ENGENHARIA ELÉTRICA E DE COMPUTAÇÃO:

Docência, pesquisa e inovação tecnológica

Lilian Coelho de Freitas
(Organizadora)

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Engenharia elétrica e de computação: docência, pesquisa e inovação tecnológica

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Atena Editora
Ponta Grossa – Paraná – Brasil
Telefone: +55 (42) 3323-5493
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APRESENTAÇÃO

O e-book intitulado “Engenharia elétrica e de computação: Docência, pesquisa e inovação tecnológica” está organizado em 12 capítulos e reúne importantes trabalhos científicos desenvolvido por pesquisadores de Norte a Sul do Brasil, que atuam em renomadas instituições de ensino e pesquisa.

Cada capítulo apresenta uma experiência única, com resultados práticos, consistentes e didáticos. Dessa forma, ao ler este livro, o leitor poderá aprofundar seus conhecimentos em desenvolvimento e teste de softwares, jogos digitais, aprendizagem de máquina, automação, geração de energia, entre outros assuntos relacionados à engenharia elétrica e de computação.

Além de uma base teórica aprofundada, nota-se que os autores de cada capítulo adotaram uma linguagem pedagógica e educativa. Assim, acredito que este livro é um excelente referencial teórico, especialmente para alunos de engenharia elétrica e de computação que estejam desenvolvendo trabalhos de conclusão de curso e que buscam exemplos de aplicações práticas para os conhecimentos teóricos estudados durante o curso. Através da reprodução dos resultados apresentados, é possível por exemplo propor melhorias, apresentar soluções alternativas para os problemas propostos ou desenvolver estudos comparativos. Assim o conhecimento científico avança.

Registro meus sinceros agradecimentos aos autores deste e-book, pelas significativas contribuições e pela parceria com a Atena Editora para tornar o conhecimento científico acessível de forma gratuita.

Aos nossos leitores, desejo um ótimo estudo, repleto de *insights* criativos e inovadores.

Lilian Coelho de Freitas

SUMÁRIO

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CUSTOMIZED EXPERIENCE: DIGITAL GAMES POSSIBILITIES BEYOND THEIR MECHANICS

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Paula Poiet Sampedro
Universidade Estadual Paulista "Júlio de Mesquita Filho" - UNESP
Faculdade de Arquitetura, Artes, Comunicação e Design
Bauru, SP
http://lattes.cnpq.br/8388039231523027

Nicholas Bruggner Grassi
Universidade Estadual Paulista "Júlio de Mesquita Filho" - UNESP
Faculdade de Arquitetura, Artes, Comunicação e Design
Bauru, SP
http://lattes.cnpq.br/2098576092415545

Isabela Zamboni Moschin
Universidade Estadual Paulista "Júlio de Mesquita Filho" - UNESP
Faculdade de Arquitetura, Artes, Comunicação e Design
Bauru, SP
http://lattes.cnpq.br/2951485996641724

Vânia Cristina Pires Nogueira Valente
Universidade Estadual Paulista "Júlio de Mesquita Filho" - UNESP
Faculdade de Arquitetura, Artes, Comunicação e Design
Bauru, SP
http://lattes.cnpq.br/8962021573218552

Emilene Zitkus
School of Design and Creative Arts, Loughborough University, GB
https://orcid.org/0000-0003-0176-1189

ABSTRACT: Since the advent of the internet there has been a shift in the games market towards publishing and selling globally, as well as the rise of online games. But besides the games themselves, this market sells experiences to the users, not just as a gamer, but also as a customizer or even a "designer" of its characters. This paper focuses on the hypothesis that games can afford interaction providing experiences beyond its mechanism and design, using customization possibilities available to players. To discuss this subject, it was used an online survey and a theoretical framework developed in the literature of design, media and psychology. The survey investigated the practice of customization and how common it became, focusing on how users obtain customizations for games and how they enhance the game experience. The findings showed that customization is a topical area in games and that players enjoy it as a part of the game. This suggests that

customizations can be used as a tool to improve the gamer sensation of attachment with the game universe.
KEYWORDS: User experience; game customization; design; digital games.

