

Digital Games and Learning

2

Ernane Rosa Martins
(Organizador)

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(Organizador)

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APRESENTAÇÃO

Como verificado na obra *Digital Games and Learning* volume 1, nos últimos anos, tem havido um crescente interesse no uso de jogos digitais para melhorar o ensino e a aprendizagem em todos os níveis de ensino, tanto em contextos formais quanto informais. Assim este segundo volume vem permitir aos leitores complementar e aprofundar seus conhecimentos, por meio de mais 16 trabalhos relevantes envolvendo a relação entre jogos digitais e aprendizagem.

Deste modo, esta obra reúne debates e análises acerca de questões relevantes, tais como: uma análise das percepções dos formandos sobre o modelo de formação que habilita para a Educação Pré-escolar e para o 1.º Ciclo do Ensino Básico de uma escola de formação de Portugal; entender a relação existente no processo de desenvolvimento de novos produtos, e a mudança organizacional proveniente destes novos produtos, serviços e sistemas; levantamento de fatores culturais mineiros para possíveis inspirações na produção de jogos digitais; mapear aspectos da identificação dos gamers com os jogos e relacioná-la ao processo de Design de Personagens, objetivando gerar uma contribuição no sentido de provocar reflexões a respeito de diversidade e representatividade de gênero no universo dos jogos eletrônicos; implementação de uma inteligência artificial que consegue se adaptar ao seu oponente durante a luta; os elementos dos jogos organizados em um modelo de game design, o Modelo Artefato-Experiência, que discute a relação entre gameplay e os elementos dos jogos e pode ser utilizado como ferramentas por diversas pessoas da área de jogos; uma pesquisa realizada com profissionais de educação, na qual se analisa como estes compreendem a temática da “gamificação da educação”, como tratam, em suas práticas, essa perspectiva e, também, suas percepções sobre a mesma; analisar as práticas efetuadas na indústria brasileira de jogos digitais, com foco na realidade dos profissionais para apontar modelos de negócios válidos para estes profissionais; uma proposta de gamificação da pesquisa genealógica e elaboração da história familiar; uma pesquisa com temática central que visa abordar a relação entre as políticas públicas promovidas pelo Estado, por meio da Administração Pública Direta e Indireta, e o efetivo desenvolvimento da indústria criativa de serious games, o qual busca garantir a democratização do acesso à essa tecnologia que tem como objetivo promover a cultura nacional, a educação, a saúde, a segurança, e a formação profissional.

Aos autores dos diversos capítulos inclusos nesta obra, meu agradecimento pela submissão de seus relevantes estudos na Editora Atena. Aos leitores, espero que este livro possa ser de grande valia para ampliar seus conhecimentos nesta importante temática, estimulando a reflexão e a busca por novas pesquisas cada vez mais significativas e inovadoras.

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ON PLAYER MOTIVATION AND THE APPEAL OF GAMES: AN EXPLORATION OF PLAYER MOTIVATION¹

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ABSTRACT: The creation of games and good reception by the public, either through commercial success, good critics or just to cause enjoyment on players. Rarely such a feat is accomplished casually; the iteration of the prototyping and testing stages in the development of a game generates the core around which every aspect of the game design stage will revolve. The concepts regarding the feeling of fun and immersion may help the development of new and captivating experiences in games.

In this paper some of the current theories will be explored, focusing on the theories of Flow, the Magic Circle and the PENS theory among others which address player motivation and the creation of compelling games.

KEYWORDS: Magic Circle, Flow, PENS Theory.

1 | INTRODUCTION

The process of designing and developing a game is — commonly and not surprisingly — extenuating and not without risk. Many factors must be taken into account during the whole process in order to assure a smooth and successful implementation and commercial viability.

One of the main issues at hand when defining game system and mechanics is the player experience and the game feel. These are important definitions and essential to captivate the game audience, as a game without players is, naturally, nothing but a collection of rules and art assets. To understand why a player should choose to engage in a given game, it would be useful to know the player motivation and how to make the most possibly appealing system.

Several authors have already tried to tackle the question and understand how to

1. Paper originally published in the proceedings of the XVI SBGames (Brazilian Symposium of Games and Digital Entertainment sponsored by SBC (Sociedade Brasileira de Computação) in 2017.

make games more compelling, how to captivate some given audience, how to create a community around games and how to optimize the way a player approaches the game.

