

# Role-Playing Game for the Osteopathic Diagnosis

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**Abstract.** The aim of this paper is to make a contribution to teaching and learning combining game-based learning and inquiry-based learning. Our main objective is to offer learners conditions enhancing the development of behaviors, attitudes and skills in the osteopathic diagnosis. To this end, we have designed a pedagogical scenario based on an online role-playing game simulating a medical appointment between an osteopath and a patient, using mainly asynchronous forums as the learners are practicing physiotherapists. The game design is based on the analysis of the real activity of an osteopath and of the case studies produced by the school of osteopathy in their previous courses. We present here the design methodology, the conceptual framework and the role-playing game scenario.

**Keywords:** Role-playing game, Inquiry-based learning, Pedagogical scenarios, Technology enhanced learning, Osteopathic diagnosis.

## 1 Introduction

For several years researches in the field of Technology Enhanced Learning focus on the design of effective learning situations integrating digital technologies. Socio-constructivist activities and collaborative learning activities have proved their efficiency in the context of problem-based learning for instance. Some of these “innovative” pedagogical methods, such as problem-based, inquiry-based and game-based learning, are particularly relevant in the context of science education and are appropriate for using digital technologies. In this context, designing relevant and high quality learning situations is still a significant concern [1].

In our research, we explore the possibility to apply such innovative pedagogical methods in training trainees-osteopaths to make a diagnosis, in reply to PLP Formation (PLP) request. PLP is a training school of osteopathy and physiotherapy in Lyon, France. It offers an osteopathic training designed for health care practitioners initially trained as physiotherapists. This 5-year training comprises seven 4-5 days of internship per year. The density of the training, combined with their physiotherapist practice, does not allow the trainees to really practise osteopathic diagnosis. PLP thus wishes to design new activities firstly aiming at training in osteopathic diagnosis and secondly aiming at implementing an active pedagogy favourable to the development of professional skills and allowing these activities to be done and monitored at distance.

In this paper, we present a Role-Playing Game (RPG) we have designed (section 3), which aims at developing professional skills required in making osteopathic diagnosis. In section 2, we outline the theoretical frameworks and the methodology used before presenting the learning game scenario.

## 2 Methodology and Design

### 2.1 Designing Serious Games

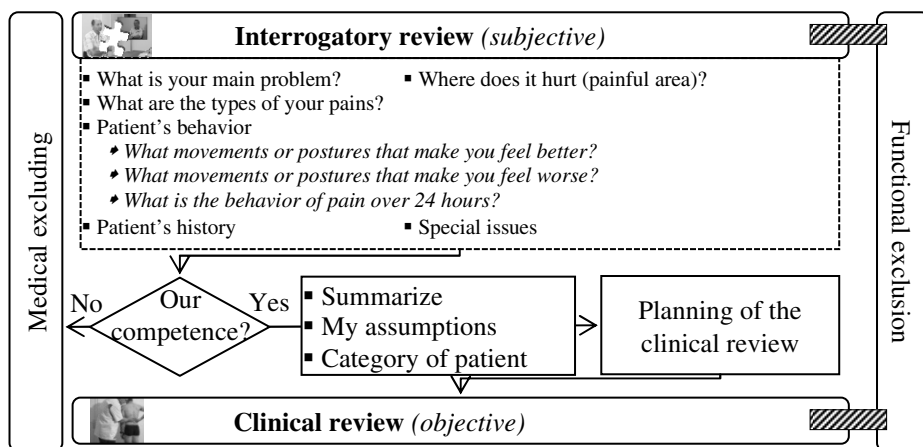
The term "serious game" was used long before the introduction of computer and electronic devices into entertainment. Abt [2] gave a useful general definition, which is still considered applicable: *"Reduced to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a context with rules among adversaries trying to win objectives. We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement."* This definition highlights the key elements of a game: *activity* as a series of actions taking place over time, *players* or *decision-makers*, *objectives* which are the desired outcomes, and *limiting context* structured by rules. Serious games are thus grounded in the (socio) constructivist learning theory. We add the three registers used in the design of a serious game: pedagogical, didactical and game principles [3], completed by the immersive aspect of the game.

*Simulation games* and *Role-Playing Games* are of special interest in the field of the acquisition or exercise of skills. They are games in which players assume the roles of characters in a fictional setting. They offer the possibility of replicating an activity in "real life" using a game form. In the case of medical training, future practitioners can practice on virtual patients without risking damages on real ones.