1 | INTRODUCTION

Game interaction is one of the most important, if not the most important factor when playing games. Each culture and civilization have their own games, but interaction is something intrinsic of them by rolling dices, playing a role, pushing buttons, using cards, boards or even just imagination. Games provide the user engaging and enjoyable activities [1].

Games have been expanded to different platforms in recent decades. Focusing on the digital field, they have progressed from primitive two-paddles-and-one-ball Pong to the sophistication of controls and visual Final Fantasy [2] (Square Enix), Far Cry (Ubisoft) and of many other titles and game series. The technology evolution has brought additional options to game designers and content creators by enabling complex controls to manage the character and interact with the game environment. It also allows more realistic scenarios, animation, textures, and different possibilities to interact (joysticks, virtual reality, smartphones, mobile platforms, videogames, personal computers, and others). All these new possibilities have influenced the popularity and the rise of digital games in the lasts decades.

Nowadays the easy access to the internet worldwide changed how games are made, played and sold. A digital game holds features like instant but restrictive feedback (interactivity), use of complex interfaces (such as sounds, images, controls, different screen types), complex and automated systems, etc [3]. Those aspects are not exclusive from digital media, but games in the digital environment have them more robustly incorporated [3].

According to Chatfield, the digital games market has expanded to become the fastest-growing leisure market, as it offers products that provide engaging and enjoyable activities [1]. Game playing is beyond entertainment only, but also a way of engaging with a scenario and learning from it [4]. Games have become highly connected with the experience and how the user experiences them. The freedom of creation and the improving processing data enabled games environments to use different possibilities of user interaction [5].

However, beyond character control and environment interaction, one of the possibilities that has been explored by games developers is user (player) freedom to customize the game's visual and character skills. By modifying and personalizing the game appearance the player also customizes his/her experiences in a variety of ways [6]. By offering a range of settings, choices, and options, customizable interfaces allow users to modify and transform, in their own way an individualized set of functions and styles, also shaping their media consumption experiences [2].

Customization can be defined as activities where users modify some interface aspects to a certain degree, with the purpose of increasing its personal relevance [6]. Other authors [6], [7], [8], [9] e [10] have studied the influence of the customization in stereotypes, enjoyment, human behaviour, task performance, etc.

The hypothesis that motivates this work is that games can afford interaction providing experiences beyond its mechanism and design, using customization possibilities available to players. It intends to discuss the customization as a tool that some games are using to promote interaction with the player and to improve the gamer attachment with the game universe, encouraging him/her to get items for customizations. This paper also discusses how players get customizations for their games and what they gained with it, if it is just for visual modifications, just for vantages against game enemies or for both.

To support the discussion this work used theoretical frameworks developed in the literature on design, psychology and media studies.

The next section, "Games and Experience" overviews the main approaches of games. It also discusses the user immersion in games, using Csikszentmihalyi flow theory. The third section focus on user experience (UX), and customization in games. Donald Norman and Jakob Nielsen are the main authors used to support this discussion. The fourth section describes the methods used in the survey, the structure of the questions and the survey sample, Then the following section analyses the survey results under user experience and immersion discussions mentioned in section two and three. The last part discusses the study limitations, as well as future research and conclusion.

2 | GAMES AND EXPERIENCES

The scope of games has been explored by many authors (Johann Huizinga, Roger Caillois, Chris Crawford, Jasper Jull, Salen and Zimmerman, and many others) from many research fields view and under different perspectives, it has provided several definitions of games and discussions about aspect like rules, material earnings, representation, competition, etc. But the pioneer to propose a study about games as a culture element was the Dutch anthropologist, Johann Huizinga in 1938 [3].

