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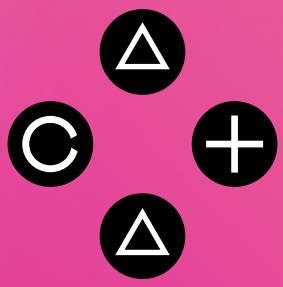

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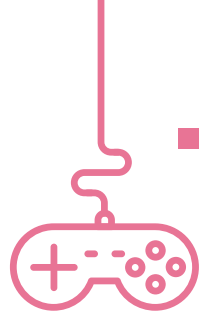

Acta Ludologica is a scientific journal in the field of games and digital games. The journal contains professional scientific reflections on digital games; it also offers academic discourses on games, especially media and digital competencies, creation, design, marketing, research, development, psychology, sociology, history and the future of digital games and game studies.

Acta Ludologica is a double-blind peer reviewed journal published twice a year. It focuses on theoretical studies, theoretical and empirical studies, research results and their implementation into practice, as well as professional publication and scientific reviews of digital games.

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Editorial

"Great stories happen to those who can tell them." – Ira Glass, American radio journalist

As years and even decades of the new millennium pass by, the claim that our lives are driven by stories does not lose even a fragment of its timeless relevance. Our general fascination with different kinds of narratives is one of the very few ways of holding people's attention in an era when no one has enough patience to wait for anything or free time to spare. A good story is what most media industries and their products are built upon; it engages our attention, entertains, overwhelms human senses, and... helps us sell all kinds of products. It could be said that media culture of the 21st century is saturated with secular myths, mythological beings and fantastic environments with escapist qualities. Digital games are, certainly enough, complex media products with distinct features and elements of self-expression. Not a single player ever says that their favourite digital game has legendary visuals or legendary combat modes. However, our personal experiences related to digital gaming often include legendary heroines and heroes and the stories they appear in. Truly, many highly popular and commercially successful casual, social media or mobile games possess little to no narrative qualities. Nevertheless, we believe an impressive storyline is what makes a (not only digital) game really memorable. It makes us actually care about what happens in the end and fully embrace the role of a heroic figure. Just let us look at digital role-playing games (hereinafter RPGs). The last massively successful Western RPG was CD Projekt Red's The Witcher 3: Wild Hunt (2015), the (so far) final instalment of the company's acclaimed fantasy series. It is thus beyond anyone's understanding why CD Projekt Red decided to produce Cyberpunk 2077 (2020), which was supposed to become the company's new 'flagship', as a first-person game. The game did not and could not fulfil its true purpose, which was to merge the player with the hero and let the player experience what it is like to see this visually rich dystopic world from a god-like perspective, the perspective of a creator. In contrast, role-playing elements are, to a lesser or greater extent, present in many other genres. Quite paradoxically, this overuse of role-playing aspects is weakening the original genre, robbing it of its distinct strengths. It is not rare to encounter players who mistake, for example, Assassin's Creed: Valhalla (Ubisoft, 2020) for an RPG. On the other hand, those thinking that the Assassin's Creed series can be defined as a set of RPGs may not be too far from the truth anymore. Anyways, digital role-playing is not special and universally applicable because it truly lets the player decide what will happen next; it is so outstanding because the player feels that their in-game choices really matter. This process of shaping one's own heroic figure is, in a way, an act of creation. Let us remember that no one has ever played an RPG to consume someone else's product. However, all interested players have done so to create their own stories and explore fictional worlds, which are so fascinating that their only weakness lies in not being real.

However, the question of what makes a (game-related) story exceptional implies a plethora of different problems which we may encounter while trying to interpret or simply identify one. Of course, this set of issues reaches far beyond the boundaries of the digital games industry and much deeper into our everyday lives. The latest issue of Acta Ludologica acknowledges this fact quite clearly. Reacting to what we already know about game design and its elements, B. Dupont and S. Malliet discuss 'dark patterns', many of which tend to lure players into transactions involving real money or into the vortex of non-substance addiction. The authors contextualise this concept with the semiotic model of the 'ludeme'. Such a problem is necessarily associated with the frameworks of digital literacies, which walk hand-in-hand with education. As outlined in J. Miškov's research study, today's education is largely driven by digital technologies. Thus, we need to explore which kinds of game elements can be used in terms of e-learning and ensure that students will see these efforts as welcome diversification of their curriculum. Focusing on a different topic, yet still underlining how important it is to share one's knowledge, A. Burlamaqui Ferreira and R. Marques de Albuquerque reflect on 'indie' game developers, who inspire others to follow in their footsteps through uploading 'how to' videos and sharing their practical experience. H. Akmal and P. Coulton's study offers both a complex philosophical perspective related to our current understanding of Human Centred Design and a wider discussion on the Internet of Things and its ontological frameworks. Seeing digital games' difficulty as a welcome and rather necessary part of playing them, M. Terrasa-Torres presents difficulty as a form of aesthetic expression driving the player's experience. M. Engler and A. Trnka emphasise the fact that concept art is an autonomous artistic phenomenon with a bright future, also outlining practical aspects of creating concept art and exploring its promotional features.

Dear readers, thank you for being interested in Acta Ludologica and the journal's ever-evolving story. Let us hope it will become even more successful and worthy of academic attention.

assoc. prof. PhDr. Jana Radošinská, PhD.
Communication Today's Deputy Managing Editor

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Contextualizing Dark Patterns with the Ludeme Theory: A New Path for Digital Game Literacy?

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ABSTRACT:
So-called dark patterns are widely discussed in game design. This phenomenon raises concerns for gaming education because numerous dark patterns trick players into real money transactions or gambling. A major obstacle to the practical assessment of the severity of a 'dark' pattern is the very definition of 'game patterns', basing solely on action-oriented structures. In order to take into account not only abstract expressions of the game system, but also the experience of the player, as well as the diverse contexts in which games are played, this article proposes to use the semiotic model of the 'ludeme'. A ludeme is a minimal element in game design consisting of a grapheme, an acousteme, and a motifeme. We begin by explaining and situating the conceptual framework of the ludeme theory, with a specific interest in its application to repetitions of the same game element over time and through different digital games. Then, the theoretical framework is applied to SimCity BuildIt and particularly to the 'dark patterns' in it. In the last part, paths for further developments of the model of ludemic analysis are discussed, with regard to its relevance for media education and digital game literacy.

KEY WORDS:
dark patterns, digital game literacy, game analysis, ludeme, ludoliteracy, SimCity.

Introduction: The Relative Darkness of Dark Patterns

"Moral relativism aside, I think 'bad' games exist",[1] claims B. Jackson in The Atlantic, while W. Audureau from Le Monde promises a "dive into UX, the art of manipulating video game players".[2] Thereby, both journalists introduce their readers to the concept of 'dark patterns' that you should have encountered a few times if you follow the media trends around gaming. It is indeed gaining attention as an umbrella term for a variety of game design features which should be (following the respective stances of the journalists) acknowledged, avoided, restricted, or even banned for players' safety. The designation 'dark patterns' originated in user experience design[3] to refer to "instances where designers use their knowledge of human behaviour and the desires of end users to implement deceptive functionality that is not in the user's best interest".[4] Rapidly, it became common among practitioners and journalists, before being taken up by HCI research. There are many instances of dark design in web development, such as the implementation of a deliberately complicated user interface that makes it hard on users to change their privacy

1 JACKSON, B.: *The Zynga abyss.* Released on 24th January 2012. [online]. [2021-03-08]. Available at: <https://www.theatlantic.com/technology/archive/2012/01/the-zynga-abyss/251920/>.

2 AUDUREAU, W. P.: *Plongée dans l'UX, l'art de manipuler les joueurs de jeu vidéo.* Released on 15th October 2019. [online]. [2021-03-08]. Available at: <https://www.lemonde.fr/pixels/article/2019/10/15/plongee-dans-l-ux-l-art-de-manipuler-les-joueurs-de-jeu-video_6015608_4408996.html>.

3 Remark by the authors: Harry Brugnell's self-claim of being the coiner of the term in 2010 with his website www.darkpatterns.org seems to hold true.

4 For more information, see: GRAY, C. M. et al.: The dark (patterns) side of UX design. In MANDRYK, R., HANCOCK, M. (eds.): *CHI '18: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. New York: ACM, 2018, p. 1-14. [online]. [2021-03-08]. Available at: <https://dl.acm.org/doi/pdf/10.1145/3173574.3174108>.

settings or delete their profile. Similar techniques are now increasingly being applied in digital games, which led J. P. Zagal and his colleagues to specifically speak of 'dark game design patterns'.[5] Their definition is easily understandable, as it mostly refines the term and translates it into game design concepts: "A dark game design pattern is a pattern used intentionally by a game creator to cause negative experiences for players which are against their best interests and likely to happen without their consent".[6]

The authors further categorize dark game design patterns in three subgroups summarizing the type of deception players are exposed to: 'temporal' dark patterns lure them into spending more time playing than expected; 'monetary' patterns tempt them to spend more money, and 'social' patterns rely on the players' will to increase their social capital.[7] A few well-known examples[8] of dark patterns in games make their detrimental character visible. The most discussed are loot boxes, which are in-game surprise gifts containing randomly or pseudo-randomly assigned bonuses helping to achieve an easier win or a more pleasurable game experience. Loot boxes are classified by the website DarkPatterns.games as monetary dark patterns, because users have to use real money (or in-game currencies that they buy with real ones) to acquire the loot boxes, whereby the phenomenon is akin to gambling, or even 'structurally identical'.[9] Very common is also the 'grinding' mechanic, referring to the unavoidable repetition of simple and meaningless tasks aiming to artificially extend the play time. It is often linked to the accumulation of in-game resources, such as building material in construction games. Zagal et al. classify 'grinding' as a temporal dark pattern, although this assumption is subject to caution: As 'ground' materials have an in-game value, which sometimes is convertible into real-world currencies, they have a monetary aspect as well.

A typical social dark pattern would be the occurrence of (false) impersonation messages, for instance when a game uses the personal data of players to seduce their friends into using the game themselves, or using it more than they already do, for example, through automatically sending notifications in the name of the players to their friends. The website DarkPatterns.games additionally identifies a fourth category: 'psychological' dark patterns appeal to cognitive biases to trick players into making detrimental decisions. An example of this would be the 'illusion of control': the game system makes players think that they are improving their skills, that their ranking among other players is higher than is actually the case, or that they are close to winning whereas there is still a considerable way to go.[10] Although this 'illusion of control' may relate to numerous play experiences and to effective game design features, using 'psychological' as a separate category is problematic from an epistemological point of view. It is not consistent with the three other criteria: money, time, and social status are in this view values invested in the game's economy, whereas psychology is rather the underlying reason for yielding to the developers' trick. Therefore, 'monetary', 'social' and 'temporal' dark patterns can be psychological as well – and in fact all are, at least partly, since they rely on the management of motivational factors.

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5 See also: ZAGAL, J. P., BJÖRK, S., LEWIS, C.: Dark patterns in the design of games. In YANNAKAKIS, N., AARSETH, E. (eds): *Proceedings of the Foundations of Digital Games*. Chania : FDG, 2013, p. 39-46. [online]. [2021-05-23]. Available at: <https://my.eng.utah.edu/~zagal/Papers/Zagal_et_al_DarkPatterns.pdf>.

6 ZAGAL, J. P., BJÖRK, S., LEWIS, C.: Dark patterns in the design of games. In YANNAKAKIS, N., AARSETH, E. (eds): *Proceedings of the Foundations of Digital Games*. Chania : FDG, 2013, p. 40-45. [online]. [2021-05-23]. Available at: <https://my.eng.utah.edu/~zagal/Papers/Zagal_et_al_DarkPatterns.pdf>.

7 Ibidem.

8 Ibidem.

9 See also: KING, D. L. et al.: Adolescent simulated gambling via digital and social media: An emerging problem. In *Computers in Human Behavior*, 2014, Vol. 31, No. 1, p. 305-313.

10 *Psychological dark patterns*. [online]. [2021-05-17]. Available at: <https://www.darkpattern.games/pattern/4/psychological-dark-patterns.html>.

Albeit the case of psychological dark patterns is the most blatant (which can be the reason why, while agreeing with DarkPatterns.games on the other categories, most scholarly authors avoid mentioning this fourth distinction), it sheds light on the overall imprecision of the categorization: a pattern can belong to one or more types, depending on the analytical perspective. In fact, this is the case for most social dark patterns, which imply temporal or monetary aspects as well, an observation that brings us back to the fact that social capital, in its sociological, Bourdieusian meaning, cannot be spent in the same way as, for example, monetary possessions.[11] Nonetheless, this list of shortcomings in the scholarly examination of dark patterns should not obscure its much greater merit: to analytically tackle a central and urgent concern of users and to explore its high relevance for gaming ecosystems. Indeed, the phenomena described belong without any doubt to the daily experience of players of contemporary commercial digital games, because these are often based on the free-to-play model: installing the game is free of charge, but certain options must be paid for in order to make progress, which leads to diverse ways of pushing the player to spend in-game money, sometimes in a covert, thus possibly dark manner.

In spite of this, the very concept of dark patterns is put into question by numerous scholars, such as S. Deterding and his co-authors. Their different pieces of criticism can be summarized into one stance: Considering some game patterns as dark per se assumes that darkness is objective, given in advance and applicable to all players, play situations and times, and ethical frameworks.[12] At the same time, J. P. Zagal and his co-workers admit that darkness is "dependent on context";[13] this results at least in a vagueness of the concept, at most in an inner contradiction making the term unusable. Between the urge and significance of studying deceptive game design on the one hand and questioning the existence of dark patterns on the other hand, the need arises to elaborate a conceptualization that accounts for multiple layers of meaning creation. This paper[14] aims to make a first step in this direction, by explaining the contextuality, or relativity, of dark patterns, not to suppress it from the theoretical framing, but on the contrary to exploit its potential in terms of media analysis and media education. For these purposes, we will use the conceptual tools offered by ludeme theory, and show their relevance within this context, based on a case study of *SimCity BuildIt*[15], before concluding on their limitations as well as the questions they leave open for further research.

11 For more information, see: BOYER, R.: L'anthropologie économique de Pierre Bourdieu. In *Actes de recherche en sciences sociales*, 2003, Vol. 150, No. 5, p. 65-78.; Remark by the authors: This difficulty to make clear what players invest in gaming and what they hope to win through this investment is, in our opinion, one of the many reasons for thoroughly analysing individual games in the light of their constitutive economies, in the way that S. Giddings brilliantly showed.; See: GIDDINGS, S.: Accursed play: The economic imaginary of early game studies. In *Games and Culture*, 2018, Vol. 13, No. 7, p. 765-783.

12 See also: DETERDING, C. S., STENROS, J., MONTOLA, M.: Against "Dark Game Design Patterns". In LEORKE, D. (ed.): *DiGRA'20 – Abstract Proceedings of the 2020 DiGRA International Conference*. Tampere : DIGRA, 2020, p. 1-3. [online]. [2021-05-23]. Available at: <https://eprints.whiterose.ac.uk/156460/1/DiGRA_2020_paper_189.pdf>.

13 ZAGAL, J. P., BJÖRK, S., LEWIS, C.: Dark patterns in the design of games. In YANNAKAKIS, N., AARSETH, E. (eds): *Proceedings of the Foundations of Digital Games*. Chania : FDG, 2013, p. 40-45. [online]. [2021-05-23]. Available at: <https://my.eng.utah.edu/~zagal/Papers/Zagal_et_al_DarkPatterns.pdf>.

14 Remark by the authors: Of course, the views exposed in this study only engage its authors, but we want to explicitly express our gratitude to the fellow scholars who contributed to its maturation through their stimulating remarks: Rowan Daneels, Maarten Denoo, Morgane Frères, Eva Grosemans, Pierre-Yves Houlmont, Pierre-Yves Hurel, and Alexander Vandewalle.

15 ELECTRONIC ARTS: *SimCity: BuildIt*. [digital game]. Redwood City : Electronic Arts, 2014.

‘Ludemes’ Instead of ‘Patterns’: Centering on Player Experience

Returning to the issue of grinding, a behaviour very often linked with detrimental game use in medicine and psychology publications,[16] we can note a strong discordance between these and more culturally or semiotically oriented analyses. Indeed, ludology and game theory, since J. Huizinga, have emphasized that repetition and recursion, for instance of the same mining mechanics, should be considered common, if not even ‘core features’[17] of play. Moreover, some players experience grinding as a positive, entertaining game component, and N. Bojin[18] even acknowledges “a subjective component to the grind”, allowing for differentiated ways of engaging with it. What seems to hold true for grinding could in fact apply to many other dark patterns. Behind the above cited critical text by Deterding et al., provocatively entitled *Against ‘dark game design patterns’*, one can read an unease with a core characteristic of game patterns (dark or not): they are abstract descriptions of segments of the underlying game system, as they focus on what action the system requires of the player (input) and what reaction it delivers as a consequence (output). This view relies on the seminal definition of digital game patterns by S. Björk and J. Hopalainen: “game design patterns are semiformal interdependent descriptions of commonly reoccurring parts of the design of a game that concern gameplay”.[19] Within this conceptualisation, ‘gameplay’ has the strict, systemic meaning of “the structures of player interaction with the game system and with the other players in the game”,[20] which ignores the possibility that different players, in the context of the same or a different game, can attach different meanings to these structures.

In this view, a Goomba from the *Super Mario* franchise[21] or a zombie from *The Last of Us*[22] can both be considered instances of the same enemy pattern. Or, if we consider patterns of which is said that they can occur in a maliciously modified and thus ‘darkened’ form, such as harvesting,[23] cultivating fields in the *Age of Empires* series[24] and producing resources in *Universal Paperclips*[25] would fall within the same category, despite

16 KING, D. L., DELFABBRO, P.: Understanding and assisting excessive players of video games: A community psychology perspective. In *Australian Community Psychologist*, 2009, Vol. 21, No. 1, p. 63-73.

17 LOZANO, A.: Creative possibilities of repetition in videogame aesthetics. In *Studi di estetica*, 2018, Vol. 48, No. 18, p. 48-70. [online]. [2021-05-23]. Available at: <http://mimesisedizioni.it/journals/index.php/studi-di-estetica/article/view/627>.

18 BOJIN, N.: *Exploring the notion of ‘Grinding’ in massively multiplayer online role playing gamer discourse: the case of Guild Wars*. [Dissertation Thesis]. Burnaby : Faculty of Communication and Technology, Simon Fraser University, 2013, p. 4-135. [online]. [2021-05-24]. Available at: <http://summit.sfu.ca/system/files/iritems1/13445/etd7871_NBojin.pdf>.

19 BJÖRK, S., HOLOPAINEN, J.: *Patterns in game design*. Boston : Charles River, 2005, p. 34.

20 Ibidem, p. 3.

21 NINTENDO EAD, NINTENDO EPD: *Super Mario Bros (series)*. [digital game]. Kyoto : Nintendo, 1985-2021.

22 NAUGHTY DOG: *The Last of Us*. [digital game]. San Mateo : Sony Computer Entertainment, 2013.

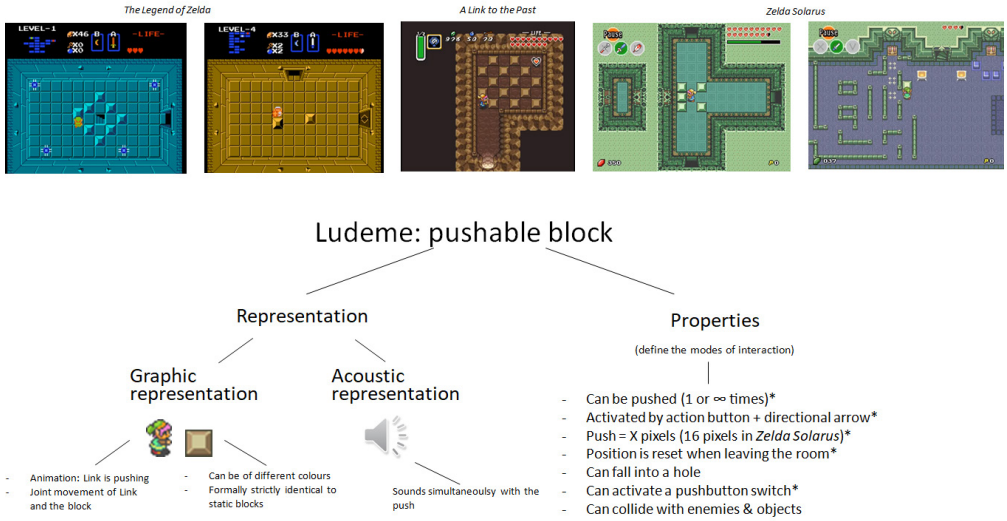
23 Remark by the authors: Lewis – followed on this point by Zagal et al. – explains that harmless “harvesting” can turn into dark “interaction by demand” if the time requested to, for example, let a crop ripen, cannot be used for other actions. If so, it is then a means, often backed by out-app notifications, to make players leaving and joining the game at moments and for times decided not by themselves, but by the game system.; LEWIS, C.: *Irresistible apps: Motivational design patterns for apps, games, and web-based communities*. Berkeley : Apress, 2014, p. 109-110.

24 ENSEMBLE STUDIOS et al.: *Age of Empires (series)*. [digital game]. Redmond : Xbox Game Studios, 1997-2021.

25 LANTZ, F.: *Universal Paperclips*. [digital game]. New York : F. Lantz, 2017.

involving different objects, standing for different genres and making different actions possible through their results. Thus, following the authors, patterns define themselves not by directly graspable aspects, but by their 'us[e]', their 'consequences', and their 'relations'[26] to other patterns which they can reinforce, contradict or alter. For instance, the *Deadly Traps* pattern is described in terms of "game events that kill Avatars and Units if they are within the area of effect of the trap".[27] Among their defining traits, deadly traps trigger the following consequences: "[they] threaten players with Penalties of Damage or loss of Lives or Units if the players activate them. [...] Deadly Traps can cause Tension or Surprises, especially in Exploration or Reconnaissance goals. Deadly Traps can also be used to limit the Game World in an intuitive way. Deadly Traps are examples of Ultra-Powerful Events which are impossible to Evade by the players who have activated them".[28]

Admittedly, the authors always accompany the description of such patterns with one or more examples from existing digital games, and sometimes of concrete in-game manifestations of the patterns. In the present case, they state that "typical examples of deadly traps include pits, falling blocks, lava, fire, acid, steam, machinery, crushing presses, fast-moving vehicles, and collapsing bridges, but many more are possible".[29] However, these examples are merely conveyed for the sake of comprehension: the patterns themselves are defined on an abstract level, which results in "general descriptions".[30] The – in a manner of speaking didactical – addition of examples illustrates the restrictions of the thinking in patterns itself: its abstraction makes it difficult to visualize for the non-specialist in game design, which is the case for most players. Furthermore, by focusing on (inter)action, patterns foreground the role of the mechanical component of digital games, leaving aside their other, especially audiovisual features.



Picture 1: Schematisation of a ludeme according to Hurel

Source: HUREL, P.-Y.: *Le bloc-à-pousser chez un amateur de Zelda: trajectoire d'un dépliement*. Presentation presented at LabJMV Seminar. Liège, presented on 17th December 2018.

26 BJÖRK, S., HOLOPAINEN, J.: *Patterns in game design*. Boston : Charles River, 2005, p. 38-39.
27 Ibidem, p. 74.
28 Ibidem, p. 75.
29 Ibidem, p. 74.
30 Ibidem, p. 38.

Yet when remembering particularly vivid memories of past gaming activities, especially those which they interpret as significant for their later gaming preferences, gamers seem more inclined to recall in-context features of games, such as the iconic 'pushable blocks' in the *Zelda*[31] series series (Picture 1).[32] In their most common form, these blocks can be pushed or pulled in either direction, allowing solving spatial puzzles. Together with this mechanical aspect, the 'pushable block' combines a graphic appearance, and a sound accompanying the pushing, making what it is easily recognizable by players,[33] despite minimal variations through the opuses of the Zelda series. This semiotic tripartition is not specific to Zelda, but is rather generally applicable to numerous basic elements in games.

Basing on similar premises,[34] D. Hansen comes up with a proposition of a digital game grammar with the *ludeme* as the 'basic video game unit'.[35] His work draws on heterogeneous sources from analogue and digital game studies and mitigates diverse views on minimal design elements,[36] in an attempt to link together 'being and doing, formalization and use, game and player'.[37] The ludeme, as the videoludic equivalent of F. de Saussure's morpheme, is constituted of a "grapheme (graphic unit), a sound, or even an acousteme if one wants to continue the structuralist tradition, and of mechanical properties or mecanemes".[38] Our decision to analyse dark game content in terms of ludemes, rather than patterns, reflects a deeper discussion on the processes of meaning creation that take place during game play. For instance, J. J. Vargas-Iglesias and L. Navarrete-Cardero[39] refer to the concept of a mechanic as a game's basic textual unit, and point out that different points of view exist regarding its definition. There is, on the one hand, the position that a mechanic should predominantly be understood in terms of game rules, i.e. code that has been implemented by the game developers and that exists independently of any player activity. An example of this view can be found in R. Hunicke, M. LeBlanc and R. Zubek's MDA framework,[40] outlining that mechanics are essentially programmed algorithms, while the dynamics refer to the interaction of a player with these mechanics. On the other hand, there is the position popularized by M. Sicart[41] that such

31 NINTENDO EAD et al.: *The Legend of Zelda (series).* [digital game]. Kyoto : Nintendo, 1986-2021.

32 HUREL, P.-Y.: *L'expérience de création de jeux vidéo en amateur – Travailler son goût pour l'incertitude*. [Dissertation Thesis]. Liège : Faculté des Sciences de l'Information et de la Communication, University of Liège, 2020, p. 5-287.

33 Ibidem, p. 179.

34 Remark by the authors: Practically, the redefinition of ludemes is based on a dialogic co-construction between D. Hansen and P.-Y. Hurel between 2018 and 2020, rather than on a seminal authorship of one author above the other.

35 HANSEN, D.: *Morphologie du médium vidéoludique : Le ludème envisagé comme unité minimale fonctionnelle du jeu vidéo*. [Master's Thesis]. Liège : Département de Langues, Lettres et Traductologie, University of Liège, 2019, p. 40.

36 Remark by the authors: The origin of the term "ludeme" itself remains uncertain, as Hansen explains. Quite symptomatically, a good part of his work traces the origins of the concept and to construct a new definition. According to Parlett, the ownership of the term can be given either to A. Borvo or to P. Berloquin in the 70s. However, their use of "ludeme" has little in common with our own understanding of it, which is much more akin to later occurrences listed by Hansen, such as the works of B. Cousins or R. Koster (both in the 2000s). In any case, Hansen is not the first scholar to use the word 'ludeme' but his work still notably redefines it towards the in-context-use which we adopt in this article.; See PARLETT, D.: *What is a ludeme? And who really invented it?*. [online]. [2021-05-24]. Available at: <https://www.parlettgames.uk/gamester/whatsaludeme.html>.

37 HANSEN, D.: *Morphologie du médium vidéoludique : Le ludème envisagé comme unité minimale fonctionnelle du jeu vidéo*. [Master's Thesis]. Liège : Département de Langues, Lettres et Traductologie, University of Liège, 2019, p. 41.

38 Ibidem, p. 51.

39 VARGAS-IGLESIAS, J. J., NAVARRETE-CARDERO, L.: Beyond Rules and Mechanics: A Different Approach for Ludology. In *Games and Culture*, 2020, Vol. 15, No. 6, p. 588-607.

40 For more information, see: HUNICKE, R., LEBLANC, M., ZUBEK, R.: MDA: A formal approach to game design and game research. In FU, D., HENKE, S., ORKIN, J. (eds.): *Proceedings of the Challenges in Games AI Workshop, Nineteenth National Conference of Artificial Intelligence*. San Jose : AAAI Press, 2004, p. 1-5. [online]. [2021-05-24]. Available at: <http://www.cs.northwestern.edu/~hunicke/MDA.pdf>.

41 SICART, M.: Defining game mechanics. In *Game Studies*, 2008, Vol. 8, No. 2. [online]. [2021-05-24]. Available at: <http://gamestudies.org/0802/articles/sicart/>.

a mechanic is only activated by a significant effort of a player, and as such, that player agency should be always considered an indistinguishable part of a game's building blocks. In proposing to investigate game content in terms of ludemes, rather than patterns, we indirectly align to this second position.

Our argumentation is further supported from the perspective of formal and structural semiotics on games. D. Myers[42] asserts that, while games consist of pre-existing programmed elements such as objects or statistics, their semantic essence resides in the fact that these elements are continuously being recontextualized and repurposed through player activity. Myers points out that unintended (and often even immoral or antisocial) activities on behalf of the player should therefore not be considered side effects of a game text, but rather as belonging to its essence. Similarly, P. Lankoski and S. Björk[43] argue that a game text indeed consists of a number of basic atoms or components, but that the challenge of analysing game content resides in exposing the relations between these primitives. Again, this deeper understanding can only be achieved if one takes into account the interaction between a player and these building blocks. Finally, C. A. Lindley[44] refers to four formal layers that constitute a ludic world, one of which is the performative layer. Within this performative layer, the game world presents itself to the player in a way that is unique to each playing session, and the game narration never merely unfolds according to fixed plot points.

In this view, the Goombas in Mario games differ from the zombies in The Last of Us, and so do the office supplies in Universal Paperclips and the armfuls of cereals in Age of Empires: they are different ludemes triggering different recognition and reaction processes for the players encountering them. This perspective also supports the diversity with which comparable mechanics are perceived and experienced by individual players, for example as Bojin reports with regard to grinding in *Guild Wars*.[45] While "patterns" may be relevant for game design and game analysis, ludemes mimic the experience of players themselves, in the context where they play, and provided with their own videoludic culture.

A Lexicon of Ludemes: Variation and Evolution across Digital Games

As basic units composing a digital game, ludemes must be combined to produce larger groups, or 'sequences'.[46] These sequences themselves aggregate to constitute the complete gameplay. For such groupings to take place, the same ludeme must mostly

42 MYERS, D.: Time, Symbol transformations, and Computer Games. In *Play & Culture*, 1992, Vol. 5, No. 4, p. 442-456.

43 LANKOSKI, P., BJÖRK, S.: Formal analysis of gameplay. In LANKOSKI, P., BJÖRK, S. (eds.): *Game research methods*. Pittsburgh : ETC Press, 2015, p. 24-34. [online]. [2021-05-24]. Available at: <https://dl.acm.org/doi/10.5555/2812774.2812779>.

44 LINDLEY, C. A.: The semiotics of time structure in ludic space as a foundation for analysis and design. In *Game Studies*, 2005, Vol. 5, No. 1. [online]. [2021-05-24]. Available at: <http://www.gamestudies.org/0501/lindley/>.

45 ARENANET: *Guild Wars*. [digital game]. Seoul : NCSoft, 2005.

46 HANSEN, D.: *Morphologie du médium vidéoludique : Le ludème envisagé comme unité minimale fonctionnelle du jeu vidéo*. [Master's Thesis]. Liège : Département de Langues, Lettres et Traductologie, University of Liège, 2019, p. 66.

be repeated. Although it is possible that a ludeme only appears once in a game, this case is rare: the abovementioned recognition and reaction processes rely in most cases on the repetition of ludemes within the same game, allowing the players to learn how to handle them quickly and efficiently. As their experience grows, players tend to become acquainted with increasingly more ludemes and to analyse them with more certainty. To stay in the linguistic vein, we can use the term 'lexicon' for the private mental collection of ludemes which a specific player 'possesses' and which, accordingly, they can call upon when confronted with a given game. This process of recalling a ludeme from their lexical repertoire enables rapid action in game environments often characterized by causal complexity and/or time scarcity. For example a former player of *Super Mario* on NES can immediately assess the danger (losing a life) of a Goomba in most of the games from the franchise and know about a means of eliminating it (by jumping on its head).

Like all semiotic elements, ludemes can be borrowed and cited by different people and works, thus players also can rely on their experience with Zelda blocks, if available, when solving *Pokémon*[47] puzzles involving similar elements (Picture 2, 3). They can do so because over time they have learnt how to recognize and use them, and have added them to their own lexicon. On the side of the game creators, this happens because they consciously (sometimes probably also unconsciously) took up ludemes from their own lexicon, and reused them in the work that they were creating.

Pictures 2 and 3 make clear that an 'original' ludeme being taken up by another later work rarely achieves perfect identity: mostly, there is only a resemblance between the two. To put in linguistic words again: like all languages, digital games are subject to variations or, seen diachronically, evolutions. However, ludemes can wander from game to game, genre to genre, and creator to creator, the most massive reuse of ludemes logically within digital game franchises, like the already cited Mario: the high level of similarity between the Mario titles across time and platforms is precisely what makes them Mario games, and makes players recognize, value, and trust them as a whole. How far the series has pushed the ludemic replication, and how well experienced players have acquired the language of Mario, is visible in the spin-off *Super Mario Maker*[48] (first opus in 2015). This mix of game and creation engine proposes in fact a list of functioning ludemes issued from the history of the franchise.

Picture 2: Link pushing blocks in Tower of the Gods

Source: Puzzle. [online]. [2021-03-16]. Available at: <https://zelda.fandom.com/wiki/Puzzle>.

47 For example: GAME FREAK: *Pokémon: Let's Go Eevee!*. [digital game]. Tokyo, Kyoto : The Pokémon Company, Nintendo, 2018.

48 NINTENDO EAD: *Super Mario Maker*. [digital game]. Kyoto : Nintendo, 2015.

Picture 3: Pushing blocks with the Strong Push Technique in Pokémon: Let's Go Eevee
Source: Secret Technique. [online]. [2021-03-16]. Available at: <https://bulbapedia.bulbagarden.net/wiki/Secret_Technique>.

Without discussing the numerous economical aspects favouring franchise dynamics in contemporary smartphone games production, one can state that an important part of the commercial Android and iOS game market consists of faithful remakes and adaptations with modernizations of iconic game series of the 90s and 2000s. These games capitalize on the nostalgia of generations of players who have grown up with titles such as *Crazy Taxi*,[49] Age of Empires or *The Sims*[50], but at the same time take into account the fact that these games are now part of the collective archive of digital game culture, which serves as publicity for new iterations.

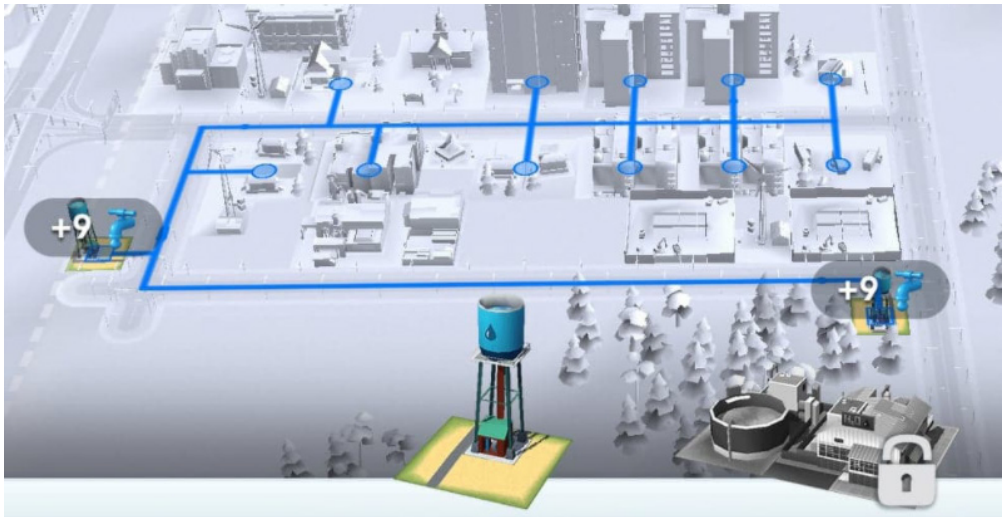
Exploiting Players' Game Lexic: Dark Ludemes in SimCity BuildIt

In the same way, SimCity BuildIt, the game that we will use for our case study to examine the usefulness of a ludemes approach in the context of dark design, exports the computer-originated SimCity franchise on smartphones and mixes a rather straightforward reuse of most ludemes from previous titles with some added elements typical of free-to-play smartphone games. It is still a town-planning simulation, where the player builds a city and makes it grow in scale and prosperity, but now involves social features

49 HITMAKER: *Crazy Taxi*. [digital game]. Tokyo : Sega, 1999.
50 MAXIS: *The Sims (series)*. [digital game]. Redwood City : Electronic Arts, 2000-2021.

(such as adding Facebook friends as neighbours, which unlocks specific rewards) and in-game purchases as well. To illustrate one of the many ludemes which are common to both games, we can look at the in-game challenge of connecting areas of the city to the underground water supply network in both the computer version (here *SimCity 2013*)[51] and the smartphone remake: the graphic representation is very similar, the mechanical features as well: connecting to the existing pipes and providing the surrounding area with water (Picture 4, 5). The sound produced, a gurgling sound, is very comparable too. For the players, it means that knowledge and experience accumulated in the computer versions can easily be reutilized in opuses on mobile.

Picture 4: Underground pipes in SimCity 2013
Source: Water. [online]. [2021-03-16]. Available at: <http://simcity2013wiki.com/wiki/Water>.



Picture 5: Underground pipes in SimCity: BuildIt
Source: authors' screenshot; ELECTRONIC ARTS: *SimCity: BuildIt*. [digital game]. Redwood City : Electronic Arts, 2014.

51 MAXIS: *SimCity*. [digital game]. Redwood City : Electronic Arts, 2013.

True to its free-to-play model, the game also contains pay features, all aiming at accelerating the pace of expanding and embellishing the city. They go together with incentives for the player to choose them. In the following, we will focus on the ludemes playing this role. BuildIt is not the first foray of the EA franchise into free-to-play, as it was preceded by *SimCity Social*,[52] which operated between 2012 and 2013. The rather covert manner in which this more socially oriented, previous version of the smartphone game stimulates the player to spend their time and money has led some scholars[53] (among other non-scientific commentators) to classify it as a game with dark patterns. Although in a less extensive manner, BuildIt takes up some of these features, such as the 'artificial scarcity', creating a specious sense of urgency through temporary offers (with a countdown highlighting the upcoming deadline). But more central to the core gameplay of the game is the 'pay to skip'[54] pattern. More than the computer versions of SimCity, the smartphone game indeed relies on the accumulation and production of various primary and secondary resources. The wood, metal, and plastic that the player collects can be then transformed into more elaborate materials and goods such as boards or nails.

As is common in numerous digital games focusing on resource management, more complex goods require more time and more rare components to be produced. However, there is here a glaring difference in the production time of goods of the same complexity level.[55] For example, the production of wooden boards takes up to 30 minutes, as opposed to seconds for other kinds of simple artefacts needed to build houses. This obvious unbalance combines with a paying shortcut allowing boards (and other objects) to be produced instantaneously. Indeed, the resources to-be-created are transferred into a limited number of slots, where they are queued and provided with a timer indicating the time until their completion. When occupied, these slots are accompanied by a button representing a banknote, preceded by a number. Through pushing the banknote button, the player can spend the corresponding amount of SimCash to obtain the resources immediately.

SimCash is the name of the one in-game currency which has to be bought with real money. This use of such a fictive currency with real money value is in itself seen as a dark pattern called premium currency (see DarkPatterns.games), because it blurs the estimation of monetary value. It is important to emphasize that SimCash does not exist in the computer versions of the game, nor does any kind of premium currency. The action and consequences of buying in the Android and iOS game are complexified by the existence of another currency, the Simoleons. These are represented as golden coins, and not linked with real-life money. While SimCash gives access to the most advantageous purchases (besides the immediate completion of goods, it also allows for buying prestigious and efficient infrastructures), Simoleons are used for less decisive actions and earnings and cannot be exchanged for building materials.

If we conceive of the currencies in BuildIt as patterns, and particularly as dark patterns, their analysis ends with the previous observations. Yet, in our opinion, the ludemes approach allows for further developments, by allowing a comparison between versions on the basis of what players perceive on their screen and react to. Indeed, the picture of a banknote figuring SimCash and functioning as a link to the pay transactions page is

52 MAXIS: *SimCity Social*. [digital game]. Redwood City : Electronic Arts, 2012.

53 See also: ZAGAL, J. P., BJÖRK, S., LEWIS, C.: Dark patterns in the design of games. In YANNAKAKIS, N., AARSETH, E. (eds): *Proceedings of the Foundations of Digital Games*. Chania : FDG, 2013, p. 39-46. [online]. [2021-05-23]. Available at: <https://my.eng.utah.edu/~zagal/Papers/Zagal_et_al_DarkPatterns.pdf>.

54 Ibidem.

55 Remark by the authors: Thereby, we understand the in-game production system, that can be schematized into a laddering in complexity and requirements: first-level resources only require time to be produced, second-level artefacts require tendentially more time and the transformation of first-level resources, and so on.

actually taken up from a previous PC version of SimCity, namely *SimCity 3000*[56]. Therein, it is not linked with expenses in real money, but rather part of the 'loan'-ludeme. Through clicking on it, a fictive loan can be taken out, providing new financial resources in the game. This ludeme is central to the game, as it is the fastest way to augment the player's cash provisions, especially in the beginning, when numerous expensive infrastructures have to be erected without much income. In some difficulty modes, it is even impossible to start building a city without taking out such a loan. Transferring the banknote grapheme from the loan to the Simcash ludeme means calling upon associations made by the players because of their previous experiences with the former, such as inevitability, beneficiality, or harmlessness in terms of real-world consequences.

While the reuse of the banknote is an example of citation from one work in another from the same franchise, and as such limits its effect to players familiar with the cited work, it integrates itself in a broader blurring of the line between real money and fictive transactions in BuildIt. What they have in common is their reliance on ludemic processes. The co-occurrence in the smartphone game of two very similar ludemes for different kinds of exchanges falls into the same category. Indeed, the Simoleon is composed of a coin grapheme, of a sound (acousteme) figuring the tinkle of falling coins, and points towards in-game earnings and expenses, while SimCash is represented by a banknote, accompanied by a slightly different metallic tinkle sound, and points towards real-world transactions (Picture 6).

Picture 6: Two very similar ludemes for different transactions in BuildIt

Source: authors' screenshot; ELECTRONIC ARTS: *SimCity:* BuildIt. [digital game]. Redwood City : Electronic Arts, 2014.

Other observations can be made on the complex economic system of BuildIt (which contrasts with the overall simplicity of the game), but those two examples already display the intertwining of ludemic processes across different versions of SimCity and within BuildIt as such. These developments show, in our opinion, two advantages of analysing potentially misleading or detrimental game design with ludemes: it acknowledges the use of already lexicalized references from the players' game culture by designers, as well as the interpretations of this design by players who recall these references for orienting themselves in a game. In the case of ludemic coherence, these assumptions made by the players help them to achieve their goals. This is what happens, for example, when knowledge about pushable blocks from Zelda is reused to solve puzzles in Pokémon. In other

56 MAXIS: *SimCity 3000*. [digital game]. Redwood City : Electronic Arts, 1999.

cases, and if no other interpretative frameworks counteract the false interpretation, ludemic contradiction leads the players to make decisions against their best interests – for instance resorting to thoughtless real-world transactions in BuildIt.

