

ANXIOUS DESIGN: BENEFITS OF DESIGNING SIMULATORS WITH STRUCTURAL ELEMENTS THAT GENERATE ANXIETY.

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ABSTRACT

This brief intends to explain how methodical research around possible anxiety-generating elements present in the structure of games and simulators, can bring considerable learning benefits to participants. The hypothesis is that anxiety can be intentionally and effectively structured in the design of andragogic simulators, with the effect of promoting cognitive development, social consciousness and emotional awareness. Information is recovered through specific observation guides and questionnaires. Evidence showed positive results when user's experience is accompanied by a trained facilitator, who provide feedback to users in specific timeouts. Ethical considerations of these simulators are extensively discussed in this paper, and full information, control and objectives of the research were stated to all participants. The process of designing and installing anxiety-generating elements in the structure of a simulator is explained using the Mercante game as an example.

INTRODUCTION

While reviewing manuals to design games and simulators, it is fairly common to find a chapter containing the importance of user's emotions. Most of the literature will pursue the goals of engagement and/or recreation as the key factor for success (Duke 1974, Lazzaro 2004, Fullerton, T., Swain C., & Hoffman S. 2008, Tvetanov 2015). On the other hand, research of elements that create anxiety or discomfort have been less noted. To be clear, the intent of this research is not to consider nor discuss gamified activities used in the treatment of phobias, anxiety or stress disorders.

The approach addresses the risky discussion of the conscious and intentional use of structural elements in games and simulators to create anxiety and acknowledgement of it. In all cases, participants reflect upon the structural reasons for feeling anxious during the simulation and receive feedback to continue playing and overcome this feelings. Evidence from prior research shows business simulators to be effectively used in both, technical learning and self-knowledge development (Duke 1974, Herrero & Pinedo 2005).

The *Mercante* game will be used as an example on how to embed emotional elements into a classic business simulator. The *Mercante* game is based upon a supply chain model, but by adding some structural elements, participants get caught in "class struggle" (Marx 2015, Semo 1981, Labriola 1971). Participants, without full comprehension of this phenomenon, will feel anxious and develop inadequate strategies and poor negotiations during the simulation.

Within the multiple definitions of anxiety, the common element is the discomfort felt without an evident source. This is what clearly differentiates anxiety from frustration or fear, which have clear sources. For game and simulation research, it is easier to design using clear sources of discomfort. So for

most cases, conflict and competition upon clear and evident elements are the common triggers of user's emotional considerations (Weinberger & Stein 2008, Hejdenberg 2005, Fullerton, T., Swain C., & Hoffman S. 2008).

Sources of competition and conflict can be clearly identified by simulation participants because tokens, cards or bills give structure to compare points, resources or strengths. When questioned for the reasons of conflict or discussions, participants will most likely answer elements that are clear and correctly identified as the sources (Tedeschi, Schlenker & Bonoma 1973). On the other hand, when researching around anxiety, it is vital to create constant uneasiness while at the same time making it difficult for participants to clarify the source. For this purpose the source has to be hidden *inside* the structure of the game.

From the various approaches to anxiety and anxious behaviors, the psychoanalytic theory has more thoroughly documented than any other in relation to games. Since Freud's description and analysis of the anxious content of a kid's play in 1920, a vast number of psychoanalyst have worked around this conception. Especially important were the researches of Melanie Klein (1964) and Donald Winnicott (1981). The theory considers there is a meaning of the behavior during a game, directly related to individual's history and anxiety coping mechanisms. Since there is almost no interest in participant's history in business simulation, the use of basic human anxiety triggers is highly effective to reveal and refine coping mechanisms. In the case of the *Mercante* game, the structured class struggle will be the anxiety trigger.

ETHICAL CONSIDERATIONS

The *best first* (like openings in chess) move is to note the ethical considerations. Is it correct to consciously and intentionally use structural elements in games and simulators to create anxiety in the players? Seven years of research, point to yes as an answer, but only if the user's experience is accompanied by trained facilitators. The main objective is to create awareness and develop psychic tools to raise consciousness and skills for the emotional dilemmas in strategic thinking, negotiation and decision making. All participants sign consent forms and are fully informed before. Days after, players are evaluated to guarantee no side effects were present, and to check if learning outcomes were still clear. Absolutely no side effects were present, and for most participants learning outcomes were adequately clear (at least sufficient to solve ethical issues). Methodical use of observation guides and individual questionnaires allow research material to be peer-reviewed.