Huizinga points that the game is a free activity, consciously declared as a "not-seriously" and it happens besides habitual life, but at the same time it is capable of fully immerge the gamer; the game activity is disconnected from profit gain and material interest [11]. Considering our current scenario, Huizinga's idea does not fulfil the entirely game range (serious game and gambling for example), but he established some interesting point to support the present study.

According to Huizinga, to happen the game needs an established time and a place where its rules would be followed: the game world must be separated from real life [11]. To keep the separation against the "real life" and the "game limits", Huizinga proposed the idea

of a Magic Circle [11] [3].

Magic Circle is the place where the game happens, it could be physically defined, as a tennis court or soccer field, it can also have an imaginary definition [11] such as a videogame or computer game that is processed inside a machine, but the player is outside interacting with the machine. Using other words, it does not necessarily need physical boundaries or limitations.

This separation between “game space and time” and “real life” is important to “immerge” the gamer into the game environment [11]. The gamer almost believe that he/she is really in the game’s world, interacting with elements and focused on realizing some task to progress [3] [8] [11], this attachment is widely discussed by researchers and game designers.

Considering that people play to have experiences [15], the sensations of presence have been explored in different manners by game designers and producers. Boyle at all suggested that one of the most prominent compose used to explain experience, from a subjective point of view while playing games is Csikszentmihalyi flow theory [1]. Flow is a subjective state that people reported when they were completely involved into something to the point of forgetting time, fatigue, and everything else, but the activity itself [12].

The flow occurs in a point of balance between the user skills and the difficult to do a task, combining cognitive and emotional situations, the flow implies in an optimal match between those [12]. It tends to occur when the user’s personal skills are totally involved in overcoming a challenge at the edge of his domination capacity [12]. If a person is interested in learning a game, he/she has low skills, but the game does not demand a good performance at the beginning. If the game turns too easy in its tasks, the person will be bored (his/her abilities are higher than the challenges). If the game turns too difficult, the person will feel anxiety. But if the difficulty is balanced according to the person’s abilities, this person will be in flow.

It is important to highlight that the flow is not restricted to games field, it can happen during any activity, it is also not enclosed in game experience, the player can or cannot reach the flow channel.

The games must provide to the player challenges that he cannot frivolously overcome. Playing a game is an activity of improving skills to pass through the challenges, it means that playing a game is therefore fundamentally a learning process [4] [13].

The gamer engages with the game voluntarily searching for the experience of pleasure [14]. And elements like balanced challenges, definitions of time and space, tasks and rules are necessary to improve the gamer experience, it promotes the game flow. The game itself is not the experience, the experience is the result provided by the player interaction with the game. So as important as the game itself is the experience created resulted by interaction. The flow and the sensation of attachment with the game universe are inside of the experience.

To reach the flow state the player must be connected with the game. Challenges and tasks will provide it but considering that flow demands the player completely evolvement [12], customizations can help to achieve the flow state. The player can change parts of what he/she sees, changing the game environment to turns it a more comfortable or familiar scenario that he/she "helped" to create. Using other words, the flow state in games might be influenced by customizations and player freedom to modify and change how he/she sees the game environment. Thus, customizations can be a tool that helps to reach the flow.

The sensation of being in virtual environments can be improved by a lot of other aspects, it depends on the game genre, user abilities and experiences. By offering a variety of customizations options to interfaces the user can transform his/her experiences. Utilization testing results indicate that content customization allows users to improve their experience, adapting it to their own needs, wishes and desires [7], adapting to their goals and enhance their positive game experiences [6].

Considering that these customizations normally are about characters' appearance and performance [6], it is important to point that not every time these customizations are optional. Some games force the player to get items or change the characters' visual to continue the game or to explore side quests. It is important to highlight that this paper focus is on optional items to customize games.

This section discussed some important terms in game studies - i.e. the flow state and how to achieve it - and introduced the customization as a tool to connect users with the games environment and improve their experience. The next section is about User Experience in games and customizations and possibilities presented by the virtual environment.

