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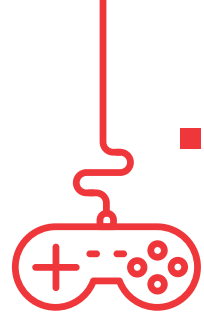

Acta Ludologica is a scientific journal in the field of digital games. The journal contains professional scientific reflections on digital games; it also offers academic discourses on games, especially media and digital competencies, creation, design, marketing, research, development, psycho-logy, sociology, 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 reviews.

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Editorial

Gaming as a Human Right

In 2019, we celebrated 30 years of freedom in Slovakia as well as in the Czech Republic. During this year, we were reminded how our lives would look if socialism had not disappeared from our society. It was not so long ago that respect for basic human rights existed only in the imagination. The one and only governing political party indoctrinated society by its ideology from early childhood and people could not choose how to live their lives. Do you want to be successful at your job? Enter the communist party. Did you express your opinion? You may end up in prison. People born under this ideology did not even know they had being influenced or manipulated and they considered the regime as normal, which is the saddest thing about the years before November '89.

The years before the end of socialism were pretty rough for artists, too. Movie makers, painters, writers, musicians and people whose work was based on creativity, as well as intelligent and highly educated persons could not work as freely as they should. Their work was controlled and in many cases also censored. History remembers forbidden movies, songs and books but you will not learn about digital games created during socialism in Czechoslovakia. Back in the age of the Iron Curtain, there were many people playing games and even creating them. In some cases, those games were an expression of opinion against the regime. It was more difficult to make any game when compared to the western world as creators did not have such technological options but they compensated for it with creativity and ideas. We can assume that making and playing games before '89 was a brave activity knowing about the possible punishment even though communist officers and agents did not know a lot about games in general, not even about computers as it was technology coming from the western world. Maybe, they did not consider games as a 'dangerous' artistic statement and part of a culture.

Czech researcher Jaroslav Švelch understands them as cultural heritage. He tells the story of gaming behind the Iron Curtain in the book of the same name which was published by the prestigious MIT Press. He dedicated his research work to his hobby computing and the history of digital games made during the socialist era. In our interview, he also explains the connection between games and politics, especially using gaming culture nowadays and in the past. Digital games as marketing tools in politics are the subject of one of our studies, too. The authors focus on digital games that have become powerful persuasion tools and which can be utilized for political marketing purposes. It is important that we as researchers will bring those games to the public's attention in case they are used in negative ways. Just as communists did not see the potential of digital games, we can encounter this opinion in the public about this pop cultural phenomenon today. Our next study is dedicated to digital games helping the treatment of mental disorders, especially ADHD-ADD. It proves that digital games are not only the product of art and fun but they can be also helpful in a series of various problems.

In this issue, you can find other interesting studies and articles about games and the virtual world which you can read because freedom has existed for 30 years now which provides us with an endless stream of culture from all over the world. Freedom as we know it has been in danger during recent years and influences the gaming industry in many countries. What we can do is not to leave the fight to artists but to support their effort every time they need help, and what is more important – we should do everything possible to prevent such things like censorship and creativity repression.

Magdaléna Švecová
University of Ss. Cyril and Methodius in Trnava

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Games and ADHD-ADD: A Systematic Mapping Study

Ruth S. Contreras-Espinosa, Angel Serra, Jose Luis Terrón

Dra. Ruth S. Contreras-Espinosa
University of Vic- Central University of Catalonia
Faculty of Business and Communication
C/ Sagrada Família 7
085 00, Vic, Barcelona
SPAIN
ruth.contreras@uvic.cat

Ruth S. Contreras-Espinosa is Researcher and project Manager in International Research projects. Currently she is coordinating a work package of the 'CO3 project, Digital disruptive technologies to co-create, co-produce and co-manage public services along with citizens' funded by the European Union's Horizon 2020 Research and Innovation programme. Previously collaborator in 'Transmedia Literacy. Exploiting transmedia skills and informal learning strategies to improve formal education'. Horizon 2020. Areas of activity: UX-UI, UX Research, Game studies, Game based learning, Gamification, Technology enhanced learning, Serious Games, Interaction design. Co-founder of the Observatory of Communication, Digital Games and Entertainment (OCVE) – INCOM, founded by Autonomous University of Barcelona and University of Vic. Lecturer in Higher Education.

Dr. Angel Serra
University of Vic- Central University of Catalonia
Faculty of Education, Translation and Humanities
C/ Sagrada Família 7
085 00 Vic, Barcelona
SPAIN
angel.serra@uvic.cat

Angel Serra is a professor at the faculty of Translation and Humanities Education at the University of Vic-UCC. He combines teaching with the practice of clinical psychology in adolescents and adults. He has held various management positions in the university such as director of the Psychology Department, director of the research group in Clinical Psychology and Neuroscience, and of the Master's in General Health Psychology. He has done research on the narrative construction of identity in adolescence, the application of therapy through virtual reality and currently works to detect the suicidal ideation in the first degrees of the UVic-UCC. He has written the book: Write with light (2015), about the daily log of emotions and thoughts through photography.

Dr. Jose Luis Terrón
Autonomous University of Barcelona
Faculty of Communication Studies
Edifici I, Carrer de la Vinya, s/n
081 93 Cerdanyola del Vallés, Barcelona
SPAIN
joseluis.terron@uab.cat

Jose Luis Terrón is a professor of the Department of Audiovisual Communication and Advertising at the Autonomous University of Barcelona. He has been director of the Institute of Communication (Incom-UAB, 2008-2016); Director of the Observatory of Communication and Health (integrated in the InCom-UAB), of which he is founder. He is a member of the Editorial Board of Cuadernos de Comunicación, Salud, Revista Española de Salud Publica and Revista Internacional de Comunicación y Desarrollo (RICD) and of the Scientific Committee of the scientific journals Communication Papers, Interface – Comunicação, Saúde, Educação and the Cuadernos Artesanos de Comunicación (CAC) book collection. Director of Publicacions InCom-UAB.

ABSTRACT:
Attention Deficit Hyperactivity Disorder (ADHD) is a neuro-developmental disorder that starts in childhood and has a persistent pattern of behaviour involving lack of attention and/or hyperactivity-impulsiveness that interferes in social, academic or work processes, or reduces the quality of them. Through activities with games, children and adolescents improve memory, concentration, motor planning and time management skills. According to some studies these may present positive effects for the attention span, executive functions, working memory and other cognitive skills. However, there are few studies that explain their effects. This paper presents a systematic mapping study and underlines the direction taken by the empirical studies undertaken on the use of digital games in treating ADHD and ADD. A total of 12 articles, covering 2005 to 2015, were selected. The research questions behind the study were: RQ1 What particular characteristics have been investigated by researchers?; RQ2 What research methods have been used?; and RQ3 On which game has the study on ADD-ADHD been focused?. There are studies are focused on the risk of addiction, increased attention deficit or behaviour problems and studies evaluating the improvement in executive functions, reduction in hyperactivity and motivation. The research methods used were experimental and exploratory methods. Finally, the digital games are analyzed without distinguishing between the genres and theme of the game.

KEY WORDS:
adolescents, attention deficit disorder, attention deficit hyperactivity disorder, digital games, children, literature review, systematic mapping study.

Introduction

According to Salen and Zimmerman,[1] a game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome. Moreover "meaningful play occurs when the relationships between actions and outcomes in a game are both discernible and integrated into the larger context of the game".[2] Through activities with games, players improve memory, concentration, motor planning and time management skills. Therapeutic sessions for children and adolescents with ADHD aim to help them improve executive functions and specific skills.[3] Several scientists have proposed game-based cognitive-behavioural interventions, which seem to be highly promising.[4] *Attention Deficit Hyperactivity Disorder* (ADHD) is a neuro-developmental disorder that starts in childhood and has a persistent pattern of behaviour involving lack of attention and/or hyperactivity-impulsiveness that interferes in social, academic or work processes, or reduces the quality of them. Currently it is one of the most prevalent neuro-developmental

1 SALEN, K., ZIMMERMAN, E.: *Rules of play*. Cambridge, MA : The MIT Press, 2004, p. 80.
2 Ibidem, p. 35.
3 RETALIS, S., KORPA, T., SKALOUMPAKAS, C., BOLOUDAKIS, M., KOURAKLI, M., IOANNIS, A., FOTEINI, S., PINELOPI, P., FENIA, L., PANAGIOTA, P.: Empowering children with ADHD Learning disabilities with the Kinems Kinect Lerning Games. In BUSCH, C. (ed.): *Proceedings of the 8th European Conference on Games Based Learning*. Berlin : Academic Conferences and Publishing International Limited Reading, 2014, p. 470.
4 FRUTOS-PASCUAL, M., ZAPIRAIN, B. G., ZORRILLA, A. M.: Adaptive Tele-Therapies Based on Serious Games for Health for People with Time-Management and Organisational Problems: Preliminary Results. In *International Journal of Environmental Research and Public Health*, 2014, Vol. 11, No. 1, p. 750. [online]. [2019-11-03]. Available at: <https://www.mdpi.com/1660-4601/11/1/749/htm>.

disorders in child psychology and psychiatry, with around 5% of children and 2.5% of adults affected. According to DSM-5, ADHD is more frequent among males than females in the general population, with an approximate proportion of 2:1 in children and 1.6:1 in adults. Females tend to present rather features of lack of attention than males.[5] ADHD has been identified as an upset in executive functions and emotional self-regulation. This means a difficulty in inhibiting replies, starting actions intentionally, a deficit in attention control, decision-making, objective planning and organization, mental flexibility as well as meta-cognition. ADHD is part of a wider alteration in executive functions.[6]

The results of studies in this field of psychology do not appear to be balanced. Investigation has shown both positive and negative effects (benefits and risk) in relation to digital games in terms of attention, executive functions, work memory and other cognitive skills. There are also few articles that carry out a review balancing the effects thereof during the child/juvenile period of boys and young people with ADHD. In terms of ADHD and digital games, authors such as Prot et al. present an overview of research findings on positive and negative effects of digital games, thus providing an empirical answer to the question, 'are digital games good or bad?' Several negative effects of digital games are reviewed including effects of violent games on aggression-related variables as well as effects on attention deficits, school performance and gaming addiction. In addition, related positive effects of digital games are described, including effects of action games on visual-spatial skills, and effects of educational digital games, exergames, and prosocial digital games.[7] Furthermore, in various studies games have been defined in many ways, either in terms of the gaming experience, or as an interactive structure of endogenous meaning that requires players to struggle toward a goal.[8]

Method

The main goal of this paper is to summarize the main results obtained and outline future work. The research questions behind this study were the following: RQ1 *What particular characteristics have been investigated by researchers?*; RQ2 *What research methods have been used?*; RQ3 *On which game has the study on ADD-ADHD been focused?*.

