

## Chapter 22

# Initial Analysis for Creating a Generic Online Educational Game Shell

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### ABSTRACT

*As the first of five chapters describing the development process for a generic educational game shell, this chapter discusses how the authors analyzed 40 computerized educational games to determine the main characteristics built into digital educational games. The analysis allowed comparison of game attributes with the pedagogic and technical needs of target populations (i.e., primary and secondary school teachers and students) and their learning contexts.*

### INTRODUCTION: DEFINITIONS AND DEVELOPMENT PROCESS

This and the next four chapters describe in detail the development process used by the research team at SAVIE (*Société d'apprentissage à vie* – [www.savie.qc.ca](http://www.savie.qc.ca)) at Télé-université in Québec, Canada, to develop a generic educational game shell (GEGS) based on *Parcheesi* for the *Carrefour virtuel de jeux éducatifs/ Educational Games Central* online community (<http://egc.savie.ca>).

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Before defining a GEGS, we note that any game can be broken down into two components:

- The game's *structure* determines the way the game is played: rules, the stages of the game and player moves, challenges that the players face, and strategies which they can use to win. In the context of a game, we say that we “empty” the game of its content to uncover its unique underlying structure. This structure, once clearly defined and analysed, becomes a “frame,” or a “generic game shell,” when it is programmed and put online.

- The game's *content* consists of the information employed in the game: this content is generally found (for non-computerized games) in cards and on game boards. In the case of educational games, it also includes stated learning goals and competencies to be developed by playing the game. Once a frame game is fully defined, it is enough to insert new content, accompanied by pre-determined learning objectives, to generate an up-to-date educational game adapted to a particular target group.

Based on this division, a *frame game* is an existing game, e.g., *Parcheesi*<sup>TM</sup>, with its content emptied and only the structure retained (Hourst & Thiagarajan, 2007; Stolovitch & Thiagarajan, 1980).

Board games are the easiest to adapt into frame games because they have simple structures with few rules, which makes adaptation easier, and they are likely to fit the definition of a game as distinguished from simulation, because they take place in an imaginary environment rather than a simulated "real" environment (Sauvé, Renaud, Kaufman, & Marquis, 2007; see also Chapter 1 of this volume). They are often well-known; who has not played *Snakes and Ladders*, *Tic Tac Toe* or *Parcheesi*?

When used for online learning, a frame game becomes a generic educational game shell (GEGS). A GEGS is an online design environment that facilitates game creation by teachers and trainers, providing them with the tools they need to: (1) set technical and pedagogical parameters for the game; (2) create strategies and rules that direct players' actions; (3) create learning materials; (4) set criteria to define the end of the game and determine the winner; and (5) expand on the tools required for game review and evaluation, ensuring that the game is regularly updated and strengthening its learning impact.

The SAVIE development process for an online GEGS was adapted by Sauvé (2002) from learning design models that generally include five stages (Brien, 1981; Dick & Carey, 1996; Grafinger, 1988; McGriff, 2000). The process, validated by Sauvé et al. (2002, 2004) during the creation of four online GEGS, consists of the following five stages:

- **Preliminary analysis and planning:** analysis of the target learner group(s) and the learning context; specification of the shell's pedagogical and technological requirements; review of existing frame games; and selection of the structure of the game to be adapted.
- **Design:** description of the structural components and content elements of the existing game to be saved, modified, or added to create the shell; creation of a design model in the form of screen pages and reference documents describing the GEGS components.
- **Media development:** development of technical specifications for the online shell's graphic and multimedia components; programming of different elements and their functions in the shell; and functional integration testing of the shell.
- **Validation:** specification of the formative evaluation framework; development of evaluation instruments for the target population; target population trials; and making any necessary revisions.
- **Formative evaluation of games created with the GEGS:** development of an educational game using the shell; specification of the experimental framework; development of measurement instruments to be used by experts and the target population; validation of the game by experts, and revisions if necessary; game trial by the target

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