

# Chapter 11

## Design of a Socioconstructivist Game for the Classroom: Theoretical and Empirical Considerations

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### ABSTRACT

*The overall goal of our research was to create a Web-based health education game that was compatible with new school requirements in Quebec, Ontario, and New Brunswick, Canada, covering the development of competencies including problem solving and critical thinking, while using a learning approach involving the collective construction of knowledge. This chapter introduces the theoretical and empirical studies which led us to choose the game framework and question types to achieve the desired learning objectives.*

### INTRODUCTION

Our overall research goal was to create a web-based health game within a game shell being developed in the *Carrefour virtuel de jeux éducatifs/Educational Games Central* environment (<http://egc.savie.ca>).

While the game was intended for learners at all levels, we were specifically interested in the age group who are just completing elementary school, or starting secondary school. We began our work with a study of school programs in the Canadian

provinces of Quebec, Ontario, and New Brunswick to identify the parameters which would guide our choices as well as the health subjects to be emphasized. (Parts of this study are described in Chapter 7.) We then based our development process on the work of Depover, Giardina, & Marton (1998), using their five-stage process for building a *Système d'Apprentissage Médiatisé Interactif (SAMI)*, an interactive multimedia learning system). This chapter presents aspects of the first two stages: *data analysis* (theoretical and empirical), and *design* of the game shell and the health game. We first defined the crite-

DOI: 10.4018/978-1-61520-731-2.ch011

ria which drove the choice of the frame game we used and then determined the types of questions that would be consistent with a constructivist approach to game-based learning.

To start, we conducted a review of the the approaches to learning and health education recommended by new school programs in the provinces under study. We also analyzed a variety of educational games already offered on the Internet and on CD-ROM to highlight characteristics that would support learning according to the models prescribed in the school programs. We then studied the needs and preferences of the target audience for the types of educational games that would interest them. To do this, we used one questionnaire for students, and another for future teachers. We also held two focus groups with 5<sup>th</sup> and 6<sup>th</sup> year elementary school students in Quebec. The synthesis of these studies allowed us to define an optimal game framework, taking into account the constraints and preferences of both elementary school and university students (in their capacity as future teachers), and to outline possible health game subjects.

## **THE PROJECT: CONTEXT AND QUESTIONS**

This project builds on several studies, game implementations, and development projects (five generic shells for multimedia educational games on the Internet in the *Carrefour virtuel des jeux éducatifs/ Educational Games Central* website (<http://ecg.savie.ca>) that were developed by the research team at *SAVIE* (Société d'apprentissage à vie), a partner in the Canadian *SAGE for Learning* research network. One of *SAVIE*'s aims is to provide teachers at all levels, in-house trainers, and community or non-profit organization workers with tools to develop educational games on the Internet and to use them with their students or clients by means of generic computer-based frame games. Some examples of frame games that have

been programmed for online use are *Snakes and Ladders*, *Tic-Tac-Toe*, *Trivia*, and *Mother Goose*. A generic shell is a frame game which has had its original content removed and for which only the structure remains. Game authors can use the shell to build a new game by adding their own content. For example, a teacher who wishes to make a history game could input his own questions on the historic period that he wants to cover with his students. For this research, a new game shell was to be created to allow the construction of games in a new format. The specific game to be created was an educational game covering some aspect of health for young people between 10 and 12 years old.

Decisions related to the conception of the game shell and game were influenced by several constraints. The mandate was to build a game shell that met the strict definition of "game" as opposed to "simulation game" (see Chapter 1). The frame game had to allow the use of a socioconstructivist approach. We had to take into account the technological and ergonomic constraints found in schools. There was a limited budget. The game shell had to remain independent of any educational content and be reusable for various clientele. Finally, the learning environment had to allow for learning new content rather than serving only for testing student knowledge levels (Rail, 2005).

Several questions arose, such as, what frame game to choose? With what characteristics? How would we take into account new curricula for elementary and secondary education in Quebec, Ontario and New Brunswick? To answer these, we collected both theoretical and empirical data. The combination allowed us to choose a frame game adapted to the needs of future teachers and their students.

## **PROGRAM REQUIREMENTS**

Because the target audience for our health game was young people from 10 to 12 years old, the

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