In this section, we have shown that ludemic analysis leaves room for players' prior experiences and knowledge in the interpretation of gameplay elements. Moreover, it places this interpretation in the centre of the issue of detrimental game design. Design elements can be abusive because they trigger specific and delusive expectations relating to their outcome, but these expectations can only be activated through an interpretative process. In the last part of this article, we will sketch the consequences of this view on two categories which are important for media education purposes: the players' agency and their literacy.

What Ludemes Can and Cannot Do for Media Education: Questions to Ponder

Literacy and agency are central to the emancipatory goals of media education: both as an ideal and as a teaching discipline, they strive to achieve media understanding in terms of reception and production, and promote the active behaviour of citizens when confronted with media issues. Decomposing games into ludemes rather than patterns shifts the focus from the game to the player's reading of it, which means that possibly manipulative components cannot be considered in a one-size-fits-all fashion anymore. It instead acknowledges the situated, changing, and political character of play.[57] Among other things, it implies that different players can achieve diverse levels of literacy regarding manipulative design. As this diversity traces back to the diversity of prior play experiences and personal tastes regarding digital game genres,[58] it forces us to always consider a player's (un)awareness level in relation to specific game sequences and to their own needs as a conscious agent.

If we come back to our case study, using ludemes to decompose the SimCity franchise results in making clear how some aspects of game design can become or *be made* delusive. Using graphemes and acoustemes from a version without in-game payments and transposing them into a model with transactions counteracts the reuse by players of heuristics from previous game experiences. But, in a more positive way, analysing the evolution from the 'loan' ludeme from computer versions, up to the 'transaction' ludeme in the smartphone digital game makes visible *where precisely* manipulation occurs. Educators can indeed show which design elements are modified, added or suppressed to orient players towards actions which they can reprove. Through comparing different versions of a digital game through time, or through retracing the use of similar ludemes among different games, evolutions in game design can be made visible, audible and experienceable. Crossing these analyses with insights in the changing business models within the digital game industry allows learners to grasp these models in a practical, experiential mode. We see this approach as a first step towards educating (especially young) audiences in controversial business models, such as free-to-play offers, not through rejecting them as a whole, but through decomposing their use of already existing material from the overall digital game culture.

57 APPERLEY, T.: *Gaming Rhythms: Play and Counterplay from the Situated to the Global*. Amsterdam : Institute of Network Cultures, 2010, p. 11-28.

58 ZAGAL, J. P.: *Ludoliteracy: Designing, understanding, and supporting games education*. Pittsburgh : ETC Press, 2010, p. 116.

This kind of analytical, deconstructive view helps learners to identify points of attention for themselves, and to make informed and precise choices when playing games containing possibly delusive elements. If players can operate so – and we do think that they can, if properly informed –, then it seems that not only the noun 'patterns' must be put into question in an educational context, but also the adjective 'dark'. As a matter of fact, darkness can be dissipated through literacy, and is thus more a reception effect than a defining feature of the ludemes. Among the attempts to redefine the concept,[59] we want to suggest building upon A. Terp, P. Graßl, and H. Schraffenberger's idea of 'reflective patterns': if these "appeal to the user's reflexive ability",[60] then it is possible to think of *non-reflective* patterns, formulated in a way that discourages or hinders reflexion. Thinking of non-reflexivity as an obstacle which can be analysed and surpassed, speaks for an educational approach to digital games, calling for a pedagogical view, didactical methods, and literacy goals. Yet, as Hansen himself points out, the essence of ludemes lies in learning principles: they provide anchor points within the constitutive uncertainty of playing games, allowing players to think of plausible hypotheses for a successful interaction with the game system. These presumptions then can be tested through trial-and-error processes.[61] Hansen only briefly introduces the operators of the learning-through-ludemes, but his sketch can already inspire media educators, who can rely on this method when designing content aiming at reinforcing digital game literacy.

Taking into account previous work from Zagal, these educators should avoid any artificial reduction of this variety of experiences, and try not to "describe [...] judgmentally rather than analytically" by "assum[ing] that people experience a game the same way they do".[62] Raising literacy generally among players is a good thing if it goes together with valuing their agency. In recognizing that playing digital games is playing with the signs of which they consist, our approach wants to look not only at the continuum between 'awareness' and 'unawareness' of a problematic property of a game, but also at that between 'unwillingness' and 'willingness' to expose oneself to it. The oscillation of the player along both axes explains better why some players deliberately find pleasure in engaging in processes designed to make them spend time and money, although they recognize them as such. Re-establishing players' agency paves the way for educational approaches in which they are considered as participants of their own literacy acquisition: by making them rely on their own prior knowledge and valuing it, we can provide them with the tools for analysing new gaming experiences, as well as with the feeling of competency in this enterprise.

For this to happen, two major research perspectives yet need to be explored. On a theoretical level, the ludemic framework, still young and incomplete, must be reinforced, for example by systematically harvesting the ludemic lexicon of a huge variety of games, or through identifying which other interpretative elements than ludemes, as we mentioned earlier, are recruited when players gauge a new game. On the practical side, the theoretical model of learning through ludemes must be tested. This can happen empirically, through in-situation observation of players confronted with games that they do not know, as well as through

59 Remark by the authors: Researchers from Gam(e)(a)ble, the project in which we participate, are pursuing this goal as well, because "unravel[ling] the design complexity of gambling in games" and "address gaps in prevention, early intervention and social assistance" implies to define precisely which gambling mechanics can be described as delusive and/or harmful, and how this negative potential can be avoided or overcome.; See: *Why Gam(e)(a)ble?*. [online]. [2021-05-17]. Available at: <www.gameable.info>.

60 TERPSTRA, A., GRASSL, P., SCHRAFFENBERGER, H.: Think before you click: how reflective patterns contribute to privacy. In *What Can CHI Do About Dark Patterns? CHI Workshop – May 8, 2021*. New York : ACM, 2021, p. 2. [online]. [2021-05-17]. Available at: <https://darkpatternsindesign.com/position-papers/>.

61 HANSEN, D.: *Morphologie du médium vidéoludique : Le ludème envisagé comme unité minimale fonctionnelle du jeu vidéo*. [Master's Thesis]. Liège : Département de Langues, Lettres et Traductologie, University of Liège, 2019, p. 89.

62 ZAGAL, J. P.: *Ludoliteracy: Designing, understanding, and supporting games education*. Pittsburgh : ETC Press, 2010, p. 116.

intervention studies to measure the possible literacy gains of a sensibilisation to ludemic game analysis. Next to these complete but time-intensive perspectives, more pragmatic methods already common in game studies can be applied: playing at different levels of expertise or adopting several playing styles;[63] letting different coders analyse the same game and complement the gained insights with document analysis of meta texts of the game in question;[64] or conceptualizing players as semiotic systems in themselves,[65] while taking care of establishing different models taking into account diverse kinds of situated play.

Regardless of the epistemological lens(es) that are adopted, a methodology needs to be established that enables us to operationalize the shifts of meaning that can occur when a ludeme is being recontextualized through player activity. Specifically, a game analysis method should be elaborated that facilitates the investigation of three processes of re-contextualization: Firstly, re-contextualization within the same game. It is possible that the first time players encounter a dark element (for instance a loot box) they are tempted (by its graphic design in the case of a grapheme) to take the bait. As the game progresses, though, players might become more aware of the statistics underlying this loot box and about the added value of its rewards in the overall game. Players may become more ludo-literate through experience, and accordingly develop different interactions towards a dark design element, as such effectively reinterpreting it.

Secondly, re-contextualization across games. While certain dark design elements can be transferred from one game to another, in this process their acoustic, mechanical and graphic characteristics do not remain identical to the original, and their 'dark' properties may be altered as well. An interesting case in point is again the example of the loot box. While originally developed in the context of casino-style gambling games, loot boxes have now become part of the universe of a broad range of genres, where there exist more diverse and heterogeneous possibilities for their contextualization. For instance, in the currently highly popular title *Genshin Impact*[66], the odds of obtaining an item from a loot box are no longer completely randomized, but are partly based upon a player's previous achievements. As such, the loot box simultaneously operates as a balancing mechanic, levelling the playing field between more and less experienced players, which leaves the question whether or not its 'dark' nature is the same as in its original conception.

But we should not forget about recontextualization outside the magic circle. Lastly, as was shown in the context of monetary and social patterns, the characteristics of dark game elements are often dependent on how they are implemented in third party platforms such as Steam or Facebook. It is a well-known case, for instance, that Steam has recently modified its policy of enabling financial transactions between players, making it more difficult to buy or sell game avatars. This means that the monetary pattern attached to certain grinding mechanics is effectively altered. Subsequently, we notice that gaming communities start to set up their own servers where such transactions are made possible again.[67] This shows that a continuous process of recontextualization occurs, based on practices outside the game realm (and thus partly outside the control of the developers).

63 AARSETH, E.: Playing Research: Methodological approaches to game analysis. In MILES, A. (ed.): *Proceedings of the 5th Digital Arts & Culture Conference (MelbourneDAC 2003)*. Melbourne : RMIT University, 2003, p. 2-6. [online]. [2021-05-24]. Available at: <http://www.bendevane.com/VTA2012/herrstubbz/wp-content/uploads/2012/01/02.GameApproaches2.pdf>.

64 MALLIET, S.: Adapting the principles of ludology to the method of video game content analysis. In *Game Studies*, 2007, Vol. 7, No. 1. [online]. [2021-05-24]. Available at: <http://www.gamestudies.org/0701/articles/malliet>.

65 For more information, see: KÜCKLICH, J.: Perspectives of Computer Game Philology. In *Game Studies*, 2003, Vol. 3, No. 1. [online]. [2021-05-24]. Available at: <http://gamestudies.org/0301/kucklich/>.

66 MIHOYO: *Genshin Impact*. [digital game]. Shanghai : MiHoYo, 2012.

67 For more information, see: THORHAUGE, A. M., NIELSEN, R. K. L.: Epic, Steam, and the role of skin-betting in game (platform) economies. In *Journal of Consumer Culture*, 2021, Vol. 21, No. 1, p. 52-67.

We finally want to draw attention to another debate regarding the term 'dark patterns', which has very recently emerged at a number of conferences and informal communication channels. In this case not the use of the concept of 'patterns' is being criticized (as was the main line of thought of the current paper), but additionally it is being argued that the term 'dark' should be abandoned, in favour of a term that does not carry any ethnic connotation, in an attempt to decolonize the academic discourse. Although at the moment it is difficult to predict which this alternative term should be, a number of authors have begun using the concept of reflectivity in order to refer to the presence or absence of player deception.[68] In conclusion, we state that the ludeme approach have a lot of potential to tackle a number of terminological, conceptual and methodological difficulties surrounding the investigation of dark design in digital games. While it offers a more flexible method to grasp the subtleties of this phenomenon, we notice, though, that a refinement of our conceptual tools is required. We hope that, in bringing up these issues we have established a first step towards the development of such a refined instrument and contributed to a constructive debate on how this can be effectuated.

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68 For more information, see: TERPSTRA, A., GRASSL, P., SCHRAFFENBERGER, H.: Think before you click: how reflective patterns contribute to privacy. In *What Can CHI Do About Dark Patterns? CHI Workshop – May 8, 2021*. New York : ACM, 2021, p. 1-6. [online]. [2021-05-17]. Available at: <https://darkpatternsindesign.com/position-papers/>.

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Motivation with Game Elements in Education Mediated by E-Learning Resources

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ABSTRACT:
We present a report from our preliminary research, which focused on the possibilities of implementing game elements into e-learning at university. We were interested in the attitudes and preferences of the students on the introductory course for the study of culture, where a questionnaire survey was conducted. We asked students what potential they see in the application of digital technologies in e-learning, what motivates them to study online and what advantages and limits of the educational principles of games they see in e-learning. Here we offer a description of the preliminary results that led to our next research steps. The questionnaire was distributed among students of two runs of the Introduction to the Study of Culture course at the Faculty of Social Studies of Masaryk University, who completed it after the final test. A total of 188 students submitted a completed form. These were bachelor students, usually in the first year of study, mostly women. We chose a freely available online tool for the analysis, our approach to data processing was non-mathematical at this stage. Nevertheless, we believe that it has enabled us to gain a direct and unmediated insight into the subject of our research. Mixed methods pragmatic rationalization of the research process traditionally refers to the complementarity of datasets and greater validity. Based on the findings, we recommend to educators and developers of the online learning environment how they could improve the design of e-learning in accordance with the needs and different learning styles of students.

KEY WORDS:
digital games, e-learning, flow, game-based educational principles, gamification, learning objectives, motivation and self-determination theory, online learning systems, teaching model.

Introduction

Universities are pioneers of e-learning but the process of teaching and learning online has been innovated only partially. This study suggests a shift from the instructive (linear or passive) approach to game-based teaching. It aims to uncover what place games hold in schooling, how they affect people and what students take away from them. The aim is to find out what potential students see in the application of game principles in e-learning, and thus recognize the possibilities and limits of their implementation from the perspective of key participants in the education process. This work researches and analyses new opportunities that modern information and communication technologies open up in the field of education and lifelong learning. Educators possessing knowledge on how to direct the transmission of information in class can design e-courses accordingly, so they can exploit digital games' inherent educational potential in teaching mediated by e-learning resources. Based on the findings, we offer recommendations about how to achieve a qualitative change in online learning.

The idea of the role of the teacher as a designer of online learning leads us to the fact that in order to have a holistic understanding of the educational process, it is necessary to know the attitudes of its key participants, i.e. not only educators and e-learning experts, but also students themselves. With the intention of a deeper understanding of the given issue, we conducted a questionnaire survey as part of the preliminary research

among students to better understand their preferences in relation to an alternative teaching model based on educational game principles. In this study, we focus on gamification in an educational context. First, we should better explore how interaction with a gamified system can develop in education, than address the question of whether gamification works. As such, our contribution provides guidance for researchers, educators, designers and software developers in building a new generation of gamified systems that reflect both theory-based and empirical design.

Theoretical Frame

Satisfaction of e-learning users depends on their having good experiences. Research of users of the online learning environment focuses on understanding their behaviour, needs and motivation through interviews, analysis of surveys and other methods of feedback. Studies of the motivational potential of educational game principles are still somewhat limited by the development of learning systems. However, it is necessary to start gaining insight into the preferences and needs of key participants in the online learning process in order to contribute to the development of e-learning, not only at Masaryk University but elsewhere. We hope to provide educators with the inspiration to create an e-course and developers with the incentives to expand the functions of the online learning systems.

User Experience from E-learning

With e-learning, universities strive to achieve goals and effects, such as a high degree of satisfaction, motivation, efficiency and performance of students. Research on information systems clearly shows that user satisfaction is one of the most important factors in evaluating the success of system implementation.[1] However, we do not have enough knowledge about why people stop learning online after their initial experience with e-learning.[2] There are several reasons for the poor performance, efficiency, satisfaction and motivation of students in e-learning, some of which are: poorly managed projects ignoring the main stages of e-learning development (i.e., analysis, planning, development, implementation and evaluation), use of inappropriate motivational techniques, insufficient technical and technological implementation of e-learning, improperly selected staff, incorrect data on demographic and other characteristics of students and poor graphical interfaces.[3] Insufficient analysis of the user profile, inappropriate design methods and gamification schemes that are too simple can lead to applications not achieving the expected results.[4]

1 DELON, W., McLEAN, E.: Information Systems Success: The Quest for the Dependent Variable. In *Information Systems Research*, 1992, Vol. 3, No. 1, p. 61-94.
2 SUN, P. C. et al.: What Drives a Successful E-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction. In *Computers & Education*, 2008, Vol. 50, No. 4, p. 1184-1201.
3 URH, M. et al.: The Model for Introduction of Gamification into E-Learning in Higher Education. In *Procedia – Social and Behavioral Sciences*, 2015, Vol. 197, No. 1, p. 389.
4 PEDREIRA, O. et al.: Gamification in Software Engineering – A Systematic Mapping. In *Information and Software Technology*, 2015, Vol. 57, No. 1, p. 158-167.

According to P. J. Shea, A. Pickett and W. E. Pelz, an effective online learning environment should support: contact between students and faculty members, reciprocity and cooperation between students, quick feedback, time to task, active learning techniques, communication of high expectations and respect for the diversity and learning patterns of each student.[5] There are recommendations for teachers and institutions to organize the content in the instructions for the platform: quick and positive feedback, adapting tasks to skill levels, experimenting and repeating tasks, the main task is divided into smaller subtasks, different paths to the goal, the use of different game mechanics and encouraging activities despite current failures. The main goal of e-learning, i.e., high performance, efficiency, commitment, satisfaction and motivation of students, could be achieved using game mechanics and gamification.[6]

Urh et al. proposed an e-learning model introducing gamification into higher education adapted to the characteristics of users. It consists of the following elements: administration of important factors of e-learning, elements of user experience, development phases, game mechanics, game dynamics, and gamification elements in e-learning and their effects on students. "Proper management of e-learning means organizing, planning, staffing, leading and managing all important elements of e-learning". The authors include pedagogical, technological, design, administrative, human, financial and gamification elements.[7] Gamification emphasizes the visible display of goals that motivate students. It must be clear to them what they will gain through e-learning and how this knowledge can be put into practice. The main goal of e-learning should be divided into smaller tasks, which are easier and can gradually result in increased motivation and satisfaction. "The progress and current status of student activities must be clearly displayed graphically. The feeling of progress provides students with motivation for further work. The balance of study materials and students' abilities can lead to a state of *flow*, which is the most effective and rewarding way of learning". M. Urh et al. further recommend that any student success that results from the activities be appropriately rewarded in the form of positive feedback. "Positive feedback as a basis for gamification increases users' self-confidence and motivation". The purpose of gamification in e-learning is to encourage students to continue working despite failure.[8]

To design an e-learning model with gamification elements, we must know who our users are and what their needs are. "Gamification must be integrated into the model in a way that reinforces students' understanding of the importance of education for their future. By gamification, we can connect students' personal goals with those of e-learning, which should be clear and unambiguous. The goals of e-learning must be presented very precisely, as well as the rules, guidelines, time frames, requirements and its limitations". E-learning evaluation is the process of setting the achieved goals of e-learning. "Through evaluation, we obtain information about student satisfaction, motivation, performance and effectiveness. Generally speaking, e-learning is a type of web application and usability is a very important element of web applications". According to Nielsen, usability can be defined using five components: learnability, usefulness, memorability, error rate, and satisfaction.[9]

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5 SHEA, P. J., PICKETT, A. M., PELZ, W. E.: A Follow-Up Investigation of Teaching Presence in the SUNY Learning Network. In *Journal of Asynchronous Learning Networks*, 2003, Vol. 7, No. 2, p. 62-79.

6 LEE, J., HAMMER, J.: Gamification in Education: What, How, Why Bother?. In *Academic Exchange Quarterly*, 2011, Vol. 15, No. 2, p. 2-4.; SIMÕES, J., REDONDO, R. D., VILAS, A. F.: A Social Gamification Framework for a K-6 Learning Platform. In *Computers in Human Behavior*, 2013, Vol. 29, No. 2, p. 346-352.

7 URH, M. et al.: The Model for Introduction of Gamification into E-Learning in Higher Education. In *Procedia – Social and Behavioral Sciences*, 2015, Vol. 197, No. 1, p. 391-392.

8 Ibidem, p. 394-395.

9 NIELSEN, J.: *Usability 101: Introduction to Usability*. Released on 3rd January 2012. [online]. [2021-05-31]. Available at: <http://www.nngroup.com/articles/usability-101-introduction-to-usability/>.

Game-based Learning

We describe digital games in terms of their interactivity – they constantly provide feedback, either as scores or as changes in the virtual world, so that players can monitor their progress towards the goal.[10] They are based on a set of agreed rules and constraints,[11] aimed at a clear goal that is often set by the challenge.[12] Immediate feedback provides players with information about the correctness of their actions and decisions.[13] According to K. Maroney, games can be defined as a "game form with goals and structure".[14] T. K. Grünberg defines a game as a system based on rules specifying what is in it, how everything behaves and how players can communicate with the game world. He talks about game mechanics, which are factors, objects, elements and their relationships in the game. The dynamics of the game are the emergent behaviour that arises from the game when the mechanics are put into operation. Aesthetics is the emotional reaction of players to the game.[15] Well-known elements of game mechanics are: points, levels, badges, achievements, virtual goods, leader boards and virtual gifts. Some elements of game dynamics are: rewards, status, competition, self-expression, etc.[16] Digital games also include competitive activity, but it is not their defining characteristic as along with the narrative or story development in a game.[17]

The term game-based learning or game-based education is defined as the use of digital game as a resource to support a teacher who uses a framework of game rules for a specific learning purpose.[18] A clear framework of rules given by the digital system makes the game, where the player must get acquainted with these rules and accept them during the game itself.[19] Among the principles of engagement and immersion in the education process online, R. Conrad and A. Donaldson include learning by solving problems in a group together with constructivist principles of acquiring and creating one's own knowledge.[20] It is the direct involvement of students in decision-making processes and learning from the consequences of these decisions; exploring various aspects of the problem in a secure environment that relate to the real world; acquiring knowledge from a new perspective; setting goals and tasks, role playing, etc. In addition, digital games simulate tasks in such a way that their execution in the game involves the same cognitive processes

10 See also: PRENSKY, M.: *Digital Game-Based Learning*. New York : McGraw-Hill, 2011.

11 GARRIS, R., AHLERS, R., DRISKELL, J. E.: Games, Motivation, and Learning: A Research and Practice Model. In *Simulation & Gaming*, 2002, Vol. 33, No. 4, p. 442-466.

12 MALONE, T. W.: Toward a Theory of Intrinsically Motivating Instruction. In *Cognitive Science*, 1981, Vol. 5, No. 4, p. 334-368.

13 CAMERON, B., DWYER, F.: The Effect of Online Gaming, Cognition and Feedback Type in Facilitating Delayed Achievement of Different Learning Objectives. In *Journal of Interactive Learning Research*, 2005, Vol. 16, No. 3, p. 244-257.; MORENO, R., MAYER, R. E.: Role of Guidance, Reflection, and Interactivity in an Agent-Based Multimedia Game. In *Journal of Educational Psychology*, 2005, Vol. 97, No. 1, p. 118-127.

14 MARONEY, K.: *My Entire Waking Life*. 2001. [online]. [2021-05-31]. Available at: <http://www.thegamesjournal.com/articles/MyEntireWakingLife.shtml>.

15 GRÜNBERG, T. K.: *What's the Difference between Game Mechanics and Game Dynamics?*. [online]. [2021-05-31]. Available at: <http://www.quora.com/Whats-the-difference-between-game-mechanics-and-game-dynamics>.

16 *Gamification 101: An Introduction to the Use of Game Dynamics to Influence Behaviour*. 2010. [online]. [2021-05-31]. Available at: <http://jndglobal.com/wp-content/uploads/2011/05/gamification1011.pdf>.

17 WOUTERS, P. et al.: A Meta-Analysis of the Cognitive and Motivational Effects of Serious Games. In *Journal of Educational Psychology*, 2013, Vol. 105, No. 2, p. 250.

18 For more information, see: PRENSKY, M.: *Digital Game-Based Learning*. New York : McGraw-Hill, 2011.

19 See also: WASTIAU, P., KEARNEY, C., BERGHE, W.: *How Are Digital Games Used in Schools? Complete Results of the Study*. Brussels : European Schoolnet, 2009. [online]. [2021-05-31]. Available at: <http://games.eun.org/upload/gis-full_report_en.pdf>.

20 See: CONRAD, R., DONALDSON, A. J.: *Engaging the Online Learner: Activities and Resources for Creative Instruction*. San Francisco : Jossey-Bass, 2004.

that are needed to perform tasks in the real world.[21] T. W. Malone considers challenge, curiosity and imagination to be the most important factors that make playing a digital game intrinsically motivating.[22] Two essential factors related to digital games, autonomy (choice) and competence (the challenge is experienced as challenging but not too difficult, see the concept of flow), come from the theory of self-determination and are known to positively influence motivation.[23]

Gee's Typology of Learning Principles in Games

Digital games more or less successfully apply functional learning principles, J. P. Gee argues that digital games are quite intricate learning experiences that have a great deal to teach us about how learning and literacy are changing in the modern world. Considering how the games are designed and how they are played, the author outlines several learning principles that are built into 'good' digital games, principles supported by current research on human learning in cognitive science.[24] Widening the scope of this argument through examples, Gee compares learning and literacy in digital games to the functioning of both effective and non-effective classrooms (and e-courses in our context). For him digital games are the forerunners of instructional tools that will determine how we learn in the future.

We understand the learning principles of games applied in e-learning as a way of satisfying the basic psychological needs of autonomy, competence and relatedness according to self-determination theory.[25] Autonomy in e-learning is supported by such principles as active, critical learning, meta-level thinking, identity formation, the ability to choose from several pathways, to explore and discover. Competence can be strengthened by self-reflection from feedback, trial and error in a safe environment that does not unnecessarily frustrate or bore users because they are in their "regime of competence" or in the flow channel,[26] which allows students to achieve reasonable learning outcomes, which are appropriately rewarded, then repeat basic lessons, gradually add to what they already know and solve more complex problems by generalizing previous solutions, transferring this experience to more difficult cases and to real life. We attribute the need for relatedness to the principles of distributed knowledge in the study group and their dispersal outside of it, the distinction between insider-outsider knowledge, the positioning of meanings within affinity groups sharing cultural models of the world and education, as well as to team play, simulation of work scenarios, and role playing in projects. Students' participation

21 TOBIAS, S. et al.: Review of Research on Computer Games. In TOBIAS, S., FLETCHER, J. D. (eds.): *Computer Games and Instruction*. Charlotte : Information Age, 2011, p. 128-220.; SITZMANN, T.: A Meta-Analytic Examination of the Instructional Effectiveness of Computer-Based Simulation Games. In *Personnel Psychology*, 2011, Vol. 64, No. 2, p. 490-527.

22 MALONE, T. W.: Toward a Theory of Intrinsically Motivating Instruction. In *Cognitive Science*, 1981, Vol. 5, No. 4, p. 334-368.

23 PRZYBYLSKI, A. K., RIGBY, C. S., RYAN, R. M.: A Motivational Model of Video Game Engagement. In *Review of General Psychology*, 2010, Vol. 14, No. 2, p. 155-166.; RYAN, R. M., RIGBY, C. S., PRZYBYLSKI, A.: The Motivational Pull of Video Games: A Self-Determination Theory Approach. In *Motivation and Emotion*, 2006, Vol. 30, No. 4, p. 348-364.

24 For more information, see: GEE, J. P.: *What Video Games Have to Teach Us about Learning and Literacy*. New York : Palgrave, 2003.

25 See also: REEVE, J.: Self-Determination Theory Applied to Educational Settings. In DECI, E. L., RYAN, R. M. (eds.): *Handbook of Self-Determination Research*. Rochester : University of Rochester Press, 2004, p. 2-183.

26 See: CSÍKSZENTMIHÁLYI, M.: *Flow: The Psychology of Optimal Experience*. New York : Harper and Row, 1990.

in groups, for example on social networks, has proved its worth, and at the same time they do not feel supervised. They gather there because people in their circle have the same problems, interests and responsibilities, groups support them and offer them a sense of belonging. The educational objective is the transfer of experience into real work. Thus in the hands of a modern educator, there are new opportunities for designing e-learning experiences.

Learner-centered Psychological Principles

The American Psychological Association proposed several learner-centreed psychological principles focusing on factors that are primarily internal to and under the control of the learner. The principles also acknowledge the external environment or contextual factors that interact with these internal factors and are divided into those referring to cognitive and metacognitive, motivational and affective, developmental and social, and individual difference factors influencing learners and learning. They are intended to apply to all learners involved in the educational system. For the purpose of the study, we focus on motivational factors.[27] They are: 1) motivational and emotional effects on learning (what and how much is learned is influenced by motivation); 2) intrinsic motivation to learn (pupil creativity, higher order thinking, and natural curiosity contribute to motivation to learn); 3) effects of motivation on effort (acquiring complex knowledge and skills requires student effort and guided practice).

Flow

A playfully conceived design of e-courses should ideally correspond to the state of flow, which was described by M. Csikszentmihályi.[28] It is a term used in positive psychology where it relates to the optimal experience and inner motivation (in contrast to outer motives for behaviour of a person). The author describes flow as the mental state of operation in which a person performing an activity is fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of the activity. True satisfaction is associated with activities that push the boundaries of an individual's skill-set without pushing them *too* far (see Picture 1). A key point of Csikszentmihályi's work is that almost any task or experience can be converted into a flow experience. The use of flow in games helps foster an enjoyable experience which increases motivation and encourages players to continue playing.

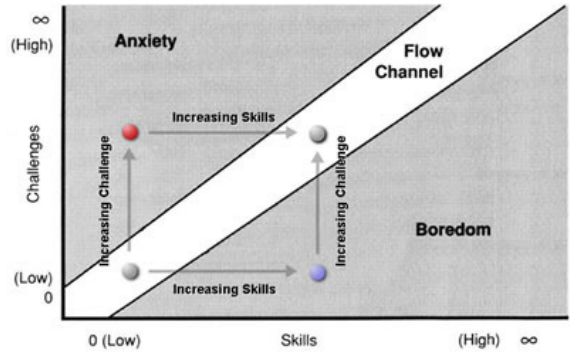
By creating opportunities for feedback and setting achievable goals within a task, it is possible to achieve flow in online instruction, a sport, a game, or even a seemingly boring job.[29] According to S. A. Jackson and R. C. Eklund, flow is an important part of challenging activities, where a person's concentration and abilities are important to achieve

27 *Learner-Centred Psychological Principles: A Framework for School Reform & Redesign.* 1997. [online]. [2021-05-31]. Available at: <http://www.apa.org/ed/governance/bea/learner-centered.pdf>.

28 See also: CSÍKSZENTMIHÁLYI, M.: *Flow: The Psychology of Optimal Experience*. New York : Harper and Row, 1990.

29 VOISKOUNSKY, A. E.: Flow Experience in Cyberspace: Current Studies and Perspectives. In BARAK, A. (ed.): *Psychological Aspects of Cyberspace: Theory, Research, Applications*. New York : Cambridge University Press, 2008, p. 71-100.

the desired results.[30] According to J. McGonigal, the feeling of flow is evoked by four elements that good games have in common: goals, rules, feedback and voluntary participation.[31] Educational design should understand how to achieve it, so that students continue learning. From these motivational principles of games are also derived the motivational outputs of gamification, which are supported by an environment with clear goals, fun challenges that meet the needs of the student and ensure that he or she can choose from the new.



Picture 1: Flow channel

Source: LORINCE, J.: *The Origins of Flow.* Released on 11th September 2012. [online]. [2021-05-31]. Available at: <http://www.motivateplay.com/2012/09/the-origins-of-flow/>.

Game Elements in Education

Gamification is a design technique generally defined as "the use of game design elements in non-game contexts".[32] It uses the motivational elements of games and is increasingly utilized as a possible solution to the dropping levels of motivation observed in learners.[33] The context of a learning environment presupposes clear evaluation rules, scoring, competition, rewards etc. Applications of the gamification approach are based on the need to arouse students' interest in learning and to involve them so that they can have fun, encouraging them to achieve more ambitious goals and comply with the rules. Gamification scenarios can be divided into three categories: dynamics, mechanics and components.[34] Dynamics represents the highest conceptual level in a gamified system. It contains limitations, emotions, narration, progress and relationships. A mechanic is a set of rules dictating the outcome of interactions within a system, while dynamics are

30 JACKSON, S. A., EKLUND, R. C.: Assessing Flow in Physical Activity: The Flow State Scale-2 and Dispositional Flow Scale-2. In *Journal of Sport & Exercise Psychology*, 2002, Vol. 24, No. 2, p. 134-149.

31 For more information, see: McGONIGAL, J.: *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*. 1st Edition. New York : Penguin Press, 2011.

32 DETERDING, S. et al.: From Game Design Elements to Gamefulness: Defining "Gamification". In LUGMAYR, A. (ed.): *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*. New York : ACM, 2011, p. 10-14.

33 BUSSE, V., WALTER, C.: Foreign Language Learning Motivation in Higher Education: A Longitudinal Study of Motivational Changes and Their Causes. In *Modern Language Journal*, 2013, Vol. 97, No. 2, p. 435.; DARBY, A. et al.: Students' Motivation in Academic Service-Learning over the Course of the Semester. In *College Student Journal*, 2013, Vol. 47, No. 1, p. 185.; LEPPER, M. R., CORPUS, J. H., IYENGAR, S. S.: Intrinsic and Extrinsic Motivational Orientations in the Classroom: Age Differences and Academic Correlates. In *Journal of Educational Psychology*, 2005, Vol. 97, No. 2, p. 185-195.; PAN, Y., GAUVAIN, M.: The Continuity of College Students' Autonomous Learning Motivation and Its Predictors: A 3-Year Longitudinal Study. In *Learning and Individual Differences*, 2012, Vol. 22, No. 1, p. 93-98.

34 See also: WERBACH, K., HUNTER, D.: *For the Win: How Game Thinking Can Revolutionize Your Business*. Philadelphia : Wharton Digital Press, 2012.

responses of users to a set of these mechanics. Mechanics refers to the game elements that drive action forward. These are challenges, coincidences, competition, cooperation, feedback, resource gathering and rewards. The components form the basic level of the gamification process. They include achievements, avatars, badges, collections, content unlocks, progress bars, donations, leader boards, levels, virtual goods, etc. For example, points (components) provide rewards (mechanics) and create the impression of progress (dynamics).

S. Apostol et al. identify eight elements of games that are used to gamify lessons, such as: rules, goals and outcomes, feedback and rewards, problem solving, story, player(s), safe environment, sense of mastery.[35] K. M. Kapp further distinguishes between those qualities that can only lead to a superficial level of student involvement and those that are most valuable for education.[36] The first group consists of those which can only serve as a source of external motivation, such as rewards, points and badges. In addition, S. de Sousa Borges et al. note that "in gamification approaches, these elements are not at the heart of the system, but aim to motivate users to use it".[37] Others make up the story, the challenge, the decision, the sense of control and mastery. Kapp considers it acceptable to give students a sense of autonomy and competence if they voluntarily perform tasks for their own improvement. He believes that "in order for a game to become an effective learning experience, it requires a combination of several elements that make it an effective means of education".[38] Apostol et al. concluded that "the best way for an educational designer or teacher to choose elements of the game is to consider the learning objectives and the desired outcomes of the learning process".[39] The recommendation is linked to the course compilation. Other researchers believe that it is important to use an expanded inventory of techniques that balance external with internal motivators[40] and to design a gamification system that can be adapted to ensure that all students in the classroom can enjoy the benefits of gamification.[41]

Gamification and Motivation

In education in particular, gamification techniques are being welcomed as a promising strategy to enhance motivation[42] which is found to be one of the most important

35 APOSTOL, S., ZAHARESCU, L., ALEXE, I.: Gamification of Learning and Educational Games. In *Conference Proceedings of eLearning and Software for Education*. Bucharest : Carol I, 2013, p. 68-71.

36 For more information, see: KAPP, K. M.: *The Gamification of Learning and Instruction*. Hoboken : Pfeiffer Publishing, 2012.

37 DE SOUSA BORGES, S. et al.: A Systematic Mapping on Gamification Applied to Education. In CHO Y., SHIN, S. Y. (eds.): *Proceedings of the 29th Annual ACM Symposium on Applied Computing.* New York : ACM, 2014, p. 217.

38 KAPP, K. M.: *The Gamification of Learning and Instruction*. Hoboken : Pfeiffer Publishing, 2012, p. 50; 98.

39 APOSTOL, S., ZAHARESCU, L., ALEXE, I.: Gamification of Learning and Educational Games. In *Conference Proceedings of eLearning and Software for Education*. Bucharest : Carol I, 2013, p. 68-69.

40 DICHEV, C. et al.: From Gamification to Gameful Design and Gameful Experience in Learning. In *Cybernetics and Information Technologies*, 2014, Vol. 14, No. 4, p. 81-99.

41 HAMARI, J.: Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian P2P Trading Service. In *Electronic Commerce Research and Applications*, 2013, Vol. 12, No. 4, p. 237-244.; HAMARI, J., KOIVISTO, J.: Social Motivations to Use Gamification: An Empirical Study of Gamifying Exercise. In AVITAL, M., LEIMEISTER, J. M., SCHULTZE, U. (eds.): *Proceedings of 21st European Conference on Information Systems*. Utrecht : AIS, 2013, p. 2-11.; EICKHOFF, C., HARRIS, C. G., VRIES, A. P.: Quality through Flow and Immersion: Gamifying Crowdsourced Relevance Assessments. In HERSH, W., CALLAN, J., MAAREK, Y., SANDERSON, M. (eds.): *Proceedings of the 35th International ACM SIGIR Conference on Research & Development in Information Retrieval*. New York : ACM, 2012, p. 872-879.

42 RAMIREZ, D., SQUIRE, K.: Gamification and Learning. In WALZ, S. P., DETERDING, S. (eds.): *The Gameful World. Approaches, Issues, Applications*. Cambridge : The MIT Press, 2015, p. 630-651.

determinants of educational success.[43] Motivation describes the psychological processes that direct and energize behaviour.[44] It is motivation that steers people's actions; as such being one of the essential driving factors of the effort learners put into study activities.[45] When designing gamified systems, this requires a user-centreed approach, characterized by a focus on the needs and wishes of students. "Because digital games are specifically designed for entertainment, they can create states of desired experiences [similar to flow] and motivate users to stay in activities of unparalleled intensity and duration".[46] Studying online usually requires stronger motivation, which makes it a promising area for gamification. Only when they make boring activities interesting can the game elements increase the level of inner motivation. There is an indirect relationship between rewards and intrinsic motivation. Gamification focuses on external motivators, and its effects on motivation are not the same for all in the class.[47] There is a broad consensus on the need to adapt gamified learning and consider how gamification affects different students and what the effects of gamification are on the different personality profiles that make up a class.[48]

The effects of gamification are highly dependent on the users who use the gamified systems. Experience from practice emphasizes equal access to students and the possibility of adapting the system to their learning styles. Game elements are easy to implement, as they resemble the traditional classroom assessment model, which often leads to their overuse, which is not justified by learning objectives. One of the goals is to increase student involvement. Engagement can be defined as student attention and immersion in the task.

Gamified Systems and Meeting User Needs

Gamified systems that provide feelings of autonomy, competence and belonging are likely to strengthen students' autonomous motivation, both by causing and explaining the pleasant, motivating and engaging experiences earned within them.[49] For the same reason, any "future intervention effort that seeks to take advantage of the motivational pull of video games should effectively include gameplay features that have the potential to increase satisfaction".[50] According to R. van Roy and B. Zaman, "the design practice

43 ABRAMOVICH, S., SCHUNN, C., HIGASHI, R. M.: Are Badges Useful in Education? It Depends upon the Type of Badge and Expertise of Learner. In *Educational Technology Research and Development*, 2013, Vol. 61, No. 2, p. 218-231.; BUCKLEY, P., DOYLE, E.: Gamification and Student Motivation. In *Interactive Learning Environments*, 2014, Vol. 22, No. 6, p. 2-13.; TAYLOR, G. et al.: A Self-Determination Theory Approach to Predicting School Achievement over Time: The Unique Role of Intrinsic Motivation. In *Contemporary Educational Psychology*, 2014, Vol. 39, No. 4, p. 342.

44 See also: REEVE, J.: Self-Determination Theory Applied to Educational Settings. In DECI, E. L., RYAN, R. M. (eds.): *Handbook of Self-Determination Research*. Rochester : University of Rochester Press, 2004, p. 3-182.

45 VAN ROY, R., ZAMAN, B.: Why Gamification Fails in Education and How to Make It Successful: Introducing Nine Gamification Heuristics Based on Self-Determination Theory. In MA, M., OIKONOMOU, A. (eds.): *Serious Games and Edutainment Applications, Volume II*. Cham : Springer, 2017, p. 488.

46 DICHEV, C., DICHEVA, D.: Gamifying Education: What Is Known, What Is Believed and What Remains Uncertain: A Critical Review. In *International Journal of Educational Technology in Higher Education*, 2017, Vol. 14, No. 9, p. 5; 12.

47 VAN ROY, R., ZAMAN, B.: Why Gamification Fails in Education and How to Make It Successful: Introducing Nine Gamification Heuristics Based on Self-Determination Theory. In MA, M., OIKONOMOU, A. (eds.): *Serious Games and Edutainment Applications, Volume II*. Cham : Springer, 2017, p. 501.

48 BARATA, G. et al.: Identifying Student Types in a Gamified Learning Experience. In KHOSROW-POUR, M. (ed.): *Gamification: Concepts, Methodologies, Tools, and Applications*. Hershey : IGI Global, 2015, p. 542-557.

49 DECI, E. L., RYAN, R. M.: Self-Determination Theory: A Macrotheory of Human Motivation, Development, and Health. In *Canadian Psychology*, 2008, Vol. 49, No. 3, p. 183-184.

50 PENG, W. et al.: Need Satisfaction Supportive Game Features as Motivational Determinants: An Experimental Study of a Self-Determination Theory Guided Exergame. In *Media Psychology*, 2012, Vol. 15, No. 2, p. 192.

of gamified systems generally shows excessive dependence on external motivational regulations".[51] When designing gamification as an implementation of external regulation, SDT helps us understand unwanted side effects. When students are forced to exert external leverage as a way of managing their learning behaviour, they are more likely to feel diminished autonomy and perform study activities primarily to receive promised external rewards (e.g., bonus points). In such a situation, controlled motivation can undermine any pre-existing autonomous motivation.[52] Students can then begin to attribute their motivation to added external regulations that reduce or even eliminate any initial, internal motivation. As a result, feelings of autonomy can be further reduced, which at the same time reduces any internal impulse, so that the student's motivation eventually changes from one's own to a controlled motivation.[53]

When originally external motivational stimuli appeal to the basic psychological needs of the participant, external regulations are thoroughly internalized all the more so, which leads to autonomous motivation. External regulation, and by broadening the scope also the typical implementation of gamification, has the potential to intensify feelings of autonomous motivation, provided that people perceive them as desirable for their psychological needs. In the educational context, it is associated with various positive educational consequences, such as improved grades and a better understanding of the subject materials.[54] In addition to remuneration and feedback, gamified systems should provide a secure learning environment where students can gain experience without being judged or punished for failure.[55]

Methodology

The chapter reveals our research strategy influenced by specific features and assumptions of mixed research design, which was, due to the holistic nature of our research subject, considered to be the most appropriate for two-way interaction between students and their teachers. Here we publish the results of a questionnaire survey completed by students, which preceded interviews with educators and guided us in our subsequent questioning. A detailed analysis is an impetus for a qualitatively deeper elaboration of the theoretical challenges of game studies, pedagogy, sociology, psychology and computer science, which are generally associated with teaching and learning in e-courses. The research design of the user-centered study thus utilises questionnaire surveys among students.

51 VAN ROY, R., ZAMAN, B.: Why Gamification Fails in Education and How to Make It Successful: Introducing Nine Gamification Heuristics Based on Self-Determination Theory. In MA, M., OIKONOMOU, A. (eds.): *Serious Games and Edutainment Applications, Volume II*. Cham : Springer, 2017, p. 495.

