educational failure. At the end of this year 84 % of these children were promoted to the next grade. "It was a notable achievement, especially taking into consideration, that the teachers who had previously identified difficulties in these children, themselves performed the assessment" (Vaccaro & Schiefelbein, 1981 quoted in Vaccaro, 1990:71).

A second primary task was concerning to the development of autonomy by participants. Being able to run the programs and initiate the educational processes by themselves ("by definition of objectives, developing teaching methods, managing resources and using educational material") (Vaccaro, 1990:64).

As a primary task it was fundamentally situated within a selective appropriation processes. In its development "the participants take on specific areas according to their skills and depending on the real possibilities for action […] because participants operate within the boundaries delineated in the initial proposal" (Vaccaro, 1990:75). Then through negotiation process, the participants "have to develop the ability to maintain, adapt, and get back to the initially proposal, originated by a group of professionals" (Vaccaro, 1990).

b) In a second approach, the Transference – Appropriation was situated within a perspective of process, which was fundamentally emphasised by a social mobilization rationale of education. According to Magendzo (1990:55), in this perspective the agents not only are focused on their "specific actions of their Projects" but also "in creating programs and maintain their commitment by working with diverse communities groups".

This approach could be situated within the creative appropriation process that is the "invention or creation of possibilities for action in situations that call for a new type of intervention. In this case the participants were prepared to respond to other spheres

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arises within a climate of reciprocal relations based on trust, collaboration and respect within an organization, where "the sharing of tacit knowledge among multiple individuals with different backgrounds, perspectives, and motivations becomes the critical step for organization knowledge creation to take place" (Nonaka & Takeuchi, 1995:85 quoted in Fullan, 2001).

of action based on new or different problems that beset the community" (Vaccaro, 1990:75) (See Figure 2.2)

The appropriation was defined by Vaccaro (1990) as the process where participants "learn concepts and knowledge and develop values and attitudes that enable them to then take control of the programs and generate new possibilities for social action" (Vaccaro, 1990:64). In itself it was a process enveloped in "a high degree of uncertainty and characterized by a conflict of values" (Schön, 1983 cit en Vaccaro, 2007), and which was outlined basically by action and systemic praxis of the agents, within principles of collaboration and democratic relations.

In this sense *Learning by doing* constituted a central strategy in this process of appropriation, which drew an educational perspective of LWs with children's work based on their lives and individual experiences and where play had a central role.

The creative appropriation carried out a comprehensive educational action in which the educators created a cognitive space by carefully identifying objectives, planning of appropriate activities and promoting active participation by the learners in the educational process. At this point the cognitive space was defined by conditions that "enabled the learners to acquire knowledge and use it in their praxis" (Magendzo, 1990:55) (See Figure 2.2) In other words, the opportunity to learn in "time on task" (Carrol, 1963; Anderson, 1987 cit en Vaccaro, 2007) as an access to what is called complex learning.

In this approach the complex learning was shaped through the process of negotiation between the community and the professionals of PIIE. It was developed in an iterative manner concerning how "the educational program were appropriated by the community" (Vaccaro, 1990), "often emerging lines of work going beyond the initial proposal as formulated by the professional team. Those in charge of the project, as well as the participants found themselves involved in new actions that required re-thinking the initial proposal " (Vaccaro, 1990:73).

According to Vaccaro (2007), the process of transference and appropriation is in itself a unique experience (singular), complex (it can not be simplified), unstable and always changing". That is why the generated knowledge arises from an action in constant co-evolution (Vaccaro, 2007).

Figure 3.3 Intertwined and self-organization learning of Human Agency by Learning Workshops

Source: own construction

d) The collective memory of LWs as a route of building local capacity

The collective memory of LWs understood as the ability of learning from its own experience would set a fundamental route of building local capacity at least for three reasons. Firstly, the fitness landscape in an organization depends not only on an organization's own actions but also on those of the other organizations it interacts with (Stacey, 1996); secondly, we live and operate in a world of institutions and our opportunities will also depend on how they function (Sen, 1999) and thirdly the relation between individuals and institutions is developed in a continuous feedback process, that is, a circular nature of interconnection between choice, action and outcomes that "leads to a complex connection between cause and effect" (Stacey,1996).

Although the CES in the Learning Workshops where addressed to a "subsidiary role in the educational field" (Garcia-Huidobro, 2002) what certainly is important to emphasize is the transference of the experience of LWs to the design of Chilean

educational policies. In this sense the LWs were transferred to the "900 Schools Program" (P-900), the first active educational policy in democracy (1990) which was focused on "improving learning of children who attend free elementary schools, located in rural and extreme urban poverty areas in the country's thirteen regions" (Garcia-Huidobro, 2006) specifically "on that 10% of highest educational risk establishments, that is those schools with the worst result in the SIMCE[5]" (Garcia Huidobro, 2006). Then the coverage of LWs in the formal system was widening in 1990 to 34.000 children until 2000 in which 36.369 children attended to it.

Its impact could be addressed to the improvement of student's learning through the increase in their educational achievements in 4th grade by assessment SIMCE test and with respect to "students with similar characteristics in schools that did not participate in the program" (Garcia Huidobro, 2006) (See Table 2.2).

