DEVELOPING AN IMS-LD COLLABORATIVE PROJECT CREATION APPLICATION COPROLINE (COLLABORATIVE PROJECT ONLINE)

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Abstract— **The context of this work is the development of the online application COPROLINE for collaborative learning. This work is more precisely in the field where the authors seek to promote, by remote computing means, the construction of knowledge collectively. Authors' approach is first to think about the conditions to create to have real collective activities between learners, then to design the computer environment that supports these activities. The authors chose to adopt project pedagogy as the foundation for these collective activities. This pedagogy has already proved its worth, mainly in traditional learning situations in the classroom, and the authors want this work to project it on a remote environment accessible by teachers and learners.**

Keywords— **Collaborative Learning, Project, Pedagogy, IMS-LD, E-Learning**

I. INTRODUCTION

In this work, the authors have moved from the development stage of COPROLINE (teaching part), the part in which teachers can design and put online their teaching projects as well as the export to other IT environments supporting the IMS- LD towards the development of the second part (learning part), which will constitute an area of collaboration and construction of collective knowledge. In this part the authors try to introduce learners to an easy tool for generating collaborative learning products online. COPROLINE allows learners to work in groups on a very rich educational space for online communication and collaboration tools, why? Because COPROLINE includes several tools (Forum, Chat, Mail ...) which are essential means of collaborative work.

As the authors have already indicated, they have adopted the project pedagogy as the foundation of collaborative work, which is why in authors' system learners work on educational projects compatible with the IMS-LD specification developed by their teachers, learners after having connected on the platform are looking for their projects and performing tasks that are already set by their teachers.

II. THEORICAL PART

A. Instructional management system – learning design

IMS-LD was published in 2003 by the IMS / GLC. (Instructional Management Systems Global Learning Consortium: This specification allows representing and encoding learning structures for learners both alone and in groups, gathered by roles, such as "learners" and "Team" [1]. A lesson plan can be modeling in IMS-LD, defining roles, defining roles, learning activities, services and many other elements and building learning units. The course outline is modeled and built with resources assembled in a compressed Zip folder and initiated by an executable ("player"). The latter coordinates the teachers, students and activities as long as the respective learning process progresses. A user takes a "role" to play and perform activities related with it to achieve satisfactory learning unit. In all, the unit's structure, roles and activities build the learning scenario to be executed in a system compatible with IMS LD.

IMS-LD does not impose a particular pedagogical model but can be used with a large number of scenarios and pedagogic models, demonstrating its flexibility. Therefore IMS-LD is often called a meta-pedagogic model. Previous e-learning initiatives claim to be pedagogically neutral, IMS-LS is not intended to pedagogical neutrality but seeks to raise awareness of e-learning on the need for a flexible approach.

IMS-LD has been developed for e-learning and virtual classes, but a course face to face can be done and integrated into a structure created with this specification, as an activity of learning or support activity. If the ultimate goal to create rich learning units, with support to achieve the learning objectives by providing the best possible experience, face-to-face meetings, and any other learning resource are permitted such

as video conferencing, collaborative table or any field action research.

IMS LD uses the theatrical metaphor, which implies the existence of roles, resources and learning scenario itself: one room is divided into one or more acts and conducted by several actors who can take on different roles at different times. Each role is to carry out a number of activities to complete the learning process. In addition, all roles must be synchronized at the end of each act before processing the next act.
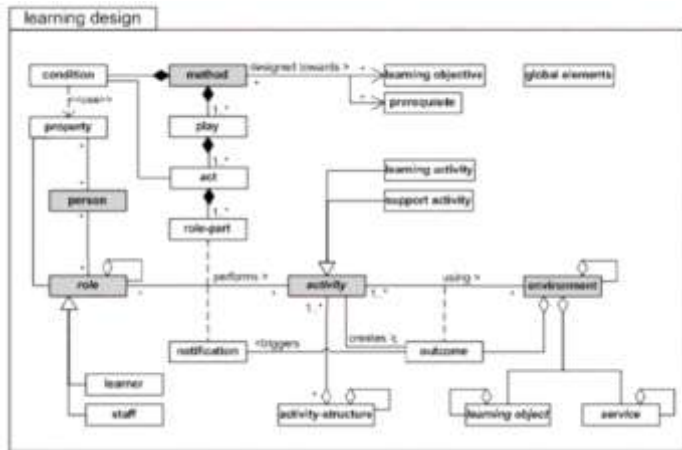