52 CAMERON, B., DWYER, F.: The Effect of Online Gaming, Cognition and Feedback Type in Facilitating Delayed Achievement of Different Learning Objectives. In *Journal of Interactive Learning Research*, 2005, Vol. 16, No. 3, p. 244-257.; FILSECKER, M., HICKEY, D. T.: A Multilevel Analysis of the Effects of External Rewards on Elementary Students' Motivation, Engagement and Learning in an Educational Game. In *Computers & Education*, 2014, Vol. 75, No. 1, p. 137-147.

53 GLOVER, I.: Play as You Learn: Gamification as a Technique for Motivating Learners. In HERRINGTON, J., COUROS, A., IRVINE, V. (eds.): *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013*. Chesapeake : AACE, 2013, p. 2000-2007.; TOHIDI, H., JABBARI, M. M.: The Effects of Motivation in Education. In *Procedia – Social and Behavioral Sciences*, 2012, Vol. 31, No. 1, p. 821-823.

54 DECI, E. L., RYAN, R. M.: Self-Determination Theory. In WRIGHT, J. D. (ed.): *International Encyclopedia of the Social & Behavioral Sciences*. 2nd Edition. Amsterdam : Elsevier, p. 486.; RYAN, R. M., DECI, E. L.: Promoting Self-Determined School Engagement. Motivation, Learning, and Well-Being. In WENTZEL, K., WIGFIELD, A., MIELE, D. (eds.): *Handbook of Motivation at School*. New York : Routledge, 2009, p. 172-195.

55 HAKULINEN, L., AUVINEN, T., KORHONEN, A.: The Effect of Achievement Badges on Students' Behavior: An Empirical Study in a University-Level Computer Science Course. In *International Journal of Emerging Technologies in Learning*, 2015, Vol. 10, No. 1, p. 19-28.; LEHTONEN, T. et al.: On the Role of Gamification and Localization in an Open Online Learning Environment: Javala Experiences. In KINNUNEN, P., SHEARD, J. (eds.): *15th Koli Calling Conference on Computing Education Research*. New York : ACM, 2015, p. 51-58.

The conceptual framework appeared to us as the most suitable for connecting the pedagogical aspect of work with the theory and research goal, question and chosen method. The terms we want to illuminate or substantiate empirically determine what is highlighted. The effort to answer the question about the nature of a certain phenomenon determines from which concepts we draw and with which other concepts they are connected.

A summary of the partial findings from the analysis of the questionnaires will help us to deepen our understanding of the role that game principles can effectively play in teaching. Several thematically similar questions highlight one central category of student motivation towards e-learning. A presentation of the results of the questionnaire survey among students and their subsequent discussion conclude this phase of the research. We want to present the perspectives of key participants in the educational process.

Objective and Research Questions

The main goal was to find out what potential students see in the application of game principles in teaching with an e-learning component and to identify the possibilities and limits of the application of learning game principles in the education process. We also asked what motivates students to study online. In order not to anticipate differences in the perception of this process by its key participants (i.e. students, educators and e-learning experts), we decided to conduct a separate analysis of subject surveys and questionnaires among students, knowing that their results may show some similarities and differences in attitudes and preferences of groups of respondents. However, we publish partial findings separately due to the consistency and sequence of the research process, the inhomogeneous type of data and also due to the lack of space. We discuss the results in the work with selected research conducted in the field of games and education. In our research, we asked the following research questions.

- *What benefits/negatives of educational principles of games do students see in e-learning?*
- *What motivates students to study online?*
- *What educational potential does the application of digital technologies in teaching have from the students' point of view?*

Research Design

We do not primarily achieve the preliminary results using statistical procedures or other methods of quantification, although by simply describing the data from a questionnaire survey among students conducted in the pre-research phase, we create a basis for discussion of the findings before semi-structured interviews with educators and experts in a dominantly qualitative study. Our analytical procedure is therefore non-mathematical in nature. In the preliminary research, we conducted a questionnaire survey among students of the blended learning course Introduction to the Study of Culture. They were bachelors in the first or second year, especially Czechs and Slovaks, while women were most often represented among the course participants. A total of 188 people completed the questionnaire. The questions covered game principles, preferences of students, their

attitudes, learning styles, priorities, etc. J. Hendl states that it is possible to mix different approaches to data collection by including closed questions (e.g., yes/no) and open questions in the questionnaire (what is your opinion on this type of teaching?).[56] We include an analysis of subject surveys and findings from the questionnaire, which serves as a pilot study, in an effort to gradually offer views of both sides of the interactive teaching process. Various aspects of the teaching system or its elements are sequentially examined by different methods and with differently situated respondents in an institutionalized framework of education mediated by e-learning resources.

That some good qualitative research works with simple quantitative measurement tools shows we can doubt the 'qualitative/quantitative' dichotomy. D. Silverman considers most of these dichotomies or polarities in the social sciences to be very dangerous. They are a reason not to have to think about what groups scientists into 'armed camps' unwilling to learn from each other.[57] As M. Hammersley puts it*:* "The process of research in science is the same no matter what method is used, and moving to paradigms effectively blunts discussion and hampers progress".[58]

Data Collection Methods

To collect answers for the questionnaire survey, we used the free online tool Google Forms, which provided us with a clear summary of results, from which we draw when describing the data from the 188 respondents who completed the form. The questionnaire contained both closed and open questions, where students had the opportunity to comment in more detail on some topics. Unless otherwise stated, we work with data from all participants in the preliminary research, i.e. N = 188. For some open one-word answers (e.g., age), we excluded blank fields and expressions such as "I do not wish to mention", "others", "various", "what is possible", "still anonymous?", etc., which lacked analytical value. For example, we quantified the answers from the open question on the preferred teaching methods according to their frequency for the graph. In these cases, we also report a reduced sample size (e.g., N = 100).

For better comprehensibility and reduction of numerical data, we combined some ordinal, semantically close answers by simply expressing the overall inclination, direction of thinking, tendency or position of respondents within a wider range of graded attitudes, e.g., we combine agree "yes" and "rather agree" in the description. We proceed similarly with rather negative or negative answers. When describing the data, we offer the reader qualitative examples, excerpts and quotations, so that they can form their own idea of their content and meaning. We provide a summary of the answers at the end of the section of the analytical chapter devoted to the results of the preliminary research.

Turnover

We sent a call for voluntary completion of the questionnaire to 273 email addresses of students present at the final exam, which took place in the form of a test in the computer

56 HENDL, J.: *Kvalitativní výzkum: Základní teorie, metody a aplikace*. 4th Edition. Prague : Portál, 2016, p. 57.
57 SILVERMAN, D.: Ako robiť kvalitatívny výskum: Praktická príručka. Bratislava : Ikar, 2005, p. 23.
58 HAMMERSLEY, M.: *What´s Wrong with Ethnography? Methodological Explorations*. London, New York : Routledge, 1992, p. 182.

room at the faculty. Students had the opportunity to complete the questionnaire anonymously on a computer on the spot after the test, or from remote access to the network via a link provided in the email. To increase the return, we sent the incentive to participate in the questionnaire survey several times. A total of 188 students from the two spring runs of the ZUR138 Introduction to the Study of Culture course in 2016 and 2017 filled in the electronic form. The return was over two thirds of the classified students, namely 68.9% (an above-average result).

Description of the Target Group

The target group of respondents to the questionnaire consisted of bachelor's degree students at the Department of Media Studies and Journalism of Faculty of Social Studies of Masaryk University, who were mostly in the 1st year (89.4%), the remainder in the second (8.5%) and third year (2.1%). From the few optional answers regarding the age of the respondents and according to their matriculation year, we can roughly estimate that they usually ranged from 18 to 22 years of age when completing the questionnaire. Women make up 69.1% of the research sample, while men make up 30.9% (which, according to the annual reports of the faculty, is given by the gender composition of students in general). Over three quarters of respondents (76.1%) commute to study, mostly from the Czech Republic (85.7%) and the Slovak Republic (13.3%). Almost three-fifths of them (58%) work while studying.

Overcoming the Limits of the Research Approach

Blended research is a research paradigm of educational research where a specific research problem and the need to gather information on it from multiple perspectives justifies the use of blending techniques.[59] Other benefits besides complementarity and expansion include convergence, validation and agreement of results from different methods.[60] Such a rationalization of the process traditionally refers to triangulation and greater validity. Different perspectives generate a more complete and informative picture of what is happening. Such images are more rounded, finer and more valid than those created by a single method.[61] The diversity of perspectives contributes to the balance of the study and its elevation to a higher level. Their combination can also be more useful for practitioners and innovators. The important question is how what we have learned in one context can be used in another. According to Morgan, it is important to assess the factors that affect whether the acquired knowledge can be transferred to another place or to another environment.[62]

59 MERTENS, D. M., HESSE-BIBER, S.: Triangulation and Mixed Methods Research: Provocative Positions. In *Journal of Mixed Methods Research*, 2012, Vol. 6, No. 2, p. 76-78.

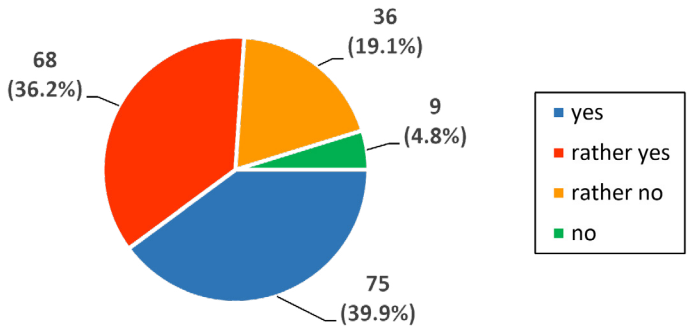
60 GREENE, J. C., CARACELLI, V. J., GRAHAM, W. F.: Toward Conceptual Framework for Mixed-Method Evaluation Designs. In *Educational Evaluation and Policy Analysis*, 1989, Vol. 11, No. 3, p. 256-273.

61 TORRENCE, H.: Triangulation and Mixed Methods Research: Provocative Positions. In *Journal of Mixed Methods Research*, 2012, Vol. 6, No. 2, p. 113.

62 MORGAN, D. L.: Paradigms Lost and Pragmatism Regained: Methodological Implications of Combining Qualitative and Quantitative Methods. In *Journal of Mixed Methods Research*, 2007, Vol. 1, No. 1, p. 49-75.

Results

To reflect our findings from the preliminary research, it is necessary to emphasize the role of the educator, who accompanies students through the study, encourages active, critical thinking, and motivates them to work and learn. We see educational game principles as one of the means to achieve this. However, we cannot do without the internal motivation of students. We see cooperative teaching as a possible way to motivate students. Our findings shed light on students' attitudes to e-learning. According to them, we can conclude that rather than pure frontal teaching (42.6%) or pure e-learning online (5.9%), students prefer a combination of both (51.6%), which corresponds with the definition of blended learning combining full-time teaching in lectures with e-learning support. However, almost three quarters of students (57.5%) would rather welcome a shift to automate their study in terms of formalized, standardized online learning processes along the lines of some foreign universities. In relation to what the e-learning of the course should contain, students spoke in favour of the introduction of a larger number of audio-visual and interactive elements in electronic study materials (63.3% and 75%, respectively). In their opinion, it is also attractive and meaningful (75% and 76.1%, respectively, see Graph 1) to include game elements in e-learning, such as mini-games, quizzes, side quests, trophies, avatars, plus points, levels, bonuses, puzzles, badges, scores, leader boards, team games, social ties, reputation system, etc.



Graph 1: In your opinion, does the involvement of game elements in e-learning make sense?
Source: own processing

- *What benefits/negatives of educational principles of games do students see in e-learning?*

In an open-ended question, students commented on why they did (not) consider game elements in teaching meaningful. The arguments for their introduction conceive of game elements as diversifications of teaching, which can revive, specialize and bring change to the current education system. Students consider game elements to be more fun ("I will always learn through fun rather than reading a script"), a non-directive form of learning that can ease teaching in the sense of Comenius "school by play". According to students, game elements can complement full-time lectures and offer added value, such as bonus points for preparation *"beyond the mandatory framework"*. In addition to the cooperative principles of games, they often mentioned ability to evoke, promote and increase competition among people, which students consider to be an innate quality of humans ("Every person is competitive by nature, if they see their position in the rankings up"). In connection with the effort to achieve a better score, they also talk about the fact

that cleverly designed games would lead them to study repeatedly ("Game elements can make a person re-read the topic to improve their result"). If the teacher promotes competition among students with rewards, they can arouse them for better performance and more frequent preparation. "If these game elements were also a way to 'improve' the final evaluation at the end of the course, they would certainly attract more students". With the help of game principles, it is possible to stimulate students to practice the curriculum.

They also reported being more likely immersed in a game that helps them concentrate on a problem "if the topic is boring". According to them, it is a way to make teaching more attractive, engaging and to keep attention longer. They themselves admit that "sometimes it's hard to keep your attention". Better than "mechanically crushing notes from a sheet" it is more acceptable, "when we enjoy it and when we can be active". Learning through play is an interesting opportunity for them to take an active part and, apparently, by really trying things out and by developing a certain emotional activity, they find it easier to remember the issue. Games allow you to look at things from different angles and think about them in a broader (e.g., historical, socio-cultural) context. "When playing games or performing various tasks, one learns things that one did not intend to learn, and it is often a more effective form of learning than when one tries to learn things, for example by memorizing". Let us present a few responses:

"There are many reasons why people enjoy playing video games, and if we put some of this medium into learning, I think it can have a positive impact when you learn in this form, you don't feel the seriousness, tension and pressure you can experience from classic learning."

"If the game had an idea, was catchy, and at the same time it was able to interpret in some way a substance that we would otherwise have to read from books without understanding, then it would be ideal because it's a fun way to learn".

"Because I enjoy learning more, I'm looking forward to it, I like puzzles. It's a challenge for me".

"I'm a competitive person, and if I saw that I was doing something, I would do it rather than just see the bare results of the work. There are more ways to do something, which is great in the long run".

"It's usually easier for me to remember things with the help of gameplay elements. It also makes us often think about the problem in a broader context".

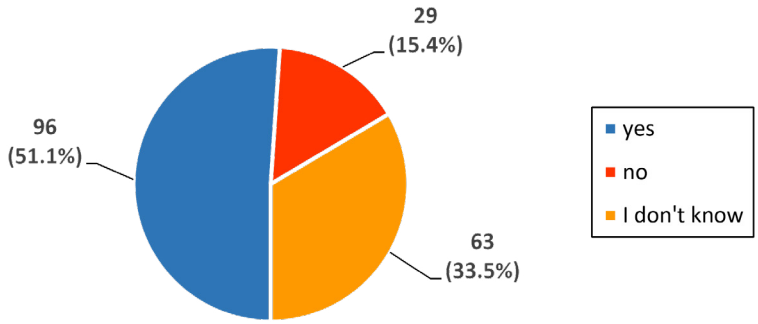
Negative counter-arguments were that competitiveness may not suit everyone. "I don't think competing with each other in terms of learning knowledge will find a sufficient response among students. They prefer to spend their time on 'real' games or other fun/educational activities". Other students do not like to do "group things" for team games or role-playing. Some just do not enjoy playing digital games on a computer on a regular basis and do not think it makes sense in class, they may find it unnecessarily lengthy, distracting, even though they admit it depends on the specific form. One student generally says about games: "They seem unnecessarily simplistic; I like to learn things in context – it helps me remember them better and put them in context faster" Learning in context through situational experience is exactly what well designed educational games should offer.

Thus, there are students who are still not convinced of the benefits of educational game principles in e-learning. For them school is "no birdhouse" and the fun follows only

after duties. “When I learn, I learn and I only care about the quality of the information”. There are also individuals who consider the game elements in teaching to be the “degradation of today”: “Yes, it’s interesting and maybe effective, but books are books”. Other negative attitudes describe gameplay elements as “childish” and “unnecessary” for college students. “They seem childish to me. I’m not studying for the game, but for myself. If I want to learn and have knowledge, I will study. If I don’t want to, some game elements won’t force me”.

- *What motivates students to study online?*

The most frequently mentioned potential of educational game principles is their ability to motivate students. “They would motivate me in the ongoing preparation due to their attractiveness. If I could get any bonus points, compare myself to others, I would only welcome it”. There are those who are more motivated by competitive gaming principles and the reward and balance system can motivate them if they really want to be the best, or at least achieve a satisfactory result for themselves. A significant force in motivating students are various incentives, as one of the respondents says, “it would have to bring me benefits”, by which they mean, for example, points in addition to the final evaluation in order to achieve a better grade. In this way, the educator can motivate students who do not play digital games or have not yet encountered educational game principles in their learning and have no experience with them. For example, if at the end of each interactive syllabus they try a sample test to get a better idea of what to expect in the final one, or practice in the subject matter, it can non-directively help them to prepare regularly and continuously. Our results show that 51.1% of students would be motivated by game elements in this way (see Graph 2).



Graph 2: Would the game elements motivate you to prepare regularly and continuously?
Source: own processing

It is important for them to get feedback on whether they are familiar with the curriculum. Thus, games can prompt more activity, stimulate students’ interest, and help to approach less digestible subject matter. Project and simulation teaching also suitably shows the real conditions of practice, which already during the study form the expectations of students and the certainty with which they will perform their future profession. According to the respondents, team play support team spirit, creativity and group dynamics, where project team members encourage each other to perform best, learn to cooperate and respond to stimuli from others, which is one of the basic skills for the 21st century. “The game draws students more into the education, they have to get involved and, as we know, it arouses one to perform”. It’s a challenge for students. The reward they imagine for quality work and for their study performance at school is also motivating, although everyone

perceives it in different ways, such as their own good feeling (67.6%); credits (66%); or as written feedback and praise from the teacher (55.3%); final grade (52.1%); merit scholarship (37.8%); bonus points (35.1%) or academic degree / diploma (34%).

On the other hand, the student says in the following answer: "If I'm interested in the subject, I'll do it without getting virtual points and trophies, if it doesn't make sense to me, game elements will not motivate me". Results indicate that students are motivated for enrolment in an optional course by subject topics (88.8%), classmates' recommendations (67.6%), difficulty and requirements for completing the course (53.2%) and by teachers (38.3%). See a few reactions bellow:

"I consider the motto 'school by play' long overdue, and if it works, then for preschool children. If someone decides to motivate me with games, they should be quite intelligent and sophisticated, which in 90% of cases they are not and are rather childish and embarrassing. In that case, such a game rather demotivates me".

"I can motivate myself to study and I enjoy it without game elements".

"My experience with 'game elements' is such that it rarely serves its purpose and, in most cases, a fun quiz is not fun, badges/trophies are loose, etc. If the 'game elements' were as described by the teacher/assignment/syllabus, I would certainly be a little more interested and probably motivated".

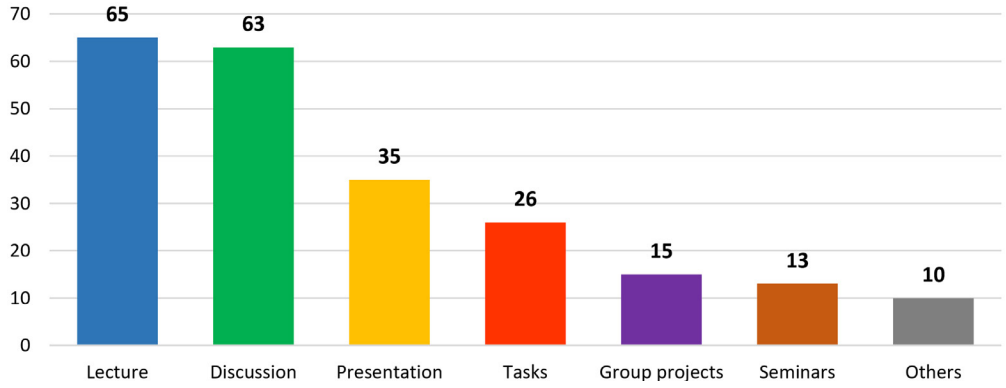
"Although this idea seems interesting, I assume that in college, they are all advanced and intelligent enough not to require such things. Personally, I really like games, but they are only suitable for studying in certain subjects, and especially in the case of journalism, I really can't imagine it".

- *What educational potential does the application of digital technologies in teaching have from the students' point of view?*

Among 188 Bachelor's students in the sample, where women predominated in a ratio of 7:3, most of them almost always use a computer for work and study, just as often as they see fit. They like to work with computers and consider themselves to be relatively experienced users. They most often connect to the Internet from home (or from a private flat or dormitory) and with their mobile device to school and public networks. They mainly use a laptop and a smartphone for this.

The vast majority of students are inclined to believe that using computers in education is an advantage, but it is not necessary in all circumstances. They still prefer printed sources over electronic ones. Classmates often share study materials with each other, for example on social networks, download various other resources from the Internet and modify them as needed. Students' relationships to electronic resources vary between acceptance and rejection. A surprisingly small part of the respondents are motivated to enrol in the course by the availability of study materials (8.5%), the form of e-learning of the full-time course (4.3%) or its teaching methods (26.6%).[63] Rather, they monitor its complexity and requirements (53.2%) or the number of credits (47.9%), while they get advice from older classmates who completed the course (67.6%). Above all, however, the topic of the subject must be as interesting (88.8%) as the teacher (38.3%).

63 Remark by the author: In addition to the frontal lecture (65%, N = 100, see Graph 3), students want to discuss topics (63%), preferring interactive, contact teaching (13% mentions seminars and workshops), where the teacher works with students and where they present (35%) the outputs of group projects (15%).



Graph 3: What teaching methods do you prefer? (N=100)

Source: own processing

Most students participate in interest groups on social networks to varying degrees (88.3%), while using information from these circles (90.9%). On social networks, when assigning a group task, it seems to be easier to organize and arrange work groups than in the school information system. Almost three-fifths of respondents prefer independent work in combination with teamwork as needed (59.6%), but their attitude to assigning a group task is rather that they would have to overcome it (55.8%). Groups work only when everyone is actively involved and contributing. Students would agree to introduce more audio-visual (63.3%) and interactive elements (75%) to e-learning on the course. In the same way, they find it attractive (75%) and meaningful (76.1%) to introduce game elements into electronic study materials, which, according to some responses, could bring a breath of fresh air into the "absurd" and "outdated" educational system of today.

Specific excerpts from open-ended answers speak of the reasons why people do not feel as under pressure with playful forms of teaching, they can relax from the tension of serious lectures, where they usually have to listen to the teacher's explanation (i.e., if it attracts their attention), or they are just as seriously tested. Many of them consider it ideal if the educational game has a good idea, is engaging and at the same time able to interpret the material they are discussing in a clear and non-directive way, which is also fun. Some say they would be more willing to learn what they need to complete the course. Such learning for them is "more fun", they are "looking forward to it", and they "like challenges". Competitive types are motivated by the effort to improve, when they see progress made and they are getting better, they want to work on themselves. With game elements, they remember more and more easily, especially if educational games can evoke emotions in a person. In addition, players are prompted to think about the problem in context in order to overcome it.

Students seem to perceive positively the chance to write a test on a computer (85.1%). Continuous tests, but also quizzes and puzzles, e.g. at the end of the lesson, help with the practice of the material and the verification of knowledge, which, however, should be somewhat voluntary if they are responsible for their results and should enjoy it. Such an opportunity, not an obligation, can prompt them to prepare regularly and continuously on their own. Students who are not convinced of the educational potential of game principles say that if they are to motivate them to learn, they should be "quite intelligent and sophisticated", not childish and immature, which would rather "demotivate" them. Game elements often do not fulfil their purpose due to the way they are implemented and the quality of execution. According to other opinions, it is only suitable for certain subjects and fields. We were also interested in the possibility of transferring competencies, knowledge and skills from school to the real world. Students consider game elements to be rather meaningful if they are

introduced effectively for the needs of practice. They believe that they can motivate them to perform better and try things for themselves. They consider cooperation in a team to be an important skill in a work team, the productivity of which the game principles could increase. Role-playing requires students to see the world from a new perspective in the roles they play within a work team. They increase the demands on their activity, commitment and reliability within the group, which leads to faster acquisition of work habits.

On the other hand, the self-serving and unfinished introduction of game elements at school or in the workplace can bore students and employees and even demotivate or annoy them. The approach of some colleagues can disgust others, even if they are interested. Therefore, a well-thought-out implementation of game principles, taking into account the feedback and character of the target group, seems to be essential. Among the students are those who prefer traditional teaching methods as informal discussions on various topics from practice and the field. Others have a "specific comfort zone" and may not be comfortable with such an approach (e.g., introverts in team building or role-playing). Some doubt the potential to simulate a work environment and fear the creation of "false expectations".

Discussion

Our study points to a trend towards linking gamification with practical education. T. Sitzmann found out that simulation games increased individuals' self-confidence by 20% in performing the task in which they were trained.[64] According to the author, the level of learning is highest when the simulation makes the apprentice active in deciding and verifying his or her training. Gamification determines the emotional transformation, because there is not so much at stake in the event of a failure– repeated failure allows us to learn something more and new. In the simulation, the consequences of failure in the training environment are not real, which, according to P. Buckley and E. Doyle, may lead to a feeling of less responsibility for the result of the exercise.[65] It is therefore necessary to take into account learning objectives and the context in which the acquired abilities and skills will be practically applied (e.g., hospitals). Courses based on group work during their studies are accepted lukewarmly among students (11.2%), three-fifths (59.6%) prefer a combination of standalone and group work as needed. However, the rather negative attitude of students (55.8%) towards the assignment of the group task is surprising. Respondents talk about black sheep being inactive, which can have a negative impact on the learning process. This is a possible reason why many of them do not want to be involved much in group tasks. For example, a student's reputation system could be applied according to their performance in group work, when they automatically receive peer feedback at the end of the course. In particular, A. Domínguez et al. suggest that frequent, meaningful, and quick feedback can improve student outcomes as well as motivation.[66]

It seems that teaching based on game principles is more suitable for smaller groups than for whole classes, to which the teacher cannot pay as much attention individually. Higher demands are placed on educators and the study group. Students' attitudes towards group work are generally more negative than teachers expect. On social networks,

64 SITZMANN, T.: A Meta-Analytic Examination of the Instructional Effectiveness of Computer-Based Simulation Games. In *Personnel Psychology*, 2011, Vol. 64, No. 2, p. 490-527.

65 BUCKLEY, P., DOYLE, E.: Gamification and Student Motivation. In *Interactive Learning Environments*, 2014, Vol. 22, No. 6, p. 2-13.

66 DOMÍNGUEZ, A. et al.: Gamifying Learning Experiences: Practical Implications and Outcomes. In *Computers & Education*, 2013, Vol. 63, No. 1, p. 381-391.

it seems easier to organize and arrange work groups when assigning a collaborative task. Students gather there because people in their circle have the same problems, interests and responsibilities, groups support them and satisfy the basic need for belonging. Given the possibility of transferring the experience gained at school to the future professions of students, it is also essential that students verbalize their knowledge, as it allows them to integrate new knowledge with their previous knowledge, leading to better retention and higher learning transfer.[67] In relation to play elements such as team games and role-playing, students spoke in favour of their involvement in education by increasing social and communication skills and preparing them for practical situations. They make it possible to simulate practice, for example, by setting up a project and learning to work on it in a team, train cooperation and the art of discussion (e.g. simulation of an editorial environment).

According to three quarters of students, it is also attractive (75%) and meaningful (76.1%) to include game elements in e-learning. In relation to what the e-learning of the course should contain, students were generally positive about the introduction of more audio-visual and interactive elements in electronic study materials (63.3% and 75%, respectively), although their relationship to electronic resources is impartial. They generally seem to prefer the teaching form of blended learning, i.e., lectures supplemented by e-learning aids (51.6%). Studies report positive effects of gamification on student performance, like better grades[68] and learning behaviour, e.g., in terms of task effort.[69] Adding badges to P. Denny's online learning tool[70] led students to contribute more and be more involved than when no badges were collected. However, a maximum of 41.5% of the 188 students participating in our survey imagine bonus points, badges, trophies or a higher level of avatar on their study profile as a reward for their performance at school. Most prefer their own good feeling (67.6%), credits (66%), written feedback or praise from the teacher (55.3%) and the final grade (52.1%). Surprisingly, gaining an academic title motivates them less than bonus points.

From the answers of our respondents, it may seem that if a student does not have their own motivation to study, or a relationship to the profession, then no game elements will help. We cannot do without our inner motivation. Students value the praise of a teacher or colleague. J. Lee and J. Hammer insist on the social dimension of the gamified environment, which allows students to identify themselves publicly, strengthen social credibility, and gain recognition for achievements that might otherwise remain invisible.[71] According to some, competition can make aspiring employees in competitive sectors strive and prepare for the real conditions of the profession. We are talking, for example, about ambitious and competitive students looking for challenges and comparisons with others. Competitive types are motivated by the effort to improve, when they see progress made and that they are getting better, they want to work on themselves. Competition does not have to suit everyone; it rather demotivates and annoys some students.

Competitiveness in gamification[72] as opposed to cooperation, encourages the struggle to be the best, even by cheating. If victory automatically means loss for someone else,

67 WOUTERS, P., PAAS, F., MERRIËNBOER, J. J. M.: How to Optimize Learning from Animated Models: A Review of Guidelines Base on Cognitive Load. In *Review of Educational Research*, 2008, Vol. 78, No. 3, p. 646-674.

68 SUA, C. H., CHENG, C. H.: A Mobile Game-Based Insect Learning System for Improving the Learning Achievements. In *Procedia – Social and Behavioral Sciences*, 2013, Vol. 103, No. 1, p. 43-49.

69 BARATA, G. et al.: Engaging Engineering Students with Gamification. In GATZIDIS, Ch., ZHANG, J. (eds.): *Proceedings of the 5th International Conference on Games and Virtual Worlds for Serious Applications*. Poole : IEEE, 2013, p. 25-30.

70 DENNY, P.: The Effect of Virtual Achievements on Student Engagement. In MACKAY, W. E. (ed.): *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. New York : ACM, 2013, p. 764-771.

71 LEE, J., HAMMER, J.: Gamification in Education: What, How, Why Bother?. In *Academic Exchange Quarterly*, 2011, Vol. 15, No. 2, p. 2-4.

72 GLOVER, I.: Play as You Learn: Gamification as a Technique for Motivating Learners. In HERRINGTON, J., COUROS, A., IRVINE, V. (eds.): *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2013*. Chesapeake : AACE, 2013, p. 2000-2007.

it can promote a more self-centreed society[73] and discourage admirable qualities such as volunteering or doing good for other people. Although losers may set higher goals for the future, research has shown that they will ultimately be systematically worse than their "winning" counterparts, regardless of their competencies.[74] Although the implementation of external motivation can encourage people in the short term, it has the potential to deprive them of internal motivation[75] and teach them that they should only work if they are rewarded.[76] Most gamified systems still rely on external incentives to reward activity badges or promote competition. Replacing existing higher-order internal motivation with its external counterpart can potentially harm highly motivated people.[77] Examples show that gamification thus obscures its goal and can have far-reaching negative effects on those who perform the worst and on the least motivated. K. R. Christy and J. Fox concluded that the use of rankings in educational environments leads to a stereotypical threat (the belief that someone can be judged on the basis of a negative stereotype).[78]

The use of scoreboards in the academic environment affects the academic performance of different demographic groups differently and it is the educator's responsibility to consider the predispositions of individuals. J. Koivisto and J. Hamari have shown that women experience a stronger effect when gamification contains social aspects and men when it contains some kind of competition.[79] Teaching with game principles is suitable for those with insufficient internal motivation who are not satisfied with traditional forms of teaching; it also suits competitive types, students with special needs and students who study remotely. Cooperative game principles and team games may not be pleasant for introverts. Still there is a hope that game principles could potentially help alleviate academic failure.

University is an environment where students can fully satisfy the basic psychological need for autonomy. An approach based on self-determination theory assumes that autonomy supports internal motivation.[80] As a result, conditions that restrict a sense of control or freedom of action may undermine intrinsic motivation.[81] It is relevant to examine whether variations in the level of control that games allow moderate intrinsic motivation. In the context of teaching, it is possible that a lack of control over decisions such as the choice of game and playing time weakens its motivational potential for students who are unable to influence the choice. From an educational point of view, for example, focusing students on an aspect of the game can bring learning, but it is also likely that the intervention will disrupt the flow state, thus undermining its fun nature. Several dimensions of this issue need to be addressed in order to create truly engaging educational games, issues

73 See also: SIMON, R. L., TORRES, C. R., HAGER, P. F.: *Fair Play: The Ethics of Sport*. Boulder : Westview Press, 2014.

74 For more information, see: BUSER, T.: *The Impact of Losing in a Competition on the Willingness to Seek Further Challenges*. Rochester : Social Science Research Network, 2014.

75 DECI, E. L., KOESTNER, R., RYAN, R. M.: Extrinsic Rewards and Intrinsic Motivation in Education: Reconsidered Once Again. In *Review of Educational Research*, 2001, Vol. 71, No. 1, p. 2-26.; TOHIDI, H., JABBARI, M. M.: The Effects of Motivation in Education. In *Procedia – Social and Behavioral Sciences*, 2012, Vol. 31, No. 1, p. 821-823.

76 MUNTEAN, C. I.: Raising Engagement in E-Learning through Gamification. In POGONARIU, M. (ed.): *Proceedings of the 6th International Conference on Virtual Learning*. Cluj : ISLS, 2011, p. 324-328.

77 HANUS, M. D., FOX, J.: Assessing the Effects of Gamification in the Classroom: A Longitudinal Study on Intrinsic Motivation, Social Comparison, Satisfaction, Effort, and Academic Performance. In *Computers & Education*, 2015, Vol. 80, No. 1, p. 153-160.

78 CHRISTY, K. R., FOX, J.: Leaderboards in a Virtual Classroom: A Test of Stereotype Threat and Social Comparison Explanations for Women's Math Performance. In *Computers & Education*, 2014, Vol. 78, No. 1, p. 67-76.

79 KOIVISTO, J., HAMARI, J.: Demographic Differences in Perceived Benefit from Gamification. In *Computers in Human Behavior*, 2014, Vol. 35, No. 1, p. 180-187.

80 RYAN, R. M., RIGBY, C. S., PRZYBYLSKI, A.: The Motivational Pull of Video Games: A Self-Determination Theory Approach. In *Motivation and Emotion*, 2006, Vol. 30, No. 4, p. 348-364.

81 DECI, E. L., KOESTNER, R., RYAN, R. M.: A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation. In *Psychological Bulletin*, 1999, Vol. 125, No. 1, p. 628-667.

such as the opposition of learning and playing or freedom versus control.[82] According to a meta-analysis of research on games and education,[83] there is untapped potential for improving learning if games are well designed for this purpose. This naturally also applies to the design of e-courses by modern educators.

Conclusion

This preliminary research aimed to present the potential of educational principles contained in modern digital games, which could be used as a supplement to teaching in an imaginary, model environment of a virtual classroom, where the content is adequately complemented by game elements as components of the teaching method. Such a mini-game is only one of the parts of the education system, which also includes interactive curricula, various forms of study materials and tasks, submissions, discussion forums, polls, etc. We are talking about a holistic approach focused on the functioning of the whole and on the relationships between the elements of the system, which works on the basis of game rules and mechanics. Any gamification of online education should reflect needs, motivations and goals of students. Satisfying the basic psychological needs in the design of a gamified system focused on the user experience is perceived as one of the ways to more effective e-learning. Gamified system designers should not look at rankings and online comparisons to encourage users to compete with each other, but rather use them as a personal reference and create an environment of challenges and guidance for users on how to get better. Consider designing courses towards the cooperation of classmates, who are otherwise exposed to rather competitive patterns and tendencies in the culture and society that surrounds them. Such a design is personalized, accessible and develops the literacy of students and educators with practical use. Over time, students create their own activities and choose where to go during their studies.

Limits, on the other hand, represent higher demands on teachers and the whole group. The proposed method appears to be more suitable for smaller seminars that support interactive, contact teaching. However, not everyone likes certain game principles and it very much depends on the personality characteristics of the target group. By simply adding points and rankings to the system, gamification is limited to self-serving scoring without any or, conversely, adverse effects. Focusing on points and rewards rather than play and internal engagement may not always meet the goal of the desired behaviour change by adapting to students' intrinsic values. With a creative approach, gamification could be applied in a number of areas. However, it depends on the technologies used and requires a high initial input from educators or their parent institution. When designing, we should always consider that the game primarily meets the learning objectives that we initially set and that it really engages the students. From using commercial games to support learning activities in game-based learning to using elements from games in non-game contexts or simulating work scenarios and developing serious games with learning purposes, it is important to differentiate between these approaches and the learning outcomes that can be achieved with them.

82 CASTELL, S., JENSON, J.: Serious Play. In *Journal of Curriculum Studies*, 2003, Vol. 35, No. 6, p. 650-664.; WOUTERS, P. et al.: The Role of Game Discourse Analysis and Curiosity in Creating Engaging and Effective Serious Games by Implementing a Back Story and Foreshadowing. In *Interacting with Computers*, 2011, Vol. 23, No. 4, p. 330-335.

83 CLARK, D. B., TANNER-SMITH, E. E., KILLINGSWORTH, S.: *Digital Games for Learning: A Systematic Review and Meta-Analysis*. [online]. [2021-05-31]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.405.4312&rep=rep1&type=pdf>.

Hopefully, our work will serve as a forerunner of more extensive research that will develop the educational potential of game principles in e-learning. Future research should isolate game elements and evaluate their effectiveness in the education process to better understand how they work in a given context. It should also clarify how individual game elements relate to behavioural and motivational outcomes and how to design a gamification system to support and increase intrinsic motivation.[84] It should set out the conditions under which gamification affects the performance and scores of individual course participants. The evidence supports the need to create an environment with clear goals, challenges, and authentic stories in which team spirit is strengthened through game mechanics and discussions. In addition, these gamified environments should meet the needs of the student and add an aspect of fun or novelty. Voluntary participation must also be ensured, as research has shown that the effectiveness of gamification is greater when a student can choose.[85]

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Good Practices for Indie and Solo Game Developers: A Survey Based on Online Videos

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ABSTRACT:
Although the most established model of digital game development is through funding from publishers, there has been a major boost to independent game development, especially after the 2000s. This production context has specific challenges, particularly for lone developers. Some indie developers share their experiences and tips with the community using videos, and these videos illustrate the challenges and mindset around indie development of their time. This article presents a survey of good practices for lone (solo) indie developers compiled from twenty-nine YouTube videos. There are thirteen content creators who shared various tips about tools to use; ways to improve the game design of a product; ways to improve production process management and how to avoid pipeline failures during the development; recommendations on how to handle and how to manage marketing, focusing on fanbase management; advice on how to stay healthy during the process and mindset changes that are required for the development of games. The tips are compiled and a discussion is made on how they outline a dimension of the indie context and mentality of their time, and how they illustrate what are considered good practices among community members.

KEY WORDS:
game development, good practices, indie community, indie game, solo developers.

Introduction

Most best-selling digital games are the result of the work of large multidisciplinary teams. In this context, the tendency is to concentrate the most important creative decisions in a few professionals, and the high investments make business reasoning a determinant in the production process. Although many professionals are well adapted to this context, the search for creative and financial autonomy, as well as the availability of tools that facilitate game development, have inspired developers to create their own games in smaller teams with smaller budgets. Symbolically, it is as if these developers migrated from being just cogs in the engine to become the drivers themselves, taking the reins of the product and then creating something that pleases them – or following a process that pleases them.

In understanding the phenomenon of indie game development, it is important to research it with a historical perspective in mind. M. B. Garda and P. Grabarczyk[1] describe three different dimensions that determine whether the game is independent or not (in one or more dimensions): financial, creative, and publishing. These authors describe games with one or more independence types as independent and create a differentiated description for indie games. This term would designate a movement that emerged in the mid-2000s and that has other characteristics besides independence, such as retro aesthetic proposals and idealism about what digital games should be. T. Donovan[2] points out web browser games and online game stores as some of the factors that helped start the movement. It grew rapidly, and "as 2009 drew to a close, video games stood on the crest

1 GARDA, M. B., GRABARCZYK, P.: Is Every Indie Game Independent? Towards the Concept of Independent Game. In *Game Studies*, 2016, Vol. 16, No. 1. [online]. [2021-05-07]. Available at: <http://gamestudies.org/1601/articles/gardagrabarczyk>.
2 DONOVAN, T.: *Replay: The History of Video Games*. Lewes : Yellow Ant Media, 2020, p. 368.

of a new era of creativity powered by both the grand visions of leading game designers and the fizzing experimental wildness of the indie movement". The independent market is diverse, grouping self-taught idealists, experienced developers who are "disillusioned with the increasingly brutal corporate structure of game development"[3] and other profiles. Some examples of games contextualized in this indie movement are *Braid*[4] and *Spelunky*[5], both released in 2008. *Minecraft*[6] was released in 2009 in alpha version and has become one of the largest phenomena in its number of users. Another notable example is the game *Stardew Valley*,[7] released in 2016. The amazing story of the lone developer, who developed a game passionately and dramatically, becoming a millionaire at the end, is one of the most exciting chapters of J. Schreier's book.[8] These success stories are sources of inspiration for developers looking to build careers as indie developers.

Although these stories are inspiring, indie development – and especially solo development, with just one main developer – has its own contextual challenges and difficulties. Developing games is laborious, complex, and stressful, requiring continuous focus, hard work, and many reworked sections. Solo development may entail several issues such as mental health, depression, and anxiety. In this challenging context, it is common for indie developers to create communities and partnerships. On the website *YouTube* there are several videos focused on *indie* developers, where the presenter uses their experience and knowledge to help other professionals by creating a repository of experience reports. Although some ideas illustrate quite personal views, one can also observe patterns about the difficulties encountered, tools used, and suggestions for fellow developers. This study seeks to make a systematic survey of these testimonies, to organize and create new levels of meaning to these multiple pieces of knowledge.

Background

Studies on indie or independent game development face conceptual challenges. The definitions of independent production can be compared to similar situations in indie films or indie comics, for instance. However, digital games have their own history and context, as well as a short scholarly tradition. J. Juul[9] argues that independent development may be understood as a mode of game practice, rather than a simple definition. It means understanding it as an arrangement of production methods, design conventions, distribution practices etc., which are also historically situated. This perspective allows scholars to understand game development within a context where multiple modes are possible. J. Juul illustrates three modes is his study: single-purchased AAA games, modern casual live games, and culturally independent games, while many other modes could be elaborated. He associates culturally independent games, for instance, with features such as small teams, presence in festivals, crowdfunding usage, and an appreciation of deviation from AAA modes of production.

3 HOLMES, D.: *A Mind Forever Voyaging: A History of Storytelling in Video Games*. Scotts Valley : CreateSpace Independent, 2012, p. 149.
4 NUMBER NONE: *Braid*. [digital game]. Austin, TX : Number None, 2008.
5 MOSSMOUTH: *Spelunky*. [digital game]. San Francisco, CA : Mossmouth, LLC, 2008.
6 MOJANG: *Minecraft*. [digital game]. Stockholm : Mojang, 2011.
7 CONCERNEDAPE: *Stardew Valley*. [digital game]. London : ConcernedApe, Chucklefish, 2016.
8 SCHREIER, J.: *Blood, Sweat, and Pixels: The Triumphant, Turbulent Stories behind How Video Games Are Made*. New York : HarperCollins, 2017, p. 83-106.
9 JUUL, J.: *The Independent Mode: A Functionalist Account of Independent Games and Game History*. Paper presented at International Conference on the Foundations of Digital Games (FDG '20). Bugibba, presented on 17th September 2020.

