The learning of cooperation and autonomy: a new paradigm of human resources development

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Abstract

This article intends to show a new paradigm in human resources' development. We start from the basic assumption that it is necessary to change the way in which the training and the development of human resources are currently made. We describe the results of a theoretic investigation which tries to identify the principles of a pedagogy related to autonomy and cooperation. In the sequence, these results are confronted with the reality in an experiment about the learning of information's technology.

1 INTRODUCTION

Information's technology is becoming a Science from a new era. It is being built a new perception of the world which is called systemic or holistic. The biological, psychological, environmental and social phenomena are totally dependent from each other in it. Capra (1982) remembers that it is no longer possible for the social sciences to ignore the technology, but it is also not possible the development of technology ignoring the social sciences.

The changes in paradigm happen together with such deep changes that they are often characterized as revolutions. It is easy to realize that the world is no longer the same: all human doings are changing.

Nowadays, in the organizations, people talk about a new paradigm in managing, in quality control and in relationship with the environment. This study intends to design a new model for human resources development.

In a world where there is a fast technological evolution, we should face the learning of technology in an autonomous and critical way. But how is it possible to develop autonomy? We need to think about how the learning happens, or even what are the processes through which man builds its own knowledge. We must also consider in this new model the need for long life learning.

To learn about technology with technology. The resources of information's technology can change the paradigm in which traditional distance learning is made and are able to answer to practically all restrictions raised in relation to it.

In addition, we cannot forget that there is a great stigma about technology and that it appears through unbalanced relationships among people who have technological knowledge and people who do not. In a higher level, we have international technological dependency - in which a whole nation is not capable to decide autonomously about its own destiny. In a lower level, this dependency can be noticed in many institutions and even in interpersonal relationships.

In this way, if we emphasize the training, when considering development of human resources, in spite of an autonomous learning:

- we are making people more and more dependent on the ones that know how to use the technology;
- economically it will be very expensive and inefficient since the changing in the environments brings the necessity of more and more training.

If we are not able to make people learn autonomously and cooperatively, all the revolutionary promises brought by the computers (development of the intelligence in the ordinary man, efficiency in production, more security, more democracy) will not be more than dreams. And reality can get even worse if technological development makes longer the cultural distance among people.

2 BASIC ASSUMPTIONS IN THE LEARNING OF AUTONOMY AND COOPERATION

How does the learning of autonomy happen? There are no easy answers about how the man learns. Three theories that contribute to the understanding of the concept of autonomy in learning are: Jean Piaget's genetic epistemology, Paulo Freire's pedagogy of liberation and Francisco Varela and Humberto Maturana's socio-biology. In spite of the different point of views, they have important similarities. And these similarities allow us to formulate basic assumptions to the desired pedagogical approach, such as:

- First Assumption: The introduction to the learning of a technological tool should start from the learner's specific interest. Then, the learning happens with the effective use of the tool while he is caring on a task. According to Piaget, the knowledge is built through effective action - taken over the objects - or in the interaction with other subjects.
- Second Assumption: The knowledge of the tool's technical characteristics should happen together with its use. In this way, the amount of technical knowledge transmitted should be the least necessary to operate in the

environment.

- Third Assumption: The autonomous learning requires cooperative relationships among the learners. As Paulo Freire says, no one educates anyone, no one educates himself alone - men educate each other mediated by the world. Piaget says that the development of autonomy happens exactly because of the social interactions. And Maturana and Varela understand life as a cooperative phenomenon from which the cognitive phenomenon, being part of life, inherits its characteristics.

3 COOPERATION AND AUTONOMY - THE NEW PARADIGM BEING OBSERVED IN THE PRACTICE

3.1 The researched practical situation

The field of experimentation of this work was the hiperNet project coordinated by Luiz F. Melgarejo (Member of Computer Department of Universidade Federal de Santa Catarina). This project has being promoting the community learning of new telematics technologies in the state of Santa Catarina. It involves a pedagogic model for the use of educational resources in computer networks and also a computer model which should be able to support technically the pedagogical conception adopted.

Today, the hiperNet project has already a Gopher client available -the eduGopher- of a very high professional level that incorporates the possibility of remote and cooperative edition in the server's data-base, as well as an e-mail system -the eduCorreio. Both environments combined to a MOO client -the eduMOO, still being developed - are the first version of an environment which is being called the ''eduFórum'' and which represents the first public version of the hiperNet system.

For an effective pedagogical implementation it has been created the hiperNet network. The steps taken in this direction allowed the appearance of partnerships with many institutions an made it possible the implementation of the NET's - Telecommunications Nucleus of Learning/Experimentation. There are already many NET's in the state of Santa Catarina (one in the city of Brusque and three in Florianópolis) and the contacts made allow us to foresee the quick expansion of hiperNet network.