Even though this question looks innocent, the answer demands a non trivial level of insight of the player motivation, psychology and group behavior. A unified and comprehensive theory as to why some audiences tend to prefer some games over others remains elusive. In this paper this question will be addressed using some of the main theories available in the literature — each one of them uses a distinct point of view in order to justify why games are so captivating.

2 | HUIZINGA AND THE MAGIC CIRCLE

Credited by some authors as the pioneer of the study of the play activity, Johan Huizinga wrote in his book *Homo Ludens* [9] about how play presents itself as a cultural activity and as a cultural element in society. Huizinga does not investigate on its origins, though. He considers that playful behavior exists and it originates in a deep instinctive level that precedes civilization or even intelligence.

In this context, play is not only a social function; it is a biological one as well. This claim is proven by the fact that play is not exclusive to humans, animals also engage in playful behavior spontaneously. Furthermore, in humans play precedes speech and motor skills — which can be interpreted as further proof of such claims.

The function of such activities is not investigated either, Huizinga speculates which could be significance based in [2] and [12]. It reads as follows:

The numerous attempts to define the biological function of play show a striking variation. By some the origin and fundamentals of play have been described as a discharge of superabundant vital energy, by others as the satisfaction of some “imitative instinct”, or again as simply a “need” for relaxation. According to one theory play constitutes a training of the young creature for the serious work that life will demand later on. According to another it serves as an exercise in restraint needful of the individual. Some find the principle of play in an innate urge to exercise a certain faculty, or in the desire to dominate or compete. Yet others regard it as an “abreaction” — an outlet for harmful impulses, as the necessary restorer of energy wasted by one-sided activity, as “wish-fulfillment”, as a fiction designed to keep up the feeling of personal value, etc.[9]

Play is identified as a social construct in the way it creates its own reality, the so-called Magic Circle by Huizinga. Play must have clear limits, even though the rules may not be as clearly defined; given such a game is nothing more than play activities with a set of rules added in order to define roles, outcomes, limits, etc.

For Huizinga, the involvement and the attention playful behaviour evokes defies explanation as merely the biological realm is being analyzed at this point of the text, despite previously the psychological domain being subject of such scrutiny as well.

It is interesting to note that in more recent literature [8, 10, 7] the same reasons as

cited by Huizinga are still present, more specifically as the intrinsic player motivations, namely, Imitative instinct, need for relaxation, training for a role, exercise in restraint, urge to exercise a faculty, desire to dominate or compete, outlet for harmful impulses, restorer of energy and the “wish-fulfillment” in all their forms.

These same objectives can be grouped in what was defined as games and as serious games; it is possible to notice that elements like imitative instinct, training for a role and urge to exercise a faculty all relate intimately to the area that would be defined as serious games by [1] in the future, as the others belong — not exclusively — to the domains of entertainment.

One other characteristic of play that is defined in [9] is that “all play is a voluntary activity”. It is not possible to impose the play activity to someone, as it would make play lose its meaning.

The most famous part of Huizinga’s theory, however, is the concept of the Magic Circle — a limit imposed to the play either by its participants or the rules. This limit may be spatial, temporal or social and it is necessary to note that not all limits may exist simultaneously or that the existence of one does not imply that the others must be present as well.

The main utility of the Magic Circle is to separate play from reality. This notion makes explicit the fact that the conflict in the play area is artificial, even though some consequences may not be, for instance, in a wrestling match the conflict is artificial, the fighters are not having a real fight; it is a staged conflict, a mere competition of skill. The bruises and wounds experienced, however, are quite real and some may have impact on the life outside of play — the *real* life.

The definition of the Magic Circle has a powerful implication, as it creates a universe apart from the everyday life, a self contained micro cosmos in which some rules are added and other rules may be taken away from the relationship between the players; some otherwise illicit activities may be temporarily accepted and errors have no or little consequence in life outside the Magic Circle.

The rules and outcomes defined by the rules of play create, furthermore, an order in an otherwise chaotic environment — life itself. This order does not imply predictability, the actions of other players may still be surprising, what the Magic Circle ensures is that every possible move within the game rules have a deterministic and predictable outcome. The uncertainty of the next move of an opposing player creates the tension, the predictability of the outcome ensures order.

In fact, this is an important component for the reward mechanism present in games, as the player will try to foresee which actions will be the most beneficial for some given strategy. For games of luck, this premise still holds true, as the player expects a reward, the only difference is that there is a probability of receiving it, instead of being a natural outcome for some given action.