Scholars have not limited their studies on the concept of independence. In F. Parker's survey,[10] he divides research on indie games into four categories: history of indie games, theory and definitions, political economy – and the implications of indie development for the capital system, and socio-cultural. The latter includes not only the existence of communities of developers in particular cultural systems, but also tools and modes of production that emerge from these contexts. As the present study focused on YouTube videos describing tips and good practices for independent developers, it fits in this category of Parker's scheme, addressing what kind of content independent developers share in online videos, in a particular historical period.

Games are complex objects that work with aesthetics, narrative, and playful and technological innovation and are, therefore, difficult to predict and organize. With that said, it is possible to deduce the increased difficulty of developing a game without any team, i.e., of a solo indie developer. A. Y. Alencar and P. Jucá[11] conclude that the most recurring obstacle for indie companies is keeping up with deadlines and having the wrong scope definition. This problem can arise from the desire to continuously add new features to a game during the development process. Problems with scope can be the result of undermining steps such as polishing or testing, which might compromise the final product. Another very relevant issue for small developers is external financing. R. Hill-Whithall[12] describes different forms of financing: bank loan, government aid programs, current employment or *side-jobs*, investment by an investor, and investment through crowdfunding or publishers. Each of these forms presents specific challenges for the developer. In addition, the way funding is handled can influence whether the game is perceived as independent and/or indie.

The challenge for indie developers, especially solos developers, is not only management but psychological aspects as well. B. Byrne[13] warns us about the problem of burnout syndrome, which is the result of chronically stressful work that generates exhaustion. This issue requires attention from the developer, who should not underestimate the psychological difficulties of engaging in an ambitious project in a solitary way. N. D. Lipkin[14] warns about the relevance of further study on indie developers' motivation and how it influences labour conditions. Developers motivated by passion who are willing to ignore market difficulties may find difficulties that blend financial and psychological issues. J. Whitson, B. Simon and F. Parker[15] warn against the risk of ideals of independence and entrepreneurship hiding more dramatic situations of precarious labour conditions. To help with this difficult context, some developers try to write about this process. In this case, we can refer to the document *Indie Game Design Do-s and Don't-s: The Manifesto* by E. McMillen,[16] the creator

10 PARKER, F.: Indie Game Studies Year Eleven. In PEARCE, C., KENNEDY, H., SHARP, J. (eds.): *DiGRA '13 – Proceedings of the 2013 DiGRA International Conference: DeFragging Game Studies*. Atlanta, GA, U.S. : DIGRA, 2013, p. 2-10. [online]. [2021-05-14]. Available at: <http://www.digra.org/wp-content/uploads/digital-library/paper_100.pdf>.

11 ALENCAR, A. Y., JUCÁ, P.: Dificuldades Organizacionais de Empresas Indies de Desenvolvimento de Jogos Digitais. In DA SILVA JUNIOR, J. R., ESPÍNDOLA BAFFA, A. C. (eds.): *Proceedings of SBGames 2019*. Rio de Janeiro : IEEE Computer Society, 2019, p. 1268. [online]. [2021-05-07]. Available at: <https://www.sbgames.org/sbgames2019/files/papers/IndustriaFull/198414.pdf>.

12 HILL-WHITTALL, R.: *The Indie Game Developer Handbook*. Burlington : Focal Press, 2015, p. 213-240.

13 BYRNE, D.: *Developer Burnout Is Real*. Released on 17th October 2018. [online]. [2021-05-07]. Available at: <https://dev.to/daraghbyrne/developer-burnout-is-real-2f0p>.

14 LIPKIN, N. D.: The Indiepocalypse: The Political-Economy of Independent Game Development Labor in Contemporary Indie Markets. In *Game Studies*, Vol. 19, No. 2. [online]. [2021-05-07]. Available at: <http://gamestudies.org/1902/articles/lipkin>.

15 For more information, see: WHITSON, J., SIMON, B., PARKER, F.: The Missing Producer: Rethinking Indie Cultural Production in Terms of Entrepreneurship, Relational Labour, and Sustainability. In *European Journal of Cultural Studies*, 2018, Vol. 24, No. 2, p. 606-624.

16 McMILLEN, E.: *Opinion: Indie Game Design Do-s and Don't-s: A Manifesto*. Released on 30th December 2009. [online]. [2021-05-07]. Available at: <https://www.gamasutra.com/view/news/117521/Opinion_Indie_Game_Design_Dos_and_Donts_A_Manifesto.php>.

of *Super Meat Boy*[17]. The document recommends being honest in your work, loving what you are doing, understanding that what is being created by your own hands is art, and risking with innovations in any project, while keeping a critical sense, and not letting yourself be totally carried away by emotion. However, the most important thing is to understand that you need to know a little bit about the legislative part and, in some way, try to make money with your game - after all, it is your hard work.

Being more technical, R. Hill-Whittall wrote a manual that analyzes tools, resources, and software for indie development.[18] He argues that it is important to verify through financial analysis which tools/software will be used and, if necessary, use open-source programs. He also mentions Quality Assurance (QA) and suggests trying to outsource as little as possible in this area by testing mechanics individually by themselves or with relatives, friends, and testers willing to play. The *Bugzilla* software can also be used to track errors (bugs) for free. One of the most essential aspects of indie development is marketing, especially getting in contact with consumers, since the game, depending on how it is released, will depend entirely on how the developer managed the visibility of their game. R. Hill-Whitall states that although there are some marketing companies specialized in game-related content, *YouTubers* are the new focus for indie developers as they are more accessible and reach more viewers.

One of the ways to study the context of indie game development is through interviews with professionals in the field. An example of these studies is M. Toftedahl, P. Backlund, and H. Engström,[19] who highlighted the importance of creating a community of interested players as a form of support for developers. Another study based on interviews is from L. S. Pereira and M. M. S. Bernardes,[20] who explained management and organization strategies and discussed, in particular, the less formal characteristic of those work environments, and that it is important to reflect on the differences and similarities between professional indie developers and people who create games or content for games as a hobby. They also point out that understanding the development of indie games can raise importance to meaningful issues for the gaming industry as a whole. O. Guevara-Villalobos[21] explores the nuances of indie identity; in other words, the variety of perspectives that compose the wide category of indie or independent, suggesting it is dispersed and fragmented regarding political, artistic and marketing ideas. Finally, N. D. Lipkin[22] interviewed a number of indie developers, discussing market, labour conditions, and how developers perceived the 'indiepocalypse' phenomenon. Those studies focusing on interviewing developers outline their experience and views. The present study aims to complement those by researching the online sources that are available to indie developers, believing they express a different aspect of the indie context.

17 TEAM MEAT: *Super Meat Boy*. [digital game]. Asheville, NC : Team Meat, 2010.

18 HILL-WHITTALL, R.: *The Indie Game Developer Handbook*. Burlington : Focal Press, 2015, p. 1-64.

19 TOFTEDAHL, M., BACKLUND, P., ENGSTRÖM, H.: Localization from an Indie Game Production Perspective: Why, When and How?. In FASSONE, R., BITTANTI, M. (eds.): *DiGRA '18 – Proceedings of the 2018 DiGRA International Conference: The Game Is the Message*. Turin : DIGRA, 2018, p. 13-15. [online]. [2021-05-14]. Available at: <http://www.digra.org/wp-content/uploads/digital-library/DIGRA_2018_paper_59.pdf>.

20 PEREIRA, L. S., BERNARDES, M. M. S.: Aspects of Independent Game Production: An Exploratory Study. In *Computers in Entertainment*, 2018, Vol. 16, No. 4, p. 11-13.

21 GUEVARA-VILLALOBOS, O.: Independent Gamework and Identity: Problems and Subjective Nuances. In BATEMAN, C., LOWENHAUPT, R., NACKE, L. E. (eds.): *DiGRA '11 – Proceedings of DiGRA International Conference: Think Design Play*. Hilversum : DIGRA, 2011, p. 2-18. [online]. [2021-05-14]. Available at: <http://www.digra.org/wp-content/uploads/digital-library/242_Guevara-Villalobos_Independet-gamework-and-identity-Problems-and-subjective-nuances.pdf>.

22 LIPKIN, N. D.: The Indiepocalypse: The Political-Economy of Independent Game Development Labor in Contemporary Indie Markets. In *Game Studies*, Vol. 19, No. 2. [online]. [2021-05-07]. Available at: <http://gamestudies.org/1902/articles/lipkin>.

Methodology

This study analyzes documents, taking into consideration that videos available online are primary sources and a type of document. According to C. Robson, "the term is sometimes extended to include non-written documents such as films and television programs".[23] It is considered that testimonies shared on this YouTube channel present an important and non-academic form of knowledge. The methodology consists, briefly, of searching for keywords on the YouTube website. However, to prevent cookies from manipulating the search, a tab has been opened in anonymous mode on Google Chrome. The keywords were "Indie game solo tips". The filter starts with the title, if it does not refer to the indie universe, it is excluded from the final research. Although the research is focused on indie solo developers, it is possible to utilize tips for indie teams for solo developers as well. Due to the huge amount of results, it is necessary to create other smaller filters: (i) tutorials for a specific engine have been excluded, since the proposal of the study is not to focus on the technical details of some specific software; (ii) devlogs of a specific game that did not offer tips or insights to other developers have also been excluded; (iii) specific marketing cases for a specific platform have also been excluded, following the same logic as the tutorials for a specific engine; (iv) videos that do not offer tips have been excluded; (v) videos with less than 500 views have been excluded to avoid content that receives less community scrutiny; (vi) videos offering tips that cannot be adapted for solo developers have been excluded.

Thus, with the filters, after 29 results, the videos began to saturate, easily fitting into the filters because of the search algorithm that tries to find videos related to the keyword, but ends up delivering videos with little relation to the search. In this way, many videos were found, and they are mostly focused on solo development. Below is a table separated by columns referring to the year of publication, the title of the video, the name of the channel, and the *link* of the video, respectively.

Table 1: Selected videos

Year of Publication	Video Title	Channel Name
2018	Making Your First Indie Game (5 Tips!)	Thomas Brush
2019	8 Solo Game Developer Mistakes to Avoid! [2019]	Ask Gamedev
2019	5 Solo Game Dev Mistakes You MUST Avoid (My Experience!)	Thomas Brush
2018	5 Tips for a Solo Game Developer!	BTO
2019	5 TIPS I've Learned after a DECADE of Making Indie Games!	Thomas Brush
2017	Can You Succeed as A Solo Developer?	Game Dev Underground
2018	Solo Indie Game Development on a Budget	Glass Beaver
2018	7 Game Design Mistakes to Avoid!	Ask Gamedev
2018	Indie Game Marketing with Zero Budget!	Ask Gamedev
2018	Can You Make It as a Solo Indie Game Developer?	Dilmer Valecillos
2018	Making Games Solo Is Not the Same as Making Them Alone	Game Dev Underground
2016	Indie Game Dev Tip #1 – The 4 M's of Success	GameDev Rick
2019	Never Make Games Alone	Game Dev Underground
2019	51 Game Design Tips! (In 8 Minutes)	Jonas Tyroller

23 ROBSON, C.: *Real World Research: A Resource for Users of Social Research Methods in Applied Settings*. Chichester : Wiley, 2011, p. 348.

2018	9 Tips to Help You Finish Your Indie Game	Game Dev Underground
2019	Gamedev Secrets from Shovel Knight's Creators [2019]	Ask Gamedev
2019	The 5 BEST Tips for Getting Started as an Indie Game Dev GONE WRONG!	Darkstone Digital
2018	3 Lies About Being an Indie Game Dev	Thomas Brush
2018	5 Indie Game Dev Tips	Buildbox
2018	How to Make a Game ALONE (5 Secrets)!	Thomas Brush
2019	Making Time for Indie Development: 5 Tips!	DevDuck
2018	8 Game Development Mistakes to Avoid!	Ask Gamedev
2019	5 Ways to Make People Care about Your Game | MARKETING TIPS	Jonas Tyroller
2019	5 Indie Game Marketing Hacks with NO MONEY	Thomas Brush
2018	Let's Be Honest about Indie Game Development — Q&A	Thomas Brush
2020	Indie Game Development Tips: 3 Things You MUST Have!	How to Build Games
2017	The #1 Secret to Indie Game Marketing Success	Game Dev Underground
2017	How to Get Your Indie Game Funded (Without Using Kickstarter)	Game Dev Underground
2018	Passive Income for Game Developers – 5 Ways to Make It	Game Dev Underground

Source: own processing

After filtering the results, five analysis criteria were created. Comments from the creators of content in the videos were transformed into indirect quotations and then classified into at least one of the following categories: (i) *Professional developer data*, in this category we can check the weight of the information provided in the video. Some content creators did not make their experience in the industry explicit, so the search for their personal sites or social networks that at least indicated an approximation of their experience was needed. (ii) *Tools*, a category specifically made for tips that talk about software suggestions or ways to use them, i.e. direct advice and recommendations on specific *software* or tips related to *game design*, without being specific to a programming language or *game engine*. (iii) *Process management* includes tips on techniques related to project administration. (iv) *Marketing* categorizes tips designed to improve engagement for/with the community and/or target audience. This category was created taking into consideration an *indie-solo* developer who does not have funds to hire a *marketing* company. (vi) *Personal issues* was created, in short, to talk about the mental and physical health of the *indie* developer. After analyzing each of the videos in the categories above, it was possible to create a table with the condensed data. Subsequently, the table was used as a basis for the description and analysis of the generated data.

Results

In the results, the videos were composed mostly with tips about how to manage the project, as was expected from the studies of A. Y. Alencar and P. Jucá[24] that suggested that the biggest mistake of indie developers, in general, is to underestimate the scope and

24 ALENCAR, A. Y., JUCÁ, P.: Dificuldades Organizacionais de Empresas Indies de Desenvolvimento de Jogos Digitais. In DA SILVA JUNIOR, J. R., ESPÍNDOLA BAFFA, A. C. (eds.): *Proceedings of SBGames 2019*. Rio de Janeiro : IEEE Computer Society, 2019, Vol. 9, p. 1268. [online]. [2021-05-07]. Available at: <https://www.sbgames.org/sbgames2019/files/papers/IndustriaFull/198414.pdf>.

having poor management. The entire project is compromised. However, most videos do not have full focus on a single category, and the creator ends up advising on more than one category. Thus, among the 29 videos, tips on process management appear in approximately 76% of cases. Next, both marketing tips and personal issues appear in 31% of cases with, finally, tool tips making up only 14% of cases.

Professional Developer Data

One of the parameters of analysis was the experience that the content creator has in the game development area, considering that this factor is relevant to determine the empirical basis of the testimonies. In this sense, a considerable number of years of experience in the gaming industry was recorded. We have thirteen content creators across the 29 videos and we divided their data between two categories: having published a game as an indie developer and overall performance time in the industry. Out of these thirteen content creators, 46% have games published as indie developers, such as T. Brush,[25] who published *Pinstripe*[26] and has a launch of his new *Neversong*[27] game scheduled. The other 46% do not have any games published as indie developers (although some have experience outside the indie environment), with the majority developing their first game during the time the videos were released. Among those who have participated in the industry outside of the indie context, there are cases such as Davidson,[28] who worked for 14 years in the industry but focused on education careers, with more than 621,000 students on the online courses platform *Udemy*. The remaining 8% did not have any information available about whether they had already published a game or not, such as the representative of the *BuildBox* engine channel.[29]

The performance time was divided into four subcategories, in which 38% have more than ten years of experience in the area, among them one of the creators of *Shovel Knight*[30], A. Faulkner,[31] who gave tips to indie developers during his interview. A total of 16% worked in the game development area for five to ten years. The second-highest percentage, 30%, refers to those who have between one and three years of experience in the general industry, such as J. Tyroller,[32] who developed *Islanders*[33]. The last 16% did not provide any estimate for their time of performance in the area.

Tools

The category of tools, which includes both game design and software tips, is the one with the least tips. There are only 5 videos out of the 29 that describe tips that have been

25 BRUSH, T.: *3 Lies about Being an Indie Game Dev*. Released on 7th December 2018. [online]. [2021-05-07]. Available at <www.youtube.com/watch?v=s6FWBY5mCVw&t>.
26 TMOS GAMES: *Pinstripe*. [digital game]. Irvine, CA : Armor Games, Serenity Forge, 2017.
27 ATMOS GAMES, SERENITY FORGE: *Neversong*. [digital game]. Boulder, CO : Serenity Forge, 2019.
28 DAVIDSON, R.: *Indie Game Dev Tip #1 – The 4 M's of Success*. Released on 3rd January 2016. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=PGEvWAU3xRI>.
29 *5 Indie Game Dev Tips*. Released on 17th December 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=MJ6zB002LBA>.
30 YACHT CLUB GAMES: *Shovel Knight*. [digital game]. Los Angeles, CA : Yacht Club Games, 2014.
31 *Gamedev Secrets from Shovel Knight's Creators*. Released on 15th November 2019. [online]. [2021-05-07]. Available at: <https://youtu.be/ZtxG5bXM2fM>.
32 TYROLLER, J.: *51 Game Design Tips! (In 8 Minutes)*. Released on 8th February 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=5ijuH_oMu-U>.
33 GRIZZLY GAMES: *Islanders*. [digital game]. Berlin : Grizzly Games, 2019.

classified as tools. Two of them mentioned more concrete tools; D. Nadaski[34] delivers a long list of free software recommendations, and G. Dunn[35] recommends finding a place to set specific goals, i.e., a place you normally write down your urgent matters. Management programs such as *Trello*, *Kanban Flow* (this being his favorite), *Hack n' Plan*. He also recommends that a developer should make all possible backups using tools from *Github* or *BitBucket*. Some tools are more oriented towards game design tips. J. Tyroller[36] delivers 51 game design tips in his video through an analysis of games submitted to a game jam he created and coordinated, and O. Bst[37] states the need to find inspiration from other games while designing the game design of a product, i.e., to analyze existing mechanics in order to conclude what needs to change. More specifically, A. Faulkner, Shovel Knight's designer, in his interview with *Ask Gamedev*,[38] talks about character design, stating that the developer needs to look for a silhouette that is easy recognizable. It needs to be noticeable so that the player does not have to keep searching about where they are and the colour palette of the character should not be ignored, that way the character will not get mixed up with the colour palette of the scenario.

Finally, we also classified in tools what T. Ruswick[39] states about financing, mentioning that, instead of using collective financing and if the developer uses the *Unreal Engine*, it is possible to contact Epic Games to try to get an *UnrealDev* grant, which allows the developer to earn between 5 thousand and 50 thousand dollars. In addition to funding provided by *Epic Games*, *Chucklefish* also offers funding (and publishing) services, and *Kongregrate* offers publisher services. He also talks about funding given by *CryEngine* (no longer available). Finally, he talks about using the *indie-fund.com* website.

Process Management

Appearing in approximately 76% of the videos, process management tips are the most common, as suggested by A. Y. Alencar and P. Jucá,[40] confirming that the *indie* developer's greatest requirement is to have good project management. Therefore, content creators who witnessed or performed the mismanagement of the project gathered tips so that their viewers would not make the same mistakes. So, for easy viewing, the tips were divided by their creators, i.e., according to who said it. Thus, each creator has their own list of tips about process management. Some of the tips shared by T. Brush[41] are

34 BEAVER, G.: *Solo Indie Game Development on a Budget*. Released on 19th July 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=sz2ZnRSp2YE>.

35 *Indie Game Development Tips: 3 Things You MUST Have!*. Released on 5th February 2020. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=SgefZNRsgbE>.

36 TYROLLER, J.: *51 Game Design Tips! (In 8 Minutes)*. Released on 8th February 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=5ijuH_oMu-U>.

37 *5 Tips for a Solo Game Developer!*. Released on 22nd May 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=XHYn3mB73IQ>.

38 *Gamedev Secrets from Shovel Knight's Creators*. Released on 15th November 2019. [online]. [2021-05-07]. Available at: <https://youtu.be/ZtxG5bXM2fM>.

39 RUSWICK, T.: *How to Get Your Indie Game Funded (Without Using Kickstarter)*. Released on 22nd July 2017. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=ERr5YtJ2uEg>.

40 ALENCAR, A. Y., JUCÁ, P.: Dificuldades Organizacionais de Empresas Indies de Desenvolvimento de Jogos Digitais. In DA SILVA JUNIOR, J. R., ESPÍNDOLA BAFFA, A. C. (eds.): *Proceedings of SBGames 2019*. Rio de Janeiro : IEEE Computer Society 2019, p. 1268. [online]. [2021-05-07]. Available at: <https://www.sbgames.org/sbgames2019/files/papers/IndustriaFull/198414.pdf>.

41 BRUSH, T.: *How To Make A Game ALONE (5 Secrets)!*. Released on 14th December 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=ZjDibmEtJmY>.; BRUSH, T.: *Making Your First Indie Game (5 Tips!)*. Released on 8th September 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=ON-RCLmkHqs>.; BRUSH, T.: *5 Solo Game Dev Mistakes You MUST Avoid (My Experience!)*. Released on 6th July 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=IsF7SpQzfYs>.; BRUSH, T.: *5 TIPS I've Learned after a DECADE of Making Indie Games!*. Released on 31st August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=qUPwuBAnUew>.

more motivational, such as seeking inspiration from others by watching videos, looking at screenshots, etc.; discovering and trusting the developer's talents; and making games that the developer appreciates. Others deal with how to organize the workflow. In that sense, he recommends defining the rules of the game: a simple, quick, and short GDD (Game Design Document) is enough. B. Clarke[42] adds that it is important to think carefully before acting, so as not to waste time on activities that will not be used. T. Brush also mentions the creation of a plan with a small scope in mind. He recommends trying to create modular *assets*, both artistically and in code, to save resources. He warns neither to forget nor underestimate the polishing phase. Also, he reminds that developing a game is not just about creating the game. Much of it will be used for other things, such as creating a community, marketing, publishing, receiving feedback, etc., so these activities should be on the schedule. T. Brush has tips more oriented towards kinds of actions: using pre-made assets, checking for accessible tools and software, and using Google to solve problems along the way. Some of his tips address the development from a wider professional perspective: he recommends taking the work seriously and preventing family members from disturbing the workflow. There is also the problem of having income while creating the first game, which perhaps means one will need another job while the game is developed.

The *Ask Gamedev* channel[43] also has many recommendations. Many of them deal with seeking feedback during the development, such as: to always have a demo build for sampling, to create a test plan, to avoid getting so attached to an idea (if it looks bad, it is better to admit it and try something else), and to make a *post-mortem* of the game and analyze the *post-mortems* of other games to avoid making the same mistakes. He also reminds us of technical tips for the process, such as using industry patterns rather than improvising too much in coding, doing source control – always looking for a stable version – and planning for certification. The game needs to be sold and for that it needs to be certified to enter a platform. That could take time. There are recommendations that relate to game design, such as remembering to teach the player how to play the game, understanding that games that focus entirely on the story are exceptions, and keeping the target audience in mind all the time. Finally, there are scope tips, such as avoiding underestimating the polishing phase, and avoiding the danger of over-scope – also mentioned by O. Bst[44] and A. Faulkner.[45] The idea is to cut out what seems to be unnecessary and to avoid adding features endlessly.

T. Ruswick[46] also delivers a large list of tips, regarding collaboration, planning, and persistence. Regarding collaboration, he recommends having testers, seeking feedback, and outsourcing. He also mentions the possibility of creating tools for the engine one is using. Such tools, including assets, can be sold to support the main project as passive income. The

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42 *The 5 BEST Tips for Getting Started as an Indie Game Dev GONE WRONG!*. Released on 5th August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=Sebin6s80tI>.

43 *8 Game Development Mistakes to Avoid!*. Released on 24th March 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=HbhdTt4lgPk>.; *8 Solo Game Developer Mistakes to Avoid!*. Released on 16th April 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=umpp1ytp4Zk>.; *Gamedev Secrets from Shovel Knight's Creators*. Released on 15th November 2019. [online]. [2021-05-07]. Available at: <https://youtu.be/ZtxG5bXM2fM>.

44 *5 Tips for a Solo Game Developer!*. Released on 22nd May 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=XHYn3mB73lQ>.

45 *Gamedev Secrets from Shovel Knight's Creators*. Released on 15th November 2019. [online]. [2021-05-07]. Available at: <https://youtu.be/ZtxG5bXM2fM>.

46 RUSWICK, T.: *Can You Succeed as a Solo Developer?*. Released on 28th June 2017. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=NSYMS4p6LyE>.; RUSWICK, T.: *9 Tips to Help You Finish Your Indie Game*. Released on 2nd April 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=JWbVDfMgdyg>.; RUSWICK, T.: *Making Games Solo Is Not the Same as Making Them Alone*. Released on 9th August 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=HQdot2OudAg>.; RUSWICK, T.: *Never Make Games Alone*. Released on 21st April 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=VCVg5WwyV00>.

tips on planning are: to know from the beginning the platforms on which the game will be distributed, to work with deadlines even in solo projects, and to have a strong sense of priority – it is easy to dedicate too much time in features felt to be "cooler" or more comfortable to execute. When it comes to persistence, he emphasizes the value of finishing projects and avoiding the temptation of switching before the end. He warns us to be prepared for the last 10% of development. Finishing can be (and will often be) more exhausting and time-consuming than the creation of the first majority of the game. Maintaining a productivity flow is essential to finish it (also cited by O. Bst[47]). B. Clarke[48] adds that if you lose this workflow once, it will be easy to lose it again. D. Valecillos,[49] on the other hand, talks about how it is better to start as a solo developer to be able to get a sense of what the whole process is like, from prototyping to launching. Then, one can acquire a sense of what the management of a project is like. For him, it is good to work as a solo developer, because one does not have to wait for a team to keep working. Depending on the project, the scope, and on one's skills, it will be faster if one does everything, continuously, keeping the flow of creativity instead of waiting for the artist, programmer, or the game designer to continue their tasks.

There are two points to success related to management as explained by R. Davidson.[50] The first is to be aware of the value of your project, including aspects such as whether the game allows for a sequel and the monetization strategies it can implement. Also, the game should be able to create memorable moments, leaving players speechless. B. Clarke,[51] in addition to that which has already been included in the lists above, presents three more tips in his video, focusing on process management: when it is too hard, it is better to have a break. He also recommends making something big, or to work on the dream game, as this will provide motivation. Finally, avoid wasting time with processes that have been done by someone else if possible. B. Nowak, from *DevDuck*,[52] who is creating a game during his spare time, created a video to share management tips that helped him keep his *full-time* job and, in the meantime, develop his own game. He recommends converting idle time into productive time. For example, if the developer is going somewhere by bus, he or she can take the opportunity to think about certain elements that are not completely scripted in the game. He also mentions the importance of trying to finish all existing tasks before adding new ones, beginning with small projects, and avoiding 'zero days', when one has done nothing for the project. To him, it is also positive to use a tool to take notes on ideas or references and to manage the process, such a notebook or *Trello*. He recommends keeping this tool always at hand. G. Dunn[53] also mentions having a tool in which to write down all your ideas. The representative of the game engine *BuildBox,*[54] reading the article written by T. Crump, in addition to their suggestion to begin with small projects, recommends creating a colour palette to decide and manage the game colours. They reinforce the importance of the artistic dimension of the game, and of creating good quality assets.

47 *5 Tips for a Solo Game Developer!.* Released on 22nd May 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=XHYn3mB73IQ>.

48 *The 5 BEST Tips for Getting Started as an Indie Game Dev GONE WRONG!.* Released on 5th August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=Sebin6s80tI>.

49 VALECILLOS, D.: *Can you make it as a solo indie game developer?.* Released on 17th October 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=pzZSH7z6zr8>.

50 DAVIDSON, R.: *Indie Game Dev Tip #1 – The 4 M's of Success*. Released on 3rd January 2016. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=PGEvWAU3xRI>.

51 *The 5 BEST Tips for Getting Started as an Indie Game Dev GONE WRONG!.* Released on 5th August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=Sebin6s80tI>.

52 *Making Time for Indie Development: 5 Tips!.* Released on 27th May 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=HKt853TK7Mo>.

53 *Indie Game Development Tips: 3 Things You MUST have!.* Released on 5th February 2020. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=SgefZNRsgbE>.

54 *5 Indie Game Dev Tips*. Released on 17th December 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=MJ6zB002LBA>.

Marketing

In terms of marketing, most videos have tips related to player community (also called fanbase), be it the creation or the management, and your relationship with it. These tips make up 67% of all marketing tips, giving one the idea that the main way to make the product publicly recognized, for an indie developer, is by creating and managing a fan base. In the case of marketing related tips, they were also organized by the author. One of them is *Ask Gamedev*,[55] who mentions the relevance of creating a loyal fanbase and interacting with them. He warns, however, that a loyal audience cannot guarantee success if the product is of low quality. He emphasizes the importance of seeking feedback, suggesting that one tries to show the game to others with the best quality possible, and taking negative feedback seriously. There is also reference to a precise understanding of who the target audience is, and the idea of using similar games for that. Finally, he recommends avoiding underestimating the value of an optimized and good-looking page in online stores.

J. Tyroller[56] also reinforces ideas such as the importance of creating a community or fanbase and seeking feedback for the game. He adds that feedback can be a mutual activity, in the context that a developer can both give and receive feedback from peers. He recommends giving and collaborating before asking for favours. There is also a suggestion to value the fantasy of the game in its advertising. Concerning creating a community and receiving feedback, O. Bst[57] talks about creating devlogs, which are documents on the product's historical development (whether recorded or written). In this way, the product is disclosed while receiving feedback for what is written in the documentation. Other categories that were created for the best visualization of the tips were if the tips are related to YouTube, which is also the same platform used in the current research. Reference to YouTube appeared in 44% of videos with tips in the marketing category. Most of these specifically talk about the use of YouTubers to promote the game. These YouTubers are the creators of content that are usually sponsored to play the game as a form of disclosure. One of the tips, from T. Brush,[58] is not to ask YouTubers to play the game. Instead, get them involved. For instance, one could reach out to them and ask if they have any form of criticism to give, if they want to participate as a voice actor or help in the creation of a character, thus, letting them get to know the game. He also talks about not overestimating influencers, i.e., content creators. He admits that they are a great help depending on the audience of the influencer, as they can easily blend with the *fanbase.* However, sometimes this will allow the game to be viewed, without necessarily generating a jump in product sales.

In addition, there were tips on market analysis, as R. Davidson[59] states that it is necessary to think of something that has market appeal. Not just entering the market with what one has but thinking about what can become marketable. This does not mean turning the entire game into a copy of something else but knowing which parts can be used for product marketing. In terms of strategies for advertising the game,

55 *Indie Game Marketing with Zero Budget!.* Released on 31st July 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=yQggqaxx6cg>.

56 TYROLLER, J.: *5 Ways to Make People Care about Your Game | MARKETING TIPS*. Released on 14th December 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=yFw3zLg0fTQ>.

57 *5 Tips for a Solo Game Developer!.* Released on 22nd May 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=XHYn3mB73lQ>.

58 *8 Solo Game Developer Mistakes to Avoid!.* Released on 16th April 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=umpp1ytp4Zk>.; *Indie Game Marketing with Zero Budget!.* Released on 31st July 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=yQggqaxx6cg>.

59 DAVIDSON, R.: *Indie Game Dev Tip #1 – The 4 M's of Success*. Released on 3rd January 2016. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=PGEvWAU3xRI>.

T. Brush[60] shares his views. He recommends making a list of press journalists who may be interested in the kind of game and using the Metacritic website to find those who reviewed similar games. He describes his recommended approach to create personal posts on Reddit advertising games and is skeptical about spending much energy to get posts on Twitter or developing an official website. There are also mentions of Nintendo Switch as being a good platform on which to publish.

Personal Issues

Personal issues, which generally involve the developer's mental health, were divided into three categories, the main one being confidence and self-esteem, present in 67% of the videos. Confidence is often talked about as a key element to avoid quitting, and self-esteem is often talked about to help the developer to not get 'blocked' if he/she does not feel that his/her work is perfect, which could generate problematic perfectionism.[61] It was also mentioned that one should learn to receive criticism, disassociating the project from the developer's own identity, and T. Brush[62] adds that receiving criticism can be difficult, but it is better to admit the error and try to improve than to go into denial. So, as R. Davidson[63] states, although the journey is often more difficult than it seems, the developer needs to remain motivated to be able to deliver the project since, for the project to be launched, it needs to be finished. This idea is also reinforced by the representative of the game engine *Build Box*.[64] This motivation can be arranged by analyzing the past, as T. Brush[65] states when saying that, as in the past, developing games was a completely different scenario from now, with many more difficulties, seeing that the number of paths that have opened lately can help a developer stay on the project.

The other category that had a lot of presence was about the change of mentality and habits, which also makes up 67% of the videos in the category. In this category, there are tips that seem simple, such as cleaning your table and brushing your teeth,[66] which, during the process of indie and solo development, run the risk of being disregarded. Since many solo indie developers work from home, they may not realize the importance of maintaining a healthy professional environment. Tips related to reserving some time for leisure, since no game will be finished if the developer is overworked[67] or cares too much about the product launch day[68] to the point of causing problems to their physical and mental health. Another

60 BRUSH, T.: *5 Indie Game Marketing Hacks with NO MONEY*. Released on 22nd June 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=otza1Eg5AsY>.; BRUSH, T.: *5 TIPS I've Learned after a DECADE of Making Indie Games!*. Released on 31st August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=qUPwuBAnUew>.

61 RUSWICK, T.: *Never Make Games Alone*. Released on 21st April 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=VCVg5WwyV00>.

62 BRUSH, T.: *Let's Be Honest about Indie Game Development – Q&A*. Released on 17th June 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=4kyD8yaDuXE>.

63 DAVIDSON, R.: *Indie Game Dev Tip #1 – The 4 M's of Success*. Released on 3rd January 2016. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=PGEvWAU3xRI>.

64 *5 Indie Game Dev Tips*. Released on 17th December 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=MJ6zB002LBA>.

65 BRUSH, T.: *How To Make A Game ALONE (5 Secrets)!*. Released on 14th December 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=ZjDibmEtJmY>.

66 BRUSH, T.: *5 TIPS I've Learned after a DECADE of Making Indie Games!*. Released on 31st August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=qUPwuBAnUew>.

67 RUSWICK, T.: *9 Tips to Help You Finish Your Indie Game*. Released on 2nd April 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=JWbVDfMgdyg>.

68 BRUSH, T.: *5 TIPS I've Learned after a DECADE of Making Indie Games!*. Released on 31st August 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=qUPwuBAnUew>.

tip shared by T. Brush[69] is to accept that the developer probably will not get rich easily, but that this does not prevent the venture from becoming sustainable. The expectation of quick and easy enrichment can be a problem. It is also necessary to be patient since the development of a game is time-consuming due to its complex and complete production pipeline, and sometimes even a prototype can take time to come out as it was planned.[70]

Finally, in the minority, being in 22% of the videos, is the category about avoiding loneliness. T. Ruswick[71] points out that it is extremely necessary to have contact with a community and that creating games as an indie and solo developer is not creating them alone. And this is complemented by T. Brush,[72] who says that it is necessary to have people you trust around you to tell you when you should stop trusting your instincts and start analyzing a specific part of the research base. Thus, despite not being in any of the above categories, D. Valecillos[73] states the need to see the creation and development of the product as a way of gaining experience, collaborating with the thoughts mentioned above about knowing how to receive *feedback* and, from that, improving on your next attempt.

Discussion

The data provides a large number of tips and perspectives. While analyzing them, it is important to realize that they come from the testimonies of individuals who describe their view of the process. Therefore, tips should not be taken as rules or absolute truths. They make more sense as points of reflection for the indie and/or solo developer to use as a guide for the critical analysis of their own context. An example of divergence that illustrates this difficulty is the comparison of the writings of R. Hill-Whittal,[74] who encouraged indie developers to use open-source software, and the testimony of D. Nadaski[75] whose list of recommendations is composed, mostly, of paid software. What is better, of course, depends on each case, and exposing each author's perspective can help other developers mature their own ideas and decide for themselves. More than pointing towards good practices, the compilation of tips outlines what content creators believe are the most relevant challenges for indie developers of that period, as well as the tips they find relevant. From the sample analyzed, it can be observed that, as A. Y. Alencar and P. Jucá[76] suggest, issues of the management of the production process are the biggest challenge of the indie developer. The scope issue, however, is not a specificity of indies and/or solo developers, but it is also a challenge found in large productions[77]. Perhaps the most significant difference is

69 BRUSH, T.: *3 Lies about Being an Indie Game Dev*. Released on 7th December 2018. [online]. [2021-05-07]. Available at <www.youtube.com/watch?v=s6FWBY5mCVw&t>.

70 RUSWICK, T.: *9 Tips to Help You Finish Your Indie Game*. Released on 2nd April 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=JWbVDfMgdyg>.

71 RUSWICK, T.: *Never Make Games Alone*. Released on 21st April 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=VCVg5WwyV0O>.

72 BRUSH, T.: *5 Solo Game Dev Mistakes You MUST Avoid (My Experience!)*. Released on 6th July 2019. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=IsF7SpQzfYs>.

73 VALECILLOS, D.: *Can you make it as a solo indie game developer?*. Released on 17th October 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=pzZSH7z6zr8>.

74 HILL-WHITTALL, R.: *The Indie Game Developer Handbook*. Burlington : Focal Press, 2015, p. 1-64.

75 BEAVER, G.: *Solo Indie Game Development on a Budget*. Released on 19th July 2018. [online]. [2021-05-07]. Available at: <https://www.youtube.com/watch?v=sz2ZnRSp2YE>.

76 ALENCAR, A. Y., JUCÁ, P.: Dificuldades Organizacionais de Empresas Indies de Desenvolvimento de Jogos Digitais. In DA SILVA JUNIOR, J. R., ESPÍNDOLA BAFFA, A. C. (eds.): *Proceedings of SBGames 2019*. Rio de Janeiro : IEEE Computer Society, 2019, p. 1268. [online]. [2021-05-07]. Available at: <https://www.sbgames.org/sbgames2019/files/papers/IndustriaFull/198414.pdf>.

77 SCHREIER, J.: *Blood, Sweat, and Pixels: The Triumphant, Turbulent Stories behind How Video Games Are Made*. New York : HarperCollins, 2017, p. 245-270.

that large productions often have the backing of financially robust companies, while small developers can more easily fall into pernicious situations. J. Schreier describes the example of the indie game Shovel Knight; the developer ran out of money for a simple coffee.

The scope issue is a challenge because it is, in fact, a complex problem. The strategies described in the analyzed videos are in line with the themes described by A. Y. Alencar and P. Jucá.[78] It is important to note that some tips are more technical, such as using a simplified Game Design Document or modular assets. Most, however, refer to frequent errors. In this area, both the literature and YouTube testimonials seem to serve mainly to help novice developers to avoid falling into common pitfalls (like underestimating the quality assurance stage, starting with overly ambitious projects, or avoiding third-party feedback), as well as helping developers who have gone through these experiences to interpret and make sense of what happened, realizing that they are common mistakes. Finally, some tips refer to giving useful ideas that may not have crossed the developer's mind and that may be valid in their case. Examples of this are the use of prefabricated assets or the sharing of engine tools used in the game to generate passive income.

One can assume the reason for such importance is related to management issues. In the case of larger companies, a developer can focus on managing only their own time and pace of work, possibly relying on producers and managers who will work exclusively on the process management. J. Whitson, B. Simon and F. Parker[79] found that developers perceive this sort of paradox; when independent games become more professional, small teams feel the need to have a producer and mimic the work models of bigger studios, while at the same time they find it important to keep their creative independence and smaller, less hierarchical teams. These authors argue for the importance of acknowledging relational labour – networking, contacting and negotiating with industry stakeholders, public relations – as time-consuming activities and key to success in the game industry. When there is no individual dedicated to these tasks, they need to be performed by the development team, and it can be overwhelming. Our data suggests that relational labour is seen as important and necessary. However, the general approach is to give suggestions of what to do, hardly problematizing the fact that relational labour demands much time, which may create an overwhelming challenge for solo developers. Decision-making in such cases is complex, as multiple tasks challenge the developer, both in terms of internal game development and in terms of relational labour.

Whereas developing games is a professional practice, there is a belief that indie development implies a sense of authorship, a way of self-expression. P. Ruffino[80] points out this discourse in game developers, when indie games may be considered personal and artistic, which can even suggest the absence of professionalism in their production. The videos analyzed in this study do mention an approach that includes making your "dream game" and being passionate about it, even making personal posts on Reddit promoting your game. However, in general they paint a landscape that reminds us of the traditional sense of professionalism. Examples are the suggestions to use management programs, organizing goals and deadlines, as well as writing a simple GDD. In that sense, the videos suggest a fairly systematic approach to game development, rather than crafting it in a

78 ALENCAR, A. Y., JUCÁ, P.: Dificuldades Organizacionais de Empresas Indies de Desenvolvimento de Jogos Digitais. In DA SILVA JUNIOR, J. R., ESPÍNDOLA BAFFA, A. C. (eds.): *Proceedings of SBGames 2019*. Rio de Janeiro : IEEE Computer Society, 2019, p. 1268. [online]. [2021-05-07]. Available at: <https://www.sbgames.org/sbgames2019/files/papers/IndustriaFull/198414.pdf>.

79 For more information, see: WHITSON, J., SIMON, B., PARKER, F.: The Missing Producer: Rethinking Indie Cultural Production in Terms of Entrepreneurship, Relational Labour, and Sustainability. In *European Journal of Cultural Studies*, 2018, Vol. 24, No. 2, p. 606-624.

80 RUFFINO, P.: Narratives of Independent Production in Video Game Culture. In *Loading... The Journal of the Canadian Game Studies Association*, 2013, Vol. 7, No. 11, p. 107-120.

free-spirited, impulse-based manner. Another surprise was that the videos analyzed suggested a surprisingly small emphasis on indie community support. The importance of mutual help amongst independent developers has been highlighted in previous research, such as M. Toftedahl, P. Backlund, H. Engström[81] and O. Guevara-Villalobos.[82] It is not to say that the idea of seeking help from the community of developers was absent, it appeared timidly in many videos in tips such as looking for *post-mortems* of other games, outsourcing and making devlogs. A more explicit reference to a community of developers was made with reference to feelings of loneliness and mental health, but it does not represent the tone of most videos. Also, independent game festivals are commonly associated with the indie community and its history (e.g., J. Juul;[83] M. B. Garda and P. Grabarczyk) and are also a key element in community building, yet was practically absent in the videos. Clearly, the production of such videos itself could be considered a form of collaboration and knowledge exchange amongst developers, but in general they do not seem to reinforce much of a community beyond that and punctual feedback exchanges amongst developers.

