

# MODELLING ROLE-PLAYING GAME AS A UNIT OF LEARNING TO ENCOURAGE COOPERATIVE LEARNING

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**Abstract.** Nowadays, society needs professionals with more capabilities, who are able to face the new challenges of the world. Colleges must refocus their teaching process in order to develop student competences and talents. This is a new paradigm of teaching, which may be able to be implemented through the use of cooperative learning procedures. Considering that using open e-learning platforms as tools to support the learning process has become an international tendency, we are focusing on how to incorporate cooperative learning in a virtual environment. In this paper, we propose to use role-playing games as a strategy that encourages the cooperative learning supported by IMS Learning Design. This specification supports the implementation of a large variety of instructional theories using the analogy of a play.

**Keywords:** Cooperative learning, Virtual environment, IMS Learning Design, Role-playing Game.

## 1 Introduction

A new paradigm in college teaching is taking place because teamwork, social skills, planning, communication, among others, are professional competences highly valued nowadays. In this context, the only way that colleges can follow to develop these competences on the students is using cooperative learning procedures.

The games applied in the classroom have become a well-accepted proposal among the students and professors [4, 5, and 6]. The Role-playing Game (RPG) is a type of cooperative game play that promotes creativity and teamwork specifically.

Technological innovation has enabled the development of virtual environments that today is an expanding field of research. The base of many of these environments is the creation of virtual learning communities, which the users interact through collaborative activities. This topic is been the object of further study to guarantee the success in the professional development process, therefore to support the teacher practice.

We propose to use role-playing games as a strategy that encourages the cooperative learning supported by IMS Learning Design since this specification is centered in the user and allows implementing a large variety of instructional sceneries.

This paper is structured as follows: First, we present the concepts and background that support our work (section 1 and 2). Second, we present the proposed role-play game process model and the application of it in a specific scenario (Section 3). And finally some conclusions and future work are presented.

## **2 Role-playing Game as a method that encourage the cooperative learning**

In college teaching a paradigm shift is taking place since teaching and services must be in accordance to the challenges the modern world presents [1]. Those challenges include the competences to adapt to changes successfully, to perform teamwork effectively, to take decisions appropriately, and to communicate efficiently. Due to this fact, the new paradigm needs to add some specific activities as the basis of the teaching. Knowledge should be discovered, constructed, transformed and extended by students. Learning is a social enterprise in which students need to interact with instructors and classmates. Faculty effort is aimed at developing students' competencies and talents. Education is a personal transaction among students and between the faculty and students as they work together. The above mentioned activities take best place within a cooperative context [1].

In the cooperative context there are five essential elements [1]. The first one and the most important element is "Positive Interdependence". This exists when group members perceive that they are linked with each other in a way that one cannot succeed unless everyone succeeds. The second essential element is "Individual and Group accountability", which is that the group must be accountable for achieving its goals but also each member must be accountable for contributing his or her share of the work. The third essential component is "Promotive interaction", which occurs when each of the members share resources and also help, encourage, and praise each the others efforts to learn. The fourth element is "Interpersonal and small group skills", which exists because groups cannot function effectively if members do not have or use the needed social skills. And the last essential component of cooperative learning is "Group processing", which exists when group members discuss how they are achieving their goals and maintaining effective working relationships. This implies to give feedback on how well the groups are working together.

In this context, [1] says that conducting a cooperative lesson consists of four phases: 1) Make Preinstructional Decisions, which consist in, (a) formulate objectives, (b) decide the size of groups, (c) choose a method for assigning students to groups, (d) decide which roles to assign to group members, (e) arrange the room, and (f) arrange materials students need to complete the assignment; 2) Explain the Task and Cooperative Structure, which include (a) explain the academic assignments to students, (b) explain the criteria for success, (c) structure positive interdependence, (d) structure individual accountability, (e) explain the behaviour expected to see, and (f) emphasize intergroup cooperation; 3) Monitor and Intervene, which is to monitor each learning group and to intervene when needed, in order to improve taskwork and teamwork, and finally, 4) Evaluate and Process, which is to do feedback about the activities.

The games applied in the classroom have become a well-accepted proposal among the students and professors and many successful use cases have been exposed [4,5,6].

The Role-playing Game (RPG) is a special type of cooperative gameplay that encourages reading, builds vocabulary, encourages teamwork and builds problem-solving abilities. And there is also a lot to be said for the creativity and imagination they encourage, this is a game in which the participants assume the roles of fictional characters to develop a story interacting among the participants. In most games, one specially designated player, the game master (GM), creates a setting in which each player plays the role of a single character. The GM describes the game world and its inhabitants; the other players describe the intended actions of their characters, and the GM describes the outcomes. Some outcomes are determined by the game system, and some are chosen by the GM.