Huizinga, though, does not delve too deeply into the player psychology, he does not try to understand the motivation of the player, just accepts playing as a need inherent

to society and how play influences society. Seeking a deeper understanding of what drives the player, Csikszentmihalyi [4] formulated the Flow theory.

3 | FLOW

The Flow theory was developed and documented by Csikszentmihalyi in 1990 [4] and further explained by the same author in 1997. The flow state is described as:

First, the experience (of enjoyment) usually occurs when we confront tasks we have a chance of completing. Second, we must be able to concentrate on what we are doing. Third and fourth, the concentration is usually possible because the task undertaken has clear goals and provides immediate feedback. Fifth, one acts with a deep but effortless involvement that removes from awareness the worries and frustration of everyday life. Sixth, enjoyable experiences allow people to exercise a sense of control over their actions. Seventh, concern for the self disappears, yet paradoxically the sense of self emerges stronger after the flow experience is over. Finally, the sense of the duration of time is altered; hours pass by in minutes, and minutes can stretch out to seem like hours. The combination of all these elements causes a sense of deep enjoyment that is so rewarding people feel like expending a great deal of energy is worthwhile simply to be able to feel it.[4]

This describes the ideal situation, in which the person is fully invested in a given activity, such as climbing, running, playing music or playing a game (the study case which will be focused). The concept of flow is tightly connected to the matter of attention, concentration and effort; it is a model to try and explain how to create an experience in which the player gets engaged for the sake of getting engaged in such activity.

Hereto, it will only be considered the activity of playing games.

It is important to notice the conditions for the flow state to be achieved:

It is a task that is possible to be achieved; should the players feel that they have no possibility to be successful, the whole activity feels pointless. Furthermore, as depicted in figure 1, if this feeling of impossible task is due to a high challenge, the player gets frustrated or anxious — if the players feel that they *must* beat that given challenge, they become anxious, otherwise, frustrated.

The player must be able to concentrate on the activity at hand; Without the ability to concentrate, the player cannot merge action and awareness. During flow, the player experiences a loss of self-consciousness so intense that other objects and thoughts fail to enter awareness.

Interestingly enough, the distractions *from the task at hand* must be avoided. Hence, the game may provide the distraction from itself (such as Navi in The Ocarina of Time that kept screaming “Hey! Listen!” while the player tried to perform some action).

The task must have clear goals and provide immediate feedback; if the players do not know what they are supposed to do, the whole game feels pointless. On the other

hand, if the players do not know if they are doing well or not, they do not know if there is a chance of achieving any given goal — or if they are moving towards the desired goal.

The player has a sense of control — “or, more precisely, a lack of anxiety about losing control that is typical of many situations in normal life [5]”; in everyday life a sense of psychic entropy is experienced as one feels exposed to causalities in activities such as crossing a busy street, in relationships or even when performing one’s job.

However, when feeling in control it creates an environment where the players feels that they can foresee the consequences of any given action or can handle any given setback that should eventually appear. This is complementary to the feeling of compatibility between skill and challenge.

The player experience a distorted sense of time; during the flow experience, the attention is so much invested in the game that little is left from cognition to devote to the mental processes that contributes to the experience of duration [3][6].

The flow state is intimately connected to challenge, which must be compatible to the proficiency of the player; a task too easy is boring, a task too difficult makes the subject anxious or frustrated, depending on how satisfactory the performance must necessarily be.

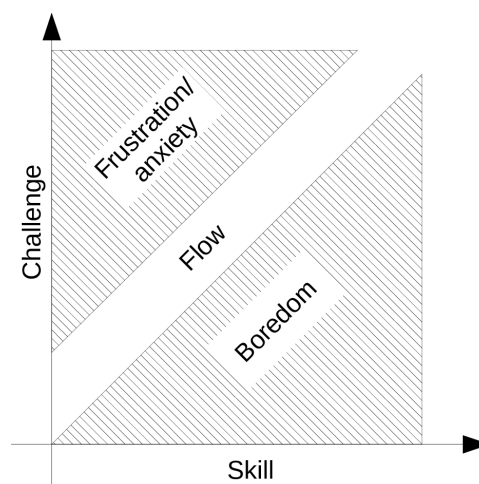


Figure 1: Flow state, frustration/anxiety zone and boredom zone. Reproduced from [8] 8

When applied to games, this concept offers a good framework to track the progression of challenges based on the player proficiency. It must be noted that this is about the perceived challenge compared to the perceived skill rather than the actual skill and challenge. To keep a player interested and committed to the system, the challenge must progress along with the skill, in order to keep the payer in the flow zone depicted in figure 1.