The tips and perspectives revealed by the videos analyzed demonstrate the mindset and practices of a specific context in the history of the indie movement, in the environment of online videos. Just as M. B. Garda and P. Grabarczyk[84] describe the movement as historically situated and associated with certain ideals, the videos analyzed express the thoughts of the indie scene about a decade after it gained momentum, mostly even after the rise of the fear of market saturation called 'indiepocalypse'.[85] One could notice that the mindset perceived in the sample is much oriented towards the challenges of developing and selling games: mainly tools, tips and strategies. More idealistic values, such as the one described by J. Juul as intentionally creating deviating experiences that contrasts with AAA games – suggesting a relationship between indie and art games – was not a theme that pervaded the videos. The notion of making a game the developer would love (either to play or develop) is evident. However, in the sample we neither noticed the concept of indie games as a contrasting bastion in an endeavor to challenge the AAA game mode, nor the emphasis on innovative and artistic experiences. As O. Guevara-Villalobos[86] points out, the indie ecosystem includes a variety of possible ways developers can identify as indie, and it can involve political and aesthetical principles. There is, sometimes, tension between developers who value independence and autonomy, driven by an entrepreneur discourse, and more artistic-oriented developers, who use games as ways of expression.

81 TOFTEDAHL, M., BACKLUND, P., ENGSTRÖM, H.: Localization from an Indie Game Production Perspective: Why, When and How?. In FASSONE, R., BITTANTI, M. (eds.): *DiGRA '18 – Proceedings of the 2018 DiGRA International Conference: The Game Is the Message*. Turin : DIGRA, 2018, p. 13-15. [online]. [2021-05-14]. Available at: <http://www.digra.org/wp-content/uploads/digital-library/DIGRA_2018_paper_59.pdf>.

82 GUEVARA-VILLALOBOS, O.: Cultures of Independent Game Production: Examining the Relationship between Community and Labour. In BATEMAN, C., LOWENHAUPT, R., NACKE, L. E. (eds.): *DiGRA '11 – Proceedings of DiGRA International Conference: Think Design Play*. Hilversum : DIGRA, p. 2-17. [online]. [2021-05-14]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.224.7239&rep=rep1&type=pdf>.

83 JUUL, J.: *The Independent Mode: A Functionalist Account of Independent Games and Game History*. Paper presented at International Conference on the Foundations of Digital Games (FDG '20). Bugibba, presented on 17th September 2020.

84 GARDA, M. B., GRABARCZYK, P.: Is Every Indie Game Independent? Towards the Concept of Independent Game. In *Game Studies*, 2016, Vol. 16, No. 1. [online]. [2021-05-07]. Available at: <http://gamestudies.org/1601/articles/gardagrabarczyk>.

85 LIPKIN, N. D.: The Indiepocalypse: The Political-Economy of Independent Game Development Labor in Contemporary Indie Markets. In *Game Studies*, Vol. 19, No. 2. [online]. [2021-05-07]. Available at: <http://gamestudies.org/1902/articles/lipkin>.

86 GUEVARA-VILLALOBOS, O.: Independent Gamework and Identity: Problems and Subjective Nuances. In BATEMAN, C., LOWENHAUPT, R., NACKE, L. E. (eds.): *DiGRA '11 – Proceedings of DiGRA International Conference: Think Design Play*. Hilversum : DIGRA, 2011, p. 2-18. [online]. [2021-05-14]. Available at: <http://www.digra.org/wp-content/uploads/digital-library/242_Guevara-Villalobos_Independet-gamework-and-identity-Problems-and-subjective-nuances.pdf>.

The data from the videos does not seem to actively engage in either perspective but focuses mostly on tools and strategies to develop games and make them as successful as possible, mostly commercially oriented and pragmatic.

Two elements often associated with independent developers were not significantly present in the data. J. Juul, as well as R. Hill-Whithall, associate independent gaming with crowdfunding as a business model, a topic that was almost absent in the material analyzed. One could ponder whether the practice has become less attractive among indie developers in recent years, or perhaps the absence was due to the general emphasis on developing games rather than funding strategies. These details from the data may suggest that commercial videos with tips for independent game developers, at least from that period, do not seem to so strongly echo the concept of indie as transgressive or deviant to AAA games, assuming a pragmatic approach to game development.

Conclusion

Through a sample of online testimonials taken from YouTube, we generated data in a context where content creators transfer their experiences, indirectly creating a list of best practices – i.e., tips, recommendations, and advice on what an indie developer should focus on or actions to be avoided. We managed to group the different tips into specific categories, relating them to research already carried out on the indie games industry. The development of this research enabled the transfer of empirical knowledge derived from the experience of indie developers to the academic environment, while also analyzing its relationships or contradictions. It is important that academic studies create a dialogue about game development in its different formats. This article aims to contribute to the discussion of good practices of an indie developer at a specific time – as they tend to change constantly.

Thus, due to this constant change, good practices can be considered temporary tips. New tools can emerge, making it easier to produce a game, while existing tools can evolve to the point of creating even more shortcuts than already exist for the production of games. The interest of large publishers and platforms in the indie scene and the tools available changes rapidly. Marketing strategies can become outdated since, as this article shows with the use of influencers, there are constant changes in what should be focused on to effectively make a game known to the public. For future research, it would be interesting, through the good practices presented in the article, to seek a way of validation and in-depth discussion of the ideas found. It would also be relevant to investigate whether other contexts – such as independent game festivals – do reproduce the mindset portrayed in this study. Perhaps indie game studies can evolve to understand the indie scene as diverse, recognizing the ideologies and discourses of each possible profile of indie developers.

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More-than-Human Game Design: Playing in the Internet of Things

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Professor Paul Coulton is Chair of Speculative and Game Design within Lancaster University's open and exploratory, design-led research lab, Imagination Lancaster. His research can more generally be considered as Speculative Design which combines real and/or hypothetical extrapolations of the development of emerging technologies with a consideration of the cultural landscape into which they may be deployed. This activity is embodied as 'research through design' and, in particular, to the design of speculative physical/digital interactive games, playful experiences, and artefacts. He is internationally recognised for his work by not only academia but also industry and was the first academic invited to speak at the Game Developers Conference. Increasingly, his work encompasses a particular form of Speculative Design; Design Fiction, which is a way of exploring futures for areas such as the Internet of Things and Artificial Intelligence. Design Fictions are collections of artefacts, that, when viewed together build a fictional world. The artificially built world is a prototyping platform for the very designs that define it, meanwhile those designs reciprocate in kind and prototype the world.

ABSTRACT:
The design of objects requiring human interaction often revolves around methods such as Human Centred Design (HCD). Whilst this is beneficial in many cases, contemporary developments of technology such as the Internet of Things (IoT), which produce assemblages of interactions, lead to the view that human centred approaches can prove problematic leading to the proposal of adopting more-than-human perspectives. This study discusses the creation of a novel board game designed to explore a more-than-human design view for IoT products and services by addressing problematic issues in relation to user data privacy and security within the IoT which arguably arise from the application of traditional HCD approaches. By embracing Object-Oriented Philosophy, The Internet of Things Board Game creates an ontographic mapping of IoT assemblages and illuminates the tiny ontologies of unique interactions occurring within these digital and physical networked spaces. Here the gameplay acts as metaphorism illustrating independent and interdependent relationships between the various 'things' in the network. The study illustrates how critical game design can help develop potential new design approaches as well as enabling users to better understand the complex digital/physical assemblages they create when utilising IoT products and services in their everyday lives.

KEY WORDS:
board game, design research, game design, internet of things, metaphorism, more-than human.

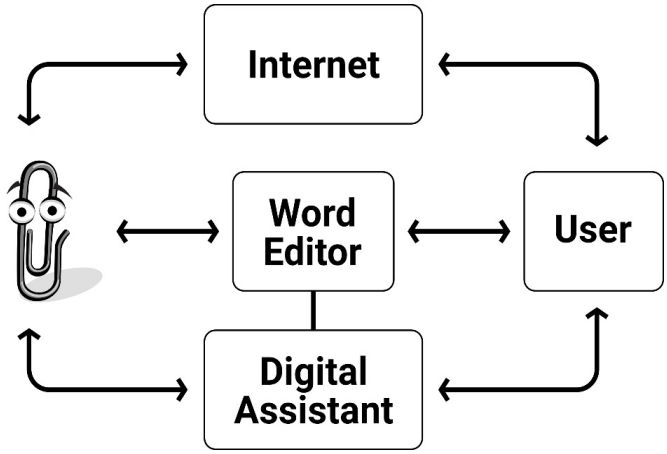
Introduction

In the mid 90's Microsoft bundled their popular Office Software with a virtual assistant they named *Clippy*. The rather annoying and at times intrusive anthropomorphised paper clip arguably did little in the way of providing actual assistance but was amongst the first steps towards a future more recognisable today with smart assistants such as *Amazon Alexa*. Whilst *Clippy* was an add-on for traditional desktop software, many of these new personal assistants come in the form of bespoke internet connected devices and are components of what is commonly referred to as the Internet of Things (IoT). Although *Clippy* has little to do with the evolution of IoT, as its only interaction with the Internet was by occasionally providing a web link to obtain further information, it does offer a starting point through which we might consider our evolving relationship with hardware and software which the IoT is rapidly expanding.

Lurking in the background of our Microsoft Office related activities, *Clippy 'listened-in'* as we began to type a letter or create a presentation. This non-human entity made human monitored and analysed our interactions creating an invisible link between us (the human user) and the computer hardware and software. I. Bogost allows us to view such links as 'alien phenomenologies'[1] through the lens of Object-Oriented Philosophy, introduced by G. Harman,[2] in which segregated links of entities produce various tiny ontologies;

1 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 32.
2 For more information, see: HARMAN, G.: *Object-Oriented Ontology: A New Theory of Everything*. London : Pelican Books, 2018.

phenomenological clusters of interactions. Further, Bogost proposes 'metaphorism',[3] which allows us to attach meaning to phenomenon producing an understanding of the nature of being and perception of world related to these human and non-human entities. Thus, we could consider the anthropomorphised form of *Clippy* as acting as a playful metaphor for digital assistance. Behind the *façade* however *Clippy* is still lines of computer programming, and when viewed through an alien phenomenology lens it becomes a more-than-human entity creating a tiny ontology including itself as a digital assistant, the human user, and the software between allowing an objective or exploded view to be analysed (Picture 1).



Picture 1: The relationships generated between different entities interacting with Microsoft's Clippy may be seen as tiny ontologies
Source: own processing

The pervasiveness of IoT-enabled (or smart) devices is rapidly expanding the number of these invisible links, going well beyond our interactions with desktop software to include interactions with everyday objects and locations. From smart meters collecting data on which rooms we occupy to smart toasters capable of providing us with the optimum level of toasting required for a *Pop Tart*®, the invisible links created by these devices produce complex networked ecologies of human and non-human entities fuelled by data. J. Lindley et al. describe these ecologies produced within the IoT through the metaphor of 'constellations'[4] representing the independent and interdependent relationships amongst human and non-human entities. As an example, take a smart kettle connected to the Internet. Though the general understanding is it is directly related to its utilitarian use ergo to boil water for the human-user, the fact that it is connected to the Internet means other stakeholders have a share in this relationship, such as Internet Service Providers (ISP), electricity companies, policies from government assigned regulations, and so on. The object-oriented perspective affords these tiny ontologies to be mapped out, and within these generated constellations of differing ontological relationships it is wrong to assume the human is at the centre. For instance, it could be the data produced through use that is

3 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 61.
4 LINDLEY, J. G., COULTON, P.: On the Internet Everybody Knows You're a Whatchamacallit (or a Thing). In MARK, G., FUSSELL, S. (eds.): *Proceedings of CHI 2017 Conference on Human Factors in Computing Systems*. New York : Association for Computing Machinery, 2017, p. 2.

of more interest to these stakeholders.[5] This fact raises concerns on the efficacy of using orthodox HCD approaches which obfuscate the complexity of relationships in the name of simplicity, often leading to considerable ethical concerns relating to areas such as security and privacy.[6]

In effect, what is achieved is an argument for challenging design orthodoxies in favour of More-than-Human-Centred Design (MtHCD) approaches.[7] We note that while the *more-than-human* concept is also being considered to explore our complex relationships with other entities such as animals,[8] or the environment,[9] this is commensurate with the work presented in this study as the philosophy allows us to consider all these things within various tiny ontologies. Thus, the IoT is an example of how design can better embrace the complexity of interactions rather than adopting approaches that seek to mask such complexity. This study attempts to illustrate this by illuminating the design decisions associated with the interactions within a board game created with the intention of revealing the intimate 'natures' of IoT devices/services.

The Internet of Things Board Game is a work of philosophical carpentry, a method introduced by I. Bogost that infuses philosophical arguments, in this case MtHCD inspired by object-orientated philosophy, within designed artefacts for the purposes of enacting metaphorism through philosophy and gameplay.[10] These appear in-game as descriptions on cards, mechanisms in play, and player-game interactions acting as tiny ontologies between the player, game, and the rhetoric of IoT. This study focuses on the different ways the game approaches the notion of metaphorism through gameplay and procedural rhetoric making the game a case study for possible more-than-human game design. The text is structured as follows, first the core concept of metaphorism and its relation to game design, IoT, and design research is expanded through a review of relevant literature. Second, the different nuances and mechanisms employed for enacting metaphorism for IoT in the game are presented and discussed; note the process of creating the game is not fully presented as this has been detailed elsewhere,[11] along with its ability in illuminating ethical and security concerns in IoT.[12] The study then concludes with a discussion around the present potential and possible pitfalls of using metaphorism in the context of game design for understanding design approaches.

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5 LINDLEY, J. G., COULTON, P., AKMAL, H. A.: Turning Philosophy with a Speculative Lathe: Object Oriented Ontology, Carpentry, and Design Fiction. In STORNI, C., LEAHY, K., McMAHON, M., LLOYD, P., BOHEMIA, E. (eds.): *Proceedings of DRS2018 Limerick*. London : Design Research Society, 2018, p. 238.

6 LINDLEY, J. G., COULTON, P.: On the Internet Everybody Knows You're a Whatchamacallit (or a Thing). In MARK, G., FUSSELL, S. (eds.): *Proceedings of CHI 2017 Conference on Human Factors in Computing Systems.* New York : Association for Computing Machinery, 2017, p. 2.

7 For more information, see: COULTON, P., LINDLEY, J. G.: More-Than Human Centred Design. In *The Design Journal*, 2019, Vol. 22, No. 4, p. 463-481. [online]. [2021-03-08]. Available at: <https://www.tandfonline.com/doi/full/10.1080/14606925.2019.1614320>.; LINDLEY, J., AKMAL, H. A., COULTON, P.: Design Research and Object-Oriented Ontology. In *Open Philosophy*, 2020, Vol. 3, No. 1, p. 11-41. [online]. [2021-03-08]. Available at: <https://www.degruyter.com/document/doi/10.1515/opphil-2020-0002/html>.

8 GALLOWAY, A.: Creative Ethnography after Human Exceptionalism. In HJORTH, L., HORST, H., GALLOWAY, A., BELL, G. (eds.): *The Routledge Companion to Digital Ethnography*. New York : Routledge, 2017, p. 470.

9 TSING, A. I.: *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins.* Princeton : Princeton University Press, 2015, p. 256-264.

10 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 85.

11 For more information, see: AKMAL, H. A., COULTON, P.: Research through Board Game Design. In *Proceedings of RTD 2019 Method & Critique*. Rotterdam, Delft : Science Center, Het Nieuwe Instituut, 2019, p. 1-16.

12 For more information, see: AKMAL, H. A., COULTON, P.: The Internet of Things Game: Illuminating Data Interactions within the Internet of Things. In *Proceedings of Living in the Internet of Things*. London : Institution of Engineering and Technology, 2019, p. 1-5.

Complexity in the Internet of Things

In his book *Everyware*, A. Greenfield discusses potential futures where technology takes on a ubiquitous nature, in particular the likelihood of technology consciously processing our daily lives as more and more data is captured.[13] This is a concept stemming from M. Weiser's vision of ubiquitous computing where it becomes invisible and sewn into our daily lives.[14] Greenfield's visions are full of connected everyday objects collectively gathering information about ourselves for an array of purposes. These visions are highly prescient of the exponential expansion of IoT products and services but also of the changes this would instigate in our everyday lives: "When everyday things are endowed with the ability to sense their environment, store metadata reflecting their own provenance, location, status, and use history, and share that information with other such objects, this cannot help but redefine our relationship with such things".[15] One aspect of this change in status comes in the form of loss of privacy with the use of IoT-enabled technology as the data we generate is used for purposes beyond our control or expectation. Whilst our expectation of IoT devices is driven by our previous understanding of their non-smart precursors, the data we generate around their use adds new challenges which are not always made apparent by the devices themselves. R. Vamosi sees this as a "betrayal" by our devices explaining how we have yet to evolve "survival instincts" for living alongside IoT or 'smart' products and services.[16]

Many of the issues emerging around the use of IoT products and services originate in their design and arguably through the use of HCD with its particular focus on simplicity of use.[17] This core axiom of simplicity[18] often means that only the basic operation of the device is presented and its role as part of a wider networked ecology is neglected.[19] For example, the *Roomba©* robotic vacuum cleaner claims to allow you to "forget about vacuuming for weeks at a time" and that it (the robot) is smart enough to know if your cat has tracked its litter through the house.[20] However, many owners were shocked to learn that the latest versions of the device produced detailed maps of their homes.[21] These were then relayed to the manufacturer who could potentially have shared them with third

13 See also: GREENFIELD, A.: *Everywhere: The Dawning Age of Ubiquitous Computing*. Berkeley : New Riders, 2006.

14 For more information, see: WEISER, M.: The Computer for the 21st Century. In *Scientific American*, 1991, Vol. 265, No. 3, p. 94-105.

15 GREENFIELD, A.: *Everywhere: The Dawning Age of Ubiquitous Computing*. Berkeley : New Riders, 2006, p. 23.

16 VAMOSI, R.: *When Gadgets Betray Us: The Dark Side of Our Infatuation with New Technologies*. New York : Basic Books, 2011, p. 16.

17 COULTON, P., LINDLEY, J. G.: More-Than Human Centred Design. In *The Design Journal*, 2019, Vol. 22, No. 4, p. 465. [online]. [2021-03-08]. Available at: <https://www.tandfonline.com/doi/full/10.1080/14606925.2019.1614320>.; LINDLEY, J. G., COULTON, P., COOPER, R.: Why the Internet of Things Needs Object Orientated Ontology. In *The Design Journal*, 2017, Vol. 20, No. 1, p. 2848. [online]. [2021-03-08]. Available at: <https://www.tandfonline.com/doi/abs/10.1080/14606925.2017.1352796>.

18 NORMAN, D.: *The Invisible Computer: Why Good Products Can Fail, the Personal Computer Is So Complex, and Information Appliances Are the Solution*. Cambridge : MIT Press, 1999, p. 67.

19 LINDLEY, J. G., COULTON, P., COOPER, R.: Why the Internet of Things Needs Object Orientated Ontology. In *The Design Journal*, 2017, Vol. 20, No. 1, p. 2848. [online]. [2021-03-08]. Available at: <https://www.tandfonline.com/doi/abs/10.1080/14606925.2017.1352796>.

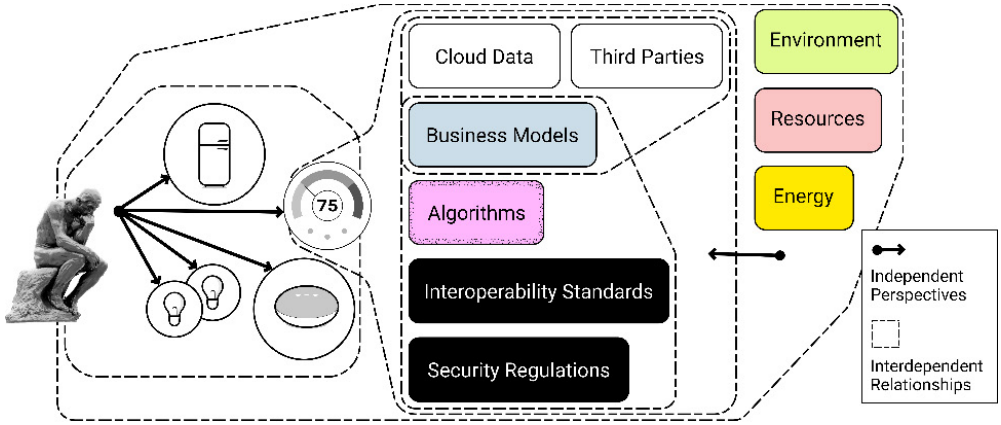
20 *The Future of Clean Takes Shape with iRobot's Most Advanced Robot Vacuum and Mop*. [online]. [2021-03-31]. Available at: <https://media.irobot.com/2019-05-29-The-Future-of-Clean-Takes-Shape-with-iRobots-Most-Advanced-Robot-Vacuum-and-Mop>.

21 For more information, see: ASTOR, M.: *Your Roomba May Be Mapping Your Home, Collecting Data that Could Be Shared*. Released on 25th July 2017. [online]. [2021-05-19]. Available at: <https://www.nytimes.com/2017/07/25/technology/roomba-irobot-data-privacy.html>.

parties. While an automatic vacuum cleaner seems attractive, a digital device which maps the interior of your home in order to – potentially – sell that map to the highest bidder, is clearly a more complicated proposition.

An Alternative Approach

J. Lindley et al. seek a change of perspective (Picture 2) moving away from the dogmatic use of HCD to a focus on simplicity in the design of IoT systems and have proposed a more-than-human approach based on the contemporary workings of object-oriented philosophies by G. Harman,[22] T. Morton,[23] and I. Bogost[24] among others. The constellation view of IoT they propose presents independent and interdependent relationships among entities in IoT networks as an expanded imagining of interconnectivity viewed by proximity to stakeholders such as the user, IoT device, or ISP.



Picture 2: A constellation view of IoT reveals independent and interdependent relations existing among seeming simple interactions

Source: own processing

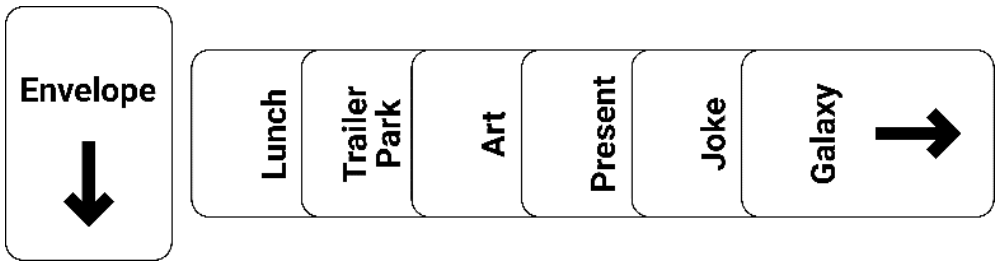
G. Harman presents Object-Oriented Ontology (OOO) as a branch of philosophy relating to phenomenology.[25] I. Bogost augmented this with his notion of metaphorism as a means of speculating on the unknown lives (or inner workings) of things.[26] As a practicing game designer and technologist I. Bogost creates games and programs that enact this idea of metaphorism by exploring different object-oriented vantage points leading to him describing himself a philosopher-programmer. Similarly, this approach could be sourced for the creation of say philosopher-mechanics,[27] or in the case of the board game and associated design research artefacts philosopher-designers.[28]

22 For more information, see: HARMAN, G.: *The Quadruple Object*. Alresford : Zero Books, 2011.
23 See also: MORTON, T.: *Realist Magic: Objects, Ontology, Causality*. London : Open Humanities Press, 2013.
24 See: BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012.
25 HARMAN, G.: *The Quadruple Object*. Alresford : Zero Books, 2011, p. 20-32.
26 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 63.
27 Ibidem, p. 109.
28 AKMAL, H. A., COULTON, P.: A Tarot of Things: A Supernatural Approach to Designing for IoT. In BOESS, S., CHEUNG, M., CAIN, R. (eds.): *Proceedings of DRS 2020* Synergy. London : Design Research Society, 2020, p. 2382.

Tiny Ontologies

The notion of tiny ontologies in this regard is a main tenet of metaphorism and to explain this a brief interlude into the philosophy is helpful at this stage. I. Bogost[29] appropriates the term from G. Harman's "flat ontologies"[30] coming from his work on OOO where he describes them as the relationships between the properties of 'things' with those of other 'things' presented in an exploded view of their universe. The philosophical example Harman gives is of the relationship between cotton and fire wherein certain properties of cotton on a quantum level must adhere to the logic that cotton should burn in contact with fire.[31] This specific quantum interaction is unknown to humans yet known and understood among the non-human entities that are cotton and fire. I. Bogost's appropriation of this logic takes into account human computer interaction substituting the non-human with software and hardware expanding on the definition as being a dense point containing everything within and in relation to it.[32] He opens a case for 'unit operations' occurring within these tiny ontologies making them independent parts of a whole yet dependent on each other.[33] As OOO places no precedence for humans over non-humans,[34] this logic begins to take shape. Where the exploded view of hardware as tiny ontologies becomes plastic, silicone, metal, glass, screws, or its materiality, the quantum levels of software become its programming language, compiler, metadata, algorithms, etc.

As an example of his tiny ontologies I. Bogost presents the card game *In a Pickle* as an ontographic machine.[35] Players must play a series of cards dealt to them in a specific order with each played card being capable of encompassing the concept of the previous card. For instance, a game of In a Pickle could look like this: *Lunch, Trailer Park, Art, Present, Joke, Galaxy* (Picture 3).



Picture 3: Example of a round of In a Pickle. Each card expands on the previous creating a linear play of words and a tiny ontology of relations between them
Source: own processing

Each card played expands on the previous card, but in the process, he argues it also creates hidden linkages between physical and conceptual entities with each coupling becoming a 'unit operation'. I. Bogost calls arrangements of words such as these *Latour*

29 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 19.
30 HARMAN, G.: *Object-Oriented Ontology: A New Theory of Everything*. London : Pelican Books, 2018, p. 54.
31 Ibidem, p. 164.
32 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 109.
33 Ibidem, p. 22-29.
34 HARMAN, G.: *The Quadruple Object*. Alresford : Zero Books, 2011, p. 106.
35 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 56.

Litanies after sociologist-philosopher B. Latour's act of list making.[36] This central logic of tiny ontologies and unit operations builds the foundations of the constellation metaphor for IoT presented by J. Lindley et al.[37] where each connected entity forms a unit operation functioning with its own inherent requirements.

Metaphorism and Game Design

This talk of metaphorism might seem tangential to game design but games and metaphor are no strangers. The use of metaphor within games (particularly video games) is common, and several sources can be found attesting to games representing a vehicle for moving metaphor and play together.[38] I. Bogost's use of metaphorism can be understood by an example from his book of how a camera takes photographs.[39] Unlike the human eye cameras process light differently taking into account how the sensor present within the camera functions, making the interaction between subject-sensor unique for different kinds of cameras with different manners of sensors. For the user it's a click of a button, a flash, and a processed image. Even if they were to be aware of the functioning inner reflections of the camera, the camera would still be 'seeing' the image through its sensor according to what rules and limitations it presented. The metaphor suggests that our understanding of how a camera experiences sight is very different than what the actual experience of 'seeing' for a camera truly is.

In relation to game design, another example is presented by J. Gee who argues that video games allow embodied thinking by throwing players into living the lives of virtual characters, ergo enabling them to think as if the virtual world were theirs.[40] Combining the two metaphors a game designed with the intent of making one 'see' through the eyes of a camera could enable a player to embody the camera to a certain degree. Especially if it were programmed to direct the player to experience sight and the processing of image as a camera would. The digital games *I am Bread*[41] and *Untitled Goose Game*[42] attempt this notion of metaphorism and more-than-humanness through gameplay by having the player exist in-game as a slice of bread or a goose respectively. That said, both games arguably lose fundamental *bread-ness* and *goose-ness* in favour of gameplay by employing tasks and gamifying the experience; these are not necessarily experiences bread or geese might have.

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36 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 38.

37 For more information, see: LINDLEY, J. G., COULTON, P.: On the Internet Everybody Knows You're a Whatchamacallit (or a Thing). In MARK, G., FUSSELL, S. (eds.): *Proceedings of CHI 2017 Conference on Human Factors in Computing Systems*. New York : Association for Computing Machinery, 2017, p. 1-5.

38 See: GEE, J. P.: Video Games and Embodiment. In *Games and Culture*, 2008, Vol, 3, No. 3-4, p. 253-63.; LAW, B.: Puzzle Games: A Metaphor for Computational Thinking. In CONNOLLY, T. et al. (eds.): *Proceedings of European Conference on Game Based Learning*. Kidmore End : Academic Conferences Ltd., 2016, p. 344-353.; MELERO, J. et al.: Puzzle-Based Games as a Metaphor for Designing in Situ Learning Activities. In ESCUDEIRO, P. (ed.): *Proceedings of the 7th European Conference on Games Based Learning*. Kidmore End : Academic Conferences Ltd., 2013, p. 674-682.; MÖRING, S.: *Games and Metaphor – A Critical Analysis of the Metaphor Discourse in Game Studies*. [Dissertation Thesis]. Copenhagen : IT University of Copenhagen, 2013.; STATHIS, K., SERGOT, M.: Games as a Metaphor for Interactive Systems. In SAASE, M. A. et al. (eds.): *People and Computers XI*. London : Springer, 1996, p. 19-33.; GUALENI, S.: *Virtual Worlds as Philosophical Tools: How to Philosophize with a Digital Hammer*. London : Springer, 2015.

39 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing*. Minneapolis : University of Minnesota Press, 2012, p. 67.

40 GEE, J. P.: Video Games and Embodiment. In *Games and Culture*, 2008, Vol, 3, No. 3-4, p. 258.

41 BOSSA STUDIOS: *I Am Bread*. [digital game]. London : Bossa Studios, 2015.

42 HOUSE HOUSE: *Untitled Goose Game*. [digital game]. Portland : Panic, 2019.

Two examples that present a better attempt at embodiment in play are in the survival-horror digital game *Soma*[43] and the board game *Dead of Winter: A Crossroads Game*. Where the former places players in the virtual footsteps of a literal digital embodiment of the human in-game character through collated memories, the latter involves a defector element in play making players actively embody their assigned character traits within gameplay. Halfway through Soma the players are faced with the reality that they have been playing a digital avatar of their original human character all along, bringing to light existential questions for the in-game character and player. As the protagonists in Soma players take an active part in being non-human by reflecting on existential constructs making decisions that affect their player's future. Likewise, as Dead of Winter is a board game with a defector element, players actively try to keep their true identities hidden taking on different strategies to achieve their personal goals which could in many cases undermine the goals of others, as they might be playing as hidden traitors in an otherwise cooperative game. Though arguably Soma being a digital game bound by algorithms achieves this dynamic more effectively than Dead of Winter, where players may opt to alter the course of play by bringing in house rules or not wanting to be the defector in the game. In that case without the presence of an assigned traitor in play, Dead of Winter still manages enforcing players to keep their personal goals secretive and thus having them embody unique character traits often going against the grain of 'cooperative play'. Either way, both these games present I. Bogost's metaphorism within the producorial rhetoric of play with minimal sacrifice to the fundamental aspects of their character or entity in play.

Metaphorism in the Internet of Things Board Game

Through different ways of utilising in-game mechanics and theme the *Internet of Things Board Game* (Picture 4) attempts its metaphorism of IoT. This section gives a brief account of its creation before illustrating how this metaphorism is employed. Interest in the creation of the board game came out of early research classifying IoT interactions through philosophical discourse in an attempt at understanding the nature of interactions within constellations.[44] The design underwent an iterative research through design methodology similar to universal methods of game design and production.[45] Taking inspiration from popular mainstream board games Dead of Winter, *Betrayal at House on the Hill*, and *Eldritch Horror,* the game exercises similar paratextual experiences coming from its assigned theme.[46] A common trait in what are considered Ameritrash games which employ rich complexities involving engaging conflicts between players and/or the game, and a heavy association with theme over abstract strategy through integrated mechanics.[47] Paratextual games exist in two worlds, one the playable game world which could be in a digital medium

43 FRICTIONAL GAMES: *Soma*. [digital game]. Malmö : Frictional Games, 2015.

44 For more information, see: AKMAL, H. A., COULTON, P.: Using Heterotopias to Characterise Interactions in Physical/Digital Spaces. In STORNI, C., LEAHY, K., McMAHON, M., LLOYD, P., BOHEMIA, E. (eds.): *Proceedings of DRS 2018: Design as a catalyst for change*. London : Design Research Society, 2018, p. 269-278.

45 See also: AKMAL, H. A., COULTON, P.: Research through Board Game Design. In *Proceedings of RTD 2019 Method & Critique*. Rotterdam, Delft : Science Center, Het Nieuwe Instituut, 2019, p. 1-16.

46 BOOTH, P.: *Game Play: Paratextuality in Contemporary Board Games*. New York : Bloomsbury Publishing, 2015, p. 4.

47 COSTIKYAN, G.: Boardgame Aesthetics. In CONSTIKYAN, G., DAVIDSON, D. (eds.): *Tabletop: Analog Game Design*. Pittsburgh : ETC Press, 2018, p. 181-183.

or physical board game, and two the world it references from often media associations like film or literature.[48] For example, *Lord of the Rings: Journeys in Middle-Earth* by Fantasy Flight Games and *Back to the Future: Back in Time* by Prospero Hall may be considered paratextual games owning to the fact that they both associate with their source media; the novel of the same name in case of the former, and the popular film franchise in the latter. P. Booth presents an in-depth discussion around paratextuality in board games arguing for how they reveal significances of either world they relate to (playable game world or referenced), as conjoined versions of each other representing different faces of these different worlds each open to interpretation.[49] Ameritrash games present this through algorithmic execution of their complex rules. To that Booth gives the example of *Arkham Horror,* a game very similar to our referenced game Eldritch Horror, which through its complexity and structure of play executes a narrative of Lovecraftian literature a world arguably more complex than the game.[50] Dead of Winter manages this through its aptly named crossroads cards which often bring about dilemmas in play, having players reassess their situations and even hidden tactics that they may have invested time in. The cards along with other mechanics enforce the theme of a post-apocalyptic undead world where play exists.

In a similar way our second important means of enforcing metaphorism is through storytelling and creating what I. Bogost refers to as vignettes.[51] As a large part of this research involved crafting a unique procedural rhetoric that worked in tandem with core philosophical research backgrounds, storytelling became an important factor in realising metaphor in-play through narrative. As players took their characters along the board different vignettes are crafted having players reinforce the rhetoric of the games paratextuality with the world of IoT. In the case of the Internet of Things Board Game the narrative around which play wrapped itself was security in IoT. The intention though not initially to reflect privacy/ security concerns in IoT, the iterative process managed to have it overlap with the core areas of philosophical spatial configurations in IoT which was the original research concern. This was not planned; yet for certain reasons it became the most comfortable means of expressing the metaphorism (more on this ahead). To that effect the game pits players against a fictional corporation attempting to gather their data a common anti-IoT stance. Players work cooperatively as fictional avatars in-game with their own unique abilities and skillset relating to different ways of experiencing the in-game imagined network of devices and interactions.

Besides their unique special abilities each avatar includes the following skills *Observation*, *Coding*, *Security*, and *Speed* which they improve as play goes on. Each signifies a number of dice the player may roll when prompted, as can be imagined the higher the skill level the higher the chances of a successful dice roll. The game attempts to interfere with this by enforcing dice-rules throughout. Collectively players then use their abilities to strategically secure physical locations from digital insecurities and security hazards against rising digital threats and vulnerabilities. As players begin to play, they quickly realise that they have little control over their actions, thus requiring a more focused understanding of what is happing in the spaces before them. Dice rolls are common in Ameritrash games facilitating a level of chance in actions, their usage here is done to highlight the fallibility of IoT networks. Players can have multiple arrangements of cards that could improve their abilities, increasing their dice rolls, but twists of fate through dice rolls bring about an ever-present air of dread in the game. These supposedly secured IoT networks can very easily fall because of a single weak link in the constellation.

48 BOOTH, P.: *Game Play: Paratextuality in Contemporary Board Games*. New York : Bloomsbury Publishing, 2015, p. 23.
49 Ibidem, p. 4-7.
50 Ibidem, p. 25.
51 BOGOST, I.: *How to Do Things with Videogames*. Minneapolis : University of Minnesota Press, 2011, p. 15.

Picture 4: The most recent prototype at the time of The Internet of Things Board Game laid out for four players
Source: own processing

The associated narrative for the game as a back story ends there as it then employs a procedural rhetoric to reveal hidden insecurities within IoT, as players move between physical locations creating digital interactions and thus linkages between physical/digital spaces. Players exchange cards in their possession each depicting an IoT-enabled device or service (kettles, toasters, lightbulbs, etc.) for tokens highlighting digital interactions within those spaces. Each space then has players fulfil a connection requirement before they may attempt to secure it to achieve their end goal. Additionally, as a central premise of the game each interaction created must be tested by players with a dice roll in a *Risk Phase* following player actions. Successful rolls signify the interactions were made securely with unsuccessful rolls signifying insecurity triggering potential consequences. These appear as cards drawn from a deck informing players of the level of risk established. Players must then attempt to find how far the insecurities have gone within their personal network of IoT devices. Each revealed insecurity creates a potential chain event of vulnerability tokens spreading throughout connected physical spaces implying the physical-digital linkages within IoT networks with each established connection (via devices or otherwise) acting as a unit operation within the network.

The moving between spaces is intended to increase understanding that these digital/non-digital spaces exist among us and can be interfaced with. Their presentation here is similar to how both Arkham Horror and Eldritch Horror explore the concept of the *Land*

of Carcosa[52] from Lovecraft. An astral plane visited in a dream-like trance that players interact with through the game as an alternate space. Here the trance is substituted for our smart devices, and Carcosa the digital space where the Internet exists. The board game thus attempts its exercise of metaphorism on three main levels. Play encourages the formation of metaphors and establishes rhetoric in relation to players (or users of IoT) with each level expanding on the previous.

Metaphorism Level 1: Unit Operations

This first level of play involves the direct relationship of the game with its players and is most prominently seen within the use of *Item Cards* (Picture 5). Through these cards and other items on the board players create unit operations that propel the game forward. Each player collects item cards representing IoT-enabled devices and services. These are traded for connection tokens which create linkages with the physical location in-game where the players are, or have been, present and their traded devices. Represented as blue cubes on their personal device cards (smart phones and tablets) these tokens enact the general understanding of IoT-enabled spaces with these interactions akin to setting up a smart device like a smart toaster in a physical location such as a kitchen. How the game manages this through the rhetoric of metaphorism is when players trigger inevitable consequences through unsuccessful dice rolls. These manifest in two forms: external network attacks, and local network attacks on personal items held by players. As a result, a player who rolls unsuccessfully must perform a series of vulnerability checks (further dice rolls) on each item and/or connection token they have on hand. In the event of any of these subsequent rolls being unsuccessful, the players execute the advised *Risk* portion of the victim card.

As an example, we can look at the *Polly Kettle*[53] item card (Picture 6). The card may be carried by players and used to create connections in-game but if a player were to trigger the *Risk Phase* of play while holding the card in hand then they would need to begin their vulnerability check on the card. Failing that would cause the player to take a *Daemon Card* (Picture 5) temporarily altering their abilities in the game. Alternatively, if the card was used at some point in play to make a connection the player would have a marker indicating they had performed that action. The penalty on failing a successful dice roll on these tokens is discarding the players primary card (smart phone or tablet), hence restricting them from making further connections in the game and halting their progress towards their end goal.

Larger scale attacks may also be seen through this same method if we take the *Toaster* item as an example. On failing its vulnerability checks the toaster drops a *Privacy Token* (Picture 6) in the space occupied by the player indicating a highly insecure location. These tokens are difficult to remove and at certain points in the game cause further vulnerabilities to emerge in that particular space, which may turn into threats bringing the players closer to failure.

52 Remark by the authors: Though not originally associated with H. P. Lovecraft's writings and dating back to the Latin name of medieval southern French city of Carcassonne, Lovecraft heavily incorporated Carcosa in his writings existing as an extra-terrestrial city often visited by his characters through dream states or out of body experiences.

53 Cameo of a parallel design fiction research on IoT and Philosophy from: LINDLEY, J. G., COULTON, P.: On the Internet Everybody Knows You're a Whatchamacallit (or a Thing). In MARK, G., FUSSELL, S. (eds.): *Proceedings of CHI 2017 Conference on Human Factors in Computing Systems.* New York : Association for Computing Machinery, 2017, p. 3.

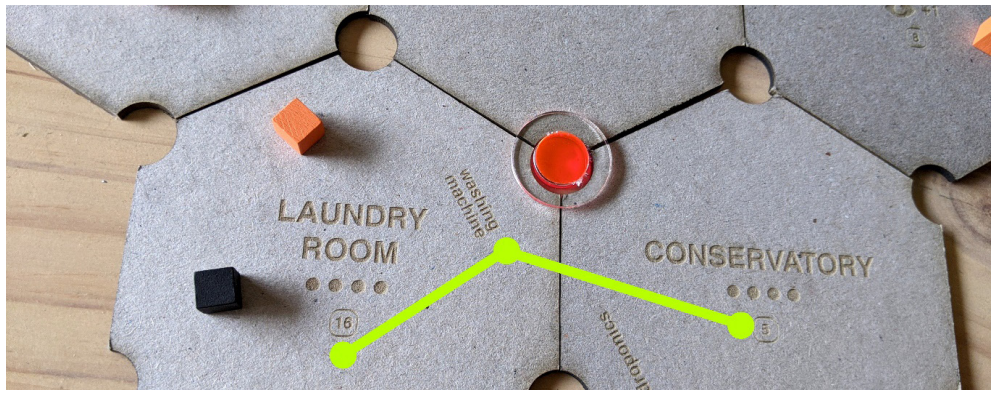
Picture 5: Item Cards (top) depicting IoT entities or concepts, Risks and Daemons (middle) disrupting play, Privacy Cards (bottom) allowing players to achieve their end goal
Source: own processing

Picture 6: The player has failed to evade the Risk Phase of play, forcing them to do vulnerability checks on their in-hand items. After failing the dice roll over the Toaster item, they are forced to place a Privacy Token in the space and take a Daemon Card. This token exploits late-game threats against players
Source: own processing

On this level a number of metaphors are being employed to establish the idea of insecure IoT systems. The personal restrictions applied by *Daemon Cards* intend to replicate the way security breaches would affect usage of IoT devices. The naming of the card as 'daemon' is in itself enacting a metaphorism as daemon's are software processes occurring in the backgrounds of our computing actions. Vulnerabilities such as trojans and viruses often employ a daemon-esque approach. Step by step the *Risk* cards inform the player of the severity and their associated consequences which gradually settles in through the procedural rhetoric of the game. The paratextuality presented is through created metaphors of physical digital locations/objects which co-exist and become intertwined through in-game mechanics, replicating real world scenarios produced by IoT products and services. There is another level of playful metaphorism coming from this as players see odd combinations emerging such as being able to connect the *Living Room* to the *Kitchen* with an IoT-enabled *Shoe,* for example. This highlights the current design trend of solutionism whereby IoT products are solving problems that don't really exist.[54]

Metaphorism Level 2: Tiny Ontologies

Moving outwards the game begins to act as a map of all the different interactions having taken place with players being able to visualise which spaces are becoming insecure and which are still safe. As explained previously the board makes it possible to read some of the tiny ontologies in play such as with the *Laundry Room* tile which has a *Washing Machine* that can be connected to the adjacent space. This manner of linguistically listing out the connections is similar to I. Bogost's referencing of B. Latour's lists or 'litanies'[55] and to the previously mentioned card game *In a Pickle*. The list of *Laundry Room–Washing Machine–Conservatory* (Picture 7) for instance is possible as are any number of combinations particularly when considering players using their in-hand items to make connections.