STRUCTURING ANXIETY

Structuring anxiety, although not a simple job, is by no means an impossible one. Firstly, basic notions on human anxiety

ety triggers are necessary. In the case of the Mercante Game, class struggle and economic stratification is the core problem. Other forms of classic triggers used in simulators are “scarcity, vulnerability, or common wealth against the individual desire” (Fragua 2008). For the trap to be effective, it is necessary to hide the conflict in the structure, so it becomes very hard for participants to identify the source of discomfort and distrust.

To consider the conflict is properly structured, four conditions have to be present. First, the outcome of the simulator can be predicted by the designer but not by the users. Second, the structural sources of anxiety can be manipulated, with or without full understanding of the participants, to create more relaxing or stressful scenarios. Third, when intentionally maneuvering anxiety generating elements, players experience extreme tensions *around* this particular elements. Fourth, due to *resonance personality factors* (Belbin: 1981), these tensions are easily observed, but must be proven as consistent within a wide variety of different groups.

It is fundamental to have a clear perspective of the risks and benefits of this simulator design style. The objective is to propose tension to create an emotional print in the players, so the recovery of information from their experience is rich in rational and emotional content. At the end of the session, users must be ready to verify the relations between structure, behavior, anxiety, strategic underdevelopment and communication failures.

The ideal scenario for simulators with this kind of structure, is to create anxiety to be used as a lever for cognitive development. The trained facilitators assure the cognitive development by discussing with the participants the idea that, “production units require social consciousness and emotional awareness” to archive individual and organizational development (Lange, 1963). It is fundamental in this category of simulators to avoid pedagogic and cultural disasters like Lizzy Maggie’s *The Landlords Game*. This economic simulator was commercially exploited without guidance or information to the public. In this case, anxiety structured in the game mislead the consumer’s learning outcomes, and the absence of information turned an excellent simulator into a global and transgenerational perversion (Pilon 2015).

DESCRIPTION OF MERCANTE SIMULATOR

The simulator is based on a simple supply chain model dressed with the following story. “There is an island called Mercante. This island is habited by the Natives who are owners of the farmlands of an endemic crop. The island is also habited by Colonists, owners of factories with the technology to transform this crop into a product. The island has seaports, some owned by Merchants and the others by Pirates.” (Mercante: Manual de Usos, 2010 translated from the original in Spanish). Participants are divided randomly into four groups, Natives, Colonists, Merchants and Pirates. The explicit objective of the simulator is “to create wealth in the island. Final production is shipped to the King and sold with a profit” (ibid).

The simulator is organized in a garden and is best when used by 30 -40 participants. The Farmlands, Factories and Seaports are represented with 1.5 x 1.5 meter bases made out of fabric. Standard version of the simulator has 3 out of each, plus one Storage room (explained later). In subsequent simulations, arrangement and number of the bases can be random or custom organized for specific goals (ex. simulate the different effects of monopoly in either cropping, production, distribution or sale).

Before the simulation begins, the story continues “and a war commences between this groups. Natives against Colonists,

and Merchant ships against Pirate ships. The winning team from the Native vs Colonist match will acquire control of the storage room, and the losing team from the Merchant vs Pirate match will shipwreck” (ibid). Matches can be solved in different ways depending on workshop circumstances (prior experiences have been flag football, paintball, or a sum-zero game in a blackboard, but never random). This combat creates an initial tension against the common objective of wealth.

After the matches are solved. All teams, except for the shipwrecked, get an initial stock of resources and money (paper bills or polished stones). Natives get initial crop *seeds* represented by small plastic balls. Colonists get *technology*, represented by plastic tools. Controlling team of the storage room gets *fabric bags* and either the Merchants or the Pirates control the *ships* represented by two cardboard boxes. Additionally two baskets are placed in neutral spaces between the bases.