Fig. 1.Conceptual model of IMS-LD [1]

B. Project pedagogy

1) Presentation

From what the authors said in one of authors' previous works [2], a project is an activity that has a specific purpose, engages in its totality people who perform it and take place in an environment. This method advocates the discovery of solutions to real problems that take place in everyday life.

According to [3] "A project confronts real problems, which are not school exercises, but problems to be solved and obstacles that the group must overcome to achieve its ends. A project approach places the mason at the foot of the wall and forces him to face challenges that are not organized to be exactly to his measure, and do not present themselves in the forms of ordinary school work.

Nowadays, project pedagogy is a method commonly used by teachers. However, it has many variations and it is difficult to give a single definition. The authors retain from this method the fact that learners work collectively in small teams from a set of specifications aiming at an effective production. This work requires real project management (task management, management of the time …).

2) Role of the teacher in project pedagogy

According to [4], "The teacher prefers to indicate how to build knowledge, the path to follow to achieve it", in this sense the teacher supervise and guide, throughout the project, learning related to educational projects, through its role of motivator and mediator, it sets up all the devices likely to promote the construction of learning through tasks that are well determined and through training that accompanies the project parties.

According to [5], classroom management is "the function of the teacher in guiding and keeping teachers in touch with learning tasks". In this case the authors talk about the management of groups of learners remotely, so the teacher must maintain the attachment of learners to their tasks based on tools provided by the COPROLINE system, the authors are talking about tools of collaboration and communication.

3) Role of the learner in project pedagogy

According to [6] "A task is a series of activities that leads to a final product", in authors' case the learner-centered task approach, which is a part of the project pedagogy, mobilizes existing knowledge, strengthen motivation and work in groups to arrive at a final product. Rather than designing teaching from a list of learning points, the teacher develops a series of target tasks that constitute a pedagogical project with a well-defined structure that learners will need to perform within a group. online. When performing a well-designed task, learners face real problems and start trying to find solutions and look for ways to work collaboratively to solve them. The COPROLINE system offers several possibilities to make the project pedagogy and more precisely the task approach possible and applicable online.

4) Implementation in COPROLINE

The implementation of the project pedagogy generally depends on the environment in which the learners will work, the authors can speak at this level of two contexts (face-to-face or remote), for authors' case the collaborative projects that will be implemented in the COPROLINE system must meet the criteria of the latter that is to say, they must respect the structure with which the system works which also meets the requirements of the project pedagogy already mentioned above. For this purpose, the project consists of one or more phases, each phase can have several tasks and each task consists of at least one sub-task. Note that spots can be themselves spots according to the following hierarchy:
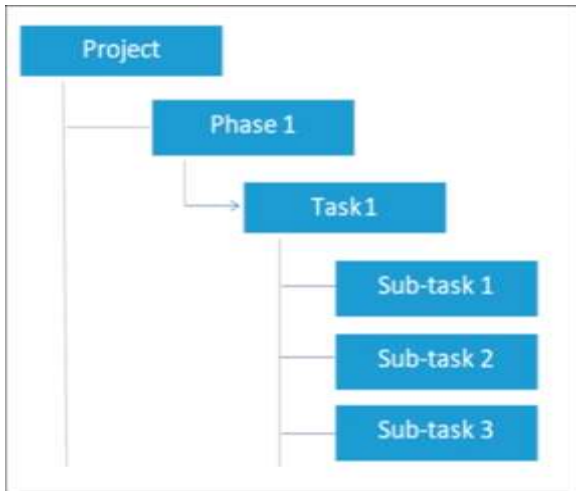
Fig. 2.COPROLINE Project Structure [7]

5) *Compatibility with IMS-LD:*

In the following diagram that represents the structure of an IMS-LD scenario, each part is divided into acts executed in sequence. According to a diagram identical to that of a play, the end of an act by default conditions the beginning of the next.