The study presented articles covering January 1, 2005 to December 30, 2015. Five major scientific databases were searched: ScienceDirect, SCOPUS, Pubmed, MEDLINE and Bio Med Central. After searching the databases with the keywords 'Attention Deficit Disorder', 'Attention Deficit Hyperactivity Disorder', 'Games' and 'Videogames' and removing the duplicates, the following search results were obtained: ScienceDirect (2),

5 *Manual diagnóstico y estadístico de los trastornos mentales*. Madrid : Panamericana, 2014, p. 500.

6 BARKLEY, R. A.: *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York : Guilford, 2006, p. 120.; NAVARRO, M. I., GARCÍA-VILLAMISAR, D. A.: Funcionamiento ejecutivo del trastorno de déficit de atención con Hiperactividad: Una perspectiva ecológica de los perfiles diferenciales entre los tipos combinado e inatento. In *Revista de Psicopatología y Psicología Clínica*, 2011, Vol. 16, No. 2, p. 1136. [online]. [2019-11-03]. Available at: <http://revistas.uned.es/index.php/RPPC/article/view/10355/9893>.

7 PROT, S., MCDONALD, K. A., ANDERSON, C. A., GENTILE, D. A.: Video Games: Good, Bad, or Other? In *Pediatric Clinics of North America*, 2012, Vol. 59, No. 3, p. 648. [online]. [2019-11-01]. Available at: <https://www.researchgate.net/publication/225072608_Video_Games_Good_Bad_or_Other>.

8 BARANAUSKAS, M., GOMES-NETO, N., BORGES, M.: Gaming at work: A learning environment for synchronized manufacturing. In *Computer Applications in Engineering Education*, 2000, Vol. 8, No. 3-4, p. 162. [online]. [2019-10-31]. Available at: <https://doi.org/10.1002/1099-0542(2000)8:3/4<162::AID-CAE5>3.0.CO;2-K>.; COSTIKYAN, G.: I have no words & I must design: Toward a critical vocabulary for games. In *Computer Games and Digital Cultures Conference Proceedings*, 2002, Vol. 1, No. 1, p. 2343. [online]. [2019-11-02]. Available at: <http://www.costik.com/nowords2002.pdf>.

SCOPUS (5), Pubmed (4), MEDLINE (2) and BioMed Central (1). Based on abstracts we first filtered out all publications that are not related to games or ADD-ADHD, or are not published in peer-reviewed journals and magazines. This was followed by a second round of filtering in which based on the full text we removed the publications that are concerned with applying games to tasks which are not directly related to the field of Psychology and Psychiatry. We also removed early papers that only explain the concept of ADD-ADHD. The search was limited to publication dates within recent years (January 2005 to December 2015). A total of 12 articles were selected after three rounds of meetings between investigators. We used a systematic mapping design for the study. A systematic mapping study provides a categorical structure for classifying the published research reports. In addition, they are similar to systematic reviews, except because they employ broader inclusion criteria and are intended to map out topics rather than synthesize study results. Articles included in this review were required to meet all of the following selection criteria:

a) They were published between January 1, 2005 and December 30, 2015.
b) They were empirically based.
c) They included participants between 6-18 years old.
d) Sources were written in English, Spanish and French.

For the purpose of reviewing the use of games in ADD-ADHD we use the term 'game' suggested by Salen and Zimmerman,[9] that includes keywords as Videogames, Digital Games, Internet Games, Computer Games, Serious Games and Simulation Games. Table 1 below presents particular characteristics that have been investigated by researchers. For each result, corresponding references are presented. Table 1 below presents for each point, corresponding references. In total, 12 studies were included.

Table 1: Particular characteristics that have been investigated by researchers

Particular characteristics	Study
To examine training working memory in children with ADHD.	Klingberg et al. (2005)
To examine the inhibitory abilities of children with ADHD when playing computer games.	Shaw, Grayson, & Lewis (2005)
To analyze digital games and attention deficit hyperactivity disorder symptoms in adolescents.	Chan & Rabinowitz (2006)
To describe and compare the behaviour of hyperactive and control children playing digital games. Examine Child Behavior Checklist and PVP scale.	Bioulac, Arfi & Bouvard (2008)
Examine the deteriorative effects of computer game playing for people with ADHD.	Tahiroglu et al. (2010)
Exploratory study in ADHD children about of the use of the PVP scale.	Bioulac, Arfi, Michel & Bouvard (2010)
To examine whether game elements (Working Memory) would enhance motivation and training performance (and its efficiency) of children with ADHD.	Prins, Dovis, Ponsioen, Ten Brink & Van der Oord (2011)
Examine inattentive and hyperactive-impulsive symptoms on ADHD and Testing a brain computer interface-based attention training game.	Lim et al. (2012)
To examine digital game use in boys with autism spectrum disorder compared with those with ADHD or typical development and to examine features relating to problematic digital game use across groups.	Mazurek & Engelhardt (2013)

9 SALEN, K., ZIMMERMAN, E.: *Rules of play*. Cambridge, MA : The MIT Press, 2004, p. 80.

Tested the short and long-term efficacy of and executive functioning remediation training with game elements for children with ADHD.	Van der Oord, Ponsioen, Geurts, Ten Brink & Prins (2014)
To describe and compare the behaviour of hyperactive and control children playing digital games.	Bioulac et al. (2014)
To investigate the relationship between ADHD and internet addiction.	Weinstein, Yaacov, Manning, Danon & Weizman (2015)

Source: own processing

Results

In this section we present the answers to each of the formulated research questions. For RQ1 *What particular characteristics have been investigated by researchers?*, the aims of the investigation carried out are diverse and display an interest in the risks and benefits of digital games in children and teenagers with ADHD. We could divide the studies into two large groups. Studies on the negative consequences that digital games might entail, where we can find:

1. Potential risks of digital games on attention span.[10]
2. Risk of addiction and problematic use of digital games.[11]
3. Evaluating behavioural problems associated with digital games with ADHD.[12]

To summarize, these studies have focused on the risk of addiction or problematic use of digital games, as well as in the increase in attention deficit due to this practice, and on behavioural problems. The second group corresponds to studies on the benefits of digital games:

1. Evaluation of response inhibition, reasoning and lack of attention.[13]

10 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 5. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; TAHIROGLU, A. Y., CELIK, G. G., AVCI, A., SEYDAOGLU, G., UZEL, M., ALTUNBAS, H.: Short-term effects of playing computer games on attention. In *Journal of Attention Disorders*, 2010, Vol. 13, No. 6, p. 669. [online]. [2019-11-03]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.908.9776&rep=rep1&type=pdf>.

11 BIOULAC, S., ARFI, L., BOUVARD, M. P.: Attention deficit/hyperactivity disorder and video games: A comparative study of hyperactive and control children. In *European Psychiatry*, 2008, Vol. 23, No. 2, p. 134. [online]. [2019-10-31]. Available at: <https://doi.org/10.1016/j.eurpsy.2007.11.002>.; BIOULAC, S., LALLEMAND, S., FABRIGOULE, C., THOUMY, A., PHILIP, P., BOUVARD, M. P.: Video game performances are preserved in ADHD children compared with controls. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 6, p. 542. [online]. [2019-11-01]. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22628143>.; MAZUREK, M. O., ENGELHARDT, CH. R.: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 262. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.; WEINSTEIN, A., YAACOV, Y., MANNING, M., DANON, P., WEIZMAN, A.: Internet addiction and attention deficit hyperactivity disorder among schoolchildren. In *Israel Medical Association Journal*, 2015, Vol. 17, No. 1, p. 731. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/60db/5196467f70d985a18a70126cc6f34d58c895.pdf>.

12 BIOULAC, S., ARFI, L., MICHEL, G., BOUVARD, M. P.: Interest of the use of the Problem Videogame Playing (PVP) questionnaire from Tejeiro: Exploratory study in ADHD children. In *Annales Medico-Psychologiques*, 2010, Vol. 16, No. 8, p. 632. [online]. [2019-10-31]. Available at: <https://www.em-consulte.com/en/module/displayarticle/article/266955/impression/vue6>.; SHAW, R., GRAYSON, A., LEWIS, V.: Inhibition, ADHD, and computer games: The inhibitory performance of children with ADHD on computerized tasks and games. In *Journal of Attention Disorders*, 2005, Vol. 8, No. 4, p. 166. [online]. [2019-11-02]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.817.3220&rep=rep1&type=pdf>.

