

Introducing the "Serious Games Mechanics"

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Introducing the "Serious Games Mechanics": A Theoretical Framework to Analyse Relationships Between "Game" and "Pedagogical Aspects" of Serious Games

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From a pedagogical perspective it is difficult to dissociate Game Mechanics (GMs) from educational components at implementation level, a Serious Game (SG) forms an entity for which its function is to educate and entertain through a single compelling experience. If, as we suggest, Serious Games Mechanics (SGMs) are represented at a higher-level of abstraction than GMs, crossovers between game and learning strategies that combine to form SGMs should be identifiable. Therefore, we propose that through dissecting a wide range of successful SGs and examining their individual learning and play components through the theoretical framework below, we can identify SGMs that have proven successful and advance towards a practical conceptual design tool for effectively implementing educational mechanisms for future SGs.

Pedagogy

Instructional Design

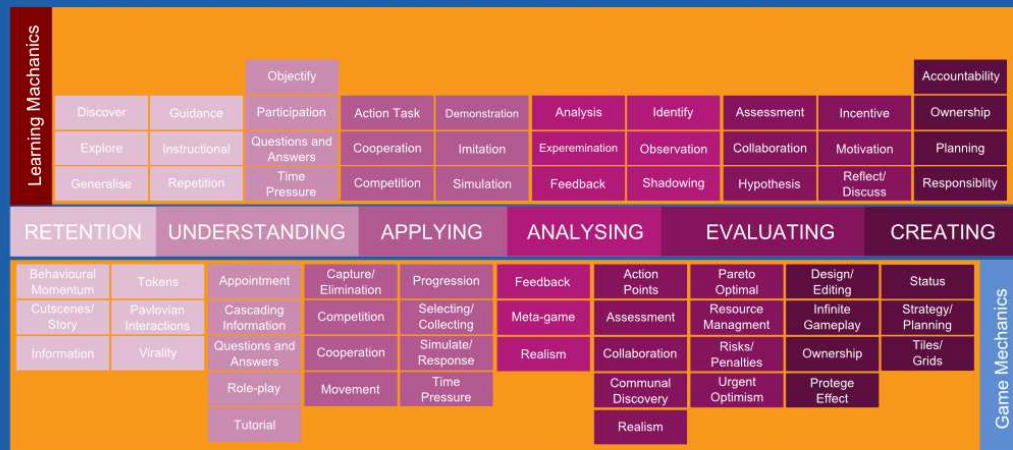
The domain of pedagogy heavily fragmented and comprises a variety of non-exclusive learning theories, each favouring a particular view on learning and each focussing on a subset of variables, such a individual motivation, affect or social aspects of learning.

Learning Theories

Amid the number of conflicting and a often contradictory pedagogical theories, it was decided to structure our framework around Bloom's Taxonomy of learning Objectives [1], as Bloom's provides an established scaffolding structure for learning objectives that often mirrors the learning found in game-play, and has previously been employed for the analysis for both Serious Game [2] and entertainment game design. More appropriate structures may become apparent as we progress.

Serious Game Analysis towards a Serious Games Mechanic

We propose the concept of a Serious Game Mechanic as the mechanisms linking pedagogy and gameplay. Through the analysis of existing Serious Games with the proposed framework we aim to identify appropriate combinations of Learning and Game Mechanics that form successful SGMs.



Game Mechanics/Learning Mechanics Framework organised according to a modified version of Bloom's Digital Taxonomy [3].

Game

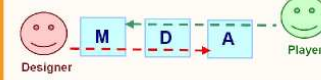
Game Design

Certain game aspects can provide indications as to where pedagogical constructs might be represented within SGs. Researchers have thus far commonly focused on genres, design patterns [4] and Game Mechanics[5,6].

theoretical models suited for the design of games include:

MDA Model

The MDA Model [7] is a simple framework, it defines three 'levels':
The 'Mechanics' level, where lies the rules crafted by the Game Designer
The 'Dynamics' level, the results of a player interacting with the 'Mechanics'
The 'Aesthetics' level, which gathers the inner feelings the players are when playing the games (i.e. what the players feels in reactions to the 'Dynamics').



Game Bricks

This concept proposed by Djaouti et al. describes the 'fundamental elements' whose different combinations seem to be able to cover the game-play of videogames" [8]
Djaouti et al identified ten bricks through which most games could be described at a low-level of abstraction.



Game Design Patterns

Game design patterns focus on the re-occurrence of structural game components and can be regarded as a structural analysis of game-play and gaming activities. Björk et al. identified and described over 200 game design patterns [4].

Game Mechanics

GMs can consist of the actions describing the player's agency within the game world through verbs such as buy, jump, hide, etcetera [5,6]. We observe that the user-centric description of GMs represents an attractive alternative to the game-centric representation of design patterns.

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