The characteristics of the flow state are intrinsic to the player, as the main focus of the theory is towards what the players feel — how they perceive their skills, how they perceive difficulty, how they feel in control. It is not a objective assessment nor the theory aims to explain how to induce the flow state on the player.

Up to this point, the concepts rely heavily in intangible concepts, just like *fun*,

challenge or *entertainment*. To use these terms to describe games feels natural, but some problems arise when they become too important, as the abstraction is still too abstract.

In the Player Experience of Need Satisfaction (PENS) model [11], the authors try and replace these concepts with a more concrete set of needs that the player expects to satisfy when playing a game. This takes away the ethereal characteristics used previously and replaces with more concrete ideas.

4 | THE PENS MODEL

For the creation of engaging experiences, *fun* and the creation of an *experience* is often enough considered, but not much attention is given to *what* makes a compelling experience, and with good reason, as these intangible concepts are not readily within grasp.

Or, as Rigby and Ryan [11] state:

And that's the problem: Broad concepts like "fun" have multiple meanings and typically aren't easy to nail down when you are trying to understand things clearly. [...] it's the context of the situation that helps us understand what "fun" means. Therefore, we need to understand the underlying experiences that bring about "fun" specifically within the context of video games because they have a particular strong power.[11]

As pointed out, the term "fun" must be understood in a given context; a book may be considered fun, a dinner may be considered fun, a voyage may be considered fun and a game may be considered fun. However, these are different kinds of fun — different experiences that are described using the same word.

The object of analysis hereto is the experience of playing games, and a powerful experience it is as some players invest a great amount of money and effort in it. The main motivation is to understand the reason why this experience evokes the feelings it evokes.

The PENS model addresses these issues mapping three needs that the player gets satisfied when playing games: competence, autonomy and relatedness. The ability to satisfy these three competences, according to this model, is what make a given game more or less engaging and fun.

The need for competence is the desire to grow one's abilities and to gain mastery of new situations and challenges. This need is intrinsic in human behavior — early infants begin to try and succeed in new tasks, children get the motivation to excel at sports and school, adults feel this drive during work.

This is true for a task which the challenge level does not change, a task that mastery has been achieved and which the difficulty does not increase. However, it is not uncommon to find professionals in this situation that try to gamify their jobs setting personal goals and trying to overcome them.

In this area both the PENS model and the Flow theory overlap. The authors of

the model admit that a large part of the engagement of video games is due to the satisfaction of the need for competence [11, p. 17].

For this need to be satisfied, there must be a clear set of goals, the player must not perceive the challenge as overwhelming and there must be clear feedback on whether or not the player has been successful.

The feedback must not only be clear, it must be helpful. It must be a safe space for mistakes and if the players were not successful, on the next try they must feel that the failed experience helped them to gain more mastery over the task at hand. Should the player feel judged or discouraged in any manner to try again, frustration is bound to set in and make the experience a sour one.

Autonomy, the second need of the model studied, is often enough mistaken for freedom, when it is merely a way of denominating the feeling the players gets when they are presented with interesting choices that may be freely explored, even if one choice implicates that another must be renounced — would you rather have your character transformed in a werewolf or a vampire, will you side with the Imperials or with the Stormcloak rebels, etc.

This need is met when the player is freed from the control of the circumstances and others, the player gets a sense of choice and opportunity to follow her wishes that is not always present in everyday life. In this manner, autonomy is more than freedom, it is the possibility to see real opportunities for oneself in the environment.

It is not uncommon for the routine to leave little to no possibility of choice, at all social levels individuals take orders that are imposed to them for any given reason. While the roles in a healthy society demand expectations that must be met by whoever is performing them the lack of autonomy takes its toll on the psychological health.

The escapism provided by television or books relegates the audience to a spectator, a mere witness to a hero who empowers herself during a quest, which is quite different to becoming the hero; the players can create a persona and get feedback while honing the skills they choose and in the process influencing the story. For this model, this is the main point of the activity of game playing, not only the escapism provided by other, passive media.

The need for relatedness is the need to establish a meaningful connection to others that creates the sensation of belonging, and that one matters to others is a basis of a mutually supportive relationship.