Table 3.3 **Relative Variation SIMCE Scores**
P-900 Schools vs. Non-P-900 Schools (control group)

Year		1990	1991 & 1992	1993 & 1994	1995 & 1996	1997 to 1999*
General		0,80	3,56	- 0,89	- 0,43	0,22
Initial Score	<50	0,82	5,12	1,38	0,06	
	50-59,99	0,30	2,64	-0,10	0,01	1,61**
	60-69,99	n/d	0,77	-2,52	-0,86	-0,62
	70-79,99	n/d	-2,72	-4,36	-1,30	-2,45
Dependency	Mun.	0,90	3,58	-1,02	-0,33	0,17
	Part. Subsid.	0,26	3,43	-0,20	-0,87	0,42
Enrollment	<100	-1,48	3,41	-1,72	-1,70	0,20
	100-299	1,09	3,28	-0,66	0,01	0,55
	300 or more	0,80	3,88	-1,04	-0,71	-0,18

Source: Evaluation of the 900 Schools Program. (Santiago Consultants et al., 2000)
*   Variation in 1999 SIMCE scores and its equivalent for 1996. Remeber that the scoring for the 1996-99 range is not totally comparable with that of previous periods.
** Corresponds to the range of initial scores <60 SIMCE points.

Furthermore the LWs contributed to a better quality among educational agents that participate in 900 School Program introducing a new pedagogical approach which reached important changes in schools:

The school environment has improved: the human relationships and personal have enriched among educators and mainly through the LWs, the personal and affective development as well as the self-esteem of children. It has been pointed out and diffused the necessity to adopt a new pedagogic paradigm that puts the accent in the learning of the students characterized as active, significant learning, collective and contextualized (Garcia-Huidobro, 2003:299).

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[5] The National System for Educational Quality Measurement (SIMCE) has been functioning in Chile since 1988 and, since then, has applied every two years educational achievement tests in Spanish and Math to all fourth and eighth grade elementary school children.

Behind the scene of these valuable achievements there are an acknowledgment that LWs evidenced coherence between their pedagogic principles and the teaching activities led by monitors in P-900 Schools, then "directive, teachers and monitors highlight as a result of LWs children evidence more security and trust, better motivation to learn, development of their creativity and better relationship with their partners" (Garcia-Huidobro, 2003:298-299).

Following to Garcia-Huidobro (2003), this coherence could be seen resting on the direct support of the Ministry of Education (MINEDUC), the external consulting of the PIIE and the educational material that pointed exactly at what is the objective that monitor have to carry on.

It is worth to emphasize that even support of MINEDUC a better pedagogic coherence of LWs was a result of their own collective memory understood as the ability to learn and adapt their own experience and the information of their environment. It was emerging through Transference-Appropriation process as an ability to adapt learning-teaching processes within reciprocal relations of trust and respect of monitors and children. Its acknowledgment would strengthen the way to a sustainable degree of coherence which avoids that schools like P-900 schools getting to be situated as "Christmas tree schools"[6] (Fullan,2001).

Concluding Remarks: The Human Agency as an interdependent learning process

In short there is no doubt that Learning Workshops were able to develop the "social factor" dimension that Drèze & Sen (1995) have ascribed to education mainly because they built up the expansion of human agency in their communities through valuable achievement of self-determination and empowerment addressing them within the social mobilization rationale of education. Through CES they were focusing on highlighting three interdependent dimensions which delineated the process aspect education has to have when it is approximated to Sen's approach.

Firstly, they developed an *ecology of learning of human agency* which operated as an "open system which interchange material, energy and information" (Guillaumín Tostado, 2006) acknowledging the potential of community and its capacity to lead the property of resilience as central elements within its own ecology of action. This property of resilience allows the management of the *capacity to be creative* in extreme

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[6][These schools] engaged in aggressive efforts to bring many new programs and services to their schools. Much less attention, however, focused on quality implementation of these initiatives or on well each new option related to what was already in place. The overall effect was the proliferation of weakly implemented and unaligned progress that might make school look good to the casual observer, but often left staff frustrated and discouraged by the failure to realize significant improvements in students learning (Bryk et al, 1998:287).

situations. This second dimension was shaped i.e. by Learning Workshops through dynamics of co-evolution, learning and adaptation within spaces of individual and collective freedoms inside the Workshops and the absence of political freedoms and guarantees of human rights in its surrounding socio-political environment.

The third dimension is referred to as *learning of human agency* which was described as a self-organized process of autonomy and empowerment mainly through three principles: *multiplicity* that is multiple entries and significant combinations that reinforce the principle of collective agency as "an increase of dimensions that change by the intensification of its connections" (Gutiérrez Pérez, 2006: 217); *connection* as the possibility to be connected, linked and intertwined that constitute the methodological basis of collective agency through group construction that allows the organization and reorganization of information and knowledge (Gutiérrez Pérez, 2006: 217) and *opening principle* as the maximum chance in all directions, being able to receive and modify influences within no pre-established models or structures. In other words they shaped an expansion of human agency as complex learning, delineated it on one hand as a space of creativity and on the other as an opportunity for honest and systemic self-reflection about the system that they constitute (See Figure 2.2).

Therefore the analysis of CES of Learning Workshops allows us an analysis from *those* particular diversities about how the expansion and strengthening process of human agency took place based on the acknowledgment of three central aspects:

Firstly, the role played by human diversity in expanding valuable capabilities for people, like self-determination and participation through the acknowledgment of dynamics of personal and social-cultural aspects and the role that other agents have in these processes as fundamental basis in the expansion of capabilities enjoyed by people.

Secondly, CES acknowledge that education as an instrumental freedom is above all a praxis that belongs to human beings, therefore it can be understood as a complex learning process.

Finally addressing education as an instrumental freedom within an educational narrative of Complex Educational Scenarios implies to acknowledge sufficient porous boundaries between different dimensions that it has in the life of people mainly because it can be understood as complex learning. In this way education, more than a process of expanding and connecting different capabilities enjoyed by people can be seen as a process of transformation of them.

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