The discussions that take place in the network are called ''hiperNet forums'' and have a subject which is freely chosen by its participants using the hiperNet software as support. The participants cooperatively built a data-base (hiperMidia) which is used as a basis and to simulate the discussion occurring in the conversational environment and e-mail. It is important to underline that each participant has equal edition rights in this data-base and is able to addict material, erase, move, comment, etc.

It is also interesting to try to define a scenery of what is a session of participation in the Forum. The participant comes to one of the NET's twice a week. He has a working station available during two hours in it. Then, he will get in contact with all the messages since its last section. In the sequence, he will send his on messages. He will also be able to research the documents in the data-base and, when necessary, take printed or local discs copies. Sometimes, he will bring new material to include in the data-base. In these cases, he will first edit an after transfer it to data-base

in the network central server. In this way, it will be available to all other participants.

The behaviors of fifteen participants among two hundred were registered in the experimental situation.

The main dimensions of the investigation were defined from five variables:

- the intensity of the learning autonomous conducts' manifestations;
- the performance in the use of environments;
- the interest in participation in the learning process;
- the kind of respect presented in the relationships mediated by technology (level of admiration addressed to technology and its representatives);
- the intensity of the cooperative interactions developed.

These variables were split in many indicators which were observed in different ways of registering. This allowed us to create categories to each variable, as well as, to decide to include the analyzed subjects in them.

3.2 The determinant factors in autonomy and cooperation

The analysis of the results showed that the subjects developed autonomous learning attitudes which became more intense when they were able to define more clearly their needs. And also when these needs were more directly associated with the activities proposed in the forum. This was already expected since learning implies, according to Piaget, in a balancing process of the cognitive structures in an attempt to adapt the organism to its environment. Or, according to Maturana and Varela, in a structural changing in order to preserve the autopoiesis. Then, the learning is by itself an autonomous process. Here autonomy is understood not as isolation or outside stimulus independence, but as a functional principle. A principle according to which the fact of an outside stimulus turning to be really observable belongs exclusively to the assimilating structure. And still, the process trough which the structure changes in order to assimilate the new fact is also dependent on itself. A thirsty organism wants water and not bread.

Since the cognitive structures are searching for "food", it can happen that the disrespect for the needs of the subjects has not a very disastrous effect, for it is possible to find these observables in spite of who is planing and trying to impose inadequate training activities. However, if the disrespect turns to be situations where there is severe repression to the subject autonomous action then, the learning process is in the risk of being paralyzed. If his acts are determined by needs alien to himself there will not be the necessary energetic mobilization. Then, there will not be value attribution and so the necessary unbalance.

This paralyzing effect of the subject needs' disrespect can be much more harmful when it comes together with the existence of admiration for technology. We assume that such disrespect increases the feeling of low self-steam leading to improvement of the dependency levels which the subject shows in the relationships mediated by technology. On the contrary, according to what it was observed in the situations studied, the respect to such needs is able to eliminate or lower these dependency levels promoting a better level of learning autonomous conduct and performance. The respect presumes the elimination of baseless transmission of information that are not present in the task that the subject has decided to fulfill. So, the respect to the needs of the subject presumes an investigation of these needs like

proposed by Freire.

It is possible to observe, from another point of view, the importance of respecting the subject's needs. The intensity of learning can be evaluate by the mobility of the cognitive structure and one of the factors that has influence on it is the complexity of the structure. And the more complex the structure the more it will be disturbed since the greater is the extension of the assimilated facts and objects. In the human beings this complexity produces recursive cycles which Piaget has identified as levels of reflexive abstraction with observables that emerge from coordination of their own. Maturana and Varela have noted already on the neural structure the presence of a great rate of disturbances self-generated. This recursive generation of observables can only occur in the effective and free functioning of the cognitive structure. In this case, the subject's interior action will promote the appearance of the observable. On the other hand, in Maturana and Varelas's theoretic perspective this recursive generation of disturbances can only occur when there is the maintenance of the structure's autopoiesis. Under repression this recursive cycles cannot find space to reproduce themselves and so, the structure can die, since the same is an autopoietic organization.

The effectiveness of the assumed assumptions in relation to the promotion of autonomous learning attitudes was also established by the fact that all subjects observed have shown significant lowering in the first and final admiration levels. This regaining of self-steam was conformed in this study by the belief that the subjects showed in their ability to go on alone in their learning process. Almost all (fourteen among fifteen observed) have stated that any person is able to learn if he wants. This regaining was also conformed by the intention of keeping on using the tool (for some including Internet) that all expressed with much confidence.