In order to design learning activities supporting the development of professional skills, one needs to analyze a professional activity in a real situation. In the next section we present how we have conducted this analysis.

### 2.2 Modeling the Activity of Osteopathic Diagnosis

Professional skills are required from an osteopath to make a diagnosis. The approach of professional activity analysis is consistent with the work of professional didactics. Our analysis is based on various data we gathered in order to capture the real osteopath's activity [4]: (1) systems of professional standards elaborated by the osteopaths' trade unions that define the osteopath profession and its principles, (2) videos of the osteopathy diagnosis activity realized for training purposes, by setting up a diagnosis session during which the PLP trainers played the roles of an osteopath and of a patient according to a synopsis based on the professional standards, and (3) interviews with the responsible of PLP aiming at making explicit the process of diagnosis. This data analysis allowed us to model the osteopath's activity and more specifically, the activity of diagnosis, as shown in Fig. 1.



**Fig. 1.** A model of the osteopathic diagnosis [5]

The activity of osteopathic diagnosis is very much like an inquiry in a sense that the osteopath proceeds by questioning, making hypotheses, carrying out investigations to test them.

To determine the best treatment for the dysfunction observed, the osteopath makes a diagnosis of the patient's problems. It is a process where the practitioner will discuss with the patient's affected structures and propose a treatment. This is why a large part of the osteopathic appointment is devoted to questioning (interrogative review) and physical examination (clinical review). Both reviews require mobilizing medical knowledge in symptomatology and semiology.

The next section presents the conceptual framework our learning scenario design is based on.

### 2.3 Pedagogical Scenarios

The analysis of teaching practices has been based for decades on several conceptual frameworks: the cognitive psychology and information processing, analysis of representations, ethno-methodology focused on "thinking in action", narratives of experiences, etc. It shows that a teacher as a practitioner has implicit models based on a set of routines [6]: recurrent learning activities, teaching routines, management and enforcement routines. These routines are especially used to orchestrate teaching and learning activities and to choose appropriate strategies with respect to students and contextual elements. At the same time, the interest in design research as a valuable methodology for educational research has been growing. Various theoretical constructs have been proposed to capture abstractions to design learning situations integrating digital technologies and among them *pedagogical design patterns* [7, 8] and *Educational Modelling Languages (EML)* [9]. Design patterns capture recurring features across narratives, encapsulating critical challenges and forces pertaining to a domain of learning design, the interactions between them and possible solution methods. EML aim at providing interoperable descriptions of learning scenarios using XML language. As pointed out by IMS-LD authors themselves [10], an EML, which mainly aims at expressiveness and interoperability, is not intended for a direct

manipulation by human users (teachers, designers, engineers...). Specific conceptual models and authoring systems are provided [11] in order to help practitioners to design their own scenarios using patterns and vocabulary nearer to their own practices. ISiS (Intentions, Strategies, and interactional Situations) conceptual framework [12] is one of these and allows structuring the design of learning scenarios by teachers-designers. This framework is based on a goal-oriented approach and offers a specific identification of the intentional, strategic, tactical and operational dimensions of a scenario. ISiS is implemented in ScenEdit authoring environment [12], a graphical tool dedicated to design learning scenarios. It aims to favor sharing and reusing practices by providing patterns for each type of ISiS component.

The next section describes the role-playing game scenario designed by combining these conceptual frameworks: serious game design, activity analysis and pedagogical scenarios design.

### 3 Role-Playing Game Scenario

When searching for a solution to the PLP request, we opted for a simulation of the osteopath diagnosis activity. Among possible types of games, a RPG seemed the most suitable as it gives the trainees opportunities to play various roles chosen to represent real roles in the real situation [13]. The RPG we have designed is implemented on a platform using only forums.

We describe in this article only the pedagogical register of the RPG. From the activity analysis (cf. section 2.2), we have identified a teaching pattern corresponding to an inquiry-based learning approach that allows the osteopath to make an osteopathic diagnosis. This pattern enhances the pedagogical register of the RPG prototype that we suggest for PLP. To design the learning game scenario, we have used ISiS model and ScenEdit authoring tool (cf. section 2.3).

The activity analysis allowed us identifying two main pedagogical intentions for this pattern. The first intention is enabling the students to “mobilize knowledge in a real professional situation”. The second intention is enabling the students to “develop autonomy in planning the clinical examination” since the trainees-osteopaths are practicing physiotherapists, and therefore they are not used to plan and carry out osteopathy examinations on their own.

