Design for Inclusion, Gamification and Learning Experience

edited by
Francesca Tosi, Antonella Serra, Alessia Brischetto, Ester Iacono

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21. A Good Procedural Rhetoric for Good Gaming Practices

by Isabella Patti

Abstract

In the wake of recent developments in the field of New Media Studies, Game Studies and Narratology, this essay aims to highlight some of principles useful to recognizing an educational simulation game when it is wellmade. Starting from the assumption that a game is a system based on rules and mechanics, and that their typology makes it more or less effective, more or less engaging and intense, more or less formative, the essay wants to analyze the principles related to content (narration) that are best suited to provide an appropriate simulation learning experience. For these reasons, the research analyzes of a selection of current educational Serious Games and compare their contents with the Procedural Rhetoric Theory (PRT) proposed by the game designer Bogost (2007). This theory identifies in the video game a system of rules and mechanics that is based on the rhetoric linguistic techniques of translated into a computational procedure. According to the PRT, games can exercise a good persuasion provided that the gameplay features a meaningful representation of this underlying procedure. To support these principles conceptually, the essay analyze also the pedagogical side of the contents and present some of the "36 Learning Principles" proposed by Gee (2007) will be used. This model proposes specific characteristics of each learning dimension and contributes to defines the principles of a wellmade learning experience. Considering the Serious Games analyzed through the lens of the PRT and the 36LP, the article aims to identify a series of rhetorical procedural principles relevant to the design of the educational content of a serious game.

Keywords: *Game Studies, New media Studies, Procedural Rhetoric, Game Experience.*

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21.1 Serious Game Movement

Confined for decades in the sphere of leisure, simple entertainment or sport, digital games have suffered for decades a real cultural discrimination that has changed only recently. The reasons for this change are essentially two: the exponential growth of the computing capabilities of digital processors and the creation of powerful infrastructures in the sector. The combination of these two data – the technical capabilities with the infrastructural ones (for example, greater speed and data processing power, easy access to the network, an increase in connection methods, the improvement of recreational dives and simulation mechanisms) – have allowed the digital media, and digital games in particular, to present sophisticated and captivating simulations able to involve thousands of people through realtime interaction. It is not important what kind of games they are, be they shooters like Halo or fantasy multiplayer adventures like World of Warcraft or realistic simulations like Flight Simulator, digital games today represent a space of fun, representation, experimentation and innovation without equal.

Only recently the academic reflection has recognized the use of digital games as a powerful tool to support people's learning (Kirriemuir and McFarlane, 2004) and several published studies have shown that these can be more efficient learning methods than traditional ones (Papastergiou, 2009). In fact, although the current number of video games used in education is still limited, it is demonstrated that their application leads to the improvement of knowledge and skills (McCall and Work, 2011).

However, despite they're growing success, the academia is still struggling to accept video games as a cultural form worthy of rigorous study and analysis, and proves unable to fully understand that their project must be accompanied by adequate evaluation of scientific processes, results and contexts involved, and by an adequate methodology dedicated to contents.

There is still a lack of scientific explanations and methodologies on the mechanisms by which the components of the videogame can facilitate behavior change and the formation of people, which further hinders the adoption of video games as educational tools. This also happens because, on a more general level and within academic research, it has been difficult to provide digital culture with a conceptual and theoretical introduction of its innovative methods understood as "models of knowledge" in development (Burdick *et al.*, 2012). In fact, after the publication of the fundamental text The Art of Computer Game Design of Crawford in 1982, the scientific papers on this subject have been published only recently. It is reasonable to think that all these improvements that have characterized the commercial videogame dimension in recent years, can

be transferred to "serious" gaming applications, that is to say in those playful products designed for collaborative learning and interactive teaching.