An act is defined as a set of partitions, each of them associating a role with an activity. Since partitions must run in parallel, the same role can only be involved once in the same act. The concept of partition makes it possible to define the activities independently of the roles and to guarantee then a certain degree of re-use: an activity can thus be proposed to different roles within the same act, as well as to the same role within different acts of a piece.

As the authors said in their last work [7], they can with this structure adapt educational project and collaborative work with the IMS-LD specification.
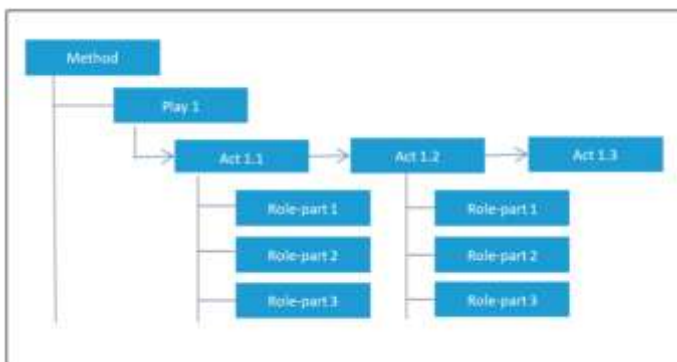

Fig. 3.Execution scheme of the elements composing the method [9]

III. PRACTICAL PART

C. **Architecture of COPROLINE – Part of the learner**

1) *General Architecture*

COPROLINE is a system of production of educational projects compatible with the IMS-LD specification, it has two parts: a part of the teachers and a part of the learners.

The teaching part is already done and operational, it will allow teachers to connect through the Internet to their server to create and manipulate projects for learners either on the same computer environment or export them to other applications supporting the IMS- LD.

The learning part that is being developed and that is the goal of this work, it allows learners to connect through the Internet to its server to view their projects, perform the tasks requested, cooperate, collaborate and discuss to accomplish their goals.

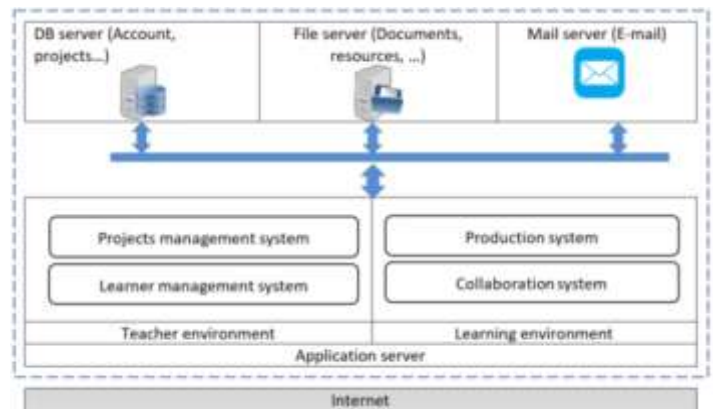The two parts are represented by the following general diagram:

Fig. 4. General architecture of COPROLINE

In this architecture, there is two separate parts of the proposed model, representing each of the independent functionalities according to the type of connection:

- o The teaching environment: this is an environment that allows you to create the pedagogical project. It is designed to prepare and organize the design and development of projects in the form of tasks and sub-tasks to be executed by the learners and at the same time to manage the storage in project resources and files in the dedicated servers.