The mechanics are as simple: Natives carry the seeds (plastic balls) to the Factories and sell them to the Colonists. Afterwards the Colonists add technology (a plastic tool) to the seeds, and transport them to the Storage Room. The Storage Room owners buy this elements from the Colonist, and pack them together in a bag to create a *Final Product*: represented by two plastic balls and one plastic tool inside a fabric bag. Storage and Seaport teams negotiate the price before shipping. Packed inside the ships (carton barrels), *Final Products* are delivered to the King/Queen, (facilitator with a table at the end of the garden) and the final sell is done.

“Before the ship goes back to the island, ships must buy from the King more seeds and technology. This is because the King has the monopoly of the transgenic seeds and the spare parts for the Factories. The initial price for seeds is 50 cents and for the technology \$1. The Seaports may sell back to the Storage the new seeds and technology. Natives and Colonists must go to the Storage for seeds and technology to restock.” (ibid). This process occurs without specific turns and for around three hours (considering the feedback timeouts).

Rules are printed for all individuals, and the facilitator reads and explains them out loud. “The first rule in *Mercante*: What is not explicitly prohibited is allowed. The restrictions are the following. Individuals playing as Natives can only carry two seeds at a time, and Colonists can only carry one technology. When using a *basket* for transportation, it is possible to carry as many seeds and technologies as possible. Final Products can only be transported using the cardboard boxes (even from the Storage Room to the Seaport). It is prohibited to take away products from other player’s hands, but products can be borrowed or sold between all participants. Equally, abandoned products or bases can be freely used by other players” (ibid). Once the instructions have been given and all questions solved the simulation begins.

POPULATION TRAINED

After trying dummies and beta-versions, between 2013 and 2015 Van der Linden consulting agency (www.vdl.mx) tested the validity by scheduling six different groups of managers in training process. Results and learning outcomes of the simulator were peer-reviewed by fellow consultants. All groups were formed with 26-37 Mexican adults, between 25 and 50 years old, gender-mixed, with average or above average education.

Two of the groups were formed by floor employees, middle managers, and regional managers from the client services and sales stations of a transnational phone company. Two other groups were formed by indigenous community leaders sponsored for a leadership training program by a worldwide founda-

tion. One group was formed by national human resources managers of a transnational non-alcoholic beverage producer. The last group was formed by employees and managers from the office of supervision for national distribution of a car manufacturing company.

RECORDED BEHAVIORS

All sessions were documented using an observation guide. In all cases reported, with individual exceptions, the behavior of teams remained constant. This allows the simulator's results to be considered as the effect of its structure, not the sum of individual traits in actions. In other words, the behavior witnessed amongst the individuals points to be a clear evidence of "structure pushing harder than agency" (Uvin, 1998).

Players go around from one base to another, trying to negotiate team strategies and the prices to their fixed buyers (Natives to Colonists, Colonists to Storage, Storage to Seaport and Seaport to King). Even if the price of seeds and technology is well known by all participants, the tendency to raise the prices starts. Discussions arrive from the natural extroverted leaders, and exile is offered to introverted personalities in duties like "take care" of the bases. On average of tested groups, it took at least one hour and thirty minutes to deliver the first 3 Final Products. Negotiations for the prices stresses the economy to an average of \$12 final price to King. Once the ships go back to the Island with new seeds and technology, the pursuit of unregulated profits pushes inflation to the possible limit (considering the amount of money available in all the Island).

In spite of the different attempts from the shipwrecked team, they are always excluded from the dynamic. Frustration or boredom in this team promotes participants into snatching products and the development of a black market. Observations were clearly consistent with theorist that point to social and economic structural exclusion as the cause of antisocial phenomenon (Semo 1981. Bauman 2007. Steger 2013).

Product carrying limitations creates a physical duty the players wish to minimize. Some of the participants will exile themselves to the bases when discussions around team strategy and prices tend to be established but not strategically operated by natural extroverted leaders. During the simulation natural extroverted leaders are inclined to play dictatorial, rather than democratic roles.

Individuals are not fully aware of the reasons why they act in specific leadership styles or strategies. Questionnaires confirm the users suddenly turn a supply chain simulator into a survival model of "economic barbarism" (Konstantinov, F. Kedrov, B & Kon, I., 1973) without understanding how or why.

The transactions are not fluent since the individuals continuously feel distrust among other teams. This continuous distrust is present in all cases and it is not a result of the individuals but an unescapable resultant emotion of the structure of the game. Fixed stratification strains the interactions and inhibits full cooperation between the players.