13 KLINGBERG, T., FERNELL, E., OLESEN, P. J., JOHNSON, M., GUSTAFSSON, P., DAHLSTRÖM, K., GILLBERG, Ch. G., FORSSBERG, H., WESTERBERG, H.: Computerized training of working memory in children with ADHD-A randomized controlled trial. In *Journal of the American Academy of Child & Adolescent Psychiatry*, 2005, Vol. 44, No. 1, p. 119. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/9172/65b9bbb2203528f57abfd31f4f97e7b238d0.pdf>.

2. Evaluation of reducing symptoms of inattention, hyperactivity and impulsiveness.[14]
3. Evaluation of improvements in motivation and performance.[15]

To summarize, these studies have focused on evaluating executive functions via use of digital games, in particular the reduction in hyperactivity, impulsiveness and lack of attention, as well as examining their effect on motivation and performance. Table 2 presents the main characteristics and results of every paper.

Table 2: Results from RQ1

	Characteristics	Results
	Intervention/Treatment	
Klingberg et al. (2005)	To investigate the effect of improving WM (working memory) by computerized, systematic practice of WM tasks.	Working memory can be improved by training in children with ADHD.
Prins, Dovis, Ponsioen, Ten Brink & Van der Oord (2011)	Examined the benefits of adding game elements to standard computerized working memory (WM) training to understand the motivation and training performance of children with ADHD and the effectiveness of training.	WM training with game elements significantly improves the motivation, training performance, and working memory of children with ADHD.
Lim et al. (2012)	This study evaluated the new version of the BCI-based attention training program in the treatment of combined and inattentive subtypes of ADHD.	Game represents a treatment modality for ADHD wich not only has the potential for being used in combination wich treatment.
Van der Oord, Ponsioen, Geurts, Ten Brink & Prins (2014)	Examined Efficacy of a Computerized Executive Functioning Remediation Training with Game Elements for Children with ADHD in an Outpatient Setting.	Positive evidence for the efficacy of Executive Functioning training with game elements.
	Evaluation / Diagnosis	
Shaw, Grayson, & Lewis (2005)	To examine inattention and impulse response.	Parental reports suggest that when playing computer games, the inhibitory abilities of children with ADHD are unimpaired.
Chan & Rabinowitz (2006)	Investigate the relationship between time spent playing games for more than one hour a day and "Inattention" and "ADHD".	Playing games for more than one hour a day has negative social and academic effects.

14 LIM, C. G., LEE, T. S., GUAN, C., FUNG, D. S. S., ZHAO, Y., TENG, S. S. W., ZHANG, H., KRISHNAN, R.: A Brain-Computer Interface Based Attention Training Program for Treating Attention Deficit Hyperactivity Disorder. In *PLoS ONE*, 2012, Vol. 7, No. 10, p. 8. [online]. [2019-11-01]. Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046692&type=printable>.; VAN DER OORD, S., PONSIOEN, A. J. G. B., GEURTS, H. M., TEN BRINK, E. L., PRINS, P. J. M.: A Pilot Study of the Efficacy of a Computerized Executive Functioning Remediation Training With Game Elements for Children With ADHD in an Outpatient Setting: Outcome on Parent- and Teacher-Rated Executive Functioning and ADHD Behavior. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 8, p. 670. [online]. [2019-11-02]. Available at: <https://pdfs.semanticscholar.org/b905/9fba8d4dc55b3e2fee8659f64255d1f24030.pdf>.

15 PRINS, P. J. M., DOVIS, S., PONSIOEN, A., TEN BRINK, E., VAN DER OORD, S.: Does computerized working memory with game elements enhance motivation and training efficacy in children with ADHD? In *Cyberpsychology, Behavior, and Social Networking*, 2011, Vol. 14, No. 3, p. 117. [online]. [2019-11-01]. Available at: <https://pdfs.semanticscholar.org/bdee/e9a69d3192431d05cf6498fe8106a879ca9b.pdf?_ga=2.95729695.2012201865.1572700179-190068604.1572700179>.

Bioulac, Arfi & Bouvard (2008)	Describes and compares the behaviour of hyperactive and control children playing digital games.	ADHD children exhibited more problems associated with digital game playing and may be vulnerable to developing
Bioulac, Arfi, Michel & Bouvard (2010)	To evaluate the difficulties induced by an excessive "consumption" of digital games.	Hyperactive children present more problems associated with digital games.
Tahiroglu et al. (2010)	Time spent playing computer games can exert a short-term effect on attention span as measured by the Stroop test. Greater risks posed by computer game playing to people with ADHD-IT.	Time spent playing computer games can exert a short-term effect on attention in children with ADHD.
Mazurek & Engelhardt (2013)	To examine digital game use in boys with Autism Spectrum Disorder (ASD) compared with those with ADHD or typical development (TD).	Children with ADHD may be particularly at risk for problems related to game playing, including excessive game use.
Bioulac et al. (2014)	When playing digital games, inhibitory control is similar in the ADHD group and the control group.	Cognitive difficulties in ADHD depend on tasks.
Weinstein, Yaacov, Manning, Danon & Weizman (2015)	To investigate the relationship between ADHD and internet addiction.	Children with ADHD are more addicted to the Internet than those without ADHD.

Source: own processing

In terms of classification according to their characteristics, four studies deal with Intervention/Treatment, and eight of them with Evaluation/Diagnosis. In general, we have seen that the four studies classed as *Intervention/Treatment* had the aim of showing the improvement in ADHD via digital game training. These benefits of digital games in the short terms have focused on aspects of cognitive information processing, especially in executive functions,[16] work memory[17] and attention span.[18] The study by Lim et al. also sought an improvement in the behavioural aspects of impulsiveness and hyperactivity.[19] Whereas the eight studies classified as *Evaluation/Diagnosis* have looked to study the risk or negative consequences of intense use of digital games, by and large as descriptive, evaluative or diagnostic studies. They were carried out following

16 VAN DER OORD, S., PONSIOEN, A. J. G. B., GEURTS, H. M., TEN BRINK, E. L., PRINS, P. J. M.: A Pilot Study of the Efficacy of a Computerized Executive Functioning Remediation Training With Game Elements for Children With ADHD in an Outpatient Setting: Outcome on Parent- and Teacher-Rated Executive Functioning and ADHD Behavior. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 8, p. 671. [online]. [2019-11-02]. Available at: <https://pdfs.semanticscholar.org/b905/9fba8d4dc55b3e2fee8659f64255d1f24030.pdf>.

17 PRINS, P. J. M., DOVIS, S., PONSIOEN, A., TEN BRINK, E., VAN DER OORD, S.: Does computerized working memory with game elements enhance motivation and training efficacy in children with ADHD? In *Cyberpsychology, Behavior, and Social Networking*, 2011, Vol. 14, No. 3, p. 117. [online]. [2019-11-01]. Available at: <https://pdfs.semanticscholar.org/bdee/e9a69d3192431d05cf6498fe8106a879ca9b.pdf?_ga=2.95729695.2012201865.1572700179-190068604.1572700179>.; KLINGBERG, T., FERNELL, E., OLESEN, P. J., JOHNSON, M., GUSTAFSSON, P., DAHLSTRÖM, K., GILLBERG, Ch. G., FORSSBERG, H., WESTERBERG, H.: Computerized training of working memory in children with ADHD-A randomized controlled trial. In *Journal of the American Academy of Child & Adolescent Psychiatry*, 2005, Vol. 44, No. 1, p. 119. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/9172/65b9bbb2203528f57abfd31f4f97e7b238d0.pdf>.

18 LIM, C. G., LEE, T. S., GUAN, C., FUNG, D. S. S., ZHAO, Y., TENG, S. S. W., ZHANG, H., KRISHNAN, R.: A Brain-Computer Interface Based Attention Training Program for Treating Attention Deficit Hyperactivity Disorder. In *PLoS ONE*, 2012, Vol. 7, No. 10, p. 9. [online]. [2019-11-01]. Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046692&type=printable>.

19 Ibidem, p. 9.

specific variables, such as the hours spent on digital games.[20] These studies underline an important point of vulnerability with ADHD subjects yet to develop: a dependence on digital games,[21] a greater lack of attention.[22] While the study by Shaw et al. also studies the effect on impulsive behaviour.[23]

We could divide the results obtained into two large groups:

1. *Training, Improving ADHD symptoms.* Within this group we can find six articles focused on training-working, memory motivation, inhibitory abilities, executive functioning-inattention (Chart 1). Specifically, an article that deals with Efficacy Improvement and Executive Functioning.[24] Two articles focus on Inhibitory Abilities[25] and one on Working Memory, Motivation and Training Efficacy.[26] Another one speaks exclusively about Working Memory[27] and finally one more on improving attention.[28]

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20 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 5. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; TAHIROGLU, A. Y., CELIK, G. G., AVCI, A., SEYDAOGLU, G., UZEL, M., ALTUNBAS, H.: Short-term effects of playing computer games on attention. In *Journal of Attention Disorders*, 2010, Vol. 13, No. 6, p. 669. [online]. [2019-11-03]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.908.9776&rep=rep1&type=pdf>.

21 BIOULAC, S., ARFI, L., BOUVARD, M. P.: Attention deficit/hyperactivity disorder and video games: A comparative study of hyperactive and control children. In *European Psychiatry*, 2008, Vol. 23, No. 2, p. 134. [online]. [2019-10-31]. Available at: <https://doi.org/10.1016/j.eurpsy.2007.11.002>.; WEINSTEIN, A., YAACOV, Y., MANNING, M., DANON, P., WEIZMAN, A.: Internet addiction and attention deficit hyperactivity disorder among schoolchildren. In *Israel Medical Association Journal*, 2015, Vol. 17, No. 1, p. 732. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/60db/5196467f70d985a18a70126cc6f34d58c895.pdf>.

