Distributed environment applied to HR formation/training:
A cooperative/collaborative learning model

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1. INTRODUCTION

The subject matter of this work is focused in the development of an application for team work over a distributed system belonging to an organization.

This choice is based in the organizations need of their members' continuing formation/training, and of the possibility of using computing resources generally sub-used by them.

For this study, the computing-attained research has been taken into account, and specially the management of various resources such as hypertexts, e-mail, chat, among others. In this context, collaborative/cooperative work guidelines are followed (Huberman, 1992; Johnson and Johnson, 1974, 1979, 1989,1995), which allow building up a distance formation/training model - being some aspects of the virtual classroom the axis of the present work (Gisbert Cervera, 1997a).

This work has as main objective:

The operations needs and aspirations of an updating and their members' formation/training.

The most advanced technology usage underlying motivations for the personnel's formation/training (Cabero, 2000).

Current learning theories application for designing differentiating[1] working environments (Cabero, 2000), and particularly, the cooperative and collaborative ones (Johnson y Johnson 1999).

The derived social-economic interest, since the results can be applied to implement trainings and long-distance courses.

Currently, in every organization, continuing training is essential. The organizational change (principal and permanent need of the organization) cannot be simply based in the re-structure and reengineering, since their results have been disappointing (Nayak, 1998). Today, organizations must become "learning-oriented Organizations" (Swieringa,1994).

Due to the growing development experienced by computing systems and communications networks over the last years with the incorporation of information systems more and more efficient, the possibility of using the existent resources (some times, sub-used) arises in organizations as a way to shorten spatial-temporal distances. This allows changing the transport paradigm concept to that of tele-paradigm, which becomes indispensable in large geographical development organizations.

Current organizations will have to learn, since society needs an upgrading in all its productive levels, in order to handle this century's uncertainty.

With the arrival of computers and minicomputers, the programs which were previously presented in book- form or by other mechanical means, started to appear as software. This gave rise to EBC (computer-based learning). In principle, two important uses are highlighted, namely: games and simulations influencing the learning as its motivate value increases (Lepper, 1985).

Dewey's influence (1916, 1924) regarding group learning renewal - revising Vigotzkii (1981) who considers education as a social process, and Piaget that studies the evolutive stages in people – points out the benefits of collaborative learning processes. This type of work is based in the simultaneous participation of all the participants for the solution of a given problem or the study of a given case, for instance.

More recently, experimental approximations for the learning have been developed, which fall under the label of cooperative learning (Cohen, 1986, Johnson y Johnson, 1999). It is worth mentioning

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[1] Differentiating working environments

that the value of the work in cooperation has been highlighted in Huberman and Hogg's work (1992; 1993), where the basis for a theory for the resolution of problems in a cooperative environment is given. The value of the cooperation for solving more rapidly the problems in an isolated manner is also pointed out. The strategy underlying this kind of learning consists in that the whole problem to be solved is divided equally, and that each of the participants must solve only one of those parts, which are afterwards integrated in a global solution.

Then, it arises PBL (problem based learning) as an instructional approximation which often incorporates small group collaborations and emphasizes the creation of small scenarios with tutors' assistance who try to solve problems making use of the learning and their abilities (Savery and Duffy, 1995).

A recent and promissory research line is the extension of knowledge by means of synchronic collaboration systems such as is highlighted by Paul Dourish (1997) in his works.

Then, CBL (computer based learning), being one of its principal attractions the potentiality offered by the same when dealing with the particular needs of specific individuals (Barker, 1997). This method allows supporting the learning activities of large students communities in which there exists a wide range of cognitive, physical and previous knowledge capacities.

Evolution leads to CSCW (Computer Supported Cooperative Work) and CSCL (Computer Supported Collaborative Learning) methods which are currently used as basis for distance trainings, supported by computing networks systems and Internet resources.

A large part of the collaborative and cooperative learning systems are supported by systems based in client/server architecture, that is, in a distributed system where the clients send requests to a server (in charge of fulfilling them), and where the clients and the sever may or may not coincide physically in a same computer.

An evolution of the previous scheme consists in going from a unique client/server system for general ends, to a specific server system, where each type of service has its own server; e.g., it can have an optimized server for images delivery in real time, other for serving files, etc, improving the possibilities both from the output and options point of view. That is why this system turns out to be scalable and, depending on the needs over a certain period of time, its configuration could be changed.

Considering the previous idea as a starting point, and in order to develop a likewise system, the first step to be defined would be the principal components needed for the operation of the system. This system is to be designed as a dynamic one, to which real time services can be added or deleted without interrupting both the client and the server's execution. The modifications will be the responsibility of a management system which facilitates the maintenance of the different versions in the system, and where each user can make use - or not - of the available services depending on their needs, and of the computer possibilities being used during those moments.

The rapid development in computing systems and networks technologies not only have influenced the scientific-technologic and commercial environments, but also have reached and have affected people's daily lives over the world, causing habit changes in all spheres. One of the fields which has most grown incorporating novel technological resources during the last years is the educative, not only the formal one, but it has also been extended to informal and massive environments. These developments have allowed upgrading the idea of distance education by means of virtual classroom resources (Gisbert Cervera, 1997b).

The concept of distance education was taken by the organizations for the upgrading and training of their human resources. In the 70's, the organizations started to understand the need of continuing training of their members, implementing different modalities.

In those large geographical organizations, the training resulted really expensive and of difficult implementation, reason why some of them postponed it. With the crisis of the 80's, most organizations understood that the only way of further subsistence was becoming an RLO (Rapid Learning Organization); idea developed and applied by NASA in the 60's, when president John F.

Kennedy said in the Congress of the United States, "our nation must take the commitment of sending the man to the Moon, before the decade ends".

This development generated by the organizations was based in their own needs, and in external aspects to be considered, such as:

The need of a continuing and constant updating on the part of the organization personnel.

The training of the agents working far from the educative centers.

The use of fixed schedules, allowing them to be compatible with those of work's.

The overcoming of some problems, such as the isolation caused by distance courses or the rigid and over-structured educative mechanisms of attendance courses.

These needs lead to the use and application of the most recent technologies for the formation and training of the human resources, and one of the purposes of the present work is to justify - or not - the application of some of the previously mentioned technologies differentiating their advantages and disadvantages in order to make an efficient use of them.