Many varieties of these games exist, but most follow the following steps to play: 1. A GM prepares a set of rules and a fictional setting in which players can act out the roles of their characters. 2. The players then create characters whose roles they will play in the game and this must be written in a card, named "Role Record Card". 3. The GM will then begin the game with a short introduction which defines the setting and the characters. The players describe their characters' actions, and the GM responds by describing the outcome of those actions. Usually, these outcomes are determined by the setting and the GM's common sense; however, the outcomes of some actions are determined by the rules of the game. 4. The game continues in this manner until the characters meet the last challenge, as determined by the GM at the start of the game. This could be to defeat a specific adversary, to solve a mystery, or to find a specific item of treasure. The GM then describes the consequences of their actions on the game world, and the game ends.

The objective of this kind of game is not to beat the others players but face and overcome the obstacles proposed by the game. The situation must be solved in a cooperative way, not competitive, which favours interaction and teamwork. Even if the adventurous motivations are different, they should have a common aim, and if they do not work together they would not be able to succeed.

IMS-LD [3] is a specification that allows implementing a large variety of instructional sceneries. Next section explains the foundation of it in order to demarcate the RPGs as a scenario IMS-LD.

### **3 Conceptual bases on IMS - LD**

IMS Learning Design (IMS-LD) is a widely accepted specification used to describe learning scenarios, which permit to define a completely the teaching-learning process and also facility to the students achieve the expected educational objectives. The use of IMS LD specification enables these scenarios to be shared among the learning management systems.

IMS propose that description of process can be "packed" into a unique entity named Unit of Learning also known as UoL.

A general level A UoL is divided in acts that each role (students, teachers, tutors, etc) plays in the UoL. The acts consist in activities and structures of activities, which

have associated learning objects (web links, text documents, images and so on) and support services (chat, forums, share resources) as a part of environments. Level B of IMS-LD specifications permit to establish conditions in the UoL and level C define a notification system that should be used for instructions or recommendations to learners according with different events occurring in the UoL [3].

Fig. 1, the overall scenario or design is described within the method (or pedagogical strategy) element, which contains play, act, and role-parts elements.