22 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 8. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; MAZUREK, M. O., ENGELHARDT, CH. R.: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 261. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.; SHAW, R., GRAYSON, A., LEWIS, V.: Inhibition, ADHD, and computer games: The inhibitory performance of children with ADHD on computerized tasks and games. In *Journal of Attention Disorders*, 2005, Vol. 8, No. 4, p. 166. [online]. [2019-11-02]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.817.3220&rep=rep1&type=pdf>.; TAHIROGLU, A. Y., CELIK, G. G., AVCI, A., SEYDAOGLU, G., UZEL, M., ALTUNBAS, H.: Short-term effects of playing computer games on attention. In *Journal of Attention Disorders*, 2010, Vol. 13, No. 6, p. 670. [online]. [2019-11-03]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.908.9776&rep=rep1&type=pdf>.

23 SHAW, R., GRAYSON, A., LEWIS, V.: Inhibition, ADHD, and computer games: The inhibitory performance of children with ADHD on computerized tasks and games. In *Journal of Attention Disorders*, 2005, Vol. 8, No. 4, p. 669. [online]. [2019-11-02]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.817.3220&rep=rep1&type=pdf>.

24 VAN DER OORD, S., PONSIOEN, A. J. G. B., GEURTS, H. M., TEN BRINK, E. L., PRINS, P. J. M.: A Pilot Study of the Efficacy of a Computerized Executive Functioning Remediation Training With Game Elements for Children With ADHD in an Outpatient Setting: Outcome on Parent- and Teacher-Rated Executive Functioning and ADHD Behavior. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 8, p. 670. [online]. [2019-11-02]. Available at: <https://pdfs.semanticscholar.org/b905/9fba8d4dc55b3e2fee8659f64255d1f24030.pdf>.

25 BIOULAC, S., LALLEMAND, S., FABRIGOULE, C., THOUMY, A., PHILIP, P., BOUVARD, M. P.: Video game performances are preserved in ADHD children compared with controls. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 6, p. 542. [online]. [2019-11-01]. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22628143>.; SHAW, R., GRAYSON, A., LEWIS, V.: Inhibition, ADHD, and computer games: The inhibitory performance of children with ADHD on computerized tasks and games. In *Journal of Attention Disorders*, 2005, Vol. 8, No. 4, p. 166. [online]. [2019-11-02]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.817.3220&rep=rep1&type=pdf>.

26 PRINS, P. J. M., DOVIS, S., PONSIOEN, A., TEN BRINK, E., VAN DER OORD, S.: Does computerized working memory with game elements enhance motivation and training efficacy in children with ADHD? In *Cyberpsychology, Behavior, and Social Networking*, 2011, Vol. 14, No. 3, p. 117. [online]. [2019-11-01]. Available at: <https://pdfs.semanticscholar.org/bdee/e9a69d3192431d05cf6498fe8106a879ca9b.pdf?_ga=2.95729695.2012201865.1572700179-190068604.1572700179>.

27 KLINGBERG, T., FERNELL, E., OLESEN, P. J., JOHNSON, M., GUSTAFSSON, P., DAHLSTRÖM, K., GILLBERG, Ch. G., FORSSBERG, H., WESTERBERG, H.: Computerized training of working memory in children with ADHD-A randomized controlled trial. In *Journal of the American Academy of Child & Adolescent Psychiatry*, 2005, Vol. 44, No. 1, p. 119. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/9172/65b9bbb2203528f57abfd31f4f97e7b238d0.pdf>.

28 LIM, C. G., LEE, T. S., GUAN, C., FUNG, D. S. S., ZHAO, Y., TENG, S. S. W., ZHANG, H., KRISHNAN, R.:

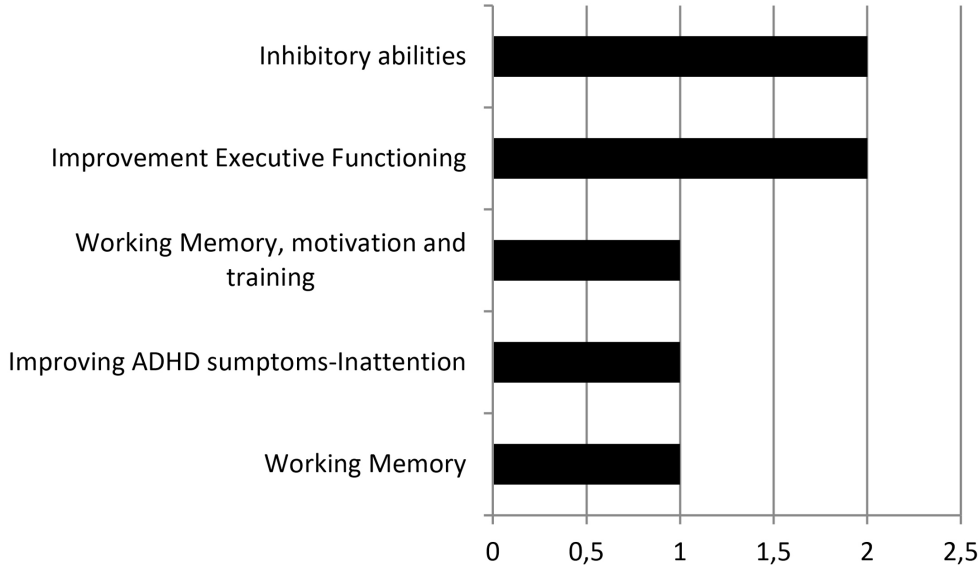

Chart 1: Results. Training, Improving ADHD symptoms

Source: own processing

2. *Risk*. In this group we can find six articles focused on Risk – Increase in Inattentive Behaviour – Dependence – Problematic use (Chart 2). Three articles state the risk of developing dependence or problematic digital game use.[29] Two more articles focus on an increase in inattentive behaviour.[30] Finally, only one article touches on behaviour disorders.[31]

A Brain-Computer Interface Based Attention Training Program for Treating Attention Deficit Hyperactivity Disorder. In *PLoS ONE*, 2012, Vol. 7, No. 10, p. 9. [online]. [2019-11-01]. Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046692&type=printable>.

29 BIOULAC, S., ARFI, L., BOUVARD, M. P.: Attention deficit/hyperactivity disorder and video games: A comparative study of hyperactive and control children. In *European Psychiatry*, 2008, Vol. 23, No. 2, p. 140. [online]. [2019-10-31]. Available at: <https://doi.org/10.1016/j.eurpsy.2007.11.002>.; MAZUREK, M. O., ENGELHARDT, CH. R: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 140. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.; WEINSTEIN, A., YAACOV, Y., MANNING, M., DANON, P., WEIZMAN, A.: Internet addiction and attention deficit hyperactivity disorder among schoolchildren. In *Israel Medical Association Journal*, 2015, Vol. 17, No. 1, p. 733. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/60db/5196467f70d985a18a70126cc6f34d58c895.pdf>.

30 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 9. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; TAHIROGLU, A. Y., CELIK, G. G., AVCI, A., SEYDAOGLU, G., UZEL, M., ALTUNBAS, H.: Short-term effects of playing computer games on attention. In *Journal of Attention Disorders*, 2010, Vol. 13, No. 6, p. 670. [online]. [2019-11-03]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.908.9776&rep=rep1&type=pdf>.

31 BIOULAC, S., ARFI, L., MICHEL, G., BOUVARD, M. P.: Interest of the use of the Problem Videogame Playing (PVP) questionnaire from Tejeiro: Exploratory study in ADHD children. In *Annales Medico-Psychologiques*, 2010, Vol. 16, No. 8, p. 633. [online]. [2019-10-31]. Available at: <https://www.em-consulte.com/en/module/displayarticle/article/266955/impression/vue6>.

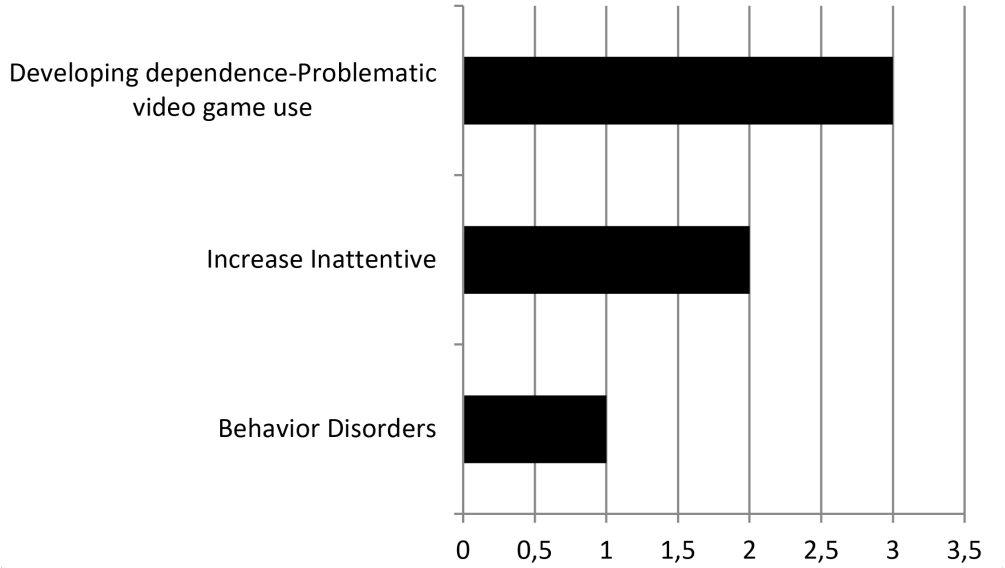

Chart 2: Results. Risk

Source: own processing

For RQ2 *What research methods have been used?,* a summary of the results of the research questions from RQ2 is presented in Table 3.