21.2 Serious Game and Rhetorical Speech

The type of videogames considered more suited to stimulate this type of learning are the socalled Serious Games (in Italian, "applied games") in which simulation themes, learning and conveyance of contents foster guided training processes: "*they are antiescapist games that are played to obtain more from real life, unlike those games which are played to escape from it*" (McGonigal, 2011, p. 46). Such games are aimed at "building up the players' competences or conveying a rhetorical message so as to make the players reflect on a particular theme" (Salvador, 2015, p. 864). More precisely, "*an applied game is a game that deals with a complex theme without revealing it, that is to say presenting itself as an ordinary game like any other*" (Maestri, Polsinelli and Sassoon, 2015, p. 68). This type of game stimulates experiences that do not isolate the player in a world of self-referential and gratuitous amusement, but rather fosters "*a shared and, at the same time, significant game experience, which generates satisfaction and knowledge for the players and improves non-linear vision, critical analysis and problem solving*" (McGonigal, 2011).

Serious Game projects can vary a lot from one another in terms of style, graphics, scale, purpose and budget: there are some that are made and tested with a very low budget by independent researchers or game developers, or supported from millionaire investments like World Without Oil whose project involved at least thirty-five designers (including Jane McGonigal), cartoonists and developers, and was presented by ITVS Independent Television Service. Some Serious Games today face such themes as industrial or road safety (S-Drive, Samsung, 2014), solve business problems (Lego Serious Play, Lego, 2000), introduce correct practices and habits as regards the conservation of our planet's resources (Food Force, FAO, 2005), deal with situations and contexts with important socio-political implications such as the Palestinian conflict (Under Siege, Dar al-Fikr, 2005). Definitely the first successful serious game that showed the possibilities of training whit this type of medium is Flight Simulator that is a realistic simulation videogame produced by Microsoft in 1982. Its peculiarity is that it was created as a game for casual players but then it has become a true training tool. Lego Serious Play, instead, has been designed to facilitate communication processes between people working in the same company and it improves creative thinking and strategy in the workplace. In the medical field, one of the most recent projects in this sense is Clinispace, a

medical realistic simulation videogame in Real Time 3D that simulates a virtual hospital. It is aimed at medical students, and it allows training in procedures in a virtual hospital. Finally the game Superbetter, designed by game designer Jane McGonigal, is a casual browser game that helps people to overcome physical or mental problems.

Summarizing, a Serious Game is a type of game designed for a serious purpose (and not with a serious theme) where the players have a complex experience through simulation: the players' experience can be interactive or not, realistic or conceptual, digital or analogical and it can change players' attitudes and beliefs, and potentially, it can lead to significant and long-term social changes. Since, as Bogost said, "*video-games are uniquely, consciously, and principally crafted as expressions. As such, they represent excellent candidates for rhetorical speech – persuasion and expression are inexorably linked*", to design a good serious game it is necessary to have the "procedural rhetoric" under control in check (2007, p. 45). By "procedural rhetoric" I mean a new type of persuasive and expressive practice at work in artifacts like Serious game: "*More specifically, procedural rhetoric is the practice of persuading through processes in general and computational processes in particular. Just a verbal rhetoric is useful for both the orator and for the audience, and just a written rhetoric is useful for both the writer and reader, so procedural rhetoric is useful for both the programmer and the user, the game designers and the player. Procedural rhetoric is a technique for making arguments with the computational system and for unpacking computational arguments others have created*" (Bogost, 2007, p. 3).

21.3 A Good Procedural Rhetoric

The question we ask ourselves at this point is what are the signs of recognition of a "successful" educational Serious Game – we say "good". To evaluate the goodness of the game one must start essentially from two factors. First of all, since the games are rules-based systems and as such allow an important and effective feedback mechanism, they are structures that must be optional (the result of a voluntary choice), never coercive and increasingly alternative to reality. More, they must be stimulating paths, with interesting obstacles and feedback systems. As McGonigal claims: "All games (digital and non-digital) share four constants: voluntary participation, feedback system, goals and rules; all the rest is strengthening or improvement of these four central elements" (2011, pp. 404 et seq.).