3 | EXPERIENCE AND CUSTOMIZATION

User Experience according to ISO 9241-210 is "a person's perceptions and responses that result from the use of a product, system or service".

In other words, it can be defined as a consequence of the system performance, presentation, functionality, behaviour and capability of interaction (hardware and software) combined with user's prior experiences, skills, habits and attitudes [14]. Hence user experience design helps to understand what the users perceive, it justifies their attitudes and expectations in order to develop a compatible design [16].

Since 1950 designers noticed that the products were not just designed objects, but a social practice and exhibitors of user's preference and then must be designed to human beings [17]. That was when the production began to focus on the user, the consumer, not to idealized and rational buyers [17]. User experience can be applied in any product physical or digital, it assumes that the experience in using the product must be considered as part of the product. Attached to User Experience there are other important term to be explained: Usability.

Usability can be considered as the user's ability to realize a successful task. It is more focused on task efficiency and work. According to Nielsen [18] Usability is not a one-dimensional term of user interface, it is traditionally associated with five systems usability attributes:

- Learnability: The system should be easy to learn
- Efficiency: It should be efficient to use
- Memorability: The systems should be easy to remember
- Errors: It should have a low rate of errors, so the user will make just a few errors during the interaction.
- Satisfaction: The system should be pleasant, so the user will probably feel satisfied to use it.

The last item, satisfaction, can be an especial attribute to systems that are used for entertainment. In fact, for some systems, the entertainment value is the most important one [18]. The games range cannot be considered totally directed to entertainment only but, a great part of the game production is.

The games have shown different aesthetical experiences and transforming the computer screen in a field of experimentations and innovations wide accessible. When the user changes the board games to the computer games, the designer's intention continuous the same, create experience [2], and the digital medium provides different ways to produce interactions.

Current digital technologies bring a huge amount of effects and possibilities to the game designers: the digital environment presents a complete changeable space, where it is possible to create shapes, imitates textures, movements, simulate a three-dimensional space, sounds, images and user interaction. All these possibilities associated with creativity have transformed the game market by adding new options to the system interface and Usability also changing the User Experience to these products. Some experiences can be reached spontaneously by the real-time control, like the flow state and control sensation (even in simple actions, like walk with an electronic avatar, jumping, changing its clothes or deciding its skills).

The digital space as an abstract field was discussed by the Czech philosopher Vilém Flusser [19]. Flusser said that the material things (like plastic, wood and iron) is shaped in a format (cup, table and knife for example), but digital images are made by electromagnetic fields and exhibits material free forms, but visible, malleable and possible to fulfil with textures (representing materials) [19]. The computer inborn malleability presents different possibilities of creation and of selling experiences to game designers. These impalpable game worlds can simulate gravity, weather conditions or any law of physics in an environment simulated by computers [5].

Since the games have got independent from physical medium, the idea of selling different experiences to buy games became common. What were once sold as expansion packages for games, became Downloadable Content, popularly known as DLC. The DLCs are contents that are sold by a smaller payment (compared to the game itself) designed to enhance a game content to which the player has already access [I8], for example, customizations. The industry bases on ROM cartridges or disks, migrated to DLCs sells extending its lifespan and making the videogames even more profitable [20].

The technology advances have been promoting changes in games market, proposing different experiences and ways of interactions. Using the DLC system, the user continues paying for a game, after purchase it, the user is attracted to a market everlasting circle though DLCs [20]. This perspective reinforces that the game value is not inside the game itself, but in experiences that it can provide to the user.

Another change in games is the microtransactions, the user plays the game for free but with a limited number of choices as playable characters and weapons. In this case, the player has a false sense of a free playing only to have the basics parts of the game with everything else locked by monetary payments [20]. Microtransactions are not exclusive from the game market and it is not exactly a content, it is a business model [20]. The microtransactions are common in mobile platforms such as smartphones, consisting in low-cost transactions to enlarge gameplayer experience. For example, the user can pay to have infinity lives or to have customizations such as different items and advantages in games.