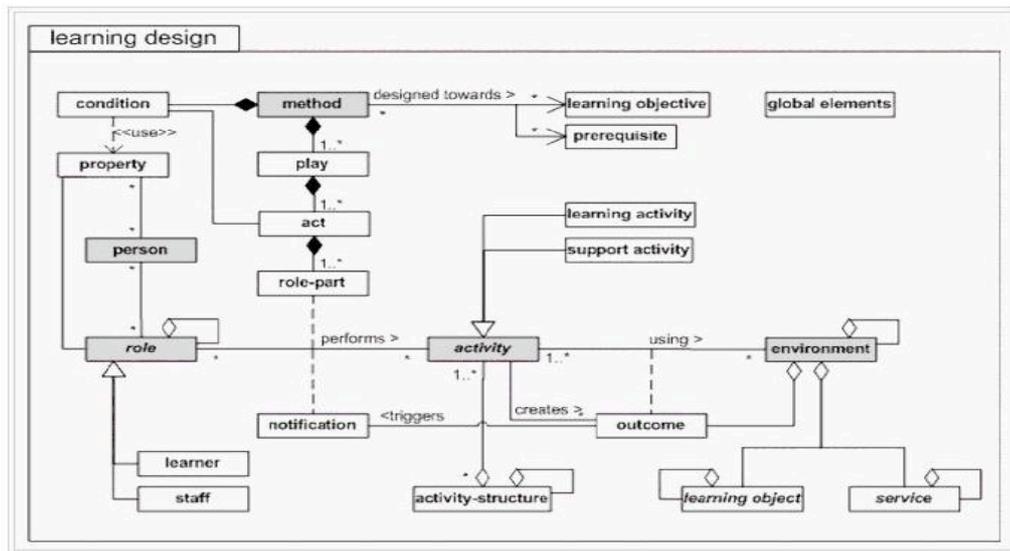


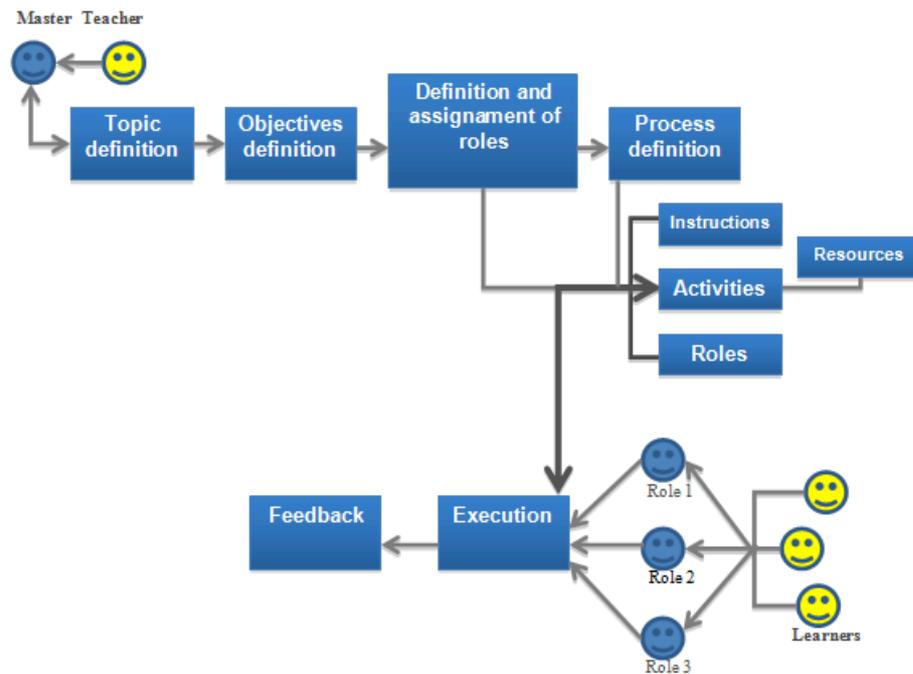
Fig.1. Conceptual Structure of the Learning Design.

If we related the RPG concepts explained before a cooperative lesson follow the phases, we could design a RPG determining its objectives, players, assignment, resources; among others (See section 2). So, after seen the explanation of this section it is possible to distinguish the relationships in the context that we propose because many IMS-LD concepts are related to a theatrical play and its conceptual structure is similar to cooperative lessons structure. Following section describe how we have modelled a role-playing game as a unit of learning using IML-LD specification.

#### 4 Modeling a role-playing game as a unit of learning

We propose a particular scenario based on the typical development of a project in which all participants and stakeholders need to have a clear idea about the project objectives and about their roles in order to complete a successful project.

The structure that we proposed for modeling the game is shown in fig. 2. The scenario has been defined as a combination between the UOL approach and the steps of play role-playing game taking into account Cooperative Learning elements. This allows the structure to be adapted to any scenario. The top part of the figure corresponds to the game preparation, i.e., the activities that the game master, in our context, the teacher, has to do. The bottom part corresponds to the activities execution that the learners will realize according to their assigned role.



**Fig. 2.** Proposed Process to describe RPGs.

For modeling the game we propose to use LAMS [9] integrated within the learning management system dotLRN [10]. LAMS is a tool for designing, managing and delivering online collaborative learning activities sequence that permits to export them as an IMS LD.

The game preparation is performed in the LAMS authoring environment. The master can use any of the activities that he/she considers necessary in order to define the topic and roles.

To define the objectives, we use the objectives editor provided by LAMS. The objectives are defined using a particular model for competence definition.

The roles could be assigned using two user features, the first one is the user learning style calculated by the Index of Learning Styles (ILS) [7] and the second one is the Learner Collaboration Level (LCL) [8]. These user characteristics are inferred by the use of ILS and Advices packages [8] dotLRN, respectively.

We recommend using the ILS if the game is applied at the beginning of the course, organizing groups with similar and different learning styles according with the

purpose of the instruction. LCL should be calculated when the students interaction in the learning platform is significant because the needed data are generated as was explained in through the user interaction. For this reason this user feature should be used for the role definition from the middle of the course ahead.

We propose to follow the guidelines made on [1] about the group size. The size of the group is influenced by the materials and the specific nature of the task, while there is no ideal size for a cooperative learning group, they can suggest small and heterogeneous groups.

In the definition process, the teacher can use the activities that he/she considers necessary to obtain the proposed objectives. The activities that we used are explained below. Fig. 3 shows the sequence of proposed activities in our scenario, development projects, from a view of the LAMS authoring environment.