Table 3: Evaluation tools used

Evaluation aim	Tool	Study
1. Attention problems	Conners Continuous Performance Test II (CPT II) Conners Parent Rating Scale (CPRS)	Shaw, Grayson, & Lewis (2005); Bioulac et al. (2014) Chan & Rabinowitz (2006); Bioulac, Arfi, Michel & Bouvard (2010)
2. Problem behaviour	Child Behaviour Checklist (CBCL)	Bioulac, Arfi & Bouvard (2008); Bioulac, Arfi, Michel & Bouvard (2010)
3. Working Memory	Working Memory Task	Klingberg et al. (2005); Prins, Dovis, Ponsioen, Ten Brink & Van der Oord (2011)
4. Internet Addiction and Problem Gamer Playing	Young's Internet Addiction Scale (YIAS) Problem Videogame Playing Scale (PVPS) Internet Addiction Test (IAT) Modified Problem Video Game Playing Test (PVGT)	Chan & Rabinowitz (2006) Bioulac, Arfi & Bouvard (2008); Bioulac, Arfi, Michel & Bouvard (2010) Weinstein, Yaacov, Manning, Danon & Weizman (2015) Mazurek & Engelhardt (2013)
5. Stroop Effect Semantic interference in reaction time	The Stroop TBAG test	Tahiroglu et al. (2010)
6. Hyperactive-impulsive	ADHD Rating Scale	Lim et al. (2012)

7. Digital game use, Genre categories digital game, Problematic digital game use, Inattention, hyperactivity and impulsivity symptoms Social Communication	Questionnaire designed for the study Entertainment Software Rating Board website Modified version of the problem Video Game Playing Test (PVGT) Vanderbilt Attention Deficit/ Hyperactivity Disorder Parent Rating Scale (VADPRS) Social Communication Questionnaire-Current (SCQ)	Mazurek & Engelhardt (2013)
8. Executive Functions and Disruptive Behaviour Disorder	Behaviour Rating Inventory of Executive Functioning (BRIEF) Disruptive Behavior Disorder Rating Scale (DBDRS)	Van der Oord, Ponsioen, Geurts, Ten Brink & Prins (2014)

Source: own processing

The twelve investigations are experimental and exploratory; out of them all, nine use control groups. Mazurek et al. undertake a comparative investigation between Autism Spectrum Disorder (56), Attention Deficit Hyperactivity Disorder (44) and Typical Development (41);[32] for their part, Klingberg et al. repeat the experiment on the same group three months later.[33] Chan and Rabinowicz focus on the parents of children with disorders[34] and Lim et al. study the same group over 2 months.[35] Of the articles revised, only one keeps this proportion in the sample,[36] with 64 boys and 37 girls. On the other hand, we must note that of the twelve investigations, in three of them the parents are involved, specifically in Chan and Rabinowitz, Lim et al. and Mazurek et al.[37] In the Chan and Rabinowitz study with 31 fathers and 41 mothers, we can see that more mothers participate than fathers.[38] In other investigations the number of parents taking part is not specified.

32 MAZUREK, M. O., ENGELHARDT, CH. R.: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 263. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.

33 KLINGBERG, T., FERNELL, E., OLESEN, P. J., JOHNSON, M., GUSTAFSSON, P., DAHLSTRÖM, K., GILLBERG, Ch. G., FORSSBERG, H., WESTERBERG, H.: Computerized training of working memory in children with ADHD-A randomized controlled trial. In *Journal of the American Academy of Child & Adolescent Psychiatry*, 2005, Vol. 44, No. 1, p. 2005. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/9172/65b9bbb2203528f57abfd31f4f97e7b238d0.pdf>.

34 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 8. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.

35 LIM, C. G., LEE, T. S., GUAN, C., FUNG, D. S. S., ZHAO, Y., TENG, S. S. W., ZHANG, H., KRISHNAN, R.: A Brain-Computer Interface Based Attention Training Program for Treating Attention Deficit Hyperactivity Disorder. In *PLoS ONE*, 2012, Vol. 7, No. 10, p. 9. [online]. [2019-11-01]. Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046692&type=printable>.

36 TAHIROGLU, A. Y., CELIK, G. G., AVCI, A., SEYDAOGLU, G., UZEL, M., ALTUNBAS, H.: Short-term effects of playing computer games on attention. In *Journal of Attention Disorders*, 2010, Vol. 13, No. 6, p. 669. [online]. [2019-11-03]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.908.9776&rep=rep1&type=pdf>.

37 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 9. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; LIM, C. G., LEE, T. S., GUAN, C., FUNG, D. S. S., ZHAO, Y., TENG, S. S. W., ZHANG, H., KRISHNAN, R.: A Brain-Computer Interface Based Attention Training Program for Treating Attention Deficit Hyperactivity Disorder. In *PLoS ONE*, 2012, Vol. 7, No. 10, p. 10. [online]. [2019-11-01]. Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046692&type=printable>.; MAZUREK, M. O., ENGELHARDT, CH. R.: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 262. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.

38 CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 8. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.

The most commonly used tools in the studies analyzed are the Conners Scale and the Child Behaviour Checklist. There is no uniformity of tools with which to study Internet addiction of problematic use of digital games, perhaps due to there being no recognition of this disorder by the APA (American Psychiatric Association). In the last edition of the DSM-5 from 2014 (Diagnostic and Statistical Manual of Mental Disorders) the possibility of including the term 'Internet Gaming Disorder' has been left open, with the aim of carrying out a more in-depth study and to be able consider it as a disorder. In terms of analyzing executive functions overall, we draw attention to the Behaviour Rating Inventory of Executive Functioning (BRIEF), mentioned in Van der Oord et al.[39] For a partial study of executive functions, we can find adaptations thereof for the Work Memory study (WMTA) and the ADHD Rating Scale for Impulsiveness. For example, Klingberg et al. uses an adaptation to study WMTA.[40] In this same sense, the Stroop effect tool, mentioned in the study by Tahiroglu et al., can be used to evaluate the capacity of inhibiting the response.[41]

For RQ3 On which *Game has the study on ADD-ADHD been focused?*, gaming aspects of included studies are summarized in Table 4. These descriptions are derived to the best of our ability from the limited information describing each study.

Table 4: Results from RQ3. Specific gaming elements of each study

Game	Conclusion	Platform	Genre	Study
Robomemo Commercial game	Working memory can be improved by training in children with ADHD.	Computer game	Educational	Klingberg et al. (2005)
Frogger 2: Swampy's Revenge Crash Bandicoot II: Cortex Strikes Back Commercial games	Parental reports suggest that when playing computer games, the inhibitory abilities of children with ADHD are unimpaired.	Computer game Console game	Action/adventure Platforms	Shaw, Grayson, & Lewis (2005)
Games in general	Playing games for more than one hour a day has negative social and academic effects.	Console game Online game	Not specified	Chan & Rabinowitz (2006)

39 VAN DER OORD, S., PONSIOEN, A. J. G. B., GEURTS, H. M., TEN BRINK, E. L., PRINS, P. J. M.: A Pilot Study of the Efficacy of a Computerized Executive Functioning Remediation Training With Game Elements for Children With ADHD in an Outpatient Setting: Outcome on Parent- and Teacher-Rated Executive Functioning and ADHD Behavior. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 8, p. 670. [online]. [2019-11-02]. Available at: <https://pdfs.semanticscholar.org/b905/9fba8d4dc55b3e2fee8659f64255d1f24030.pdf>.

40 KLINGBERG, T., FERNELL, E., OLESEN, P. J., JOHNSON, M., GUSTAFSSON, P., DAHLSTRÖM, K., GILLBERG, Ch. G., FORSSBERG, H., WESTERBERG, H.: Computerized training of working memory in children with ADHD-A randomized controlled trial. In *Journal of the American Academy of Child & Adolescent Psychiatry*, 2005, Vol. 44, No. 1, p. 119. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/9172/65b9bbb2203528f57abfd31f4f97e7b238d0.pdf>.

41 TAHIROGLU, A. Y., CELIK, G. G., AVCI, A., SEYDAOGLU, G., UZEL, M., ALTUNBAS, H.: Short-term effects of playing computer games on attention. In *Journal of Attention Disorders*, 2010, Vol. 13, No. 6, p. 669. [online]. [2019-11-03]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.908.9776&rep=rep1&type=pdf>.