Picture 7: By connecting physical locations with physical objects through digital networks hidden linkages are constructed during play. In these instances, the linkages may be of unorthodox natures exploring possibilities in IoT networks
Source: own processing

54 GRADINAR, A. et al.: *The Little Book of the Internet of Things for the Home.* Lancaster : Lancaster University, 2019, p. 10.
55 BOGOST, I.: *Alien Phenomenology, or, What It's Like to Be a Thing.* Minneapolis : University of Minnesota Press, 2012, p. 38.

On a higher level though, during the *Risk Phase* of play when a player unsuccessfully rolls their dice they must draw from the *Risk Deck* before checking for vulnerabilities on their items in hand. Cards in this deck act on a secondary level of play enforcing additional rules upon players that dictate their future moves. They reel in the storytelling element allowing a dialogue between players and the game. For instance, the *Fog of War* card (Picture 8) suggests that the players' devices are 'watching' them and once the player finishes their vulnerability checks irrespective of whether any of their devices (cards) proved vulnerable or not, they must do the following: roll for privacy, disconnect the space, and gain a *Paranoia Daemon*. Each forced action is harsher than the previous and alludes to establishing paranoia towards IoT devices. The first brings about further privacy related vulnerabilities and threats in the game, the second makes the player remove all connection tokens from the space in a panic, and finally the third reduces the players' skills for the remainder of the game.

Picture 8: Failing the Risk Phase the player has drawn Fog of War. Following the cards instructions the player must restrict their dice, though they have 3 Observation and Security traits they may only roll 2 dice in this instance. Having failed the dice roll they not only execute the items Effect but also must continue the Risk cards extended effects.
Source: own processing

In both cases described the game is creating constellations of tiny ontologies. More direct in the former with objects and locations while the latter takes it further by implying a layer between these direct linkages. One could ask just how are the devices 'watching' the player? In a similar vein another *Risk* card is the *Legislation Change* card which informs all players that the policies affecting their IoT devices have altered and therefore each player must do a dice roll to secure their fate. This card hints towards current and potential future real world examples of legislative alterations affecting digital corporations and users of digital services/devices. The General Data Protection Regulation Act of 2018[56] and Australia's News Media Bargaining Code currently under negotiation[57] are examples of what this in-game card implies. The game attempts to make these widely affecting changes towards stakeholders visible as these subtle interactions between players and the game feed into the grander rhetoric of interconnectivity and the notion of constellations in IoT. A variety of these situations are explored between the 36 cards present in the *Risk Deck* each a unique metaphorism pertinent to IoT usage.

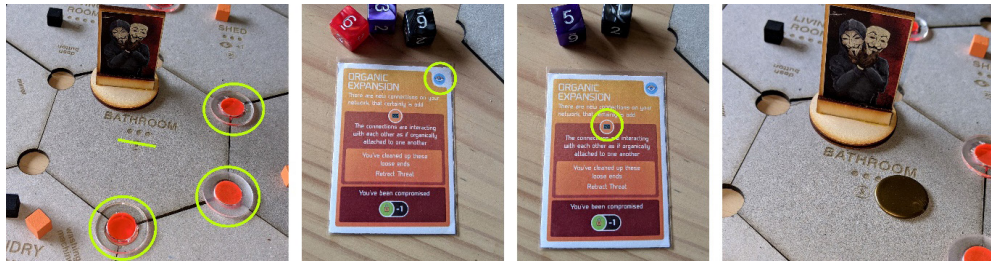
56 For more information, see: SCHULZ, M., HENNIS-PLASSCHAERT, J. A.: Regulations. In *Official Journal of the European Union,* 2016, Vol. 65, No. 119, p. 1-88. [online]. [2021-05-28]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679>.

57 For more information, see: *News Media Bargaining Code*. [online]. [2021-05-28]. Available at: <https://www.accc.gov.au/focus-areas/digital-platforms/news-media-bargaining-code>.

Metaphorism Level 3: The Digital Layer

The final level emerges from the assemblage of all the different mechanics working together in play. From being able to visualise the constellations to the story telling element present within the cards, the game hints towards two things: the fallacy of considering an IoT system capable of being made permanently secure, and the presence of a digital layer atop the physical world. Both notions coming from the paratextuality of the games referenced world, the real-world of networked devices that comprise of the IoT. This is perhaps best understood when looking at cards in the *Privacy Deck*. As the objective of the game is for players to secure a number of spaces by acquiring golden *Databox*[58] tokens, players are only capable of doing this by successfully navigating cards from this separate deck. Once a tile's connection requirement is achieved a player can attempt to secure it by drawing a *Privacy Card*. These cards take on a similar vein to those from *Eldritch Horror* where they play out a story between the player and the game presented as a conditional loop which players must navigate through rolling successful dice according to the limitations defined by the cards. Aside from the technical expertise required to resolve such issues in the real-world, the game incorporates players assigned skills and cards allowing them to navigate these issues in a similar manner to real-world problem solving for IoT. The game explores the metaphorism in a broader manner through incorporating storytelling proudly in these cards.

For instance, the *Organic Expansion* card (Picture 9) begins by informing the player that there are new unrecognised connections on their network. They are instructed to roll a dice according to their *Observation* skill and then depending on the result they enter into the loop. The card further informs them that these connections are 'leaving traces' wherever they connect to further points in the network. After the player rolls again this time with a different dice count based on their characters *Coding* ability, they either are informed that they have cleaned the network of these false connections securing a *Databox* token or have been compromised and are now facing consequences.



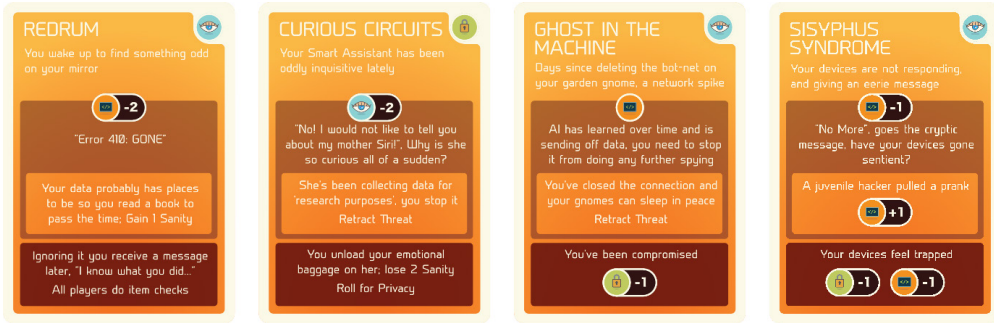
Picture 9: Having successfully connected the space to its requirement, the player has opted to deploy a Databox. The card drawn has the player first roll for Observation, succeeding that they must then roll for Coding. The successful attempt gives the player the golden Databox token to secure the space

Source: own processing

58 Remark by the authors: As the game was designed from real world concerns around IoT and present research, many of the concepts present in the game have real world counterparts. The "Databox" concept by Mortier et al. is one such construct that made its way into the design of the game. It enables a unique ecology for exploiting personal data in privacy-preserving ways for IoT systems.; See also: MORTIER, R. et al.: Personal Data Management with the Databox. In YUKSEL, M., WOOD, T. (eds.): *Proceedings of 2016 ACM Workshop on Cloud-Assisted Networking*. New York : Association for Computing Machinery, 2016, p. 49-54.

Eldritch Horror execution of Lovecraft's concept of Carcosa and other worldliness is presented here acting as metaphors in the rhetoric of the game. Here, this story telling element informs the player of a hidden layer between themselves and their physical IoT devices; the digital layer. In this layer there are interactions occurring which they might not be aware of, feeding back into the concept of tiny ontologies coming from Level 2.

What is explored here as a post-phenomenological perception of technology feeding into the object-oriented philosophical research roots of the game.[59] P.-P. Verbeek and P. Kockelkoren's appropriation of the post-phenomenological argument around the perceptions of technology by humans as an 'embodiment of objects' are among their mediations of technology.[60] They view this through a lens of background relations or technological relations, that exist in our peripherals having become mundane through use. Think of the refrigerator humming away in the background, or the Google Nest keeping track of the time to regulate temperature. They require minimal interaction to fulfil their tasks existing in their digital realms parallel to our own. The game subtly touches upon the philosophy of a digital layer among us through cards such as *Sisyphus Syndrome* (Picture 10), *Redrum*, and *Curious Circuits* each discussing a post-anthropocentric perspective of IoT-enabled devices with either the devices taking on their own needs and/or opinions or provoking their existence.



Picture 10: Several cards from the Privacy Deck attempt to engage players in the philosophical discourse of more-than human-ness coming from the roots of this research
Source: own processing

Discussion and Conclusion

Before beginning this discussion, it is important to point out that though this study highlights the game as one that informs players of the insecurities involved in IoT, the true effect of this metaphorism exercise may only be understood through play and many levels of understanding are lost in the translation to text. Although the level of understanding achieved of the underlying philosophy among players is of debate, as during play-testing players had mixed views as to how much of this metaphorism came through, the game acted as an excellent vehicle for visualising the constellation concept and some players familiar with the IoT lauded its accuracy to real world scenarios as there were moments

59 For more information, see: AKMAL, H. A., COULTON, P.: Using Heterotopias to Characterise Interactions in Physical/Digital Spaces. In STORNI, C., LEAHY, K., McMAHON, M., LLOYD, P., BOHEMIA, E. (eds.): *Proceedings of DRS 2018: Design as a catalyst for change*. London : Design Research Society, 2018, p. 269-278.

60 VERBEEK, P.-P., KOCKELKOREN, P.: The Things that Matter. In *Design Issues*, 1998, Vol. 14, No. 3, p. 39.

where connections became very apparent. For example, describing the different connections as they played – such as connecting the *Living Room* to the *Garden* with a *Toothbrush* – it helped some imagine the premise of the game further. However, to situate this success with producing a sense of more-than-humanness not all players fully appreciated was an underlying concept.

To most players it was a board game that helped them 'see' the digital layer connecting them and their physical IoT devices. It informed them of the insecurities and concerns relating to these devices in what many considered a negative way. This was not the original purpose of the game at least not for the initial iterations. The rhetoric insecurity and the carrying of this paratextuality of IoT through the game became a necessity half-way through iterations as the design processes revealed the game was difficult to understand without it. Having said that, this is still an acceptable outcome as the game's intention is for players to take back a lesson of the need to be vigilant when managing their digital devices and services. The understanding of vigilance might be different, with the original intention more geared towards enlightening one of the designed actions/intentions of their smart devices as opposed to 'these devices are dangerous, because they are insecure'. On a core level players were associating the narrative of the game with their own lives raising concerns around how much of the game's concepts were possible to affect them.

Translating the effectiveness of philosophical rhetoric is difficult to measure, with most players taking the philosophy at face value and disregarding it as an interesting aside. From those that did engage it was not enough to produce deep philosophical questions about their relationship to things. In the end, the game managed to at once bring some players closer to an understanding of IoT but for others it also served to isolate them from considering the real-world consequences, as these players were tackling it for the satisfaction of a strategy game having forgotten about IoT in the process of play. From a post-phenomenological perspective R. Rosenberger and P.-P. Verbeek give the example of an adapter often found with digital devices.[61] In a Heideggerian sensibility it is when the adapter breaks that we are aware of its presence. They argue that the broken adapter effectively withdraws us from the world we inhabit with it because our collective involvement comes from its functional nature. Our relationship with the adapter is not as an object of meaning but resides in functional fulfilment. These technological objects are not asking for engagement as they are not designed to. He compares this to an example of a piano. The piano's existence is predicated around the music it can emit. It has no direct relation to that around it, but rather it is through the act of playing the piano that it becomes what it is mediating our relationship with the world it exists in:

"Rather than thinking in terms of alienation, it [post-phenomenology] thinks in terms of mediation. Science and technology help to shape our relations to the world, rather than merely distancing us from it. This perspective of mediation embodies a reinterpretation of the foundations of phenomenology. It does not see phenomenology as a method to describe the world, but as understanding the relations between human beings and their world".[62] The game's carpentered usage of phenomenological constructs through metaphorism alludes towards the relationship between humans and technology. Design methodologies such as HCD are employed to make technology such as AI and IoT perform as if they are subject to human-users' values and considerations. An unwarranted expectation of non-human entities that MtHCD perspectives towards design attempt to address. The board game does this through playful enactment and appropriation of real-world

61 ROSENBERGER, R., VERBEEK, P.-P.: A Field Guide to Postphenomenology. In ROSENBERGER, R., VERBEEK, P.-P. (eds.): *Postphenomenological Investigations: Essays on Human-Technology Relations*. Lanham : Lexington Books, 2015, p. 40.

62 Ibidem, p. 11.

contemporary technological concerns. Many of the instances of connecting devices and services within the physical location of the game appear as unorthodox pairings of objects and spaces which during established human-centred design and analysis approaches might be disregarded but subsequently prove equally hazardous. Vulnerabilities in the network may emerge from an IoT-enabled spoon in the tree house causing havoc in the study, with storytelling further fuelling the whimsical nature of play.

The mentioning of *Clippy* at the start of this was intended to point towards this use of playfulness and metaphor within the board game. In his book D. Rose discusses of his 'Enchanted Objects' a series of Internet connected devices designed with the intention of infusing wonder within their users, in effect becoming extraordinary objects.[63] These enchanted objects come as umbrellas inspired by Bilbo Baggins' magical sword 'Sting' from *The Hobbit* that glows when it's going to rain, pill dispensers that inform you of when to take medication, and jackets that inflate simulating hugs as their wearer receives likes on Facebook. These playful appropriations enact a kind of metaphorism as well (a like to a hug, and glow to rain) which often mask the reality of those operating the platforms on which they reside. The board game created attempts to use the enchantment of metaphorism through play to challenge the notion or perceiving IoT products and services as enchanted highlighting a need for a design perspective incorporating MtHCD. The efficacy, of course debatable, this works none-the-less presenting an avenue for imagining what MtHCD and game design perspectives could entail, and how they might be used to challenge more established human centred approaches.

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63 See also: ROSE, D.: *Enchanted Objects: Innovation, Design, and the Future of Technology.* New York : Scribner, 2014.

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Difficulty as Aesthetic: An Investigation of the Expressiveness of Challenge in Digital Games

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ABSTRACT:
Difficulty is the personal experience of a subject facing resistance that prevents them from reaching a goal or desired state. It is an experiential part of everyone's existence. In digital games, difficulty is strongly linked with designed challenges and obstacles that must be overcome by physical effort, manual skills, coordination, and dexterity. But this widespread perspective is a reductionist categorization of the expressive possibilities of difficulty. Because as experiential, difficulty is aesthetic expression and therefore it is much more than the mere skill challenge. The difficulty experience that emerges from an opposing force between object and subject, between game and player, can be interpretive, poetic, narrative, ethical or atmospheric among other expressive forms. Understanding difficulty from these broad parameters, we pose it as an aesthetic expression, which forges multiple experiences at the intersection between mechanics, fiction, and the player's performance. This study analyses, drawing from philosophy, postphenomenology, and game studies, some aspects of two contemporary games, The Last of Us Part II and Death Stranding from the view of difficulty as aesthetic experience perspective, considering the significant and discursive tensions beyond purely ludic and mechanical elements.

KEY WORDS:
aesthetics, difficulty, digital games, emotions, experience, challenge.

Introduction

The standard and most widespread definitions of difficulty in digital games are intrinsically linked to game challenges. The digital game challenge is an artificial conflict defined by rules,[1] which in turn give the player the least efficient means to achieve a goal,[2] creating an unbalanced opposition between forces and results.[3] There are multiple obstacles that test the players mechanical (coordination, reflexes, stamina, perception) and, to a lesser extent, cognitive skills (knowledge, strategy, resolution). These skill-demanding challenges are coded in obstacles like combats with enemies and final bosses, platform ability sections and puzzles. Through challenges, the designer or *Invisible Gamemaster* (an abstract and authoritarian figure "that conflates the ruleset, the code, and the operations of the machine to act as the organizer and arbiter of play"),[4] seeks to provoke an emotional response in the player. This emotional response is usually associated with self-improvement, or *fiero*, an Italian word used by N. Lazzaro[5] to talk about triumph over adversity and an important part of her theory about the emotions in play. Facing a challenge

1 SALEN-TEKINBAS, K., ZIMMERMAN, E.: *Rules of Play: Game Design Fundamentals*. Cambridge : The MIT Press, 2004, p. 96.
2 SUITS, B.: *The Grasshopper: Games, Life, and Utopia*. Toronto : University of Toronto Press, 1978, p. 34.
3 AVEDON, E., SUTTON-SMITH, B.: *The Study of Games*. New York : John Wiley & Sons, 1971, p. 7.
4 NAVARRO-REMESAL, V., BERGILLOS, I.: Press X to Recognize the Other's Suffering: Compassion and Recognition in Games. In NAVARRO-REMESAL, V., JOYCE, L. (eds.): *Culture at Play: How Digital Games Influence and Replicate Our World*. The Hague : Brill, 2020, p. 101.
5 LAZZARO, N.: Why We Play Games: Four Keys to More Emotion without Story. In *Proceedings of GDC Valut*. Oakland, CA : XEO Design, 2004, p. 3.

awakens in the player a need to overcome it, to triumph over adversity through effort, and thus maintain the player's interest. This is established in J. Juul's "paradox of failure",[6] where he explains that failure in digital games is necessary and actively sought by the player, since it acts as a motivator that keeps their interest. In paradoxical terms if a digital game does not have a challenge that can make the player fail, without being unfair, they lose interest. But this configuration of obstacle, failure, effort, and triumph is a reductionist vision of game complexities and their challenges.

In some recent studies, although they have a more complex approach to difficulty and challenge, they maintain the ludic centrality, and that limits thinking around these concepts. For example, T. Constant, G. Levieux, A. Buendia, and S. Natkin explain that "objective difficulty is estimated directly by observing gameplay variables and events, while subjective difficulty is a psychological construct of the player".[7] This denotes a nominal problem, because it's correct that difficulty is always a perception, a mental construction, but challenge is not objective. Even if we talk about a set of designed system elements that are objective, the challenge never is because a challenge always needs a subject, a player with a skill set and mutable intentions when faced with it. On the other hand, A. Denisova, P. Cairns, C. Guckelsberger and D. Zendle[8] propose another dichotomy between difficulty and challenge. They explain that the perception of the concepts itself describes difficulty as a negative, annoying, and frustrating experience, while challenge describes tasks or problems that, although they pose a challenge, are stimulating.

These challenge and difficulty definitions are very limited if we compare them with more theoretically developed media such as cinema and literature, where difficulty is attached to text interpretation due to its conceptual, narrative, affective or thematic complexity. Then, from a broader framework, it makes no sense to restrict the meaning of difficulty in digital games to the purely mechanical perspective, because it denies the ludofictional expressive potential. We must understand that a challenge can be interpretive or poetic, since it explores the formal and discursive singularities of games; it may be expressed as an ethical decision, by placing the player in a compromising situation, that blurs the diffuse moral contours of the fiction; they can also introduce the player into a narrative puzzle that they must unravel in order to understand it; it can also address complex themes from committed perspectives, build horror atmospheres that integrate the player into a dark environment that evokes sensations of horror movies and literature, break the implicit power fantasies of the medium to transform them into disempowerment fantasies or create experiences of vertigo, abandoning oneself to sensations and enjoyment. These examples describe different digital game challenges that translate into difficulty aesthetics, an experience that can cause suffering and negative emotions, a positive-negative experience[9] with expressive potential.

This study seeks to explain the singularities of difficulty in digital games as aesthetic forms. To do this, in the theoretical background I first explore the meanings of difficulty in ludofictions, focusing attention on how digital games explore paths beyond mechanical challenge (although without obviating it). Secondly, I stop at the significance of digital games as aesthetics experiences from a post-phenomenological perspective. After delv-

6 JUUL, J.: *The Art of Failure: An Essay on the Pain of Playing Digital Games*. Cambridge : The MIT Press, 2013, p. 2.

7 CONSTANT, T. et al.: From Objective to Subjective Difficulty Evaluation in Digital Games. In JOSHI, A., DALVI, G. (eds.): *IFIP Conference on Human-Computer Interaction*. Cham : Springer, 2017, p. 108.

8 DENISOVA, A. et al.: Measuring Perceived Challenge in Digital Games: Development & Validation of the Challenge Originating from Recent Gameplay Interaction Scale (CORGIS). In *International Journal of Human Computer Studies*, 2020, Vol. 137, No. 1, p. 2.

9 JØRGENSEN, K.: When Is It Enough? Uncomfortable Game Content and the Transgression of Player Taste. In JØRGENSEN, K., KARLSEN, F. (eds.): *Transgression in Games and Play*. New York : Routledge, 2019, p. 153.

ing into the theoretical background, I analyse two contemporary digital games from specific aspects of difficulty aesthetics: *The Last of Us Part II*,[10] and *Death Stranding*.[11] With these two case studies, the text aims to nuance the meaning of digital games challenge and difficulty and expand its scope, locating some concepts that allows the creation of a language around this particular element of ludic aesthetics.

Difficulty and Challenge in Digital Games

Difficulty is a relevant attribute to all aesthetic experience, as G. Steiner observes in poetry and art in the late nineteenth century: "What do we mean when we say: 'this poem, or this passage in this poem is difficult?' How can the language-act most charged with the intent of communication, of reaching out to touch the listener or reader in his inmost, be opaque, resistant to immediacy and comprehension, if this is what we mean by 'difficulty'?".[12]

We can extrapolate Steiner's words to digital games to broaden the meaning of difficulty as the resistance, opacity, and incomprehension of the ludofictional text. As P. Jagoda[13] states, the constant changes in media landscape at the end of the last century and the beginning of the present broadened the discussions about difficulty, in which digital games play a fundamental role. But this connection between digital games and difficulty are far from Steiner's description. First, because challenge in digital games is usually approached from mechanical and cognitive obstacles and Steiner's difficult perspective departs from interpretative and affective complexity. Second, games and digital games carry many prejudices because they are considered a frivolous and useless activity – meanwhile, others consider it a very serious, to the point of professionalising it. In order to refute this prejudice, and validate digital games against other expressive forms, some (academic, cultural, industrial) agents have searched for distinctive and pure digital games elements compared with other media. This position has meant the restrictive and simplistic perspective that reduces a cultural expression, its tensions, recesses and nuances, its aesthetics and content, to a single element: their ludic and mechanical signifiers.[14]

When we think of difficult games, we can think of classic games like chess, or *Dark Souls,*[15] the acclaimed dark fantasy digital game, but even though they are both considered difficult, their approximation on difficulty is dissimilar,[16] and for this reason the label 'difficulty' is insufficient, which makes it necessary to clarify the possible meanings. The experience of difficulty is more than the motivating vertex of the player's interest, the search for personal improvement and domination of the system exercised by the win/lose

10 NAUGHTY DOG: *The Last of Us Part II.* [digital game]. San Mateo : Sony Computer Entertainment, 2020.
11 KOJIMA PRODUCTIONS: *Death Stranding (PlayStation 4 version).* [digital game]. San Mateo : Sony Interactive Entertainment, 2019.
12 STEINER, G.: On Difficulty. In *The Journal of Aesthetics and Art Criticism*, 1978, Vol. 36, No. 3, p. 263.
13 JAGODA, P.: On Difficulty in Digital Games: Mechanics, Interpretation, Affect. In *Critical Inquiry*, 2018, Vol. 45, No. 1, p. 199.
14 See also: KEOGH, B.: Across Worlds and Bodies: Criticism in the Age of Digital Games. In *Journal of Games Criticism*, 2014, Vol. 1, No. 1, p. 1-26. [online]. [2021-05-28]. Available at: <http://gamescriticism.org/articles/keogh-1-1>.
15 FROM SOFTWARE: *Dark Souls (PlayStation 3 version)*. [digital game]. Tokyo : Bandai Namco Games, 2011.
16 GILE, Ch.: *Different Kinds of Difficulty: Continuous and Aspirational.* Released on 12th May 2017. [online]. [2021-01-15]. Available at: <https://www.gamasutra.com/blogs/ChristopherGile/20171205/310954/Different_Kinds_of_Difficulty_Continuous_and_Aspirational.php>.

binarism.[17] This usual and widespread perspective is attached to a series of meritocratic dynamics infiltrated at the base of contemporary society[18] and flow, a positive psychology theory that explains that when faced with a correct challenge, the subject enters into a highly positive mental state as they have encountered a "challenging activity that requires skills" and "clear Goals and Feedback".[19] From this perspective, the challenge experience is understood only from its ludic and mechanical nature. And it can be measured, because being linked to the flow theory it can be measured in relation to the boredom experienced by the player if the challenge is very easy or frustration if it is very difficult. But boredom and frustration are emotions that we experience in our life and in the encounter with an artistic object, so rejection should not be the norm.

Taking up the idea of games and digital games frivolity, we find many approaches that take digital games as fun, an escape from harsh reality. But fun limits its conceptual and emotional complexity to a binary position: Is the game fun or not?[20] Certainly digital games have fun potential, but it should not be an obligation to adhere to it, or a demerit to focus on other types of emotions. Games and digital games are not necessarily fun experiences, nor are they only linked to positive emotions.[21] Even if we understand digital games as a safe space, it is not obligatory to offer only positive emotions. Digital games may be difficult, serious, disgusting and terrifying. In this sense, we understand that games and digital games can be difficult experiences that provoke negative emotions that make us suffer and complicate our existence, a *positive-negative experience*. The academic and historian B. L. Rothstein questions the puzzle nature and its tense relations with difficulty in similar terms and uses the concept of "unruly objects"[22] to define the puzzle objects that play with our perception, using conflicting instructions or hiding relevant information. That is, a puzzle made not to be understood that leads to interpretive failure. An unruly object refuses to satisfy the interpreter's expectations and that, in this denial, make them focus their senses on seeking the solution to the problem. They are physical embodiments of difficulty that provide an interpretive challenge that overwhelms and brings the interpreter closer to the experience of the sublime: a challenge that surpasses the player while it attracts them. Difficulty, in this sense, is a conflictive emotion that makes meaningful ludofictional experience.

Although these system elements are part of the challenge, they are only essential to find a set of aesthetic responses. For example, in both Dark Souls and the platformer *Celeste*[23] their challenge focuses on the player's ability and stamina, the first to survive the dark and oppressive world, the latter to overcome its intricate and precise platforming levels. *The Witness*[24] sets its obstacles as cognitive challenges creating a whole world where everything can be a puzzle, and *Baba Is You*[25] rewrites and expands its rules as levels are passed. These four examples describe different challenges based mainly on their mechanical components. But not all games follow these schemes, and even these examples cannot be separated from audio-visual, hermeneutic or thematic discourses: Dark Souls depends as much on player punishment as on its bleak atmosphere; Celeste builds its

17 COSTIKYAN, G.: *Uncertainty in Games*. Cambridge : The MIT Press, 2013, p. 11.
18 PAUL, C. A.: *The Toxic Meritocracy of Digital Games: Why Gaming Culture Is the Worst*. Minneapolis : University of Minnesota Press, 2018, p. 2-3.
19 For more information, see: JUUL, J.: Without a Goal. In KRZYWINSKA, T., ATKINS, B. (eds): *Videogame/Player/Text*. Manchester : Manchester University Press, 2007, p. 191-203. [online]. [2021-02-12]. Available at: <https://www.jesperjuul.net/text/withoutagoal/>.
20 JAGODA, P.: On Difficulty in Digital Games: Mechanics, Interpretation, Affect. In *Critical Inquiry*, 2018, Vol. 45, No. 1, p. 222.
21 SICART, M.: *Play Matters*. Cambridge : The MIT Press, 2014, p. 4.
22 ROTHSTEIN, B. L.: *The Shape of Difficulty A Fan Letter to Unruly Objects*. Pennsylvania : Pennsylvania State University Press, 2019, p. 3.
23 MATT MAKES GAMES: *Celeste (PC version)*. [digital game]. Vancouver : Matt Makes Games, 2018.
24 THEKLA: *The Witness (PlayStation 4 version)*. [digital game]. San Francisco : Thekla, 2016.
25 HEMPULI OY: *Baba Is You (Switch version)*. [digital game]. Helsinki : Hempuli Oy, 2019.

level and challenge design as a metaphor for depression; The Witness is an investigation of the mechanisms of the gameworld through complex puzzles; and Baba Is You is a puzzle game that plays with its own rules and, therefore, with the meaning of the game itself.

Fortunately, this simplistic gaze has been questioned for some time, from the false dichotomy between hardcore and casual,[26] to the discussion around walking simulator genre[27] or between philosophical[28] and affective perspectives.[29] Following these studies, we can see how difficulty has a greater emotional development than the mere frustration-*fiero* cycles. Difficulty experience also can be something unpleasant or disgusting, a transgressive expression that may even pose an emotional risk[30] and suffering.[31] The "paradox of transgression" is an aesthetic experience "when we encounter uncomfortable, repulsive, or taboo content in aesthetic contexts such as games, we do not automatically reject it outright, but may instead accept its presence".[32] This expressive form, at the same time, connects with the logics of the Kantian concept of the "sublime" since it expresses the encounter with "an overwhelming experience of something 'larger than ourselves'".[33]

Thus, difficulty in digital games can serve as an expressive resource for talking about contemporary problems. Some horror digital games are perfect fits with this statement, overlapping the ludofictional mechanisms of horror genre with the tools that the mind-game film uses to increase the difficulty of reading and understanding them[34] (tools like unreliable narrators, narrative dislocation, and low communicability), to build a complex discourse on identity, social and historical problems. *Silent Hill 2*[35] places the player in the role of a murderer suffering an identity crisis, since he does not remember that he is a murderer (an unreliable narrator), and who is tortured by the town for the committed sins. *Distraint*[36] uses the horror atmosphere to build a story about the problems of living in an ultra-capitalist society and how the protagonist (named Price) is able to sell his soul by evicting people with few resources for the (false) promise of promotion. The last example is *Detention,*[37] a game that uses horror atmosphere (with a lot of folklore) and mind-game film tools like unreliable narrator and narrative dislocation, to recount a historical and traumatic event in Taiwan: The White Terror, the repression of political dissidents and the subsequent martial law.

Difficulty in digital games depends on the designer's interest and ideas and the player's interpretation. The horror examples are difficult due their terrifying fictional settings that make advancement through its structure more complex than a non-horror digital game. In addition, we cannot ignore the interpretative possibilities assigned to each one and the player's interest, and the succinct narrative complexity assigned to the mind-game film dynamics. At this point we need to introduce the aesthetic approach because a formal approach

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26 JUUL, J.: *A Casual Revolution: Reinventing Digital Games and Their Players*. Cambridge : The MIT Press, 2010, p. 8.

27 CHANG, A.: *Playing Nature: Ecology in Digital Games*. Minneapolis : University of Minnesota Press, 2019, p. 42-43.

28 See also: GUALENI, S.: *Virtual Worlds as Philosophical Tools: How to Philosophize with a Digital Hammer*. London : Palgrave MacMillan, 2019.

29 For more information, see: ANABLE, A.: *Playing with Feelings*. Minneapolis : University of Minnesota Press, 2018.

30 JØRGENSEN, K., KARLSEN, F.: Introduction: Playful Transgressions. In JØRGENSEN, K., KARLSEN, F. (eds.): *Transgression in Games and Play*. Cambridge : The MIT Press, 2019, p. 1.

31 MORTENSEN, T. E., NAVARRO-REMESAL, V.: Asynchronous Transgressions: Suffering, Relief, and Invasions in Nintendo's Miiverse and StreetPass. In JØRGENSEN, K., KARLSEN, F. (eds.): *Transgression in Games and Play*. Cambridge : The MIT Press, 2019, p. 28.

32 MORTENSEN, T. E., JØRGENSEN, K.: *The Paradox of Transgression in Games*. New York : Routledge, 2020, p. 4.

33 Ibidem.

34 LORIGUILLO-LÓPEZ, A.: La Comunicabilidad de lo Ambiguo: Una Propuesta Narratológica para el Análisis de la Ficción Televisiva Compleja. In *Signa: Revista de la Asociación Española de Semiótica*, 2019, Vol. 28, No. 1, p. 868.

35 TEAM SILENT: *Silent Hill 2 (PlayStation 2 version).* [digital game]. Tokyo : Konami, 2002.

36 JESSE MAKKONEN: *Distraint (PC version).* [digital game]. Kuopio : Jesse Makkonen, 2015.

37 RED CANDLE GAMES: *Detention (Switch version)*. [digital game]. Taipei : Red Candle Games, 2017.

reduces the experience elements to measurable factors when an experience is never measurable by the meanings that we can extract from it. All aesthetic experiences depend on both the experience object and the subject who experiences it. An aesthetic experience creates a dialectical space between both components, revealing its complexities and singularities.

Digital Games as Aesthetics Experience

Aesthetics is a term that designates an object, an attitude, a judgment, a value, an experience, among other things,[38] is the philosophical branch that explains the pleasures derived from particular objects and experiences, their fundamental qualities versed in the experience of beauty and the sublime, in terms of the Kantian judgment.[39] Although we cannot ignore aesthetic approaches far from European centrality, such as the Asian approach, characterised – simplifying it greatly – by the sensitivity, ephemeral and transitory of beauty, above reason.[40] Within all aesthetic considerations, exists a cultural, artistic, or experiential object and a subject with a confronted relationship from which the aesthetic feeling springs. In this situation, the aesthetic experience cannot be reduced to the experience of the subject nor the formal properties of the object. The aesthetic experience creates a dialectical space between the two involved parts. Aesthetic appreciation is born "with the events and scenes that attract the attention of the man's eye and ear, awakening his interest and providing him with enjoyment while he watches and listens".[41] And this aesthetic appreciation has a value in the experience itself, since the subject "is stimulated, not only or mainly by curiosity, or by a tireless desire to reach the final solution, but by the pleasant activity of the excursion itself".[42] Understanding difficulty in digital games as an aesthetic form implies valuing it as an experience that goes beyond the reward for overcoming a challenge. Then, we need to place the player's performance and all the components of the system, both mechanical and fictional, at the centre of the discussion.

Everything has a value within the aesthetic experience. T. Smethurst and S. Craps explain that, with the debate between narratology and ludology now over, it is necessary to "harnessing the mechanical (ludic) and aesthetic (narratological and audiovisual) qualities of games together in order to produce an experience that must be analysed holistically, as something greater than the sum of its parts".[43] That's it, the ludic or mechanical elements of a game only makes sense in relation to the fictional world and audio-visual elements.[44] Following this trend, other academics have embraced the interpretive, poetic, affective, fictional, and audio-visual digital game elements, giving them the same value as the ludic system and mechanics. J. Sharp[45] collects these elements in a formal apparatus

38 For more information, see: SHELLEY, J.: The Concept of the Aesthetic. In ZALTA, N. E. (ed): *The Stanford Encyclopedia of Philosophy*. Stanford : Metaphysics Research Lab, Stanford University, 2020. [online]. [2021-05-15]. Available at: <https://plato.stanford.edu/archives/win2020/entries/aesthetic-concept/>.

39 SICART, M.: Darkly Playing Others. In MORTENSEN, T. E., LINDEROTH, J., BROWN, A. M. (eds.): *The Dark Side of Game Play: Controversial Issues in Playful Environments*. New York : Routledge, 2015, p. 104.

40 HAN, B.-C.: *Buen Entretenimiento*. Barcelona : Herder Editorial, 2018, p. 66-71.

41 DEWEY, J.: *El Arte Como Experiencia*. Barcelona : Ediciones Paidós, 2008, p. 5.

42 Ibidem.

43 SMETHURST, T., CRAPS, S.: Playing with Trauma: Interreactivity, Empathy, and Complicity in The Walking Dead Digital Game. In *Games and Culture*, 2015, Vol. 10, No. 3, p. 270.

44 See also: KEOGH, B.: Across Worlds and Bodies: Criticism in the Age of Digital Games. In *Journal of Games Criticism*, 2014, Vol. 1, No. 1, p. 1-26. [online]. [2021-05-28]. Available at: <http://gamescriticism.org/articles/keogh-1-1>.

45 SHARP, J.: *Works of Game*. Cambridge : The MIT Press, 2015, p. 28.

and G. Tavinor[46] affirms that digital games have always needed a representational apparatus, although its values are minimal as in the first digital games. D. Vella[47] exposes the need for this representational apparatus as a value in fictional perception and, therefore, also of challenge. Vella confronts the jump's meaning in two different characters: Nathan Drake, the protagonist of the *Uncharted*[48] saga, conveys the danger and effort involved in each jump; while for Mario, from the *Super Mario Bros.*[49] saga, the jump conveys pure kinaesthetic joy. A. Anable[50] focuses her speech on digital games aesthetics as a network of affective connections that overlaps image, sound, mechanics, hardware, algorithms, and players. In other words, to understand the digital games expressive potential, it is necessary to understand the multitude of elements that participate in the ludofictional experience.

Continuing with some studies about digital games as an aesthetic expression, P. Jagoda[51] classifies them in three types of challenges: mechanical, affective, and interpretive. That's it, the usual approach to difficulty based on manual skills, the emotional complexity, and the hermeneutical problems. In another study, A. Mitchell, L. Kway, T. Neo, and Y. T. Sim explain that some "games are 'difficult' in ways not normally associated with games (difficult to know how to play, difficult to know what they mean, difficult to determine whether they are even games in the first place)".[52] As an extension of the affective and interpretive difficulty – and I would add the "paradox of transgression" from Mortensen and Jørgensen –, the authors explain some defamiliarizing gameplay forms that encourage player's reflection on ludofictional language in a similar way to poetry. Because of that, they name it as poetic gameplay. Accepting that all these elements are part of the game experience means that they also affect the challenge, and because of that, any hermeneutical, thematic, narrative, emotional or fictional element that fulfils this function is an obstacle and is therefore a difficulty source. But, unlike some ludic design elements that can be defined in a more 'objective' way[53] – the number and frequency of obstacles, the length of the level, or the complexity of a puzzle – these aesthetic challenges cannot be measured.

However, as we have explained, an aesthetic experience requires an object and a subject. Then, another axis of the ludofictional experience is the player's performance, the set of actions within a ludic context and with an intention. The player's performance describes the phenomenological perspective of the player, who is inside and outside the text at the same time and is an active performer and spectator of their own interaction, as C. Fernández-Vara[54] states. Then, the designer cannot directly create the game experience, but by designing the rules and setting the boundaries and agency in the world that the player inhabits, explores, and manipulates, the designer indirectly designs the experience.

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46 TAVINOR, G.: *The Art of Videogames*. Oxford : Blackwell Publishing, 2009, p. 34-35.

47 VELLA, D.: "It's A-Me/Mario": Playing as a Ludic Character. In YANNAKAKIS, G. N., AARSETH, E. (eds.): *Proceedings of the 8th International Conference on the Foundations of Digital Games*. Chania : Society for the Advancement of the Science of Digital Games, 2013, p. 35.

48 NAUGHTY DOG: *Uncharted* (*PlayStation 3, PlayStation 4 versions*). [digital game]. San Mateo : Sony Computer Entertainment, 2007-2017.

49 NINTENDO EAD: *Super Mario Bros.* (*series*). [digital game]. Kyoto : Nintendo, 1985-2021.

50 ANABLE, A.: *Playing with Feelings*. Minneapolis : University of Minnesota Press, 2018, p. 122.

51 See also: JAGODA, P.: On Difficulty in Digital Games: Mechanics, Interpretation, Affect. In *Critical Inquiry*, 2018, Vol. 45, No. 1, p. 199-233.

52 For more information, see: MITCHELL, A. et al.: A Preliminary Categorization of Techniques for Creating Poetic Gameplay. In *Game Studies*, 2020, Vol. 20, No. 2. [online]. [2021-02-15]. Available at: <http://gamestudies.org/2002/articles/mitchell_kway_neo_sim>.

53 FERNÁNDEZ-VARA, C.: *Introduction to Game Analysis*. New York : Routledge, 2015, p. 145-146.

54 FERNÁNDEZ-VARA, C.: Play's the Thing: A Framework to Study Videogames as Performance. In KRZYWINSKA, T., KENNEDY, H., ATKINS, B. (eds.): *Proceedings of DiGRA 2009: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DIGRA, 2009, p. 6.

That is the "directed freedom".[55] This dialectical space between freedom and limitation defines what the player can do (possibility), what the rules forces them to do even if they do not want to (obligation), what they cannot do even if they want to (prohibition) and what they can make even if the rules penalise them (penalty). A game always imposes immovable margins that the player must respect, mainly because they seek this type of resistance. The performance is also useful to describe how a text can be read differently on how the actor, or the player, embodies it and, therefore, its meaning can be different. The performance is a meaning creator process, where the rules establish limits that dictate a *restoration of behaviour* that describes "a negotiation between scripted behaviours and improvisation based on the system".[56] With the performance, the player creates their own identity within the game situated in the interaction between their interests and aptitudes, the gameworld fiction, the mechanics, and the game context.

In addition, a game has a *ludic* and an *extra-ludic* interpretation,[57] that is the operative interpretation as a game and the hermeneutical interpretation as a cultural object with meaning that is related to Jagoda's interpretive difficulty. This becomes the figure of the "emancipated player"[58] as it explains how the player delves into the possible meanings of a game. This type of player always adds an extra challenge by delving into the games discursive, metatextual, mechanical, or aesthetic meanings. That is why the player's figure is so important for the aesthetics of difficulty in digital games, not because of the ability to overcome specific challenges, but also because they add value to their own experience. At the confrontation between the player's performance and the ludoficción, the digital game experience and difficulty aesthetics are created. In the creation meaning process all the actors involved must be taken into account, that is, digital games as mediated experiences where multiple elements, both internal and external (players, hardware, software, physical and virtual spaces, among others), overlap.[59] The player interprets the challenge based on their expectations and previous experience but considering that it occurs within a specific socio-cultural framework that frames and qualifies the experience in the "videoludic feedback loop".[60] For this reason, is necessarily a post-phenomenological perspective, since it allows us to place ourselves between the formal object of the experience, and the experiential and personal perspective of the player situated in a complex network of socio-economic, political, and cultural factors.

Methodology and Aim

Difficulty in cultural objects, such as digital games, is ascribed to the effort and dedication to advance. This effort can be interpretive, narrative, affective, or thematic, not only mechanical, even when it is so relevant to the digital game's media. For this analytical

55 NAVARRO-REMESAL, V.: *Libertad Dirigida: Una Gramática del Análisis y Diseño de Videojuegos*. Santander : Asociación Shangrila Textos Aparte, 2016, p. 318-319.

56 FERNÁNDEZ-VARA, C.: Play's the Thing: A Framework to Study Videogames as Performance. In KRZYWINSKA, T., KENNEDY, H., ATKINS, B. (eds.): *Proceedings of DiGRA 2009: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DIGRA, 2009, p. 7.

57 See also: KARHULAHTI, V.-M.: Hermeneutics and Ludocriticism. In *Journal of Games Criticism,* 2015, Vol. 2, No. 1, p. 1-23. [online]. [2021-02-15]. Available at: <http://gamescriticism.org/articles/karhulahti-2-1/>.