To reach these intentions, we define an inquiry-based learning strategy representing the conducting of an osteopathic appointment, detailed in four phases. It has been implemented into the ScenEdit editor in the strategy called “conducting an osteopathic appointment”, as shown in Fig. 2.

*Phase 1: Conduct an interview.* The questioning of the patient allows the osteopath to determine precise indications and contraindications of the therapy while building a reflection looking for mechanical dysfunctions of the body.

*Phase 2: Perform clinical examination.* Following the initial summary at the end of the interview, a clinical examination leads the osteopath to detect areas of the patient’s body with movement restrictions that may affect her/his health.

*Phase 3: Decide osteopathic care.* The synthesis of these two diagnoses (examination and palpation) enables the osteopath to identify a dysfunction and to determine priorities, the cause or causes of the problem and finally decide osteopathic care to implement.

Phase 4: *Practice osteopathic care*. It is only after this process that the osteopath can start the treatment.

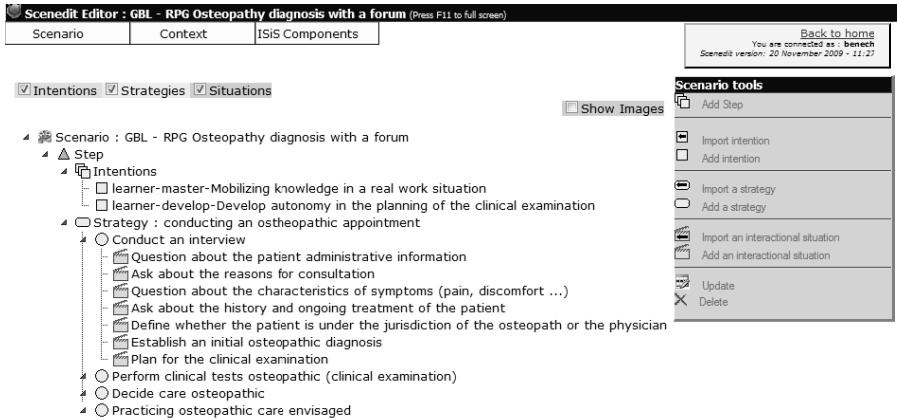


Fig. 2. Implementation into Scenedit of the osteopathic appointment strategy

The first phase, “Conduct an interview”, is declined by seven interactional situations which are collection of interactions and activities “using a specific set of roles, tools, services resources, locations according to the *situational context*” [12]. For instance, the situation “Ask about reasons for the appointment”, is the step where three trainees play the role of an osteopath asking questions, via a forum, to a patient played by two trainees who provide answers to the questions. Within both teams, the trainees discuss the questions to ask or the answers to provide via dedicated forums accessible only to the team members (Fig. 3). A description of the patient’s case is provided to the patient team which then knows the dysfunction and can respond precisely to the questions of the osteopath team whose aim is to make a diagnosis and identify the dysfunction. The validation of the diagnosis is done by the patient team comparing the diagnosis of the osteopath team with the dysfunction to be discovered.

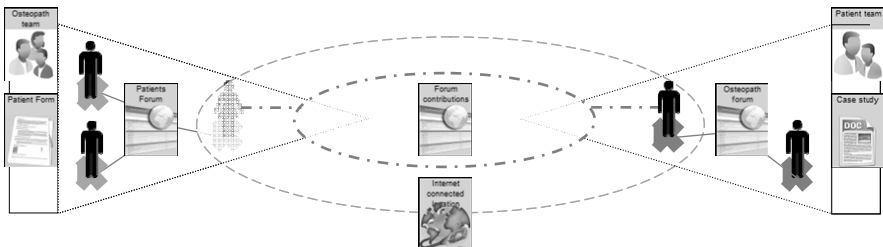


Fig. 3. Schema of the Role-playing game

## 4 Conclusion

In this paper, we have presented an overview of the design methodology, the pedagogical scenario and the first implementation on a learning platform of a RPG scenario for the training in osteopathic diagnosis. The aim of this work was first to formalize the osteopathic diagnosis using activity analysis and professional didactics conceptual frameworks and then to design a pedagogical scenario using RPG on an asynchronous forum. This learning game scenario requires the involvement of several actors to play the role of the osteopath, but also of the patient. The experiment of the designed learning situation with a group of learners at PLP School of Osteopathy is planned during training sessions in July 2011. This experiment will aim to validate: role-play, interactions between actors, accessibility and empowerment of the game. These tests will allow making necessary adjustments and settings that will improve the quality of the design in order to permanently maintain the delicate balance between the expertise to acquire and the fun intrinsically brought by the game.

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