Games in general	ADHD children exhibited more problems associated with digital game playing and may be vulnerable to developing.	Computer game Console game Online game	Not specified	Bioulac, Arfi & Bouvard (2008).
Colin McRae Rally 3 Commercial game	Time spent playing computer games can exert a short-term effect on attention in children with ADHD.	Computer game	Racing	Tahiroglu et al. (2010)
Games in general	Hyperactive children present more problems associated with digital games.	Computer game Console game	Not specified	Bioulac, Arfi, Michel & Bouvard (2010)
Robomemo Commercial game	WM training with game elements significantly improves the motivation, training performance, and working memory of children with ADHD.	Computer game	Educational	Prins, Dovis, Ponsioen, Ten Brink & Van der Oord (2011)
CogoLand Non-commercial game	Game represents a treatment modality for ADHD, which not only has the potential for being used in combination with treatment.	Computer game	Simulation	Lim et al. (2012)
Games in general	Children with ADHD may be particularly at risk for problems related to game playing, including excessive game use.	Computer game Console game Online game	Gamespot, Action/adventure, Role-playing, Strategy, Puzzle game, Educational, Fighting, First-person shooter, Music, Platforms, Racing, Simulation, Sports and fitness.	Mazurek & Engelhardt (2013)
Braingame Brian Commercial game	Positive evidence for the efficacy of Executive Functioning training with game elements.	Computer game	Simulation	Van der Oord, Ponsioen, Geurts, Ten Brink & Prins (2014)
Secret Agent Bubble Hit Kung Fu Panda 2 Commercial games	Cognitive difficulties in ADHD depend on tasks.	Console game	Platforms Puzzle game Action-adventure	Bioulac et al. (2014)
Games in general	Children with ADHD are more addicted to the Internet than those without ADHD.	Computer game Online game	Not specified	Weinstein, Yaacov, Manning, Danon & Weizman (2015)

Source: own processing

In none of the papers where a specific game is mentioned is the genre, content or narrative structure of the game gone into in any detail. In five papers the concept 'games' or 'digital games' are mentioned generally without specifying if they are commercial games or not. In the other studies, the specific names of the thirteen games analyzed are mentioned. In these papers, authors did not also specify the game genre, and they only specify the game platform.[42] The mechanics, dynamics or narrative structure of the game are not specified, neither is the use of an avatar in the case of RPGs, mentioned by Mazurek et al.[43] The majority of the games (11) are computer games, 4 are console games and 4 online games. Only 6 of these games are commercial games, but it could be concluded that digital games used by Bioulac et al. (2008, 2010), Chan and Rabinowitz, and Mazurek et al., are commercial games too from their description as console games.[44] Genre categories included: Gamespot, action/adventure (3), role-playing (1), strategy (1), puzzle game (2), educational (3) fighting (1), first-person shooter (1), music (1), platforms (3), racing (2), simulation (3), sports and fitness (1), and GameSpot (1). *Robomemo*[45] is a commercial game and has been used in two interventions,[46] delivered via a PC computer. This game was used to investigate the effect of improving working memory via a computerized, systematic practice of working memory tasks, although with the information available it was difficult to determine the rules, goals and objectives of the game. In two cases,

42 BIOULAC, S., ARFI, L., MICHEL, G., BOUVARD, M. P.: Interest of the use of the Problem Videogame Playing (PVP) questionnaire from Tejeiro: Exploratory study in ADHD children. In *Annales Medico-Psychologiques*, 2010, Vol. 16, No. 8, p. 633. [online]. [2019-10-31]. Available at: <https://www.em-consulte.com/en/module/displayarticle/article/266955/impression/vue6>.; BIOULAC, S., ARFI, L., BOUVARD, M. P.: Attention deficit/hyperactivity disorder and video games: A comparative study of hyperactive and control children. In *European Psychiatry*, 2008, Vol. 23, No. 2, p. 140. [online]. [2019-10-31]. Available at: <https://doi.org/10.1016/j.eurpsy.2007.11.002>.; CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 140. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; MAZUREK, M. O., ENGELHARDT, CH. R: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 262. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.; WEINSTEIN, A., YAACOV, Y., MANNING, M., DANON, P., WEIZMAN, A.: Internet addiction and attention deficit hyperactivity disorder among schoolchildren. In *Israel Medical Association Journal*, 2015, Vol. 17, No. 1, p. 734. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/60db/5196467f70d985a18a70126cc6f34d58c895.pdf>.

43 MAZUREK, M. O., ENGELHARDT, CH. R.: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 263. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.

44 BIOULAC, S., ARFI, L., BOUVARD, M. P.: Attention deficit/hyperactivity disorder and video games: A comparative study of hyperactive and control children. In *European Psychiatry*, 2008, Vol. 23, No. 2, p. 135. [online]. [2019-10-31]. Available at: <https://doi.org/10.1016/j.eurpsy.2007.11.002>.; BIOULAC, S., ARFI, L., MICHEL, G., BOUVARD, M. P.: Interest of the use of the Problem Videogame Playing (PVP) questionnaire from Tejeiro: Exploratory study in ADHD children. In *Annales Medico-Psychologiques*, 2010, Vol. 16, No. 8, p. 632. [online]. [2019-10-31]. Available at: <https://www.em-consulte.com/en/module/displayarticle/article/266955/impression/vue6>.; CHAN, P. A., RABINOWITZ, T.: A cross-sectional analysis of video games and attention deficit hyperactivity disorder symptoms in adolescents. In *Annals of General Psychiatry*, 2006, Vol. 5, No. 16, p. 9. [online]. [2019-11-02]. Available at: <https://annals-general-psychiatry.biomedcentral.com/track/pdf/10.1186/1744-859X-5-16>.; MAZUREK, M. O., ENGELHARDT, CH. R.: Video Game Use in Boys with Autism Spectrum Disorder, ADHD, or Typical Development. In *Pediatrics*, 2013, Vol. 132, No. 2, p. 262. [online]. [2019-11-01]. Available at: <https://pediatrics.aappublications.org/content/pediatrics/132/2/260.full.pdf>.

45 COSMED: *Robomemo.* [digital game]. Stockholm : Cogmed, 2004.

46 KLINGBERG, T., FERNELL, E., OLESEN, P. J., JOHNSON, M., GUSTAFSSON, P., DAHLSTRÖM, K., GILLBERG, Ch. G., FORSSBERG, H., WESTERBERG, H.: Computerized training of working memory in children with ADHD-A randomized controlled trial. In *Journal of the American Academy of Child & Adolescent Psychiatry*, 2005, Vol. 44, No. 1, p. 120. [online]. [2019-11-03]. Available at: <https://pdfs.semanticscholar.org/9172/65b9bbb2203528f57abfd31f4f97e7b238d0.pdf>.; PRINS, P. J. M., DOVIS, S., PONSIOEN, A., TEN BRINK, E., VAN DER OORD, S.: Does computerized working memory with game elements enhance motivation and training efficacy in children with ADHD? In *Cyberpsychology, Behavior, and Social Networking*, 2011, Vol. 14, No. 3, p. 117. [online]. [2019-11-01]. Available at: <https://pdfs.semanticscholar.org/bdee/e9a69d3192431d05cf6498fe8106a879ca9b.pdf?_ga=2.95729695.2012201865.1572700179-190068604.1572700179>.

Prins et al. and Shaw et al., and in the second part of their study, authors used a computerized version of a Pokemon task;[47] an isomorphic task that can add game elements to standard computerized training. However, as in the previous case, with the information available it was difficult to determine the game's goals and objectives. One intervention includes the game *Colin McRae Rally 3*[48]. Authors said that this commercial computer game has an effect on cognitive function and a positive effect on attention over the short term, but it is not clear what this effect is. In summary, in view of the number of articles and their objectives, there is concern about the use of games in the studies but there is little clarity about which elements of a game can be beneficial or harmful. Both commercial and non-commercial games vary greatly, depending on their genre and themes. One can't compare an educational game with something from the fighting genre. None of the papers investigates the genre, content or narrative structure of the game or how this might create specific problems or benefits for ADHD.

Discussion

This paper provides one of the reviews of the relationship between digital games and ADHD. This systematic study has led us to conclude that the aims of the investigations were oriented towards evaluating the benefits and harmful effects of applying digital games to ADHD-affected children and young people. Especially so, towards evaluating executive functions, work memory, academic performance, level of attention, impulse regulation and the risk of dependence after sessions with games. In general, there are several studies (7) that seek to improve the symptoms of ADHD with digital games. The results of the investigations have shown irregular effects. There are both positive and negative effects as to the attention, memory and also on other cognitive abilities. As to the executive functions, the positive conclusions of some of these studies should be regarded with caution because they pose methodological problems. By way of an example, the study by Lim et al.[49] has important limitations as it is an uncontrolled open test. The evaluation and control measures are solely collected from the subjective evaluation of the mothers and fathers, and not from the adolescents or the healthcare professional. Therefore, we cannot conclude with empirical certainty that there is an improvement in the symptoms. This positive instability (controversial support) in the results, opposes recent systematic revision and meta-analysis studies in regard to general cognitive and certain cognitive domains in the clinical and non-clinical population (Stanmore et al. 2017), which has found significant effects in executive functions, attention and visual spatial abilities. To be more specific, digital games have proved to be useful in improving inhibitory control and

47 PRINS, P. J. M., DOVIS, S., PONSIOEN, A., TEN BRINK, E., VAN DER OORD, S.: Does computerized working memory with game elements enhance motivation and training efficacy in children with ADHD? In *Cyberpsychology, Behavior, and Social Networking*, 2011, Vol. 14, No. 3, p. 118. [online]. [2019-11-01]. Available at: <https://pdfs.semanticscholar.org/bdee/e9a69d3192431d05cf6498fe8106a879ca9b.pdf?_ga=2.95729695.2012201865.1572700179-190068604.1572700179>.; SHAW, R., GRAYSON, A., LEWIS, V.: Inhibition, ADHD, and computer games: The inhibitory performance of children with ADHD on computerized tasks and games. In *Journal of Attention Disorders*, 2005, Vol. 8, No. 4, p. 167. [online]. [2019-11-02]. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.817.3220&rep=rep1&type=pdf>.