Nowadays many famous games in digital formats have optional microtransactions as their only monetization form. Well-known games such as Fallout Shelter, Fortnite e League of Legends (LoL) are available for free to download, and this fact reinforces how the digital game industry has changed. The players' engagement is a big designer challenge, followed by the mission to create something to encourage players to buy new experiences within the same games.

It is estimated that in 2007, the game industry had been a profit of US$ 2,1 billion in sales of game items [21]. The gamers are willing to invest money in customizations, like better items, character enhancement, buy new missions and reduce the time of waiting or buy aesthetical items (items that changes just the visual). The digital game itself has embraced a new consumption form where it changed its value as a product that the user buys to have a gameplay experience, to a product that the user gets for free to achieve experiences and buy a customizable engagement.

Virtual games in touchable medium (like CDs or ROM cartridges) can be satisfying for some players or collectors, while have a wider range of equipment, visual modifications and custom items can too. The idea of purchasing virtual objects to modify a game by microtransactions points to another experience form, the visual and aesthetic appreciation and even social status.

Customizations do not mean simple interactions, it is about providing choices to the

players, and the sense of choice is a critical aspect of autonomy [6]. It is directly linked to one of the usability attributes mentioned: satisfaction. Focusing on the User Experience, the discussion can be extended to the motivation and how customizations are emotionally processed by the player.

Donald Norman [14] discuss that when the user interacts with a product, there are three levels of the emotional system processing, the visceral, behavioural and reflective levels.

- Visceral: it is related to the user instinct in a biological degree and provides fast judgments about what is good or bad, safe or dangerous. It happens in the first sight.
- Behavioural: It influences the most part of human behaviour. It is a subconscious level related to the use of products in automatic level and associated with the effectiveness of use.
- Reflective: The users think how they feel about the artifact; it is the level were the associations experience and familiarity are determinant. It brings fillings like personal satisfaction and memories.

The three design levels are self-connected and important to the user experience. Some games explore experiences that are more connected with colours, shapes, textures, those are playing with the user visceral system. Users are interested in this level commonly when they want the thing before to know what its functions is or even its price [14]. It is commonly associated with beauty, the games explore it in many ways, including the customizations.

The behavioural is linked with rules, controls and how to use it. Customizations in this area tend to promote more control and effectiveness, they intend to provide practical use before presents visual improves.

The reflective level is directed linked with the meaning and how the others see it [14]. Some games customizations can be seen by the other players and that can influence users' customizations choices.

The reflexive level is about the message, culture, the meaning of the product (in this case, customizations) and its use [14]. The player can customize the character to get others' attention by its appearance or by caring some item, it also might mean changes of teams, levels or even how much time the player has been playing the game. The choices involving the reflective level can states to the others options in many ways including how the player got the customizations and it can influence in the whole game experience.

A research made by Evers, Ven and Weeda pointed that players that use microtransactions to buy any kind of advantages against enemies in online games, usually have less cooperation from the other players and are less respected than the others in online communities [22].

The games perceptions and experiences are complex and demand that the designers realize what experiences are better in these new forms of customizations and gaming and how to use them to enhance the player experience and the game sale.

This section demonstrated that customizations enhance the sense of control, how the technology changed the customization world and how players can use customizations in different emotional processing levels. The next session describes the survey method, questions used in this study, explaining the data collection and the questionnaire.

4 | METHOD

A. Data collection and sample size

This working hypothesis is that games can afford interaction providing experiences beyond its mechanism and design, using customization possibilities available to players.

To discuss and test the hypothesis a questionnaire was created and spread by online platforms, mainly in social media groups and e-mails. The participants did not have any participation benefits and was not established a fixed age group, sex or occupation, but most part of the answers came from undergraduate students (79%). Eighty-one (81) participants answered the questionnaire. It was preferable not to ask names or e-mails at the questionnaire to avoid that the participants felt uncomfortable or embarrassed and lie in their responses.