Based on these four qualities, all video games are made primarily and consciously as expressions and as such, the more they are designed around a

solid procedural rhetorical discourse, the more they will be able to engage players, as well as teach them something. In fact, persuasion and expression are inexorably linked in every form of expression that is oral, written or visual.

In a videogame, the procedural rhetoric analyzes the art of persuasion through rules-based representations and interactions rather than spoken or written words, and it focuses on how video game producers develop laws and rules within a game to convey a particular ideology. By "convey an ideology", I mean that representative goals video games pursue related to literature, art and cinema rather than instrumental goals related to utility and instruments (Bogost, 2007, p. 45). Being interactive, videogames require user intervention to complete their procedural representations, and therefore they offer particularly promising opportunities. However, these opportunities are not assured given that "*Interactivity guarantees neither meaningful expression nor meaningful persuasion*" but it sets the stage for both, and for a good gameplay. Indeed, interesting choices do not necessarily entail all possible choices in a given situation; rather, choices are selectively included and excluded in a procedural representation to produce a desired expressive end (Bogost, 2007, p. 46).

Greater interactivity serves to make the gaming experience more engaging, so much so that the goodness of the videogame can be done depends precisely on the "spectrum of vividness" that Bogost theorized. This spectrum "*producing more vivid experience thanks to the player's active involvement, but that vividness comes not from immersion, but from abstraction. The values common to virtual reality and computer graphics assume that the closer we get to real experience, the better. This sentiment corresponds directly to the vividness spectrum, with the best interactivity coming closest to real experience. But meaning in videogames is constructed not through a recreation of the world, but through selectively modeling appropriate elements of that world*" (2007, p. 46).

For this reason, interactivity are not based in the total number and credibility of user actions; rather, the relevance of the interaction in the context of the representational goals of the system is paramount.

21.4 Spectrum of Vividness and Rhetoric Elements

The work of this research is aimed at the project of a serious creative learning game in the context of university education to improve active knowledge acquired through simulated experience. To get an engaging "specter of vividness" and to increase the players' selective interaction, the basic structure of the game (rules and goals) was conceptually supported by the contents of some of the 36LP by Gee (2007), and practically by data collected and analy-

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zed from the students of the Design History course of the University of Florence in the 2015-2018 period). (Fig. 21.1)

The method used is based on a specific initial procedure: the creation of worksheets designed to reconstruct the greatest number of details and contents identified with a design topic / object and to learn in a problematic way (the worksheets presented simple or complex questions on basic, functional, morphological and aesthetic data; the collection and analysis of the data obtained, from which important indications emerged for the videogame to design. For example, how and where the student chose information, why some of those answers were incorrect or incomplete, how a choice was made in front of contradictory data, etc. This was an effort of humanistic investigation: not were the errors corrected, but the reasons for the errors and the type of support used for the study and research were discussed (such as: social media, video, interviews, images, quotes, etc.).

This data was used to present the narration of the game according to principle n. 31 and n. 32 of Gee. The first principle states that: "*Learning is done in such a way that learners come to think consciously and to reflect on some of their cultural models on learning and on themselves as a learner, respecting their identity and abilities or their own social affiliations, and compares them with new learning models and with himself as a learner*" (2007, p. 193). In fact, the system was developed in this direction: the analysis of errors and of different approaches to solve the questions proposed by the worksheets was useful for to hypothesize different types of "identity" of players with characteristics basic specifications. The concept maps, created to address the problems of multiple representation of narration was useful for development of augmented objects. In the end, the verification of the analysis tools to configure the system has defined different levels of knowledge of objects for different groups of students.

The game was designed with the following procedural features.

- **Applied**: it is a "Game aimed at purposes that are not pure entertainment [...] and that comes close to a complex theme without revealing this intention, without presenting itself as a game different from the others" (Maestri, Polsinelli and Sassoon, 2015, p. 68). This applied game is based on principle n.7, Committed Learning, of Gee: "*Those who take part in an extended commitment that constitutes the extension of their identities in the real world into a virtual identity towards which they feel engaged and in a virtual world they find engaging*" (2007, p. 190).