48 CODEMASTERS: *Colin McRae Rally 3 (PC version).* [digital game]. Southam : Codemasters, 2003.

49 LIM, C. G., LEE, T. S., GUAN, C., FUNG, D. S. S., ZHAO, Y., TENG, S. S. W., ZHANG, H., KRISHNAN, R.: A Brain-Computer Interface Based Attention Training Program for Treating Attention Deficit Hyperactivity Disorder. In *PLoS ONE*, 2012, Vol. 7, No. 10, p. 9. [online]. [2019-11-01]. Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0046692&type=printable>.

cognitive flexibility. However, it is impossible to compare both articles because the characteristics of the samples studied, as well as the instruments of evaluation, are heterogeneous. The selections of studies of the clinical population they have used are also non-comparable. Alzheimer's disease, Parkinson's disease, schizophrenia, diabetes, etc. In any case, we think ADHD is a disorder with a neurobiological cause and is the result of a complex interaction of genetic and environmental factors. This complexity requires a profound and specific study of the application of digital games and ADHD.

Different investigations are confirming, with consistency, that digital game players, versus non players, perform better in spatial tasks but this advantage cannot be explained through faster attention or from more efficient responses from stimuli,[50] that is to say, we are not improving their attention processing. We are proposing that digital games could be psycho educationally beneficial in boys and girls with ADHD to improve their spatial relationships. The immediate reinforcement that a player obtains through digital games could influence achieving a positive adhesion to ADHD treatment. The definition of Salen and Zimmerman highlights four features as constituting a game: system, rules, artificial conflict, and quantifiable outcome.[51] The latter term referring to a measurable goal state upon which the player and the system can evaluate progress. In a game, a combination of cognitive pace and effort is necessary. In this area, it could act positively on the work memory, seriously affected in children with ADHD.[52] The overall improvement in executive function (work memory, behavioural inhibition and cognitive flexibility) is also proven in the study carried out by Van der Oord et al. in which using a computer game achieved a notable reduction in ADHD attributable to the impact of immediate reinforcement of task results in children with ADHD.[53] As such, adding external incentives to potentially unstimulating and boring tasks and including contingent reinforcement to the tasks is proven to improve interest and interest amongst these children when carrying out different kinds of tasks on computers.

The Neurofeedback performs thanks to the feedback from the reward system. Thereupon, the most promising therapies use neurofeedback digital games to train the self-regulation in the attention of children with ADHD.[54] Digital games can aid as a motivational tool to encourage children to overcome their attention problems. This is achieved by providing highly interactive experiences that intend to create an optimal adherence to the treatment. Furthermore, the physiological signs exhibited can be used to

50 MACK, D. J., WIESMANN, H., ILG, U. J.: Video game players show higher performance but no difference in speed of attention shifts. In *Acta Psychologica*, 2016, Vol. 169, No. 7, p. 12. [online]. [2019-11-02]. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0001691816300877>.

51 SALEN, K., ZIMMERMAN, E.: *Rules of play*. Cambridge, MA : The MIT Press, 2004, p. 80.

52 PRINS, P. J. M., DOVIS, S., PONSIOEN, A., TEN BRINK, E., VAN DER OORD, S.: Does computerized working memory with game elements enhance motivation and training efficacy in children with ADHD? In *Cyberpsychology, Behavior, and Social Networking*, 2011, Vol. 14, No. 3, p. 117. [online]. [2019-11-01]. Available at: <https://pdfs.semanticscholar.org/bdee/e9a69d3192431d05cf6498fe8106a879ca9b.pdf?_ga=2.95729695.2012201865.1572700179-190068604.1572700179>.

53 VAN DER OORD, S., PONSIOEN, A. J. G. B., GEURTS, H. M., TEN BRINK, E. L., PRINS, P. J. M.: A Pilot Study of the Efficacy of a Computerized Executive Functioning Remediation Training With Game Elements for Children With ADHD in an Outpatient Setting: Outcome on Parent- and Teacher-Rated Executive Functioning and ADHD Behavior. In *Journal of Attention Disorders*, 2014, Vol. 18, No. 8, p. 670. [online]. [2019-11-02]. Available at: <https://pdfs.semanticscholar.org/b905/9fba8d4dc55b3e2fee8659f64255d1f24030.pdf>.

54 TERUEL, M. A., NAVARRO, E., ROMERO, D., GARCÍA, M., FERNÁNDEZ-CABALLERO, A., GONZÁLEZ, P.: An innovative tool to create neurofeedback games for ADHD treatment. In VICENTE, J. et al.: *Natural Artificial Computation for Biomedicine and Neuroscience.* Madrid : Springer, 2017, p. 186.; RAJABI, S., PAKIZE, A., MORADI, N.: Effect of combined neurofeedback and game-based cognitive training on the treatment of ADHD: A randomized controlled study. In *Applied Neuropsychology: Child*, 2019, Vol. 1, No. 1. p. 2-10. [online]. [2019-11-03]. Available at: <https://www.researchgate.net/publication/330980059_Effect_of_combined_neurofeedback_and_game-based_cognitive_training_on_the_treatment_of_ADHD_A_randomized_controlled_study>.

generate medical information that is of great value to better understand the complexities of the phenomenon of ADHD.[55] When we associate ADHD and digital games, the alarm bells start to ring. Even though digital games are considered, for the most part, an activity capable of producing beneficial effects for its players. There is growing evidence that suggests that games are addictive and associated with health related and behavioural problems.[56] This is one of the major concerns of the articles that have been reviewed. ADHD is a risk factor that increases the addictive behaviour in the TIC and virtual activity. In the adolescent population with ADHD, a lack of attention provokes the use of digital games and addictions to the Internet, while hyperactivity/impulsivity provokes addiction to gambling. Additional risk factors are school-related problems, aggressions and family relationships that provoke addictions to the Internet or games.[57] Studies also indicate that girls with ADHD have more attention difficulty then boys, while boys have more behavioural problems. As they grow, girls with ADHD have a higher probability of developing depression, substance abuse and eating disorder problems as compared to girls who do not have ADHD.[58] Future investigations should further examine the differences in gender and the evolution of such problems.

We should pay special attention to preventing inappropriate use of Internet and digital games, especially so with children and young people with ADHD given their potential for addiction. The length of play (high frequency) and the characteristics and type of digital game will have to be taken into consideration. MMORPG (Massive Multiplayer Online Role-Playing Games) are more addictive than other Internet applications or other kinds of digital games.[59] In addition, we have to consider that this play activity takes place in a technological context in which the internet amplified the addictive potential of these games due to easy access, speed of connection, immediate reinforcement and anonymity. If what we are seeking to do is to modify hyperactivity disorder (certain executive functions) via certain digital games, we think that intervention/treatment studies must have a deeper knowledge of the components and skills of executive intelligence, as well as being able to evaluate the empirical efficacy of the aforementioned treatment according to the methodological requirements to these ends. Otherwise, the positive results may be attributed to the initial motivation and not so much to the characteristics of the digital game themselves. It may be interesting, then, to empirically evaluate the efficacy of

55 ZAMORA BLANDON, D., MUÑOZ, J., LOPEZ, D., HENAO, O.: Influence of a BCI neurofeedback videogame in children with ADHD. Quantifying the brain activity through an EEG signal processing dedicated toolbox. In JÁCOME, I. D., ERAZO, J. P. (eds.): *2016 IEEE 11th Colombian Computing Conference (CCC)*. Popayán, Colombia : IEEE, 2016, p. 7. [online]. [2019-11-03]. Available at: <https://www.researchgate.net/publication/310809553_Influence_of_a_BCI_neurofeedback_videogame_in_children_with_ADHD_Quantifying_the_brain_activity_through_an_EEG_signal_processing_dedicated_toolbox/link/59f7927a458515547c24cb40/download>.

56 GOMEZ, R., STAVROPOULOS, V., BEARD, C., PONTES, H. M.: Item response theory analysis of the recoded internet gaming disorder scale-short-form (IGDS9-SF). In *International journal of mental health and addiction*, 2018, Vol. 17, No. 1, p. 870. [online]. [2019-11-03]. Available at: <https://link.springer.com/content/pdf/10.1007%2Fs11469-018-9890-z.pdf>.; PONTES, H., VASILEIOS, S., GRIFFITHS, M.: Measurement invariance of the internet gaming disorder scale–short-form (IGDS9-SF) between the United States of America, India and the United Kingdom. In *Psychiatry Research*, 2017, Vol. 257, No. 4, p. 477. [online]. [2019-11-03]. Available at: <https://link.springer.com/article/10.1007/s11469-018-9925-5>.

57 IZZO, V. A., DONATI, M. A., PRIMI, C.: Attention deficit/hyperactivity disorder (adhd) and behavioral addictions in adolescents: specific and non-specific risk factors. In *Psicologia clinica dello sviluppo*, 2018, Vol. 22, No. 1, p. 550.

58 NADEAU, K. G., ELLEN, B., LITTMAN, E. B., QUINN, P. O.: *Understanding Girls with ADHD*. Altamonte Springs : Advantage Books, 1999, p. 341.

59 KUSS, D. J., LOUWS, J., WIERS, R. W.: Online gaming addiction? Motives predict addictive play behavior in massively multiplayer online role-playing games. In *Cyberpsychology, Behavior and Social Networking*, 2012, Vol. 15, No. 1, p. 482. [online]. [2019-11-03]. Available at: <https://www.researchgate.net/publication/230847772_Online_Gaming_Addiction_Motives_Predict_Addictive_Play_Behavior_in_Massively_Multiplayer_Online_Role-Playing_Games/link/0046351a9dd710f8b2000000/download>.

a certain type of digital game to a therapeutic or psycho-pedagogical end, and even to regulate behavior within ADHD. On the other hand, we detected that the use of boys is greater than girls. The evidence suggests that the prevalence of ADHD is higher among males than females.[60] A possible explanation for the differences in the presence of ADHD among both sexes is the under-diagnoses of girls with ADHD. The probability is that boys are three times more likely to be diagnosed with ADHD than girls and also tend to be diagnosed younger than girls.[61] Girls may have a higher probability then boys of suffering from an unaware type of ADHD and could experience more internalised symptoms in contrast to the hyperactivity and aggression exhibited by boys. Studies of women with ADHD are growing but still very limited.