58 FARCA, G.: The Emancipated Player. In HUBER, W., BJORK, S., O'DONNELL, C., BIDARRA, R. (eds.): *DiGRA/FDG '16 – Proceedings of the First International Joint Conference of DiGRA and FDG*. Dundee : DIGRA, 2016, p. 2.

59 MURIEL, D., CRAWFORD, G.: *Digital Games as Culture: Considering the Role and Importance of Digital Games in Contemporary Society.* New York : Routledge, 2018, p. 109.

60 PLANELLS LA MAZA, A. J.: *Possible Worlds in Digital Games: From Classic Narrative to Meaningful Actions*. Pittsburgh : ECT Press, 2017, p. 172.

process I have used a methodology based on play testing[61] and close reading, supported by all the theoretical background provided. But it is important to remark that in this aesthetic approach it cannot be confined within formalistic frameworks, since aesthetic appreciation is based on the sensations and interpretations of an artistic object and, therefore, goes beyond all formalistic methodology. The aim of the present analysis is focused on the aesthetic sensations of playing digital games, paying special attention to audiovisual, discursive, interpretive, affective, or poetic categories. That is, its non-mechanical elements. Therefore, it is supported by a firm theoretical background, in addition to adding some post-phenomenological theories applied to digital games.[62]

To test the expressive possibilities of difficulty with an aesthetic value, I propose two contemporary and popular digital games: The Last of Us Part II and Death Stranding. In neither of these two games is the high difficulty recognised as one of its remarkable characteristics. To test the value and utility of analysing digital games from an aesthetic point of view, it is important to use digital games whose main characteristics are not their challenge. The difficulty of the mechanical challenge in Dark Souls is widely recognised as one of its main values, so it is better not to use it for this analysis. Although it would be interesting to focus on its oppressive, dark, and desperate atmosphere to create a survival tale at the end of the world. Both case studies exemplify the complexities of digital games and how difficulty is revealed as an important aesthetic value that goes beyond the merely ludic.

Case Study I: Imposing a Glance in The Last of Us Part II

From critical analysis, we must examine in detail how a media artifact works, which in digital games translates into how the virtual world is shown to us as players, who we are in it, how we express ourselves in the world and how our actions show us in it. All these are essential elements to think of digital games as aesthetic objects with complex discourses that are a source of interpretive and affective difficulty, even if the mechanical difficulty is relevant in the game. In The Last of Us Part II the player faces constant challenges from enemies, either directly or indirectly through stealth. But the way the game imposes a glance to the player provokes the main affective response and it stands as the main source of aesthetic difficulty.

In The Last of Us Part II the player takes Ellie's control, the co-protagonist of the first *The Last of Us*[63] and protagonist in the standalone DLC *Left Behind*[64], in a revenge journey after Joel's murder. The plot twist is that for almost half of the game the player is forced to control the subject of his revenge, Abby. As players we are always forced to play being

61 For more information, see: AARSETH, E.: Playing Research: Methodological Approaches to Game Analysis. In MILES, A. (ed.): *Proceedings of the Digital Arts and Culture Conference*. Melbourne : RMIT Publishing, 2003, p. 1-7.

62 See also: GUALENI, S.: *Virtual Worlds as Philosophical Tools: How to Philosophize with a Digital Hammer*. London : Palgrave MacMillan, 2019.; KEOGH, B.: Across Worlds and Bodies: Criticism in the Age of Digital Games. In *Journal of Games Criticism*, 2014, Vol. 1, No. 1, p. 1-26. [online]. [2021-05-28]. Available at: <http://gamescriticism.org/articles/keogh-1-1>.

63 NAUGHTY DOG: *The Last of Us*. [digital game]. San Mateo : Sony Computer Entertainment, 2013.

64 NAUGHTY DOG: *The Last of Us: Left Behind.* [digital game]. San Mateo : Sony Computer Entertainment, 2014.

another, even if we do not empathise with this virtual other, which can generate rejection, discomfort, or other negative emotions. The game, directed and written by N. Druckmann and H. Gross, explores the dramatic and affective tensions of being another and they write a speech about the banality of violence from an ambivalent double point of view. L. Anyó and Á. Colom[65] explore the complex emotional responses that this change of characters and points of view entails for the story and the player's affective response.

The game forces the player to take control of Abby despite the possible rejection that controlling Joel's murderer generates. A rejection that must be assimilated and overcome, as the player takes Abby's role for hours, coming to empathise with her despite not justifying Joel's cruel murder. In this sense, it's important to note that Joel's actions in the first game (the massacre he commits in the Fireflies hospital to save Ellie, who was going to be sacrificed to create a vaccine to face the virus that plagues the world) lead to Abby's revenge. Then, controlling Ellie, the player enters in a violence loop that leads her to commit atrocities similar or worse than those committed by Joel in the first game or Joel's murder committed by Abby. The Last of Us Part II writes a discourse about the banality of violence even when creating a conflict with the ludic design that forces the player to kill dozens of enemies. The double perspective reinforces this interpretation because Ellie's enemies in the first half of the game, are Abby's friends in the second, people with their own problems, with a life we know will end soon in a horrible way, because we are (also) its perpetrators. Although if the discourse about violence is conflictive, it is suggestive how Abby's character reflects the existential emptiness that remains after carrying out the revenge that has consumed the few last years of her life, and that we repeat in the skin of Ellie at the game's epilogue.

In addition to the fictional and narrative construction, the discourse about violence in The Last of Us Part II is sustained in an important detail, although it may seem minor due to the scope of the story: the camera. As M. Martín-Núñez states, the expressive potential of the camera frame requires "removing the control of the camera from the player to connect automatic cameras allows offering the most suitable shot to generate a certain sensation".[66] These automatic cameras "privilege audiovisual writing and dramatic tension"[67] and reveal the camera's expressive potential, framing the victims during the murders that the player commits. The game makes close combat and stealth the most plausible option for survival, and it is in short distances that the game reveals itself. The kills involve approaching the enemies from behind, grabbing their neck and stabbing or strangling them. These death scenes are designed to disgust and discomfort the player, because when they grab an enemy, the camera frames their suffering face, forcing the player to see a close-up shot of the enemy's last death throes. This camera framing imposes a glance to teach the player the horror of killing another, reinforcing its discourse with hyper-realistic images that make the enemies faces reflect their suffering in a very crude way. This repeated death scene is still unpleasant even when the player is used to it. Always considering the player performance and how they relate with the game, their identity within the game's directed freedom and their interpretative stance. This is important because violence, as well as the narrative and other fictional elements, does not affect all players, and their performance, in the same way. This affective form of difficulty, be involved at a fictional level, even makes the mechanic difficulty grow. This degree of involvement makes it difficult for the player to hurt others and to harm themself as a fictional character.

65 ANYÓ, L., COLOM, À.: Ambivalencia Emocional en The Last of Us. Las Emociones en los Videojuegos, Entre la Complejidad Narrativa y la Lealtad del Jugador. In *L'Atalante. Revista de Estudios Cinematográficos*, 2021, Vol. 31, No. 1, p. 96-97.

66 MARTÍN NÚÑEZ, M.: Encuadres. Diseñar la Escritura Audiovisual del Videojuego. In NAVARRO-REMESAL, V. (ed.): *Pensar el Juego. 25 Caminos para los Game Studies*. Santander : Asociación Shangrila Textos Aparte, 2020, p. 83.

67 Ibidem.

The Last of Us Part II repeatedly and strenuously confronts the player with a difficult situation in which they are participant. Both by the violent images that we participate in, and the narration focused on two confronted characters, the player is constantly confronted with uncomfortable situations that construct a positive-negative experience. This narrative and discursive device takes the players into an interpretive and affective difficulty regardless of the selected difficulty level.

Case Study II: The Disinterest and Boredom in Exploring and Inhabiting Death Stranding World

In open-world games the gameworld not only works as a space for separating the multiple points of interest of the maps, but also as spaces created to be explored and inhabited. These enormous worlds demand the player's attention to read and explore the terrain establishing a relationship with space, which can be abhorrent when the trip is just an excuse to extend the experience artificially. But it can also be significant when the journey pushes the player to experience it from an aesthetic point of view, to adopt a disinterested and contemplative perspective. The last Hideo Kojima's game, Death Stranding, is a good example of this formula because it makes walking transcendental, making the path not a trivial matter, but rather requires an effort to be traversed and attention to be read. Death Stranding presents a post-apocalyptic unreal world with an Icelandic landscape, even if supposed to be North America, and an abnormal climatic phenomenon named *timefall*, a toxic rain and snow that accelerates the passage of time, aging living beings and corroding materials. The entire gameworld surface is uninhabited except for the player, Sam Porter Bridges, and other porters like him, in addition to the *MULEs*, a terrorist faction obsessed with deliveries that try to steal the player's cargo, and some ghostly beings called *BT* or *Beached Things*, a symptom of this abnormal world that has merged the living and the dead. All these fictional elements are significant pieces that make Death Stranding's gameworld significant and not a mere proxy for all the game's missions. Kojima's game raises the travel importance by making the player worry about the cargo that they can transport from one point on the map to another.

As reviewer L. Thomas stated for The New Yorker, "the challenge comes less from trying to beat bosses or outmanoeuvre enemies and more from trying to cross a deep river, say, or balance a lot of unwieldy packages on uneven terrain".[68] Then, the game challenge lies in the environmental resistance that arises in the rugged terrain that the player must traverse, the abnormal climatic conditions and the enemy's presence that are best avoided by creating more complex but safe routes. This effort requires more patience and attention for reading and interpreting the terrain than mechanical skills, although it is also important. It's significant that some travels work as an extended and slow pace climax. The main travel in Chapter 6 forces the player to cross a mountainous area during a blizzard that blinds them and offers an extra resistance making it difficult to move through

68 THOMAS, L.: *The Blockbuster Digital Game that Wants to "Make America Whole Again"*. Released on 20th November 2019. [online]. [2021-02-15] Available at: <https://www.newyorker.com/sports/sporting-scene/the-blockbuster-video-game-that-wants-to-make-america-whole-again>.

the space. Another example takes place in Chapter 8, the journey to reach the chiral relay takes the player through rugged and unexplored terrain with a multitude of dangers that can take hours. The last example takes place in Chapter 10 and it is significant because the player must make the last travel that takes them across the map from one point to another in the opposite direction. These three examples establish the temporal relation between the player and the space that provokes an aesthetic response that demands physical and mental effort, making these long travels more climatic events than the boss battles.

Taking up the analysis made by L. Thomas, the journalist states that Death Stranding is considered by many players as boring for its lack of action. Or better explained, for its lack of a certain type of action (the action associated with third person action games), because walking is an action. Walking has been often trivialised and ignored in digital games, as the pejorative expression for designating the 'walking simulator' genre shows. But walking in Death Stranding, as well as walking simulators, is not boring in a negative way. Above all, boredom is not a negative emotion or the opposite of fun, it can be an ugly feeling ("amoral and non-cathartic, offering no satisfactions of virtue, however oblique, nor any therapeutic or purifying release")[69] but not an emotion to avoid. Boredom is an expressive and aesthetic form that can be pleasant, even fun.

Boredom as an aesthetic form is significant for providing slow rhythmic sensations, such as slowness, contemplation, or stillness. M. Heidegger speaks about profound boredom[70] as the experience of the existential time of things. This temporal conception of things can be related to 'catalytic narratives',[71] those fictions in which 'nothing happens' because they present their discourse without haste not governed by nuclear or climatic logic, or 'deep attention', that establishes a slowest and contemplative relationship with time, as a discourse against contemporary vital speed,[72] and the contemplation, calm exploration, temporal dilation and the non-economic sense of action of 'slow games',[73] that we may connect with the Kantian notion of disinterestedness, used by J. Juul[74] for talking about the contemplative attitude of the walking simulator genre. Death Stranding falls within these descriptions because attention and contemplation are important for exploring its huge scenarios, because walking is the main means of moving through the empty and silent terrain, and because it even has a mechanic for rest. The slow game and boredom are aesthetically significant because it allows a deeper relation with the game and for this reason is related to difficulty aesthetics.

69 NGAI, S.: *Ugly Feelings*. Harvard : Harvard University Press, 2005, p. 6.

70 LEINO, O. T.: Escape from C-D Road: On the Value of Boredom in Euro Truck Simulator 2 Multiplayer. In DEBUS, M. (ed.): *Proceedings of Philosophy of Computer Games 2018 Conference*. Copenhagen : IT University of Copenhagen, 2018, p. 2.

71 GARCÍA-CATALÁN, S., SOROLLA-ROMERO, T., MARTÍN-NÚÑEZ, M.: Reivindicar el Detalle: Sutilezas y Catálisis Barthesianas en la Ficción Televisiva. In *Palabra Clave*, 2019, Vol. 22, No. 3, p. 720.

72 MARSH, T.: Slow Serious Games, Interactions and Play: Designing for Positive and Serious Experience and Reflection. In *Entertainment Computing*, 2016, Vol. 14, No. 1, p. 45.

73 NAVARRO-REMESAL, V.: Meditaciones. Modos Zen, Contemplación y Lentitud en el Videojuego. In NAVARRO-REMESAL, V. (ed.): *Pensar el Juego. 25 Caminos para los Game Studies*. Santander : Asociación Shangrila Textos Aparte, 2020, p. 136.

74 See also: JUUL, J.: The Aesthetics of the Aesthetics of the Aesthetics of Digital Games. In DEBUS, M. (ed.): *Proceedings of Philosophy of Computer Games 2018 Conference*. Copenhagen : IT University of Copenhagen, 2018, p. 1-17. [online]. [2021-01-15]. Available at: <https://www.jesperjuul.net/text/aesthetics3/>.

Conclusion

There is no difficulty except by confronting subject and object. The philosopher J. Dewey states that a work of art "only has an aesthetic range when the work becomes the experience of a human being",[75] although it is necessary to go beyond personal enjoyment. Then, game and player are essential pieces of the post-phenomenological act of playing and thinking about digital games. The main objective of this study is to introduce some aesthetic and non-mechanical concepts that allow us to detect specific phenomena like the difficulty aesthetic elements. This brings us an analytical tool that overlaps the mechanical elements, closer to the formalist analysis, with others that are more experiential and difficult to enclose, such as discourse, theme, narrative, atmosphere, or temporality. Difficulty as aesthetics is a construct that allows us to assess all these elements and add the player as a mutable performer, with intentions and involvement with the ludic text. The analysis of two digital games has shown the relevance of several aesthetic aspects that serve to support the theories that articulate this analysis. The Last of Us Part II shows how digital games impose a gaze that affects the player's performance. The game insists on showing the horror of killing another (even though it may make mistakes at their insistence) and how that other has a life beyond their role as an enemy by forcing the player to play one of those enemies, to see it from their perspective. The suggestive interpretation about difficulty aesthetics in The Last of Us Part II is how the raw violence, the tragedy, and the change of perspective and characters create discomfort for the player. But the player must continue playing despite feeling uncomfortable using violence so harshly, being someone who they do not want to be and empathising with this person so hated or being incapable to prevent the esteemed character from losing their humanity. That is, the suggestive tensions generated by directed freedom.

Death Stranding makes walking between different points meaningful and transcendental. The mechanical difficulty meets the purely aesthetic experience as the player navigates the arduous terrain, searching for the best routes to get the cargo in good condition to its destination. The game slows down the pace that at which we are used to experiencing digital games and life, and this leads the player to establish a transcendental relationship, close to deep boredom, with the space and time of the virtual world. Death Stranding also gives importance to taking care of others and things, and the need to create a better society founded on collaboration and trust in others.

This study has drawn the expressive potential of difficulty as aesthetics in two relevant and popular contemporary video games which can be extrapolated to other video games, no matter what kind of challenge they pose. Furthermore, with these two case studies, to which we can add examples from a theoretical background, we detect some concepts, or motifs, that allows us to start a vocabulary focused on difficulty as aesthetics. Concepts such as: mechanical skills, effort as temporary dedication, survival in a hostile environment, puzzles, bleak and horror atmosphere, complex themes treatment (like depression, the banality of violence and revenge, trauma, problematics of our time like evictions or solitude), metagames (games that think about the meaning of games while playing), negative emotions (boredom, discomfort, horror, or sadness), narrative complexity (unreliable narrators, mind game film tools, narrative dislocation, or low communicability), the limited agency of directed freedom, complex discourses about politics and social issues, defamiliarization in Kantian terms, and transgression. This catalogue of concepts is just a hint towards a more exhaustive exploration of the motifs that articulate

75 DEWEY, J.: *El Arte Como Experiencia*. Barcelona : Ediciones Paidós, 2008, p. 4.

difficulty as aesthetic experience[76]. Despite not delving into the meanings of each of these concepts, this list allows us to glimpse a broader vocabulary of difficulty in digital games than the "traditional arcade game"[77] model limited to concepts like goals, challenge, fun, progression, punishment, or rewards; and, to approach from an expressive perspective that allows us to explore in greater depth the complexity of digital games.

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77 See also: JUUL, J.: Without a Goal. In KRZYWINSKA, T., ATKINS, B. (eds): *Videogame/Player/Text*. Manchester : Manchester University Press, 2007, p. 191-203. [online]. [2021-02-12]. Available at: <https://www.jesperjuul.net/text/withoutagoal/>.

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Concept Art: The Essential Part of Visual Pre-production in the Entertainment Industry

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ABSTRACT:
The study defines the role of concept art in the process of creating big visual projects. It intends to fill the gap in the academic field and to describe the process of creating concept art from start to finish, considering its theoretical as well as practical outlines. The theoretical part of the text is based on various concepts and lines of thinking, including analysis and synthesis of the obtained knowledge, as well as comparison of differing scholarly opinions on the discussed topic. Concept art as an art phenomenon of the 21st century is one of the most respected creative activities in the visual entertainment industry. Creating concept art has become one of the best paid work specialisations within the various processes of artistic and media creation. The meaning of concept art lies in the creation of 'blueprint' images and designs, based on the given concept's purpose. Concept art serves a whole team of creative individuals as a reference allowing for the further development of a creative project. It is mainly used in projects based on key visual features such as unique environments, characters, design and fantastic stories. Therefore, each individual part of the given complexity must be 'brought to life' by properly trained artists.

KEY WORDS:
concept art, design, digital games, entertainment industry, fantasy, image.

Introduction

In order to elaborate on the previously given data we proceed with delivering the necessary information for the reader on the given subject by using the so-called inductive method. We intend to build up an informational foundation for young creatives and scientists of the subject for its further understanding, implementation and growth of popularity in the academic field. First of all, we must clarify the difference between the commonly mistaken terms: *concept art* and *conceptual art*. Even though they both first appeared in the 20th century, there is a significant difference between them.

Conceptual art emerged as an art movement in the 1960s. It primarily deals with the critique of the modernist movement focused on aesthetics. Therefore, it tries to demonstrate that an idea is far stronger than its material counterpart, author skillsets or publicness. Artists could use anything to create and demonstrate their art, if it 'sold' the actual concept. Hence the art could take the form of anything – ready-made – ordinary objects, scribbled ideas or performance. The artists threw away traditional means of expression and explored the possibilities of art as a metaphor or knowledge, using linguistic, mathematical, and process-oriented dimensions of thought as well as invisible systems, structures and processes for their art.[1]

1 ALBERRO, A., STIMSON, B.: *Conceptual Art: A Critical Anthology.* Cambridge : The MIT Press, 1999, p. 17-19.

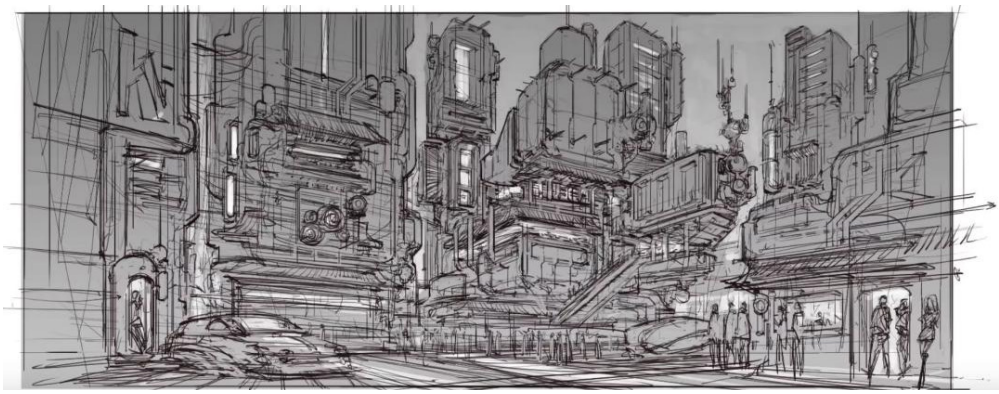
Picture 1: An example of conceptual art – Insertions into Ideological Circuits: The Coca-Cola project
Source: MEIRELES, C.: *Insertions into Ideological Circuits: Coca-Cola Project 1970.* [online]. [2021-01-13]. Available at: <https://www.tate.org.uk/art/artworks/meireles-insertions-into-ideological-circuits-coca-cola-project-t12328/>.

In order to clarify the intentions of this artwork and the conceptual art movement we have to take a note of this quote: *"If a recognizable image was used (as by the Pop artists), then its 'meaning' could not be read literally. For example, the image of Coca-Cola bottles (Picture 1) was used, not because of what it depicted, but for what it represented or symbolized. The image associated power sought by the artists could not be satisfied by (say) the image of a local Tarax soft drink bottle, but only by the 'international' (multinational) symbol of corporate identity and domination"*.[2]

Concept art is applied art that started to appear as a job around the 1930s in creative studios based in the USA (e.g., *Disney*).[3] Even though it undeniably plays a key role in the creation of visual projects, such applied art has not received either a strong definition and acceptance or a body in scholarly literature or art related universities yet. On the other hand, there are a few notable books that exclusively depict concept art to mention, like *The ultimate concept art career guide*. However, in the USA this base is far stronger due to the centralisation of the creative industry. Concept art or concept design is a visual development process occurring mainly during pre-production phases of a project. It solves the purpose of creating visual context for a narrative written concept. Concept art must look functional, visually attractive and must be built on its narrative purpose.[4] Therefore, it stands between design and illustration (Picture 2). This is also why it appears in so many forms and types: from designs of simple things like clothes, weapons, to architecture, vehicles, robots, characters and creatures, environments, complex worlds, key scenes for movies, etc. It can also possess huge diversity of media appearances; concept arts can be

2 ALBERRO, A., STIMSON, B.: *Conceptual Art: A Critical Anthology.* Cambridge : The MIT Press, 1999, p. 396.
3 GHEZ, D.: *They Drew as They Pleased: The Hidden Art of Disney´s Golden Age.* San Francisco : Chronicle Books, 2015, p. 13-19.
4 URSCHEL, J.: What Is Concept Art?. In *The Ultimate Concept Art Career Guide*. Worcester : 3Dtotal Publishing, 2017, p. 11-14.

presented as simple analogue pencil sketches, digital sketches, thumbnails, speedpaints, photobashes, 3D visualisations, 3D paintovers, atmospheric paintings or concept illustrations. After fulfilling the main purpose of design in the pre-production phase, concept artists further expand the ideas by collaborating with other artist departments working on the project – e.g., modellers, illustrators, animators, visual effects specialists, lighters, etc.[5]



Picture 2: An example of environment concept art

Source: SERRA, E.: *Cyberpunk Painting Comps by Feng Zhu.* Released on 28th March 2019. [online]. [2021-01-13]. Available at: <https://www.3dart.it/en/cyberpunk-painting-comps-by-feng-zhu/>.

To underline the difference between concept art and conceptual art, we subsequently chose to compare their similarities as well as their main distinctions. For obvious reasons we chose the artwork of the famous Joseph Kossuth: *One and three chairs* (1965), with which he tried to present the viewer with the idea-concept of a chair in three different ways. Physical – actual chair, artistically produced vision of the chair – photograph, and definition – linguistically based description. This artwork is trying to use the concept of the chair to underline the idea of different perception of the same object and to create processes of thought in the mind of the viewer. Therefore, this artwork's value does not lie in its visual representation, whereas concept art's does. Where conceptual art uses materialistic presentation only to underline the concept, concept art uses the concept to create a very specific design solution for a specific environment. The actual goal for concept art is to create the best visual and functional representation of a given concept.

Given the definition and natural emergence of the term "concept art" in the 20th century, we can find similarities throughout the history of art. Here we can see the transition between the creation of fictional stories or inventions and their visual adaptations. These adaptations, primarily illustrations and designs, may not have been designed so well in terms of functionality and commercial appeal as today, but they created a pattern that could be traced in the art of historical authors.[6] One of the most significant of them could be Leonardo Da Vinci. If we conduct a simple analysis of the variety and richness of his works, we can trace similarities with concept art, mostly in his sense of design, functionality, fantasy adaptation, high fundamental art skills, sciences knowledge application and commerce commissions. All these are natural and essential parts of contemporary concept art known since the 1930s. Given this information, there should be no reason for

5 DONGLU, Y.: The Production Process. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 19-20.

6 SOLARSKI, S.: *Drawing Basics and Video Game Art: Classic to Cutting-Edge Art Techniques for Winning Video Game Design.* New York : Watson-Guptill, 2012, p. 201.

art historians or academic circles for the further refusal of concept art, since this type of art has deep roots in the very core of art tradition. On the contrary, concept art as an art form has plenty to give to the current state of academic knowledge on arts. It can help with traditional art fundamentals to be taught and focused on again, or bring back the popularity of art to people instead of creating art that only artists and art historians 'understand'. This is the clear difference between concept art that is one of the most popular in the practical world and conceptual art that is most popular on academic artistic grounds and amongst art historians.

Another difference, and a nota bene reason for this slow acceptance in academic and art historian circles could be the position between artist and commissioner. A so called NDA – non disclosure agreement – is what follows concept art and what is ultimately causing concept art to be almost invisible, because concept art's 'existence' is bound to the project which may or may not be finished or published and the contract involves the possibility to never actually allow concept art to be seen. This fact has changed a little, because studios and productions take pride in what they have made and sometimes release art books as additional merchandise to the initial project. But if we ultimately compare the opportunities for fine artists and digital artists to show their work, when it comes to concept art, there are almost none. This has caused digital artists to create their own projects or creation of so-called *fan art*, which helps artists to be recognized, battle their frustration and increase their chances to be hired by that particular franchise. Therefore, the self-promotion challenge is ever present on social media which is a platform for digital art recognition as are galleries for fine arts.

Today, concept art serves as part of projects that are built on a fictional basis for the purpose of entertainment or product design. It has grown equally with their popularity and with technology. Technical possibilities hold the key role in the scale of projects, as well as in the birth of a new medium – *digital games*.[7] This has also led to the transformation from traditional to digital art creation, which offers infinite virtual possibilities in creation, tweaking, editing, dimensionality, re-usage etc.[8] Concept art as a type of art has also grown in popularity with the growth of the Internet. For instance, the first tutorials, online schools, festivals, 'making of' videos, started to appear only a decade ago. Since then, communities, career offers and projects have grown significantly, which we can also follow through digital games success rate.[9] The need for this new wave of art creation is therefore enormous, creating many more possibilities for young artists every year. However, the logical implementation into traditional art schools has so far been very scarce. Nowadays fundamental art skills seem to be losing on significance at traditional art schools; digital arts are not yet so well implemented and there must be a connection created between designing and illustration thinking. Therefore, professional artists from the creative industry should bring their experience to universities. Concept art and illustration require many years to be mastered as well as the necessary skills and knowledge of certain fields such as design thinking or anatomy. Therefore, there is always a big discussion concerning young creative individuals; whether to study for years at traditional art schools that are (mostly) still unable to guide them to their goals, or attend courses offered by professionals, which are now available on the Internet.[10]

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7 *How Technology Has Influenced the Gaming Industry.* [online]. [2021-01-13]. Available at: <https://www.imageholders.com/insights/how-technology-has-influenced-the-gaming-industry/>.

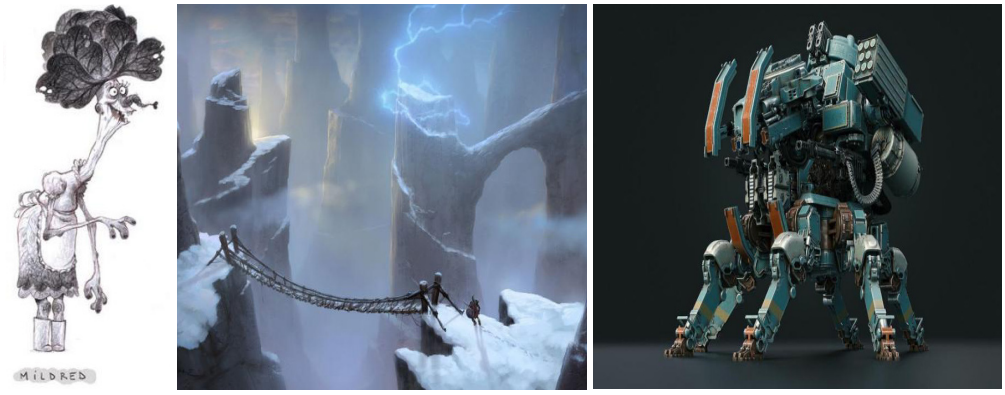
8 SOLARSKI, S.: *Drawing Basics and Video Game Art: Classic to Cutting-Edge Art Techniques for Winning Video Game Design.* New York : Watson-Guptill, 2012, p. 23-29.

9 CLEMENT, J.: *Video Game Industry – Statistics & Facts.* Released on 29th April 2021. [online]. [2021-04-30]. Available at: <https://www.statista.com/topics/868/video-games/>.

10 BELOEIL, G.: Education and Training. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 44-52.

Defining Roles and Specialisation of Concept Art

Since we have already provided the basic knowledge necessary to successfully navigate the reader deeper into the topic, we are going to further define the role of concept artists. So far, we know that concept artists work on the given, written concept which serves as an initial point. From this point, primary concepts are going to emerge through careful supervision of an art director – an artist in the position of managing other artists and maintaining the visual identity of the project.[11] This starting point is also the most creative part of the whole process, since huge quantities must be produced within a very tight deadline. It can be very stressful because of time pressure, furthermore even very tricky in terms of creativity.[12] Therefore, a very strong discipline, time management and constant study are the key. Expertise on various subjects is what makes this career a specialty. For instance, using their knowledge of core information such as human and animal anatomy, an artist can create new live forms; their further visualisation will depend on the given written concept. Information from the concept will be further analysed and applied through references and knowledge from reality. For instance, our written story is situated on a planet with a surface that can be defined as a huge marshland. This marshland is inhabited by humanoids adapted to this habitat over decades of evolution. By visual and theoretical analysis of real-life a well-trained concept artist can produce visually and logically functional *character designs*. This procedure can also be applied to the *environment* or *hard surface design*s, which are the initial specialisations of concept artist (Picture 3).



Picture 3: Character design (by Laika Studios, the feature film The Boxtrolls), Hard surface design (by Tomi Väisänen), and *Environment design/concept illustration Blizzard Entertainment (by Justin Kunz)*

Source: Character Design Work on LAIKA's Third Feature Film "The Boxtrolls". 2014. [online]. [2021-01-13]. Available at: <http://www.sylvain-marc.com/the-boxtrolls/>.; CARPENTER, N., DIDIER, S., METZEN, C.: *The Art of Blizzard Entertainment.* San Rafael : Insight Editions, 2013, p. 143.; VÄISÄNEN, T., TOKAREV, K.: *Hard-Surface Modeling & Material Tips.* Released on 25th December 2018. [online]. [2021-01-13]. Available at: <https://80.lv/articles/hard-surface-modeling-material-tips/>.

11 URSCHEL, J.: What Is Concept Art?. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 13.

12 RETZ, Z.: Expectations and Workload. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 16.

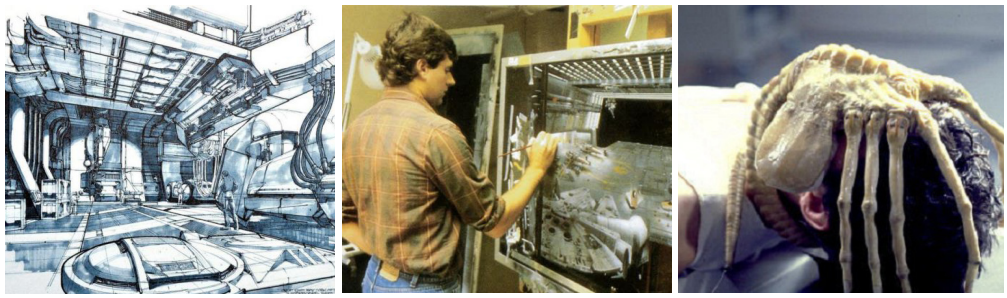
Further specialisation can be based on the artist's preference of design and knowledge expertise.[13] This type of specialisation is possible because of the enormous growth of the industry in recent years and the variety of available projects. We can see it clearly by scrolling through portfolios on one of the biggest websites providing contacts for employment, training and a platform for displaying art – ArtStation. Specialisation is also one of the essential steps in landing a specific job; it is easier for artists to focus on a specific genre or type of design than to cover the whole variety of possibilities. For instance, they could choose their main subject as fantasy or sci-fi, or – a more in-depth expertise – they can choose a specific type of design like robots, aliens, cars or weapons, architecture, etc. They can also specialise (in terms of style) in realistic or stylised designs; however, concept artists could also be defined as the most versatile in style adaptation.[14] There is one more addition that differentiates these artists from any other, and it is their employment status. Concept artists can either work as 'in-house' employees or freelancers. In-house employment is the best way to start a concept art career, since it highly depends on many various skills that need to be learned, as well as on close communication with other artistic departments.[15] Young artists can therefore quickly adapt to the 'system' and learn the necessary skills on the go, by slowly approaching more difficult tasks. As a freelancer, one must self-manage one's time to be effective; communication can be harder and strongly depends on the skills of negotiation of own ideas. Being successful while seeking quality work can also be a challenge whilst one must be one's own agent and create one's own work connections.[16] Therefore, freelancing can be more suitable for industry veterans who have already worked for several clients, know the whole process and have vast experience in the field.

Art Skills, Tools and Techniques

Even though the contemporary 'pipeline' of image creation in the entertainment industry stands on the usage of modern technology and frameworks strongly related to it, the core knowledge comes from traditional approaches.[17] A clear manifestation of this knowledge can be seen in the quality of traditional matte painting and practical effects applied in early fantasy and sci-fi movies produced in the 20th century (Picture 4).[18] Other traditional techniques used until today include drawing with pencil, painting in oil, acrylic or watercolour, painting on glass, sculpting and casting in various materials, etc. These are nowadays of course, often created digitally for the purpose of faster and cheaper production. However, we can see this tradition continue through the early steps of learning art skills, sketching before production; it is also recommended by professional artists to start

13 DONGLU, Y.: The Production Process. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 18.
14 LILLY, E.: *The Big Bad World of Concept Art for Video Games: How to Start Your Career as a Concept Artist.* Los Angeles : Design Studio Press, 2017, p. 32.
15 URSCHEL, J.: What Is Concept Art?. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 12-13.
16 REBHOLZ, B.: Freelancing. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 162-164.
17 SOLARSKI, S.: *Drawing Basics and Video Game Art: Classic to Cutting-Edge Art Techniques for Winning Video Game Design.* New York : Watson-Guptill, 2012, p. 31-61.
18 See also: VAZ, M., BARRON, C.: *The Invisible Art: The Legends of Movie Matte Painting*. San Francisco : Chronicle Books, 2004.

with traditional media in order to understand the technique, as well as imitations used in digital approaches and styles. A dot, line and primitive shape drawn by hand, is the easiest way for the brain to dive into imaginary visualisation.



Picture 4: Concept art – traditional approach (by Syd Mead), traditional matte painting on glass (Star Wars, 1977), and practical effects applied to an alien creature (by H. R. Giger, 1979)

Source: Syd Mead Aliens Sulaco Interior 03. [online]. [2021-02-02]. Available at: <http://sydmead.com/syd-mead-aliens-sulaco-interior-03/>.; STRIKE, K.: *The Hand-Painted Scenes of the Original Star Wars Trilogy That Made Us Believe It Was Real.* Released on 2nd May 2017. [online]. [2021-02-02]. Available at: <https://flashbak.com/the-hand-painted-scenes-of-the-original-star-wars-trilogy-that-made-us-believe-it-was-real-379260/>.; *'Building Better Worlds': The Production Design of Alien.* Released on 20th September 2010. [online]. [2021-02-02]. Available at: <https://zouchmagazine.com/building-better-worlds-the-production-design-of-alien/#.YGYu2ugzZPY>.

Here, we can clearly see that digital media are only powering up the tool set and skill set of the author; still, the most essential tool of all is one's brain. The core image creation skills, also known as fundamental art skills, are the most important. In such an extremely accurate and professional type of art, strongly related to a knowledge of reality, the absolute understanding of fundamental art skills is a necessity. Fundamental art skills are defined as perspective, values of light, colour theory, shape and line design as well as knowledge of the form and anatomy.[19] Today, acquiring fundamental art skills is one of the most easily found art training procedures in existence. However, gathering information is not a problem, it is its understanding and realisation through imagination. One must learn how to visualise and construct the visualisation via all fundamental art skills, starting with perspective, understanding of the form, line and shape, applying light and shadow, etc. One skill supports another; therefore, a perspective artist cannot skip any of them.

Digital art techniques applied through industry standard software and technical knowledge are the second part. There is also a set of techniques that help concept artists to be the most efficient and creative artists in the industry. These techniques are sketching, thumbnailing, speedpainting, photobashing, kitbashing, 3D overpainting, sculpting, 3D or VR sketching. Concept artists need to be well acquainted with numerous varying software types and their combinations in order to create stunning images in a very short time. However, it is not only the knowledge on how to use software, but rather the assessment of which software potentially renders the best results.[20] Nevertheless, a thorough understanding of the right software could help the artist to collaborate with studios that use this software. In the past years there were only a few of them and thanks to their long unrivalled position they have later come to be proudly called the industry's 'standard'. The dominance is obvious in the cases of Adobe Photoshop (2D), Autodesk Maya or 3Ds Max

19 BELOEIL, G.: Education and Training. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 52.

20 *Level Up! Session 80 with JAMA JURABAEV.* Released on 11th June 2017. [online]. [2021-02-02]. Available at: <https://www.youtube.com/watch?v=4XzT0i6AWPg&ab_channel=LevelUp%21>.

(3D), Substance Painter (texturing) and Zbrush (3D sculpting). Their supreme position is also marked by their high prices. In accordance with this, a low-price 'rebellion' of free and new software has emerged and by giving aspiring and new artists a cheap way to produce, they have started to grow in popularity. One very good example is the highly versatile, open source, free 3D software, Blender, which is, thanks to the support of creative and skilled people, funds and studios, is slowly approaching the title of the industry's standard programme. It is known to be very intuitive, which is currently highly valued, because it helps creators to focus more on the creative process instead of technicalities. Many other kinds of software should be mentioned as well – Corel, Rebelle, Saia, Krita, Paintstorm, ArtRage (2D); Houdini, Cinema4D, Rhinoceros, Modo, LightWave (3D); Oculus Medium, MasterpieceVR, Gravity Sketch, Tilt Brush, Qill (VR).[21]

Visual ideation is the part which makes written concepts come to life. Each execution of visual ideas and identity drawn into design makes the project more alive. Concept artists are the builders of imaginative worlds, which must appear believable and logical in order for the viewer to emerge into this world and accept it. Therefore, artists working in this department should be constantly learning different subjects, analysing from the core and building up information and knowledge of these subjects that could be anything from engineering, biology, anatomy, product design, physics, psychology, body language etc. This information is then constantly merged with its visual representations, so that artist does not only build up 'a knowledge library', but also connects it to 'the visual library'. This way, the artist is not only able to pull out the visually represented information (human and animal anatomy) of the learned subject, but also by tweaking the information, they can come up with design solution (alien humanoid). This skill is very hard to acquire, and is necessary to practice it as much as possible with acquiring information (reading or observing), visual representing (sketching, modelling from reference or real life) and practising imagination in a story, design, mood, immersion and merging them into world-building.[22]

Creation of Concept Art

In this part of the study, we focus on creative methods used in concept art. To define these methods, we use synthesis of existing methods commonly used in professional 'pipelines'. All of these have been developed throughout art history. Even though concept art could be seen as a relatively new kind of art, it uses the same methods, built and refined over time for the purpose of visual communication. Therefore, we can analyse these similarities in many different ways – through the quality of composition, perspective, anatomy, light, atmosphere, emotion and idea communication, craft, but we are predominantly interested in design and narrative qualities. Projects commonly start with given narrative concepts, which are the starting point for concept artists to come up with visual solutions. This part is the most creative part with much artistic freedom. It is the objective of the artist to burst with ideas, create solutions, and come up with interesting designs. It is a necessity to develop design and mood early on, so that the project acquires its specific identity. Later on, it becomes the job of the art director to communicate with artists briefly, giving them feedback and coordinating the creativity, so that this identity remains

21 URSCHEL, J.: Key Software. In *The Ultimate Concept Art Career Guide.* Worcester : 3Dtotal Publishing, 2017, p. 29-32.

22 CHIU, B.: *How to Train to Be a Better Artist.* Released on 22nd May 2017. [online]. [2021-02-02]. Available at: <https://www.youtube.com/watch?v=tYmrhhYh0KY&ab_channel=BobbyChiu>.

intact and follows specifications.[23] Techniques used in this early step must be as simple as they must be fast. These are *sketch*, *thumbnail* and *speedpaint*.

Sketch could be described as a swift and simplified rendering of an idea, commonly in as few strokes or lines as possible, but on the other hand, describing the character of the idea as much as possible. To speed up the process of creation, individuals or studios create multiple fast design explorations called *thumbnails*. Thumbnails could be described as fast, simplified design techniques with the main focus on silhouette (character design), or composition and lighting (environment design), which are created in small sizes and with plenty of variations of designs to choose from.[24]

Speedpaint is another example of a fast creative technique, through which the artist is trying to achieve compositional, narrative, design and mood qualities in a very short time (10 – 60 mins). Its purpose is to create strong readable pictures, mostly 'keyframes' of the story, which could be later refined in the upcoming steps.[25] Once the design and mood are achieved to serve the initial brainstorm and the pieces that are closest to the concept are chosen, artists need to further develop their ideas and approach the necessary quality. Production must be very fast, that is why the process evolved from traditional drawing and painting to usage of various digital tools. Even though digital painting gives a lot of variability in layers and computing power in effects, it can still be very time demanding in order to achieve a high realistic quality in a short time. Therefore, techniques like photobashing, usage of 3D and paintovers, sketching in virtual reality or kitbashing were created.

Photobashing is creative approach similar to traditional collage, through which the artist uses different photos blended into existing pictures. It can be used to achieve a certain atmosphere, texture quality and of course can speed up the process.[26] *3D paintover* is a combination of 2D and 3D workflows, through which is created a 3D base before painting. 3D has the power to solve lighting, space, texture quality, perspective and camera very quickly; therefore it is a very strong tool.[27] The *usage of virtual reality* in the creative process gives a lot of freedom and flow during creation. People can use their hands, realistic scaling and their own head-mounted cameras to feel strong immersion. Therefore, it erases a lot of barriers during the transcription of creative thought into digital representation. Tools in virtual reality are very simple yet very effective.[28] *Kitbashing* is a fast approach 3D model technique, where pieces of already-created models are used to create a new model or entire scene. This technique provides a fast way to design or approach visual quality or details in a short time. It is very popular when creating robots, vehicles, architecture, or entire environments.[29] Refining touches can be described as an essential and last step, which heavily rely on the usage of tools of contrast, ultimately creating carefully balanced pictures. This last step also shows how skilful an artist is, because a full composition relies on a huge amount of knowledge and experience to be functional and yet convincing and immersive.