- **Educational**: starting from a generative event, the player's primary interest is focused on the theme of life and choices, and their relationship

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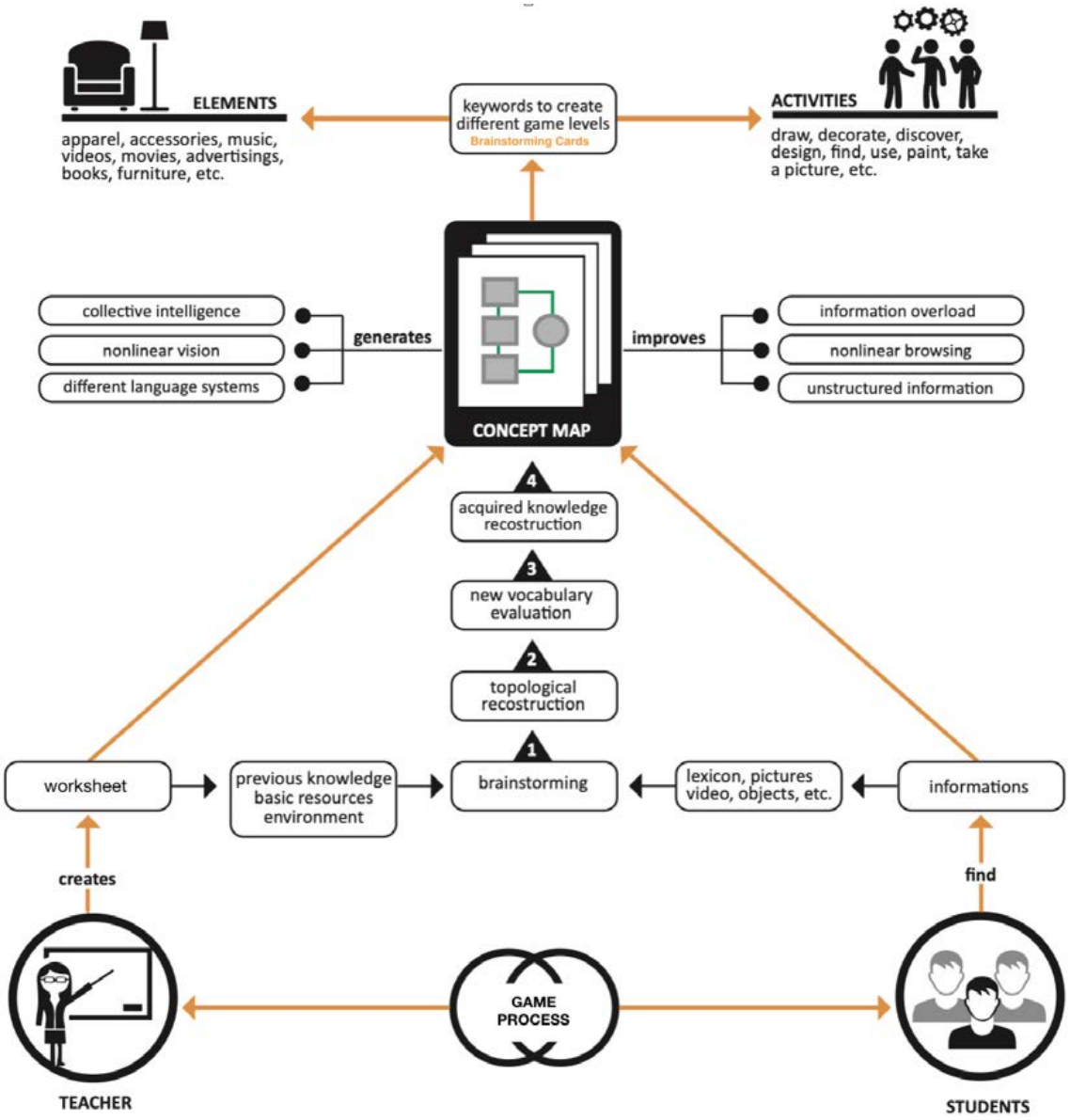