- o The learning environment: the two production and collaboration systems make it possible, on the one hand, to offer a collaborative space in which many communication tools are accessible (Forum, Chat, e-mail, etc.). on the other hand, this system is used to produce and share what is requested by the teacher.

In what follows, the authors will present the architecture of each of the two systems representing the learners' environment that is the subject of authors' work, their operating processes as well as their conceptual model.

a) Collaboration system

Depending on the learners' needs for communication and collaboration, the collaboration system offers several features such as the participation or creation of forums, the triggering of a discussion, the sending of e-mails etc. In order to frame these functionalities, the authors will first model, using UML use case diagrams [10], the different tasks performed by the learners.
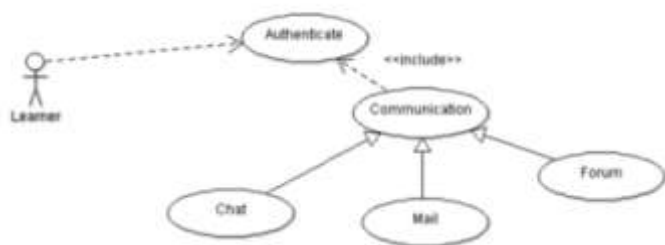

Fig. 5. Use case of the learner - collaboration part

b) Production system

The learner who participates in the production of one of the projects proposed by the teachers is already registered on the platform by his teacher. Once enrolled, the learner uses mainly the production system to consult his project, his tasks and sub-tasks that are attributed to him. The following figure shows the use case diagram for a learner.

Fig. 6. Use case of the learner - production part

The learner can consult the documents and resources proposed by his teachers and which serve to facilitate his tasks. He may also have the opportunity to participate in forums, to send a message to a teacher, to another learner. The learner can chat online with the teacher / trainer and can also edit his profile and view his results.

It should be noted that learners in the COPROLINE system who are part of the same working group, must have a coordinator who is defined from the beginning by his teacher,

this type of learner is the only one who has the right to collect the productions of the group in the same result.

2) General architecture of the learner part

In this part the authors will detail the system allowing learners to perform tasks assigned by their teachers, communicate and collaborate in an environment specifically designed for these purposes, the collaboration system is based on three main services:

- o Forum: This service allows learners to ask questions of other learners, answer questions, and view answers from colleagues;

- o Messaging: This is the service that allows learners to send and receive e-mails for their teachers or colleagues;

- o Discussion: this is the instantaneous communication offered by the COPROLINE system in which learners can create discussion rooms for a group to which learners belong;

On the other hand, the production system consists of four services:

- o Production: this is the environment used by learners to produce and download the work in the form of computer files to the file server, it should be noted that the group coordinator is the element that can download the final product of the group

- o Resources: this service allows learners to consult the digital resources proposed by their teachers and which are necessarily linked to the projects.

- o Projects: This is the environment in which learners can view their projects, tasks and sub-tasks.

- o Training: it is a place reserved for the training of learners in the accomplishment of their tasks, this service can be used by the teacher to carry out certain trainings for his learners.

The proposed learner part can be represented by the following general diagram:
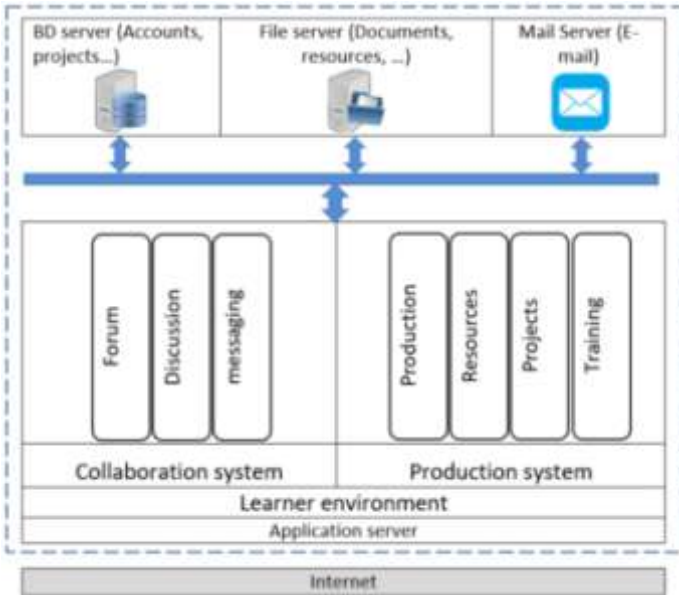
Fig. 7. Architecture of the learner part