Negotiations are rigid and often lack strategies. Most of the communication is highly "defensive" (Argyris, 1976), and gives very little space for confidence building arguments. The observation guides clarify how strategic thinking and communication fails, in direct and proportional relation to the amount of anxiety. The simulator's main objective of wealth generation is poorly archived. In favor of this argument, comparing results from seven different play groups, 46 final products is the best result registered. This result, far from what 180 man hours would be expected to produce, was achieved by 30 well-educated adults after 6 hours of simulation and various feedback timeouts.

FEEDBACKS AND LEARNING OUTCOMES

It is important to note that feedback timeouts are mandatory for this simulator. During the session players get reflection, discussion and feedback timeouts, to properly elaborate the tensions of the experience. The participants are constantly informed about the structural anxious design and the dichotomy around individual agency versus structural behavior. Awareness of the structural traps of the simulator, loosens the anxiety and promotes collaborative attitudes and strategies. Productivity and participation increases when players reflect upon the objectives and means to get there.

Strategic thinking can severely be affected by an anxiety generating structure. When properly applied, the Mercante simulator shows human "ineffectiveness in relation to the collective goal of wealth" (Tamames, 1975). The main purpose of this simulator is to create high emotional content to interfere with strategic skills. When this happens, feedback timeouts are crucial for meaningful learning, especially when individuals recover strategic skills as a result of acknowledging the structural anxiety.

Using the information recovered from the observation guides, the facilitators offer qualitative feedback to the players. They will help individuals solve the question of when to pay attention to the structural elements as the cause of failure, and when to make insights about psychic impediments to deal with anxiety. These impediments are mostly clear when individuals are making important decisions under considerable structural tension, and are valued as displays of inadequate strategies to reach the goal (Herrero & Pinedo 2005).

Strategies are evaluated in relation with the best possible move at a given moment. When player get fixed with impulsive responses feedback of this impediments create a strong insight. Insights are especially strong when the feedback about impulsive response can be related to real life routines. These two elements (structural anxiety-causing elements and unconsidered or subconscious coping mechanisms) conveyed as causes of failure during the session. At the end of the process, players discuss and replay the simulation but with the goal of trespassing structural anxiety, either by modifying the rules or by acquiring insight about personal impediments and the importance of practice in order to improve emotional health.

At the end four goals are obtained. First, participants are emotionally aware of the structure of the simulator. Second, tolerance to anxiety and preservation of maximum cognitive skills is practiced. Third, insight of unconsidered or subconscious mechanisms to deal with anxiety is acquired. Fourth, deeper understanding on how to deal with "defensive communication" (Argyris, 1976) for better negotiation skills is archive.

DISCUSSION OF RESULTS

The supply chain is organized in a way that economic stratification (directly related to structural possibilities of acquiring money and inversely related to the amount of physical work) happens as a fact. In accordance to Marxist analysis (Sanchez, Lefevbre & Castro, 1975), the King represents the aristocracy, the Seaport the bourgeoisie, the Storage represent the middle class merchants, then the proletariats and finally at the bottom the shipwrecked are the lumpen proletariats. At the end of all games, scores show the Seaport Team is the richest, far followed by the Storage Team who also creates a significant gap of points in relation to the rest of the participants.

When players clarify that this outcome is impossible to change due to the structure of the game, then the first rule of

Mercante (what is not explicitly prohibited is allowed) is used to modify the structure of the game. This rule is first used by participants to justify stealing and fraudulent tactics, but after feedback timeouts they reconsider that the first rule allows them to transform the structure into a collaborative and wealthy economy.

The social struggle structured is impossible to be solved without acknowledgment of most participants, and their will to transform the system of benefits from the upper classes. It is also fairly complicated for participants to convey into a price standardization, or wealth distribution, that regulates individual

accumulation and uncontrolled inflation. Nevertheless the facilitated discussion among these simulated realities ignites the development of more effective production processes and profound collective strategies.

Implications of this simulator are far from being fully examined and reviewed. There are still many observations to be made. Especially in the rare cases in which agency defies structures, and it is possible to witness processes in which outstanding individuals changed the rhythm and final destiny of this modeled stratified society.

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