Fig. 21.1 - System of conceptual maps of the game

with the consequent mental state. The flow of events is influenced by the state of the system which includes the previous choices, thus "forming" the player directly on the topic. This creates a direct link between gameplay and learning (Koster, 2004). That is based on playful narrative dissonance (when the playful and narrative purposes come into conflict, etc.), and on the principle n. 21, Material Intelligence, of Gee: "*Thinking, problem solving and knowledge are "stored" in tools, technologies, concrete objects and in the environment. This allows those who are learning to occupy their mind in other matters, combining the results of their own thinking with the knowledge placed in these objects, to achieve even more important effects*" (2007, p. 191).

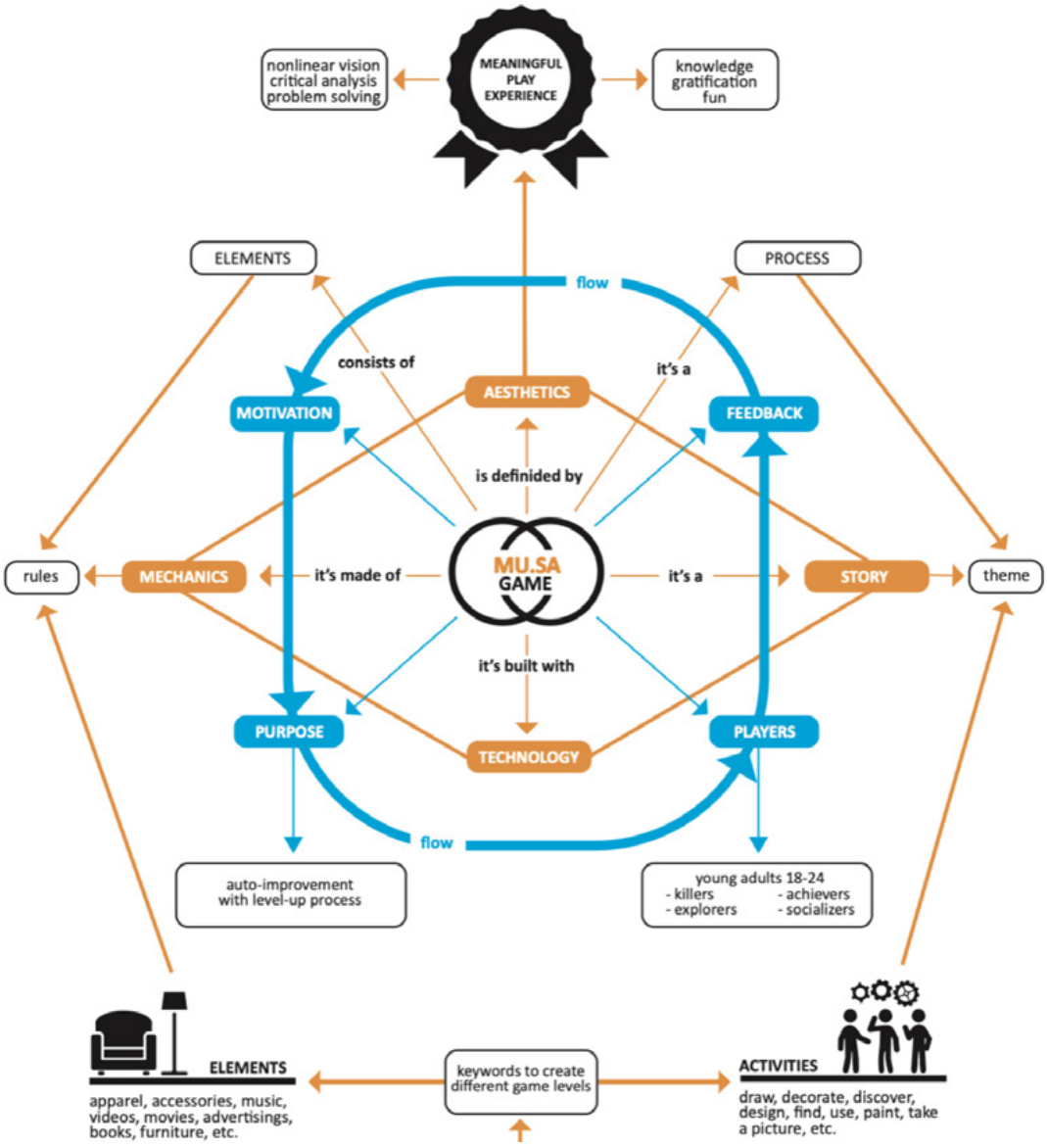

Fig. 21.2 - Game Structure System

- **Motivational**: it provides a motivational theory that the player must be motivated to go through the entire gaming experience and the parallel learning process: in order to enhance motivation it is necessary to choose a particular content, a learning path without steps and not too short, in where interactivity, rhythm, creativity and media integration are treated in detail. The motivation follows principle n. 10, Amplification of the Stimulus, of Gee: "*In the face of a small stimulus, the learner must obtain many effects*" (2007, p. 190).

- **Based on selective interactivity**: the meaning in videogames is "*Constructed not through a recreation of the world, but through selectively*

modeling appropriate elements of that world" (Bogost, 2007, p. 46) which are presented following the principle n. 27, Explicit Information "On Demand" and "Just in Time", of Gee: "*The learner receives explicit information both on demand and just in time, when he needs it or right at the exact point where the information can be better understood and used in practice*" (2007, p. 192).

- **Based on the anamorphoses**: "*Interactive technique that invites the observer to become an actor and solve the enigma by overcoming the deceptive threshold of representation to access the deception of simulation voluntarily*" (Giuliano in Cambi and Staccioli, 2007, p. 173) and on the principle n.1, Active and Critical Learning of Gee: "*All aspects of a learning environment (including the ways in which the semiotic field is designed and presented) are developed so that they can stimulate not the passive learning, but the critical and non-learning one*" (2007, p. 189).