3) Activities diagram:

The COPROLINE system allows learners to view their tasks or sub-tasks, create question-and-answer forums, chat online or take courses offered by their teachers according to the following activity diagram [11]:
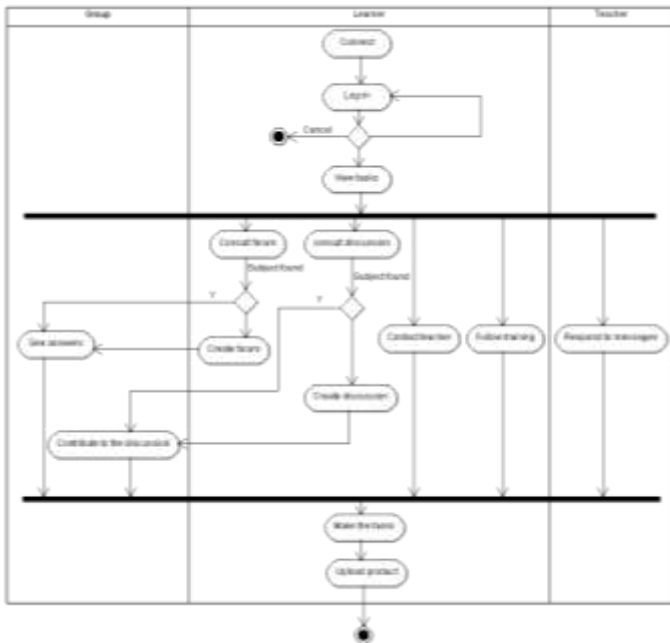

Fig. 8. Activity diagram – learner

D. COPROLINE interfaces:

1) Home :

The COPROLINE system consists of several interfaces to perform the tasks of learners, the first is to connect to the system as a teacher or learner:

Fig. 9. General interface of the COPROLINE system

2) Projects :

After the authentication as a learner the system directs it to the space concerned, the learner puts himself in front of his menu which offers him the possibility to navigate between the services already described, the following interface allows him to consult his projects as well As the requested tasks and resources attached, it should be noted that the resources can be of any type of file. Another feature at this level is the consultation of the members of the group and the possibility of contacting them by mail:

Fig. 10. Interface for consulting projects and tasks

3) Forum :

The asynchronous chat room on COPROLINE allows learners to exchange, ask questions or post replies about tasks and projects designed by their teachers. In the COPROLINE system a learner is free to switch from one service to another, he can on this screen consult his forums, answer questions from other learners or even create and manage his own forums:

Fig. 11. Forum Management Interface

4)   Discussion

The chat service allows learners to create rooms in which they can communicate and chat in real time with members of their groups:

IV.   CONCLUSION

In this work the authors started with the presentation of IMS-LD specification which allows the mobility between different computer systems supporting the same specification and they presented the project pedagogy as the basis of authors' scientific research and then they presented in the practical part the different parts of authors' project COPROLINE and more precisely the learning part.

This part is where learners can access authors' online system to perform the tasks requested by teachers, the authors will try as prospects to move towards experimentation.

The experimentation in authors' work is to realize with a target audience (teachers and learners) a set of educational projects for the realization on line so we will try to design projects for the learners as teachers and we will invite learners to get involved in the realization of their projects. The results of this experiment and their analyzes will be the subject of authors' future work.

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