

Virtu@1 CC: Learning through simulation

(work in progress)

What kind of game would Virtu@1 CC be?

Simulation and games are extensively used in many types of educational and training strategies as described in http://en.wikipedia.org/wiki/Simulation#Simulation_in_training.

The term "Digital Games" is frequently associated with video arcades. However, there are many varieties of games, as noted by Marc Pesky (Digital Games-based Learning, McGraw-Hill, 2003), and Virtu@1 CC is not a typical shooting game. The categories most appropriate to define Virtu@1 CC would be:

- organized,
- competitive/collaborative,
- intellectual and
- Self-contained.

These categories are essential for defining both the potential for learning and the underpinning theoretical principles of this game. An organized game is one with rules. Being competitive and collaborative means that players may be adversaries against the machine or against each other; but they may collaborate among themselves as well. The game is intellectual because the actions of the game do not have rewarding value by themselves, but through the game logic. In addition, self-contained games do not need an external resource such as a book or video to gain benefits from them; the game by itself is the learning situation.

There are two basic approaches that allow us to determine what kind of learning can happen in a game like Virtu@1 CC. One is the empirical evidence. Patricia Marks Greenfield (Mind and Media, 1984) did a meta-analysis of game research and discovered that interactive games strengthened certain skills and knowledge:

- **Enhanced recognition of visual images**– Ability to mentally picture the outcome of a process
- **Rule discovery**, which is similar to scientific inductive reasoning
- **Enhanced comprehension of simulations** of scientific concepts and principles
- **Capability to maintain "divided attention."** which is a trait of excellent managers.

These general learning results will also be present in Virtu@1 CC because it shares the above -mentioned characteristics with other games.

The second approach is theoretical. What principles of learning theories are embedded in situations proposed by Virtu@I CC? In this respect, the game does not embrace the principles of a single theory rather; it combines elements of the most prominent theories of learning and in absence of a unified theory of learning, Virtu@I CC integrates principles of several of them to compose a dynamic and engaging game. The reason is simple, none of these represents the whole spectrum of human learning; and then, it is advisable to take useful elements from each one of them. Virtu@I CC, as complex games, will feature organization, competitiveness, collaboration, intellectual challenge and self-containment; furthermore, principles from diverse learning theories will enrich with all types of features to make of Virtu@I CC a robust game.

Virtu@II CC will integrate principles from diverse Learning Theories

Behaviorist Theories

- Learning objectives need to be stated.
- Learning is partially due to practice.
- We learn both from positive consequences of behavior and mistakes (trial and error).
- Immediate feedback is essential to learn.

Cognitive Theories

- Learning depends of restructuring past experiences, correcting mistakes. (The game explains why certain choices are not good.)
- Purposeful goal-oriented behavior facilitates learning (there is a purpose at each stage of the game).
- Learning is consolidated through mental models or schemas (the game facilitates the user to connect different variables in scenarios).
- Reflection is not prompted by the instructor but embedded in the game (users can “playback” decisions and find out why the current outcome).

Constructivist Theories

- The game is socialized; collaboration of partners makes the game more interesting.
- Most situations in the game as presented as problem-solving. There is a goal and there are tools to aid in obtaining the goal but the solution is not evident.

Constructivist Theories (cont.)

- In doing so, they are scaffolded by the system; tools and hints can be called for. In advanced stages of the game, the hints disappear.
- Many times, the way to jump from one stage to another superior one is through discovery.
- Users advance in steps from the current status of the college or a function of the college to a zone of proximal development.

Social Learning Theories

- We learn by imitation of others or modeling (at certain points, the user can retrieve cases or best practices that have a modeling effect).
- The game strengthens enactive learning (corresponding to the time-honored “learning by doing” as opposed to being taught).
- Vicarious reinforcement, a player can see why other players are getting more points.
- Role playing facilitates learning.
- Good players develop self-efficacy and self-regulation.
- Good decisions are attributed to mastery of principles, not to luck.

Humanist Theories

- The most powerful motivation for learning is self-motivation.
- The game emphasizes the fun of learning.