- **Based on adductive reasoning**: in this case, I mean "adductive" as in Peirce's philosophy that refers to the procedure which consists in advancing an explanatory hypothesis for a certain set of observed facts, and in principle n. 16, Multiple Roads, of Gee: "*There are many ways to make progress and move forward. This allows learners to make choices, to rely on their strengths, on their learning style and to solve problems, but to try alternative ways at the same time*" (2001, p. 191).

Video games offer a particularly valid context for the interactivity that Boost calls "selective" but they are not an educational panacea, nor should they be used for all learning objectives: like all media, they have strengths and weaknesses. If the intention of the designer (s) is to design a game that presents the arguments as a cause-effect relationship based on critical methodologies, that is, on interpretation, serious games are a land of great opportunities.

Notes

[1] Bogost (2007), Jee (2007), Crawford (2003), Juul (2009), Salen and Zimmerman (2004), Shell (2008). The Movement of Serious Games is made up of designers who design games that make the difference in people's lives and considered a means of study and potentially also of social change (M. Andreoletti, 2010).

[2] On the "semiotic field" in principle n.32 of Gee (2007, p. 193).

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Designing for Inclusive Learning Experience

Conference – Florence, 10 May 2019

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The book presents contributions submitted at the Conference "Designing for Inclusive Learning Experience", which was held in Florence on May 10, 2019, at the Department of Architecture DIDA of the University of Florence.

The conference main topics regard the application of Ergonomics and Human Factors to Education, Gamification and Inclusion.

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FrancoAngeli
La passione per le conoscenze