We find important to underline that among the subjects investigated, all of them who presented an unbalance in the relationships mediated by technology have done so because of the great amount of respect addressed to the presumed specialists. But there is another kind of unbalance. It is the one promoted by lack of respect. In this cases we have not a conscience overwhelmed by feelings of low self-steam. But, the presence of a naive conscience which expects from technology much more than what it is capable of giving. And when this happens, the subject ends up devaluating completely the technology. A practical example of this situation was the case of an user who in the first session had hopes as follows:

''*Tell me quickly where is the button that I press to communicate with the American Universities that have PhD courses in psychology that focus the artificial intelligence area.*''

When she was told that it would be necessary to have the addresses of this universities and, in order to do so, she would have to search in the network, she demonstrated a great irritation and no disposition to learn how to fulfill the task. She gave up her participation in the forums in the firsts sessions. Then, it was possible to conclude that the effects of the naive or magical and the oppressed consciences are similar. That is, in both it is present an inability to understand and to appropriate the object of knowledge.

The pedagogical perspective adopted in all aspects of the hiperNet project can be summarized as follows: people should become the subjects of their learning process that is, they should be the writers and editors of their own knowledge. This perspective established in the eduFórum environment and in the hiperNet networks is determinant

to the elimination of feelings of low self-steam.

Even realizing the changes that technology can induce, the majority of the subjects still does not find in its immediate reality the alternatives that would really lead it to becoming the builders of Freire's culture world. As the author points out such discovery would totally regain its self-steam.

Finally, we still need to analyze the relationship observed between the patterns of autonomous learning conduct and the intensity of the cooperative interaction developed. In our experiment we realized that involvement in cooperatives processes always occurred together with the presence of autonomous learning conducts, that is, if a subject did not show them he would not get involved in cooperative processes either. A possible assumption is that the involvement in cooperative processes assumes the development of autonomous learning conducts. These results agree with Piaget's statements that it is necessary a balanced relationship of respect for the promotion of both aspects. In all situations observed, the negative results were associated, in both variables, to the presence of feelings of low self-steam in relationships mediated by technology.

But, if the high self-steam and the presence of autonomous conduct are assumed to the involvement in cooperative interactions, the other way around is not observed. That is, many subjects who presented autonomous learning conduct were not involved in cooperative processes. In theses cases, the analyzes of their conduct has indicated that there was not an unbalance in the current relations of respect being the subject himself that was responsible for not valuing the involvement in such processes. The needs that some of these people showed had very individualist patterns. Here it was not the possibility of improvement of their professional abilities which was present. In other cases, the person would have other needs in using computer resources and, because of that and of the short time available, he did not have the chance to get involved with the use of the network. Giving them more time would probably make it possible to developed cooperative relationships.

4 CONCLUSIONS

One of the most important results of this work is to contribute to build the concept of autonomous learning and the definition of the role of cooperative relationships in it.

Autonomy is the ability that the human being has of changing the world or the environment in which he lives. For sure, to be able to change it, it is necessary to have before the cognitive ability to think about the transformation intended. And so, to understand first the reality to be changed. In addition, when there is oppression in relationships we will also have the death of the cognitive process, since autonomy can only exist with cooperative relationships. Cooperation, autonomy and cognitive development are part of the same process.

The relationship between autonomy and cooperation can also be observed when we perceive that the confront of the subject with the object or the difficulty in promoting the ethical changes generates crisis and anxiety. And we notice that these are much easily overcome in the cooperative relationships. In this way, we understand that autonomy is the ability to overcome different point of views, to share values and symbolic systems, to establish goals and strategies cooperatively.

The current pedagogic practice in the majority of the processes related to the development of human resources gives emphasis to the training. It uses behaviorist concepts which believe that it is possible to have a total control of the learning process. Here, we do not have autonomy or cooperation - competition is the main motor for learning. However, as Maturana and Varela say, nature is full of examples in altruism and cooperation. In many biological societies to survive means to cooperate.

Nowadays, to talk about development of human resources we have to think in autonomous learning of technology, but also in making technology a part of the learning process and, by doing so, creating a new pedagogic paradigm. The new technologies are able to produce new learning situations and we believe that the new paradigm includes:

- the possibility to make people responsible for their own learning process (the only effective way for it to happen) - to make them the writers and editors of their own knowledge and not only readers and consumers of an already published knowledge;
- the learning of autonomy and cooperation;
- the development of intelligence and the ability to interfere in one own environment and change it when necessary.

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