The queries were all opened, so the participant could respond yes/no or describe about his/her experience. At the end of the questionnaire had a space where he/she could describe a situation or opinion about the subject, experience or even a suggestion. This last query offered others perspectives on upcoming works about customizations.

To do this research the participants were asked at first general questions about their age, schooling and the favourite game mode “online”, “offline”, “booth”. All these questions were required an answer to continue.

B. Customizations market

The questionnaire following questions were created to understand the gamers’ preferences to obtain customizations. Using other words, how the players get them. This questionnaire section had four questions, the first and third was required an answer to continue.

The first query asked if the player had bought customizations for any game using money and if it is a frequently practice. The second question was attached to the first and must be responded just if the first response was positive, it asked if the customization bought altered just the game visual or if it gave some advantage to the player.

The third query asked if the participants have ever used gift cards or mobile phone credits to buy customizations to their games, and if it is a common practice to them. This

question also had another query linked: if the answer was positive, the responder should describe if it was just to change the visual or if it gave some advantage in the game. These questions helped to understand the gamer's aims when customizing.

C. Game market besides game mechanisms

The question in this section intends to understand how items sales are popular in gamers communities, establishing a parallel between the number of people that buy and sell items. To do so, the participants were questioned if they have gained money or credits in some store, by selling items that they gained inside the game.

It is known that some games promote items sales to their players and have places where the gamer can sell and buy items, creating a market besides the game market itself. It is known that parallels sales, in unofficial sites exists, but this paper does not intend to focus on it.

D. Tasks in exchange for visual customization

This question was about difficult tasks to obtains visual modifications. The query asked if the gamer has already performed difficult tasks inside the game to own items just for visual customization. This question promoted a base to understand how customizations are important to the players. It was required an answer to continue, and opened to write, although just a few participants extended their responses adding comments about it.

E. Tasks in exchange for vantages against opponents

This query was created to compare to the former and discuss if there is a big difference between the number of people that performs tough tasks just for visual and people that do it for items that would give advantages against opponents. It asked if the players had done difficult tasks in games in exchange for items that gave advantages against opponents. It was also a required question.

It is important to say that in the questionnaire this query was specifically about items, because some games give points to the players that realize difficult tasks, these points can be converted into attributes to the player character, consequently giving advantages to them. To avoid confusion or mistakes the query was specific to game items.

F. Participant opinion

The last question was opened. It asked the participant opinion about the subject (customizations in games), the questionnaire in general and served as a place to share experiences or comments. Some interesting answers will be discussed in the next section.

5 | RESULTS

A. Survey organization, data and objectives

The first question showed that the age varies among the participants. It was 81 answers, and half of them (50%) were from participants between 18 and 21 years old. Fig. 1 shows the variety of responders age and the percentage of each.