While this may be an optional factor for the motivation of players to engage in games, the fulfillment of this need is decisive in a positive reaction from the player community. Not only that, but it reflects a deeply intrinsic and fundamental motivational factor, as humans constantly seek to be a part of a community and receive peer recognition.

While community is often related to a group of humans, in video games Non-Player Characters (NPC) may perform a significant role in fulfilling the need for relatedness — even if at a shallower level — with a supportive attitude of acknowledgment for the

player.

For an experience of relatedness, one must feel acknowledged by another person. When people interact, the facial expression or words being used will tell how much the other party acknowledges them.

The feeling of acknowledgment must relate to a feeling of support, where one feels that the other person to connect with oneself and one's feeling both cognitively and empathically. This is important for it would not only generate understanding, but would also enable the satisfaction of the needs of autonomy and competence through the creation of a safe environment where there is space for mistakes and evolving.

Finally, it is expected that some impact is created from an interaction, which may be some laughter, a head nod or, in a more complex level, a deep emotional connection between two partners. Otherwise, the interaction is remarked as shallow and, therefore, of no significance.

The satisfaction of this need is what drove the creation of multiplayer games, specially the Massive Multiplayer Online Games. The potential for generating relatedness in these games is due to the availability of partners and the mechanisms for finding new partners. The main focus of these games is to create camaraderie, of belonging among the players in order to forge a healthy environment.

5 | CONCLUSION

The creation of engaging games and significant experiences aiming player satisfaction is not trivial. This is due not only for the wide variety of players, each with particular preferences, expectations and wishes but also to the complexity of human behavior and psychological factors.

To make a player feel a bond with a game world or a particular NPC may be even more complex than establishing a bond with someone, as it is not a relationship between individuals, it is the creation of a community around an artifact designed to deliver some given experience to a (hopefully) large group of people.

As a means to facilitate this task — that sometimes may feel daunting and inglorious — some insight of the player mind is of great value as it would shine some light in how to captivate the audience and communicate in a more personal level.

In this paper, three concepts were presented, the Magic Circle from Huizinga, the Flow Theory from Csikszentmihalyi and the PENS Model from Rigby and Ryan. All of these concepts were conceived as a form of explaining the phenomena of games and the play activity.

While Huizinga merely accepts play as one of the needs of social beings and an activity that is separated from the world outside the play area, Csikszentmihalyi tries to explain what motivates the player to move forward in a game and Rigby and Ryan aim to pin down what lures the player towards any given game.

Despite the differences among the theories and models presented, it is possible to notice that all of them state that games are a safe space for trial and error, in which players can practice skills, socialize and exercise a deeper level of freedom than outside the game area.

Interestingly, no theory connects experience and content, possibly meaning that for a compelling game experience other factors are more important than technical specifications, contents, themes or characters.

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REFERENCES

- [1] C. C. Abt. *Serious games*. University press of America, 1987.
- [2] F. Buytendijk. *Het spel van mensch en dier als openbaring van levensdriften*, 1932.
- [3] R. Conti. Time flies: Investigating the connection between intrinsic motivation and the experience of time. *Journal of personality*, 69(1):1–26, 2001.
- [4] M. Csikszentmihalyi. *Flow: The Psychology of Optimal Experiences*. Harper & Row Publishers, 1990.
- [5] M. Csikszentmihalyi, S. Abuhamdeh, and J. Nakamura. Flow. In *Handbook of competence and motivation*, pages 598–608. Guilford Publications, 2013.
- [6] W. Friedman. *About time: Inventing the fourth dimension*. The MIT press, 1990.
- [7] T. Fullerton. *Game Design Workshop: a Playcentric Approach to Creating Innovative Games*. Elsevier, 2 edition, 2008.
- [8] J. Gibson. *Introduction to Game Design, Prototyping and Development*. Addison-Wesley, 1 edition, Fevereiro 2015.
- [9] J. Huizinga. *Homo Ludens: A Study of the Play-Element in Culture*. Routledge & Kegan Paul, 1949.
- [10] J. Schell. *The Art of Game Design; a Book of Lenses*. Morgan Kaufmann, 1 edition, 2008.
- [11] R. R. Scott Rigby. *Glued to Games: How Video Games Draw Us in and Hold Us Spellbound*. PRAEGER FREDERICK A, 2011.
- [12] H. Zondervan. *Het spel bij dieren, kinderen en volwassen menschen*, 1928.

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