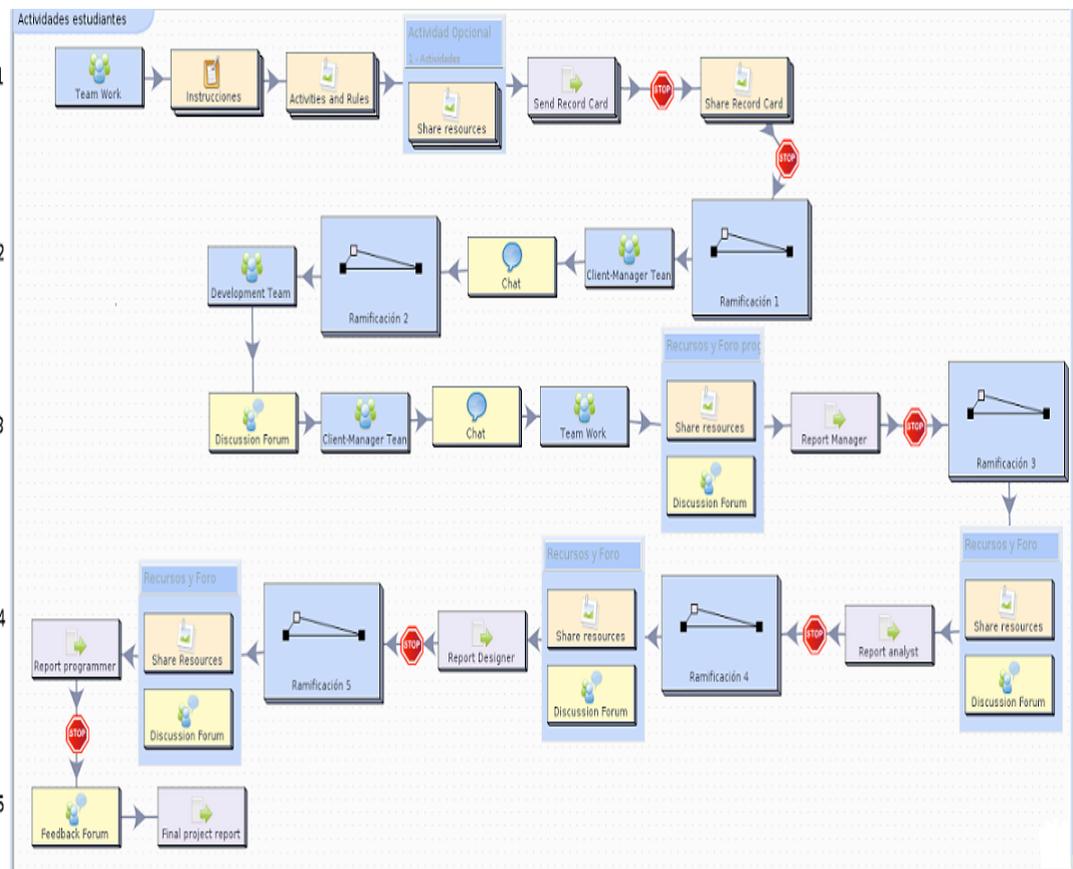


Fig. 3. Sequence of proposed activities to development project.

Traditionally, in development projects, we can distinguish four components of a project: project initiation stage, project analysis stage, project design stage and project production stage. Usually, each stage has a person in charge that performs the corresponding activities for this stage. In this way, in our scenario there are four roles: project management, analyst, designer and programmer or developer, the first of them have in charge the initiation and coordination of the team. Besides, we add the client role to make the game more challenging.

Activities in the first row correspond to the noticeboard toolkit as game guide, since we want all the students to know this information. Also, in this row, there is an activity in which learners should write their record card and send it to the master in order to that he/she publish the record card of all the members of the teamwork. The remaining rows are related to the different activities that each role performs.

Second row corresponds to activities that a client must perform. This role: 1) must propose a chat with the Project Management 2) in which expose the request.

Third row corresponds to activities that the Project Management must perform. These are 1) the creation of a forum to discuss with the team the client(s) necessity (ies) and 2) to propose possible solutions to the problem. Once the best solution has been chosen, this must be commented to the client and a project proposal must be sent to the Master. To carry out these activities, the chat, forum, shared resources and submit files have to be used.

Fourth row corresponds to activities that the analyst, designer and programmer must perform. These activities are to create a report and to share it with the team. When all the members of the team agree with the report, he/she should send it to the master, who generate a feedback about the report, suggest corrections to continue. All the activities are first performed by the analyst, then by the designer and finally by the programmer.

The fifth row consists in the feedback proposed in cooperative learning process. We have used a forum planned by the master with all the members of the team in order to provide it. Feedback given to students should be descriptive and specific, not evaluative and general [1].

For each part of the proposed game, some assessment elements are developed, which permit to define a competence level obtained for the user in the game.

## **Conclusion and Future Works**

In this work, a process for describing Role-playing Games in order to support Learning Cooperation is presented. The process description was supported by using IMS Learning Design specification, Learning Cooperation phases and RPG steps.

This work provides an opportunity to analyze the enhancement in teamwork, reading, creativity, imagination by learners, and also contributing to achievement of knowledge of the context where is applied the Game (Specific Competences). For example, in our scenario we analyze if learners achieve the desired competences of System Analysis, Design and development.

The process for describing RPG upon dotLRN platform will be integrated with the advices package that models the Learner Collaboration Level to support it. Furthermore, it will be proved in some courses at University of Girona.

The guideline defined on the previous chapters to create a specific role-playing game is one of the different possibilities to generate collaborative learning scenarios. We are generating some particular templates based in different collaborative environments used to support an automatic IMS-LD generation.

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