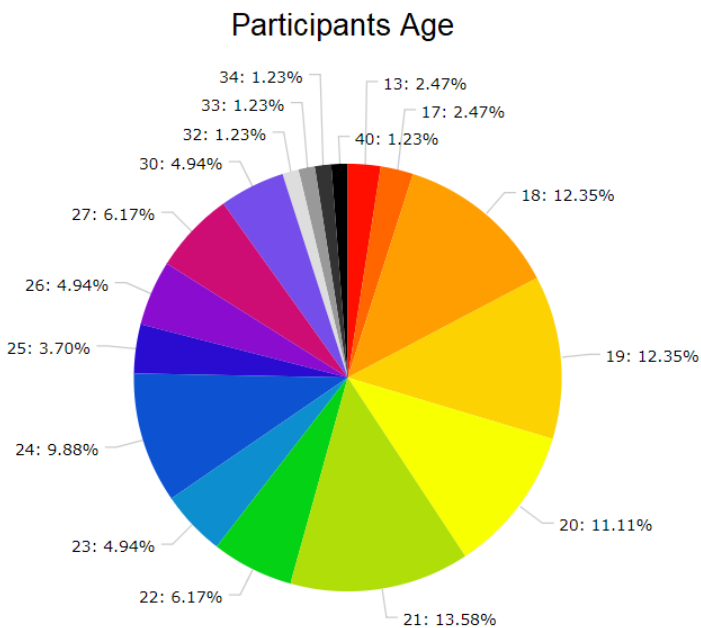

Figure 1. Survey participants age

The major part of them are undergraduate students (63), followed by 9 that are not studying (have finished the undergraduate course), 5 are in post-graduation and 3 in elementary school. 43,9% of the participants used to play more virtual games online, 40,24% offline and 15,85% both types.

Almost three-quarters of the responders declared that they have already spent money with customizations (60 people). And 18,33% of these 60 people (11 people) confirmed that it is a frequent practice. It is an expressive number considering by the total 81 participants, 13,58% usually buy customizations items using money or credit card. Its relevance is emphasized by the next question attached to the former query, where 39 of the 60 people that responded affirmatively said that they have bought customizations just for visual modifications. Fig. 2 shows the chat with this question answers.

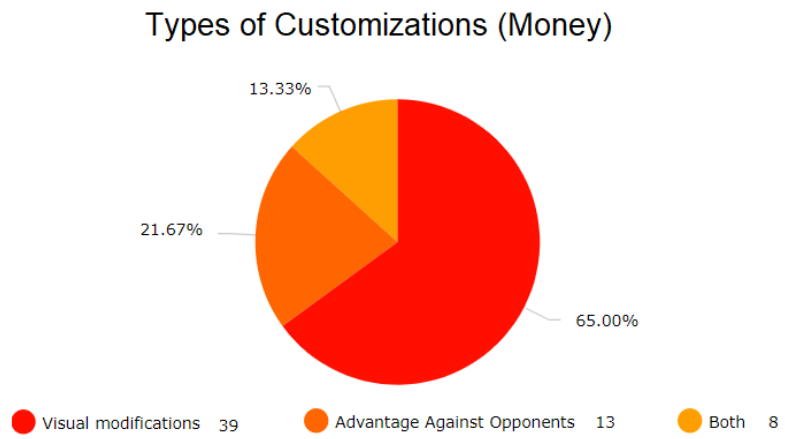

Figure 2. Types of customizations in digital games bought with money.

This chart emphasizes how the visual are important to the players, and this data set confirm through how much they enjoy different game mechanics related to customizations.

The gameplay that emphasizes players' autonomy indirectly increases enjoyment via the sense of control, it induces feelings of attachment with the game [6]. It might be linked with the satisfaction of usability: the changes in the game appearance provide satisfaction to the user. It also considerers the influence of the levels of emotional system processing pointed by Norman in section III.

When the participants were asked about the use of gift cards or mobile phone credits to buy customizations, the percentage of positive answers was minor them negative (46,25%). Although it is an interesting highlight that the major of players that have already used this kind of payment (56,76%), was to buy customizations that gave advantages to them, contrasting with former answer where the preference was for visual customizations.

This query also had a higher percentage of both kinds of customizations, pointing that 24,32% of the people that have used this kind of payment to buy visual and advantages against opponents.

Fig. 3 shows it graphically.

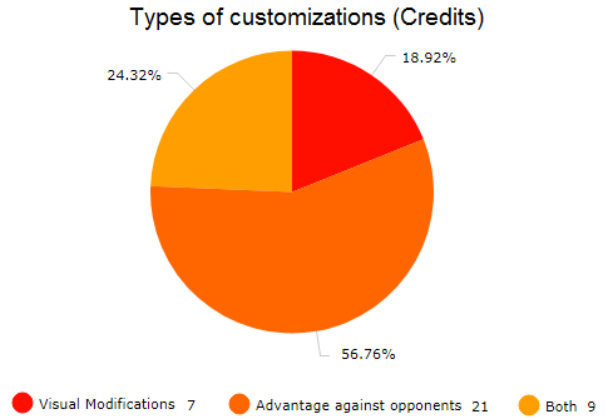

Figure 3. Types of customizations in digital games bought with credits and gift cards.