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Conclusion

Even though concept art as a career opportunity barely existed before the 21st century, it is one of the most desired positions for young artists. It is the ability to produce fictional yet believable immersive worlds for the audience which makes it so interesting. The current direction of the entertainment industry in fiction helps maintain that position and creates the necessary demand for successful careers. However, merging academic art education with this new type of art faces many problems. One of them could be the evolution of art, where in the 21st century it shows similarities with the renaissance (digital art) instead of merging into new and new art movements (fine art). One reason for that could be the current interest in science and technology and our dependence on it. It seems that till this point we have gathered so much knowledge and information, yet we must once again learn how to use it. For this, concept art seems like a reasonable answer, because in order to create new and believable fictional worlds, we must first understand how our reality actually works. This fact pushes the boundary of an artist into all sciences that exist, in order to gain and use that knowledge to create design solutions. The specialisation and growth of an individual both in the fields of art and science is therefore necessary. This should lead to the necessity for art schools to create the opportunity for young aspiring concept artists to nurture their talent, which is scarce in the current situation. This trend slowly changes thanks to individuals, mostly industry veterans, who decide to pass along the knowledge, but mostly through the internet or art schools based in USA. This leads to the necessity for local and academic environments to focus on the subject and to create the opportunity for young creative individuals. We see huge importance in this, because in order to help and nurture digital games in a non-centralised environment (not only in the USA), to grow in potential and quality, we need to bring proper education to artists when they attend school in their own country. To do that, we must first advocate the importance of concept art to existing art schools, build on similarities, but most of all build a solid foundation. Surely some of the main qualities to have arisen during the history of digital games are storytelling, design, aesthetics and unique ideas, which all speak the language of concept art. Therefore, the purpose of this paper lies as a foundation to the subject, which contains the necessary information for understanding and nurturing concept art in academia and through that the opportunity for new digital games studies to appear in local environments.

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Preserving Japan: Saving Digital Games for Future Generations

Interview with Koichi HOSOI

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His research themes include the application of digital media in society through new social business models based on partnerships between communities, the business industry, educational institutions, and the government. He established the Game Archive Project at the Ritsumeikan University at the late 1990s. It is aimed at the holistic and social preservation of digital games through collaboration between the business industry, research and educational institutions, and the government. He also recently co-authored *The Life and Times of the Nintendo Famicom: The Birth of TV Games* (NTT Publishing, 2013).

Interviewer

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Miroslav Macák is currently a full-time doctoral student at the Faculty of Mass Media Communication UCM in Trnava, Slovakia. He received both his Bachelor's and Master's degrees at the same institution in the digital game theory programme. The main topic of his scientific research is the industry of digital games. He is predominantly interested in Japanese game production. He also focuses on mainstream, AA and independent production of digital games, stories in digital games, game genres and modern trends in the digital game industry (technological, narrative and design).

Miroslav Macák (M. M.): Professor Hosoi, you have a very interesting digital games preservation project under your wings. Can you give us some background on what made you start the whole project?

Koichi Hosoi: I majored in business administration at the graduate school of Ritsumeikan University and became a researcher before being appointed as a faculty member of the newly established *College of Policy Science* in 1994. The School of Policy Science was a completely new concept at the time, and I was appointed as a faculty member in charge of business administration, but since Ritsumeikan University already had a traditional business administration department, and since a new department had just been established, I thought I would focus my research on a new area that was not covered by conventional business administration. However, which industries should we target? Then I decided to ask the first-year policy science students what industry they were interested in, and they all answered in unison, 'games'. They talked passionately about the fun of games and the impact they had on their lives. When I think about it, first-year university students who entered in 1994 are the generation that spent their entire junior high and high school years playing games as Nintendo released the Family Computer (NES) when they were in elementary school. Furthermore, 1994 was a milestone year when Sega released the Sega Saturn and Sony released the PlayStation, drastically changing the map of the game industry. As someone who was also interested in the management of the information industry, I had a strong feeling that the creative information industry, with its high profit margins, would be the most promising candidate for the rapid change in Japan's industrial structure, which had traditionally been dominated by large, heavy manufacturing companies. The game industry is undoubtedly full of potential, and the current students are immensely interested in it. I could relate to this from my own gaming experience, and yet there were almost no researchers in the field of business administration who were interested in the gaming industry at that time. At that time, I had a kind of intuition that this was something I should do.

M. M.: Can you elaborate on why you think that preserving digital games is important for our cultural heritage?

Koichi Hosoi: Computer games, along with manga and anime, have been featured in the Japanese government's Cool Japan strategy, and are considered to be representative of Japan's world-class popular culture. You can see the smiles on the faces of young people all over the world as they play Japanese games. It would not be an exaggeration to say that the gaming experiences they have had, down to the way they handle the controller, have already become a universal 'experience' or 'language'. Never before have so many people around the world accepted and shared the sensitive products and culture that Japan has created.However, many of these games, especially the early works, have been lost, and there is no prospect of preserving them in the future at this rate. Manga can be preserved for a long time by converting them to digital images, and animation can be preserved continuously by converting the recording format. Digital games, on the other hand, are a very fragile cultural resource that can only be maintained for a few decades or so due to deterioration and other factors using normal preservation methods. No simple and durable preservation method has been established so far, nor has a social framework for institutional preservation such as a library been established, and even the publisher has not completely preserved the game, even though it is a new entertainment content that was introduced about only 40 years ago. Importantly, digital games are a form of popular culture that has developed in historical and content relations with the manga and

animation cultures. If things continue as they are, it is easy to imagine a future in which, among the expressive, amusement, and entertainment arts that flourished around the world, especially among young people, at the turning point of the twentieth and twenty-first centuries, manga and animation have been preserved, but only fragmentary and partial resources remain for games. Therefore, the theme of the preservation of digital games is very important not only from the perspective of cultural resources but also from the perspective of cultural heritage.

M. M.: Do you only preserve digital games from Japanese production, or are you also archiving games made in other parts of the world localized into Japanese, or even versions of Japanese games localized for the global market?

Koichi Hosoi: Yes. All of them are the subject of our game preservation research. Of course, we think it is important to preserve all digital games released from all around the world, but in terms of limiting the scope of what we can realistically do, we consider all digital games sold in Japan to be eligible for preservation.

M. M.: Are there any specifics that make preservation of Japanese games different from the preservation of global production?

Koichi Hosoi: With the exception of private collectors and those involved in game preservation initiatives through NPOs, efforts by public institutions to create game research resources in Japan are still very limited. This year marks about 25 years since we began our research and our practice of game preservation at Ritsumeikan University, and yet so many issues remain unresolved. It has become clear through our activities around game study that public museums in Japan are extremely limited in both quantity and quality regarding game preservation, in contrast with the many large and unique collections in other countries, from whose collections, exhibition methods, and expertise on social partnerships we have much to learn. Examples of universities and public libraries are Stanford University (US), Leipzig University (Germany) and the Bibliothèque Nationale de France (France), while non-university libraries include the Strong National Museum of Play (US), National Videogame Museum (US), the National Videogame Arcade (UK), Computerspielemuseum (Germany) and Video Game Museum Roma (Italy). What these overseas museums have in common is: (1) extensive collections and storage space, including arcade games with large cabinets, (2) collaboration with governments and universities to develop learning environments and schemes for game-related research, education, and human resource development, (3) proactive opening of their collections to the public and creative exhibitions with their own philosophies on the history of games, (4) many visits by children (with their families) and many game related educational events for children, and (5) creative ways of raising operating costs (admission fees, original projects, administrative support, donations and patronage, etc.). It would be almost impossible for public collections in Japan to achieve any of these now.

M. M.: Is any part of the collection available to the general public?

Koichi Hosoi: The game archives being constructed at the Ritsumeikan Center for Game Studies are researching knowledge and experience to practice comprehensive and long-term preservation of digital games and related materials. In order to provide the archival materials to the general public, it is necessary to create a system to provide practical services beyond the level of research on a permanent basis, but we do not have such

organizational capability. This is related to the question below, but we hope to create a system and organization similar to game museums in other countries in the future.

M. M.: It is known that Nintendo lent you all of the available game cartridges for Famicom (Japanese equivalent of Nintendo Entertainment System), yet Nintendo nowadays are known to be very overprotective of their IP. How did you manage to convince them about your cause?

Koichi Hosoi: It was around 1996 or 1997, I think, that I asked for Nintendo's cooperation to conduct research on games. Since I had no connections within Nintendo, they did not take me seriously at first. At that time, I had a chance to talk with Mr. Akimasa Yamashita, who was then a section chief of the Commerce, Industry and Labor Department of Kyoto Prefecture (now he is the Vice Governor of Kyoto Prefecture). Mr. Yamashita was a movie enthusiast and understood the Contents Industry very well, so he immediately talked to Nintendo. After two or three visits to Nintendo, we were not able to make any progress, but we continued to ask for their cooperation in game research. However, in the negotiations back in 1997, Nitendo's response was that "Nintendo finds it difficult to find positive significance in researching past games, and there is nothing we can do to cooperate at this time". The person with whom I was negotiating at that time was Masayuki Uemura, Director of Development Department 2, who was responsible for the development of the Famicon. And now he is currently a visiting professor at Ritsumeikan University and officially visited your university in April 2017 as the director of Ristumeikan Center for Game Studies. Nevertheless, I persisted and went back to Nintendo several times. One day, Mr. Uemura personally contacted me and said, "Although we can't engage in game research as a company, it would be meaningful to conduct research at a university, so let's consider lending the NES software that we keep in our company. So, let's consider lending our NES software". After that, Nintendo decided to take appropriate measures as a company, and Ritsumeikan University and Nintendo signed a memorandum of understanding through the mediation of Kyoto Prefecture. Through the mediation of the Kyoto Prefectural Government, a memorandum of understanding was signed between the university and Nintendo, and Nintendo officially agreed to lend us the actual hardware of the Family Computer and the U.S. version of the Nintendo Entertainment System (NES), as well as over 1,700 NES game software titles for both domestic and overseas markets.

M. M.: Are you planning to preserve games only for selected platforms or up to a certain console generation, or do you want to archive as much as possible?

Koichi Hosoi: When considering the preservation of cultural resources such as comics and animation, it is not possible to organize a body of materials for research by assuming only specific formats and contents. The same is true for digital games, which we are considering for preservation in as many forms and contents as possible.

M. M.: Are there any elusive game/games that you have been hunting for a long time, but still cannot obtain?

Koichi Hosoi: There is a game called *Shonen Majutsu-Shi Indy* that was created for Nintendo's Family Computer. This game was based on the game book series (original story by Naomi Inoue) published by Futabasha. Of course, we can imagine easily that there are other similar titles, but this one is unique in that it is a case where the many records of the time can confirm that it was almost complete and playable. The reason why I am

interested in this title is that it was produced at the end of the period when a large number of official Family Computer titles were being produced, and in many ways it is a compilation of the best and most interesting aspects of the software that had been produced for the Famicon up to that point. I believe that this is the title that brings together the best of the programming techniques that have been cultivated on the Famicon platform. This title is currently unavailable, of course, but we have received some information on the whereabouts of a supposed development version, but our centre has yet to confirm those whereabouts.

M. M.: Many games have various updates, patches and add-ons. Some can even heavily alter the game itself. How do you decide which version of the game will be archived?

Koichi Hosoi: This is a difficult question. I think the next two questions are also rooted in the same problem: content provided as a continuous service on digital platforms. Of course, with legacy media such as books and records, there are differences in versions also, reprints, and re-playings, but with digital games, especially online games, the number and frequency of updates is extraordinary. This issue is currently one of the most important issues to consider, and neither I nor our centre have decided which versions to preserve at this stage.

M. M.: In the current game environment, many games are being made not as a product, but as an ever-evolving service. What do you think would be the best approach to preserve such games? Continuing this question, The market for mobile games is currently booming in Japan. But even though, many of the games on the platform, even those that belong to a well-established franchise, are discontinued after 1 or 2 years (with one of the most recent discontinuations being Sakura Revolution (DelightWorks), going offline only 6 months after release). Do you think there is a tangible way to preserve a live-service game that was already shut down?

Koichi Hosoi: This is also a very difficult question. I think it is a problem that arises from the fact that content is provided as an ongoing service on the Internet and digital platforms, and that we are a business that is constantly seeking to maximize the value of the user experience. I don't have the knowledge to answer it easily, but one hint might be the efforts of Perfect World, a Chinese company that partnered with our centre in 2019 for an academic exchange agreement. The company's efforts to preserve online games have a different purpose and perspective than game preservation in the academic sense, as it aims to capture and reuse information and data generated in the stages of internal development as intellectual property to generate new revenue and improve the efficiency of future game development. However, it can be understood as an example of how it is possible to preserve the entire process of creating, updating, and eventually shutting down an online game. The following is part of an interview survey with the company: "In April 2015, a new team of four members was established, led by Ms. Sun Ning, who had worked in Perfect's art department since 2004, and specializes in game preservation. Since then, this organization has been in charge of the preservation of the games developed at Perfect. Perfect's facilities can be roughly divided into the headquarters building where the business is conducted and where resources related to the game works are stored. On the other hand, Pixseed, a research institute, has a separate location set apart from the headquarters. This facility houses classrooms, educational PCs, broadcasting equipment, motion capture facilities, etc., as well as research books related to game development.

In terms of the timing of the preservation, Perfect will perform the first backup operation when a new game reaches the third month after it is released to the public as an open beta. After that, backups will be done once a year during the second half of the year for those projects that are still in operation. If a project is launched and then cancelled, the status at the time of the project's completion is backed up. In this way, special events and updates that are backed up once in the second half of the year are backed up at the same time as the various resources. Regarding the way the internal resources are managed, they are generally managed on the company's own RAID instead of being placed on a server or network. In addition to real storage technology, the company uses RAID 3 to store files. A file director tree is automatically generated for each project to ensure that the file types and names are compliant with the norms. If it does not, it will automatically change it. In addition, we have created a 3DSMAX plug-in that allows us to immediately capture screens from source files. This makes it possible to search for the source file at a glance when searching. In addition to this, they have also developed a plug-in to select the corresponding source file from the capture screen. As for the internal resource management database, in addition to regularly backing up the work itself, the various resources (characters, costumes, and weapons) that make up the work are also stored separately in the database. Each piece of data is assigned an individual ID, and metadata is also registered, making it all searchable. This makes it possible to quickly refer to something in a particular work. For example, even a single vase can have a variety of patterns, shapes, and historical backgrounds. If you enter the keyword 'vase', you can see all the vases, and if you want to use a model, you can click on the item to go to a link where you can download the stored model itself".[1]

M. M.: What do you consider to be the biggest challenge in preserving digital games for future generations?

Koichi Hosoi: There are three main issues related to the use of games as research resources in general, including the efforts of Ritsumeikan University. The first is gaining the understanding and cooperation of companies in preserving games. If we want to store games in a closed system, but also want to use them in various ways in society, we need to obtain the understanding and permission of the manufacturers and publishers who hold the various rights. On this issue, rather than unilaterally obtaining the cooperation of companies, including handling their rights, we need to patiently consider what the significance and merits of the public and social activities of game preservation will be for those companies, and try to seek their cooperation in a more voluntarily manner. The second is the difficult problem of how to preserve games other than home video games, i.e. arcade videogames, which formed the early stage of game culture and are still developing in various ways today, as well as Internet-based games such as online games and social games, which are currently very popular. This is where we see a convergence of the technical and methodological issues involved in preserving games as a form of expression. The third is the organizational theory of how to proceed with such preservation efforts within a social framework, and how to compose the management resources of people, goods, and money. On this point, it is important to learn from the aforementioned examples of video game museums overseas, and to develop human resources with a producer's mindset who can incorporate them into the Japanese context. You can always see the smiles on the faces of young people all over the world when they become absorbed in Japanese games.

1 *FY2019 Research Project for Cooperation of Game Archive Holding Institutions Implementation Report. Media Arts Collaboration Promotion Project of Japanese Agency for Cultural Affairs*. Kyoto : Ritsumeikan Center for Game Studies, 2020, p. 30-32.

And it is no exaggeration to say that their gaming experiences have already become a shared global 'language', from the nicknames of the characters to the way the controllers are operated. Never before in history have the products and culture created in Japan been so widely accepted and shared by this many people. We also need a realistic strategy for preserving games and making them into a research resource, and I think the quickest way forward is to get as many people as possible to understand this fact.

M. M.: Working with such a large amount of digital games, you surely must have played a lot of titles and series. Would you mind sharing your personal favorites?

Koichi Hosoi: *Half-Life 2*. The narrative and action are excellent. In addition, the unique screen, which is clearly different from the graphic taste of many domestic and foreign games up to that time, has a mysterious impression and depth similar to Andrei Tarkovsky's movie *Stalker*, which made me want to stay in the world longer.

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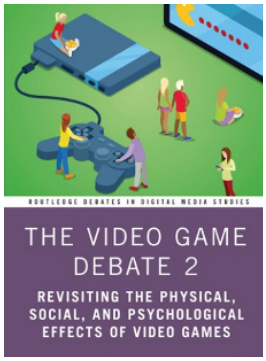

THE DEBATE GOES ON: THE VIDEO GAME DEBATE 2

KOWERT, R., QUANDT, T. (eds.): *The Video Game Debate 2 : Revisiting the physical, social, and psychological effects of video games*. New York, London : Routledge, 2021. 130 p. ISBN 978-0-367-36872-2.

Magdaléna Balážiková

Considering digital games have been present since the 1940s[1] ground-breaking books about their sociological and psychological effects would probably more or less fit on one bookshelf. An interesting recent addition to this collection is The Video Game Debate 2.

A publication consisting of ten autonomous thematically ordered chapters was edited by T. Quandt and R. Kowert. T. Quandt studied journalism, psychology, film and cultural studies and currently works as a professor at the University of Münster. His academic interests include media addiction, the social aspects of digital games and cyberbullying or presence within virtual spaces.[2] R. Kowert studied Counselling Psychology and is currently the Research Director for the non-profit organization Take This providing mental health information and resources to the gaming community and industry and is also the Chief Scientific Officer at Kitsune Analytics. Her research interests cover learning within digital games, gamer's well-being and Internet Gaming disorder or video game involvement.[3] Eleven other experts contributed to the publication, i. e. the well-known expert in problem gaming and gaming addiction M. D. Griffiths (author of Gaming addiction components[4]). Targeted at both students and scholars, the book places a great emphasis on the definitions of key concepts with to a mostly psychological tune overall. Together with other academics from the domain of gaming psychology (e.g., J. Madigan, A. Kriss, J. McGonigal), the authors perceive digital games as an area with vast potential (not only commercial, but also social and that of personal development).

The book is loosely based on the previous volume published in 2016.[5] While *The Video Game Debate* focused on what we nowadays consider 'classic' topics of video game discourse such as the history of video games, aggression and violence, gaming addiction and internet gaming disorder, social aspects of gaming or cognitive impact of digital games, The video game debate 2 offers more specialized and not so frequently covered topics such as loot boxes, e-sport, the therapeutic use of digital games or mobile gaming. In its first chapter the book connects to its predecessor and further elaborates on previously outlined debates. The domain of games is rightfully more differentiated and divided into video games, online video games and mobile video games. Chapter 2 discusses the question whether loot box buying could and should be considered a form of gambling alongside the issues of predatory monetarization. It offers an insightful overview

1 MAGO, Z.: Úvod *do* štúdia *digitálnych hier I*. Trnava : FMK UCM in Trnava, 2020, p. 23.
2 *Prof. Dr. Thorsten Quandt*. [online]. [2021-05-10]. Available at: <https://www.uni-muenster.de/Kowi/personen/thorsten-quandt.html>.
3 KOWERT, R.: *About Me. Background.* [online]. [2021-05-10]. Available at: <https://www.rkowert.com/about>.
4 GRIFFITHS, M.: Diagnosis and management of video game addiction. In *New Directions in Addiction Treatment and Prevention*, 2008, Vol. 12, No. 3, p. 28. [online]. [2021-05-10]. Available at: <https://www.researchgate.net/publication/273948544_Diagnosis_and_management_of_video_game_addiction>.
5 For more information, see: KOWERT, R., QUANDT, T. (eds.): *The Video Game Debate : Unravelling the physical, social, and psychological effects of video games*. New York, London : Routledge, 2016.

of countries based on whether they considered loot boxes in relation to gambling regulations. Chapter 3 pursues questions such as *What are serious games? How do they work? What do we need to learn about serious games?* It is enjoyable that R. S. Jacobs does not perceive serious games as a single mass but divides them into games that teach/educate, games that train/develop skills and games that persuade/change behaviour. Additionally, he acknowledges the fact that 'classic' games can also be utilized for educational purposes but they should be modified to a specific educational goal or at least accompanied by debriefing. His text calls for validated design principles solely for serious games (not derived from other fields like media studies or psychology) that are still missing. Moreover, he states that designers should question their core assumptions about what makes a good game and rightfully addresses important issues of flow (a concept from the psychology of creativity) along with the cognitive load and limited capacity of our cognitive system.

The presented work does not overlook (in Chapter 4) exclusionary practices within gaming communities. Even though promoting plurality in gaming, the authors completely omit that men as well can be susceptible to stereotypization, violence and sexism. On the top of that, the part considering techno masculinity as a form of symbolic violence seems exaggerated. Considering the academic tone of the publication text, this chapter would benefit from a larger amount of academic sources abandoning its rather essay-like style so that we don't come across generalized statements such as: "While solitary gamers may show an increase in aggression..." (p. 47). More so the previous Video Game Debate book outlined the complexity of the violence debate.

If there is in 2021 a person who doesn't know what Twitch is, he/she should read the fairly descriptive Chapter 5. Apart from the introduction to this videogame streaming service and the discourse of male streamers dominance it offers an implication that services like Twitch, though robbing viewers of the game's interactive potential, are basically interactive in new ways when we are not interacting with the game, but with the streamer and community. Moving forward to e-sports, it mentions that e-sports have been ignored for quite a long time by the psychology of digital games despite the fact that they are a multibillion industry and professional gamers are a specific group. In this section e-sports are defined as "organized video game competitions" (p. 67). Authors discuss how they differ from gaming in general as well as from sports. Another overlooked area is that of mobile gaming regardless of its fair share of overall gaming activities. Chapter 9 highlights the place of mobile gaming within the gaming universe, the difference between mobile and portable games, their history (from their antecedents of portable toys and cards to mixed reality mobile gaming) and gender specific play patterns. Another chapter (no. 7) presents the rather rare topic (at least until Kriss's Universal Play came out in 2019[6]) with an extremely wide application potential. With the help of a digital game we are not only able to defeat a monster in a game, but also the 'monster' within us. As a part of therapeutic practice digital games can serve as a 'safe space' (for trying out emotions, roles, decision making, gender identity), means of increasing emphatic traits or examining the phenomenon of projection, building frustration tolerance or facilitating catharsis and abreaction. The chapter does not fail to mention the importance of a narrative and pays attention to concept of archetypes even though author understands them more broadly than, for example, C. G. Jung.[7] Chapter 8 further expands this topic into virtual, augmented and mixed reality while being illustrated by three insightful case studies.

6 KRISS, A.: *Universal Play: How videogames Tell Us Who We Are and Show Us Who We Could Be*. London : Robinson, 2019, p. 169.

7 For more information, see: JUNG, C. G.: *Duše moderního člověka*. Brno : Atlantis, 1994.

To conclude, we are witnessing a gradual transition regarding the perception of games towards more unbiased discussion. Not so long ago, gaming used to be perceived by gamers through rose-coloured spectacles, while the public perceived it in the worst case as a path leading to violence and addiction. Indeed, The Video Game Debate 2 has something to offer to both of these groups as well as to groups in between. The leitmotif of this work is stated by the editors in the final concluding chapter: game research needs to adapt to changes in the gaming industry. At one point, R. Kowert and T. Quandt compared game research to a deer in the headlights staring into the blinding lights of dominant debates instead of moving on. The editors successfully managed to lure this deer into a forest full of adventures where there is not only already a lot to see, but simultaneously a lot to explore. One should keep in mind that the presented chapters have a cross-sectional character; therefore each topic should be individually studied in more depth. Nonetheless, The Video Game Debate 2 is enriching reading for students, academics and even game design experts.

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HADES: A MYTH-CRITICAL APPROACH

SUPERGIANT GAMES: *Hades (Nintendo Switch version)*. [digital game]. San Francisco, CA : Supergiant games, 2020.

Andrea Quero

"Imagine that Prince Zagreus experiences some sort of joyous outcome, for a change, in contrast to the arbitrary and unfortunately painful death he shall experience... now."

The Narrator

Hades is a roguelike indie game published by Supergiant Games on September 17, 2020, for both PC and the Nintendo Switch. This game follows Zagreus – son of Hades – through his attempt to escape from the Underworld. A tale as old as time: *men vs fate.* The Greek understood destiny as an inescapable lifepath woven by the Moirae for each child prior to or just after their birth.[1] Such a vision implied that nobody could ever change fate, no matter how hard they tried. It is worth noting that the game's core mechanics are intertwined with the narrative that is presented to the player, displaying fulfilling character development through the lens of a genre that fits its narrative like a glove. The gameplay reflects the seemingly endless struggle of fighting against fate: the player must go through the same biomes – the Tartarus, Asphodel, Elysium, and the Temple of Styx – over and over, to help Zagreus overcoming his destiny of staying in the Underworld for eternity.

All things considered, it is no coincidence that Zagreus and Sisyphus meet in the Underworld, since their stories mirror each other. There is a mutually reinforcing relationship between the old myth about the man forced to roll a giant boulder up a hill only for it to fall every time, and Zagreus mythical retelling of the son of Hades failing to run away from the Underworld. However, Zagreus, unlike Sisyphus – who has accepted his fate, or as Camus said *one must imagine Sisyphus happy*[2] – has chosen to defeat this ancient notion. Our role as players is to help Zagreus endure what it takes to change his destiny. Each run, the hero obtains new permanent power-ups and keepsakes from several mythical beings, while also bonding with these characters and creating affinity with them. In this respect there is a sense of progression we experience as players, while the protagonist's fate is changing every single time we fail to successfully reach our main goal alongside him. It is not through success, but through failure, that Zagreus is becoming strong and emotionally mature enough to rewrite his own story.

Nevertheless, through each successful run we also learn a harsh truth: Zagreus destiny is partially fixed. It is not possible for him to escape the Underworld. This does not mean his journey has been pointless, we also find out his circumstances are not

1 BARGDILL, R.: Fate and destiny: Some historical distinctions between the concepts. In *Journal of Theoretical and Philosophical Psychology*, 2006, Vol. 26, No. 1-2, p. 206.

2 For more information, see: CAMUS, A.: *The Myth of Sisyphus and Other Essays*. New York : Vintage Books, 1991.

static or unchangeable. There is a way to reshape the world surrounding him in such a way that staying at the House of Hades stops being a tragedy. His soul may be bound to a place he feels he does not belong to, but rewriting his story was never about running away from the Underworld. During his journey, he learns how to make it feel like home by changing the conditions of his environment. For this to happen, Zagreus must change his attitude towards his life, his house, and his family. This mythical retelling was never a classical tragedy, but a coming-of-age story. By facing his emotions, bonding with his loved ones, and giving up on avoiding his issues, he manages to end his parent's vicious cycles and behavioral patterns. Persephone had been hurting her family by choosing escapism, while Hades was doing the same by concealing his feelings. Zagreus breaks away from the endless loop by embracing the opposite attitudes and accepting that the key to change his fate was changing who he was, never about moving from a location. The answer was within him all along, not in the outside world he had obsessed with.

Furthermore, the contrast between our modern vision of destiny coexists with the classical one: *free will vs the immutable fate*. Both the player and Zagreus must reconcile with the notion that we bear no control over certain aspects of life itself, while accepting that we must take agency over the traits we can hold accountability for. It must be emphasized that the charm of mythical retelling lies in how a creator manages to reshape a well-known myth to fit ideas from a different era. We know ancient Greek myths, but *Hades* is showing us a whole new version that is more fitting to our times: a modern myth about family, mental health, and growing up. Zagreus goes from the angsty teenager who defies his father's authority no matter the cost of his actions, to a full-grown adult who becomes the pillar of his family, actively seeking a healthier environment for everyone he loves.

In this way, this story shows the player a deeply flawed protagonist who is enduring everyday struggles, just like us, rather than an unreachable and idealized hero that seems morally above mankind. Zagreus is a lost soul searching for answers. Our mission is to enjoy the game while putting together the pieces of an intricate narrative puzzle that is hidden behind a beautifully crafted ancient Greek envelope. We are playing through a narration that is slowly building up through shards of dialogue and actions, carefully woven like the threads of fate. Zagreus is growing up every single run, while we are becoming better at the game alongside him. It is up to each player whether they unlock the final epilogue or not, by enduring all the hardships and trials Zagreus must face to reach a satisfying conclusion for his arc.

In the end, *Hades* is a modern tale told through the symbols of ancient times, throughout the dynamics of a videogame genre that confronts the player with the same sensations Zagreus is facing during his journey: both the frustration of failure and the gratifying feeling of success and growth. The bond the protagonist is creating with the world around him, is the same one that we are developing with the game. Thus, the creators relied on the analogy of our experience with the game's obstacles and rewards that are inherent to the roguelike genre's gameplay to design a compelling narrative, rather than exposing the main character's feelings to us. Every single time we play as Zagreus, we incarnate him during our playthroughs. His pain is ours, but also his achievements. We are also people who are endlessly failing over and over, hoping to eventually reach our goals. We are Zagreus.

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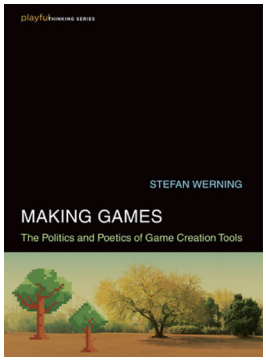

MAKING GAMES: THE POLITICS AND POETICS OF GAME CREATION TOOLS

WERNING, S.: *Making Games: The Politics and Poetics of Game Creation Tools*. Cambridge, MA : MIT Press, 2021. 158 p. ISBN 978-0-262-04483-7.

Magdaléna Švecová

The publication of the not very long scope Making Games: The Politics and Poetics of Game Creation Tools belongs to a series of books, which are published under the common title Playful Thinking, by MIT Press. The aim of the publication is to provide a broader scope showing various aspects of game studies, but also the development of games in compact form. The publication was created to show not only new perspectives on digital games, but also forgotten ones, in the form of reasonable arguments from a wide range of authors and experts with more or less conventional theories, but also a characteristic passion for games and gaming. The shorter scope accompanies not only the acclaimed book Making Games, but the whole series, and is its intention. This book by Stefan Werning, Associate Professor of Digital Media and Game Studies at Utrecht University, confirms that about 120 pages (excluding chapters, references and notes) are enough to explain the impact of the development tools used on the overall result of a finished digital game.

Werning, as a long-term researcher in the field of game design and also with experience in working in the digital games sector, draws on his experience and seeks to outline an innovative view of the factors that influence the final product of a digital game, focusing primarily on the tools. Although he also focuses heavily on traditional game creation software, the book provides a number of examples from gaming practice that show everything that is possible and actually is a tool for game development. Although the reader expects more detailed case studies, Werning focuses more on the quantity of examples that he links to game design concepts. However, what is admirable and extremely beneficial is that it perfectly connects the reality of game development with the knowledge of esteemed authors, such as M. Sicart or I. Bogost and many others. However and maybe more importantly, he links knowledge about digital game development tools with established theories from the digital media environment. Here the author uses his academic background and knowledge from film and visual art and also from authors such as L. Manovich, M. McLuhan, M. Deuze and connects them with digital game phenomena into a logical whole, while creating his own conclusions useful for further research and study. Thanks to this, the book is understood not only by academics from the field of game studies and by game developers, but also by readers from the media field.

The book is divided into three chapters. In the first part, Werning deals with the overall concept of digital game development tools, which in his case is a meta-introduction rather than just a description. He begins his story with a good example of the game called #IDARB, in which people from all over the world participated via the social network Twitter and which became popular thanks to the way it was created. Werning use this example at the very beginning on purpose and his aim is to outline what the book will be about and that game development should be looked at out of the box. Although the book describes the advantages and disadvantages of digital games created by Unity and Unreal Engine and considers how prefabricated assets affect the result just as much as producers, in his

book he brings a number of other innovative ways of creating games from spreadsheets to the games themselves. Returning to the first chapter, Werning very gradually explains the origin of the instrument and returns to its essence through ontological, communicative and aesthetic frameworks. He often compares the creation of games to the creation of other media and artistic products, currently most often to bricolage, with which we cannot agree more.

The second chapter focuses on shorter tool essays focused on various phenomena. Unfortunately, in this section, the reader gets lost under the burden of concepts of digital tools and also under the weight of the author's ideas, which could be conceptually connected. It is respectable that the author is able to analyse the tools on the basis of older as well as new game titles. The passage about the phenomenon of fans is especially beneficial, when companies make their software available to the general public, and so they can spread the tools among amateur creators, who are therefore more faithful to the games from software studios.

The last chapter is the most interesting in terms of content, because it illustrates selected phenomena in more detail than we saw in the previous chapter. Werning approaches the creation of games from various angles, saying that the creation of a game itself can be a game, which he illustrates, for example, by the use of game jams as creative tools, which are not only fun for a handful of amateurs, but also for employees of large development companies. It also shows that creating a game can be a performative process in which future players can be involved as an audience watching the game. Focusing on presenting a work can also influence its development, for example in terms of time. Last but not least, it explains how narratives resulting from socio-cultural or historical assumptions influence the creation of the game, but also, for example, the distribution of the game product itself.

The publication Making Games: The Politics and Poetics of Game Creation Tools succeeds in what it was initially aimed at: to show the role of development tools, their capabilities and their limitations in the design of digital games. Werning confirms this with countless arguments supported by case studies, but also with a large number of theories, that development tools, which do not necessarily have to be just software, frame and shape the aesthetics and political economy of games. Werning manages to open a new door for readers to look into the world of digital game creation, calling for evocative tool design, envisioning games not just as products but as a form of expression and reflection. Awareness of what a tool is will help both developers as well as academics to find innovative solutions and create more efficient ones, because it is the tools that shape us and shape what we create, as Werning mentions in his very important book.

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Slovak Game Industry Continues to Grow

Michal Kabát

According to the annual survey by the Slovak Game Developers Association, the game industry in Slovakia was not hit hard by the global pandemic in 2020. Unlike other creative sectors in the country, the gaming business actually experienced a mild growth similar to the pre-Covid-19 era. There are 63 active companies in Slovakia, up from 55 in 2020, employing 870 people (up from 762). Pixel Federation leads the market both in turnover and in number of employees, followed by PowerPlay Studio and SuperScale, all based in the capital city Bratislava. The industry is concentrated in Bratislava (30 companies) and in the surrounding region of West Slovakia (66% of all companies). The second most important centre is Košice with 12 active companies (e.g., InLogic Software, 4th top company in sales, 3rd in number of employees). The East Slovak region is home to 31% of companies overall.

Studios hired 198 new workers, while 116 were sacked. Overall turnover went up from 51 mil. EUR in 2019 to 72.2 mil. in 2020. Additionally the mood remained optimistic. The turnover for 2021 is projected at almost 85 mil. EUR. If there was any slowdown, it was in the number of newly developed full-release in-house games, with 26 in 2020, compared to 50 in 2019. However, cooperations and total active projects both went up.

The workforce in the game industry grew more diverse with 80 (9%) foreign developers (up from 40 and 5% in 2019). 41% companies employ someone from abroad, 6% more than the previous year. These employees most often come from the Czech Republic (24%), Russia and the UK (both 7%). However, the ratio of women working in Slovak game development remained at the same level (16.4% in 2019, 16.2% in 2020). A narrow majority (51%) of game developers do not think that the pandemic affected their business financially, 21% even think that it did so positively, and only 28% felt any negative impact. Even more (61%) say that the pandemic did not affect the costs of their projects. On the other hand, the impact was negative or very negative to 32% of survey participants.

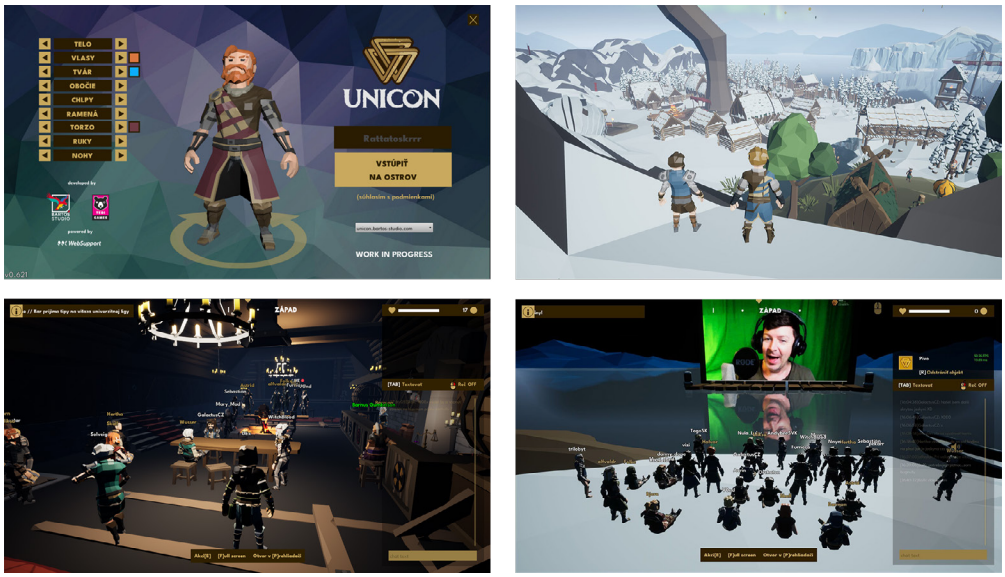
UniCon 2021: The First Game Festival You Can Actually Play

Alexandra Kukumbergová

The pandemic didn't just bring suffering, but also created new opportunities in the marketplace. This was especially true for the gaming industry that bloomed in many ways, except when it came to events such as festivals, cons, gatherings and tournaments. While esports tournaments quickly moved online and tried to win over some of the traditional sports audience, cons and festivals were mostly postponed or moved to streaming, thus losing much of their potential in connecting people and providing a place for shared experiences. There are numerous ways in which games can provide help during a pandemic crisis, and playing them in festive gatherings is one of them. The idea of using a game

interface to substitute a real life event was the theme of *UniCon 2021*, the only game festival happening this year in Trnava.

UniCon is a festival organized by employees and students of the University of Ss. Cyril and Methodius in Trnava and previous UniCons were also hosted there. This year it was managed mostly by a handful of people – huge credit goes to Dalibor Bartoš and his one-man indie studio *Bartoš Studio* (www.bartos-studio.com). The festival took place exclusively online, in the online multiplayer Viking-themed game environment created solely for this purpose. In the context of Eastern Europe, this was rather unique. We witnessed many similar events turning into virtual avatar gatherings, but none as playful as UniCon, since it not only moved the entire programme to online streaming, but it actually provided a lively, interactive and organic playground for its visitors. The festival's virtual island was filled with stories, missions, and responsive students role-playing as quest givers and other characters. While not crowded, UniCon aspired to provide its visitors with lectures as well as playful exploration of the virtual island, its lore and inhabitants, with characters (visitors and hosts) communicating through voice chats (Picture 1).



Picture 1: Screenshots of the game festival UniCon 2021
Source: own processing

Although it seems now that live events are getting the green light worldwide again, there is also an opening for this practice to continue – after all why shouldn't it since there are so many benefits in using online platforms and in using game experience as a tool to reach out, communicate, educate and play around.

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Playing My Part in the Chess Boom, or the Rise of a New Esport

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It is December 2020, the final month of a year that has felt excruciatingly long. I am sitting at my desk, laptop in front of me and little else. My cat is lying just behind it, leaning on the back of the screen, enjoying the heat emitting from beneath it. This is how I work, this is how I relax.

I could never muster much enthusiasm for popular trends, even less for quarantine raves about making sourdough (in the spring), or hardening yourself with cold water (in the autumn). It feels forced; Netflix doesn't. The recent Queen's Gambit miniseries was quite impressive. When was the last time I played chess? That must have been years ago, a few casual games with a friend who was much better. Maybe I could try a few games online, refreshing my memory about the rules?

A quick Google search with Chess.com in the top results. Free registration, a few matches with random strangers. After a week or two, I am hooked. Getting a paid membership to better analyze my play. Tens of matches, then hundreds. Watching YouTube videos with both historical and current matches. Learning about Paul Morphy and Magnus Carlsen. Unwittingly joining a craze. The Chess Boom of 2020.

Chess has been online since around 1993. Of course, it was a board game long before that, perhaps the most prestigious one, spanning centuries of tradition, rich culture and lore surrounding it, whole libraries of theory, Olympics, grandmasters and world champions. In 2020 it has also become an eSport.

On 25 March 2020, the Candidates Tournament, to decide the challenger for the current World Champion Magnus Carlsen, had to be suspended halfway due to the COVID-19 pandemic. For the rest of the year, all major tournaments were either cancelled or moved on-line. Millions of non-elite (both amateur and professional) chess players all over the world had to do the same. Chess.com and other online gameplay platforms experienced a surge in new memberships. From tens of thousands joining in March to hundreds of thousands in October after the release of The Queen's Gambit. In October, Chess.com accrued 81 million total views. This grew to 162.5 million total views in December. The wave seems to have culminated in March 2021 at 200 million. By June, the numbers were similar to December, making Chess.com the 205th most visited site globally.

Executives of eSports organizations took note of this rapidly growing interest. The first chess player to become a content creator for an eSports club was the Canadian female grandmaster Qiyu Nemo Zhou in August 2020. A week after, TSM announced a deal with the five-time U.S. champion Hikaru Nakamura. Nakamura started streaming on Twitch in 2018 and became the most popular chess streamer on the platform with 1.2 million followers. After the Nakamura deal, other eSports organizations raced to sign chess players as well.

There is audience, there are online tournaments with prize pools comparable to other eSports (Carlsen was rated the no. 1 eSports athlete of 2020 by Esports Earnings), and chess players are also streamers. On top of chess calculations, on-line chess requires other skills, common for eSports, especially in time formats of fewer than 10 minutes. Even the greatest players aren't immune to mouse slips, misclicking and putting their pieces or pawns on a different square than they intended, turning a winning game into a sudden loss.

As for myself, playing chess is probably the best interest I picked up during the pandemic. Not that I'm good. After half a year my rating is under 800, safely below the average. Most probably it will stay there.

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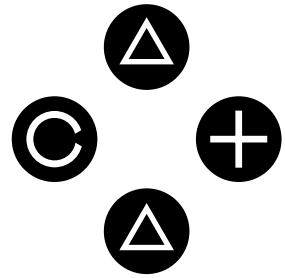

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