Besides, the questionnaire had revealed that, at least once, most of players have bought items for any kind of customization, but less them half of them have earned money or credits in stores by selling items (34,57%).

It demonstrates that the responders are more interested in have customizations for themselves, using in their characters and games and are less intending to earn money with it. This reinforces the hypothesis that guides this work that the games can afford interaction providing experiences by customizations.

It is important to highlight that many games sell customizations but not allows users to sell or exchange with other players; also, there are many unofficial websites for selling game items.

Another data inferred by the questionnaire is that most of the participants (85,19%) have performed difficult tasks to get visual customizations. And 90,12% have already accomplished difficult tasks for advantage items. Analyzing this data is possible to observe that the visual customization and advantages don't have much difference in importance for the responders.

The last query was opened to responders comment about experiences and opinions and some commented that visual modifications in games can be animated and used to annoy the opponents. Using other words, change the visual could be a game strategy. Other comment was about using customizations to highlight the character on screen; some games present lots of elements on screen and change the visual can help to find the gamer character.

In this section the survey results were analyzed and discussed, the following section presents the final discussions and a perspective of future researches.

6 | CONCLUDING DISCUSSION

Digital games in a physical medium are still popular, and many times embed customizations in its own game mechanics. Although it was perceived that some games are totally digital and have no need for a physical medium mediation. Some factors like broadband internet and the increase of storage capacity in video game consoles and current computers favours the games to abandon the physical media and invest other customizations possibilities.

The second part of the questionnaire was about customization market and it reveals that visual customizations in games are important to a lot of people. It was discussed in section III that customizations are possibilities to change the visual or improve the game scenario, but the game can run without customizations. It emphasizes how the game flow is related to the player power of changes in games (even if it was just visual) and the satisfaction of use.

The survey third part changed the point of view to the player as the salesperson of customizations and it was noticed that this group was more interested in buying rather than selling customizations items.

The fourth and fifth parts showed just a little difference between the number of players that have accomplished difficult tasks in order to gain visual and advantages items. The importance of visual is highlighted again and analyzing all these questions together is perceived that the visual is a strong gamer purpose.

The usability satisfaction (explained in section III) can be attached to the power of customization and the autonomy proposed to the player.

The access to digital platforms such as smartphones, computers, tablets, e-readers and others approaches us and make digital worlds more familiar [5]. Games have been created for too many digital platforms, and this also reinforces own attachment with digital images in untouchable but compliant media. This work indicates that customizations can afford user experience and game flow increasingly the user satisfaction in digital games.

A. Future Research

This research showed an increasingly potential for discussion. During it further questions appeared, and it will be explored in future researches. The survey used here does not specified any game genre or title, it turned the analyses more difficult, however showed that this is an interesting research subject.

Another item to be better evaluated in upcoming papers is how much games spent on average with customizations, distinguish by visual and advantages customization also considering the payment form. This survey indicates that people that bought customizations using money preferred visual customizations, and who bought using credits, preferred advantages customizations. It is a topic to be explored more deeply in further works.

In the game market lots of modifications and DLCs appears every day, it would be

interesting to quantifying how much games allows users to buy customizations, what kind of customizations and how much of the games allow users to sell them. Another issue that will be approached in the future works is about selling platforms, gambling on e-sports and how these platforms work.

This paper indicates that games customization can afford interaction providing experiences beyond its mechanics and design. Game designers and producers are investing in a market for customizations and microtransactions together with game experience.

When players invest in parallel customizations, they are investing in experience, in making the game closer to their personal preferences. Looking through this is possible to see the transition of some game designs, from physical dependence to emphasize the product experience. The user is enjoying it and investing (financially) on his own flow by his own preferences.

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ÍNDICE REMISSIVO

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