In terms of RQ1 *What particular characteristics have been investigated by researchers?*, the studies can be divided into studies that have focused on studying the risk of addiction or problematic use of digital games as well as on the increased attention deficit due to this practice, as well as behaviour problems. The second group has focused on evaluating the improvement in executive functions via digital gaming, the reduction in hyperactivity, impulsiveness and inattention, as well as examining its effect on motivation and performance. In terms of RQ2 *What research methods have been used?*, the twelve investigations analysed showed experimental and exploratory methods; nine of them used control groups, another carried out a comparative investigation and one repeats the experiment on the same group, but three months later, focusing on the parents of teenagers with disorders. Finally, the last study focused on a single group over 2 months. Only in one study was there a proportion of the sample using boys and girls similar to the prevalence of ADHD between the sexes. On the other hand, we should note that of the twelve investigations, only three of them did any work with the parents. The instruments most used were the Conners scale, which has the widest acceptance in evaluating attention problems, and the Child Behaviours Checklist to evaluate behavioural problems. There is no uniformity in the instruments chosen to study Internet addiction and problematic use of digital games, given that there is no recognition of this disorder by the APA (DSM-5), and at any rate its consideration as a disorder is under study. In terms of analyzing executive functions, for the overall study we note the Behaviour Rating Inventory of Executive Functioning, and for the partial study of executive functions we found adaptations for studying Work Memory and to evaluate Impulsiveness, ADHD Rating Scale and the Stroop Test effect. In terms of RQ3 *What Game has the study on ADD-ADHD been focused on?*, the elements that make up a game can be both beneficial or harmful are not made clear. The digital games are analyzed without distinguishing between the genres and theme of the game. None of the articles go into depth in the content or narrative structure of the game and how this could cause specific problems or benefits for ADHD.

60 NØVIK, T. S., HERVAS, A., RALSTON S. J., DALSGAARD, S., RODRIGUES, R., LORENZO, M. J., ADORE, S. G.: Influence of gender on attention-deficit/hyperactivity disorder in Europe–ADORE. In *European Child & Adolescent Psychiatry*, 2006, Vol. 15, No. 1, p. 17. [online]. [2019-11-01]. Available at: <https://link.springer.com/article/10.1007/s00787-006-1003-z>.; WILLCUTT, E. G.: The prevalence of DSM-IV attention-deficit/hyperactivity disorder: a meta-analytic review. In *Neurotherapeutics,* 2012, Vol. 9, No. 3, p. 494. [online]. [2019-11-03]. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3441936/>.

61 NADEAU, K. G., ELLEN, B., LITTMAN, E. B., QUINN, P. O.: *Understanding Girls with ADHD*. Altamonte Springs : Advantage Books, 1999, p. 340.

Conclusion

The studies can be divided into studies that have focused on studying the risk of addiction or problematic use of digital games and a second group evaluating the improvement in executive functions via digital gaming, the reduction in hyperactivity, impulsiveness and inattention, as well as examining its effect on motivation and performance. Authors used experimental and exploratory methods. The instruments most used were the Conners scale, which has the widest acceptance in evaluating attention problems, and the Child Behaviours Checklist to evaluate behavioural problems but there is no uniformity in the instruments chosen to study Internet addiction and problematic use of digital games. In terms of analyzing executive functions, for the overall study we note the Behaviour Rating Inventory of Executive Functioning, and for the partial study of executive functions we found adaptations for studying Work Memory and to evaluate Impulsiveness, ADHD Rating Scale and the Stroop Test effect. Finally, the digital games are analyzed without distinguishing between the genres and theme of the game. None of the articles go into depth in the content or narrative structure of the game and how this could cause specific problems or benefits for ADHD. As a result of the data obtained, as well as the evidence and the controversial debate described, these are the conclusions and proposals:

- Digital games could help in the treatment of ADHD as well as in the cognitive deficiencies of the clinical population.
- More empirical studies on psychotherapeutic and psych educational interventions are necessary to confirm the effectiveness of digital games in the improvement of executive functions with children and adolescents affected by ADHD. These investigations should take into account the age, gender and type of ADHD as well as the genre, content or narrative structure of the game.
- Digital games for ADHD must be designed with the objective of improving the executive function that can have direct implications in the attention and behaviour present in the real world (a general learning process).
- In future studies, the 'FITT' components of digital games should be registered (frequency, intensity, time and type). Using these indicators in the design of the game and the information gathered from the testing of the digital game will help to collect optimal information on the variable that affects the results.
- The genres of each digital game could influence the improvement of cognitive and attention abilities (monitoring many objects, problem solving, strategy in real time). The mechanics of each one of them, could lead to concrete advantages and disadvantages.
- Regarding the actions performed in the digital games, we believe that the designers need to further delve into the conscious actions of the process. Instead of focusing on a specific result or a specific achievement, the designers need to pay closer attention to the actions that will produce improvements in the meta cognitive with the objective of 'learning to learn'. This will allow the broadening of learning into other scenarios.
- Take into account that ADHD is a risk factor to behavioural addictions.

As for future work, it would be interesting to revise and select new articles that talk about the measures evaluated by means of digital games, specifically 'Executive Functions, Spatial Planning Problem Solving, Sustained Visual Attention, Concentration, Impulsivity'.

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Political Marketing in Digital Games: 'Game Over' for Traditional Political Marketing Methods

Radoslav Baltezarević, Borivoje Baltezarević, Vesna Baltezarević, Piotr Kwiatek, Ivana Baltezarević

prof. Dr. Radoslav Baltezarević
College for Communications
Culture and Communication Department
Terazije 27
11 000 Belgrade
REPUBLIC OF SERBIA
rbaltezarevic@gmail.com

Radoslav Baltezarevic, PhD. is a professor in Marketing, Communication, and Media at the College for Communications in Belgrade – Republic of Serbia. Before that, he worked at University College of Bahrain in Kingdom of Bahrain; at the American University of the Middle East in Kuwait, and at the Faculty of Business Economy and Entrepreneurship in the Republic of Serbia. He is an active researcher, and he has published eight books and nearly 80 publications. He is an Academic member of the Athens institute for Education and Research (Mass Media and Communication & Marketing Unit), and an active member of the Journalists' Association of Serbia, and a member of the Reviewers` Board of Athens Journal of Mass Media and Communications.

assoc. prof. Dr. Borivoje Baltezarević
Union University
Faculty of Management
Njegoševa 1a
21 205 Sremski Karlovci
REPUBLIC OF SERBIA
baltezb@yahoo.co.uk

Borivoje Baltezarević, PhD. is an assistant professor in Cultural Studies at the Faculty of Management, Sremski Karlovci, Serbia. His main areas of academic interest comprise the influence of technology and digital media on culture, society, identity, and plasticity of the brain. In academic research, he is primarily focused on finding contrasting and alternative paradigmatic modalities that are opposed to the transhumanistic and singularity tendencies of modern society. He is a published author, translator, copywriter, with five published academic books and more than twenty papers.

prof. Dr. Vesna Baltezarević
Megatrend University
Faculty of Culture and Media
Bulevar Maršala Tolbuhina 8
11 070 Belgrade
REPUBLIC OF SERBIA
vesnabal@gmail.com

Vesna Baltezarević, PhD. is a full professor of Intellectual Property and Media Law at Megatrend University, Faculty of Culture and Media in Belgrade and Director of the International doctoral school. She is an elected Active Member of European Academy of Sciences and Arts (Salzburg, Austria), elected Academician of the Euro Mediterranean Academy of Arts and Sciences (EMAAS), an Academic Member of the Athens Institute for Education and Research, belonging to the Mass Media & Communication Research Unit and a member of the Association of Journalists of Serbia. During her academic engagement she has published fifteen books and more than one hundred papers in national and international journals and presented at scientific conferences.

assoc. prof. Dr. Piotr Kwiatek
American University of the Middle East
Department of Marketing
250 St. Eqaila
54 200 Kuwait
STATE OF KUWAIT
piotr.kwaitek@aum.edu.kw

Piotr Kwiatek, Ph.D. is an assistant professor in the Department of Marketing at the American University of the Middle East (Kuwait). He was a member of the Faculty of Management at Poznan University of Economics (Poland). With the background in banking and industrial sectors Piotr was responsible for implementing and managing CRMs with respect to loyalty programs. He gained experience in creating fruitful partnerships between science and business in Technology Park and in developing start-ups. Dr. Piotr served for 6 years as Vice-president of the Global Sales Science Institute.

Ivana Baltezarević, MBA
Megatrend University
Faculty of Culture and Media
Bulevar Maršala Tolbuhina 8
11 070 Belgrade
REPUBLIC OF SERBIA
ivana.baltezarevic@gmail.com

Ivana Baltezarević completed her undergraduate studies at the Faculty of Law, Public Administration and Security in 2013. In early 2015, she completed her Master's Degree at the Faculty of Culture and Media – defending a Master's thesis entitled 'Product Placement in the Media'. She is currently a PhD student at the Faculty of Culture and Media.

ABSTRACT:
This study focuses on digital games that have become powerful persuasion tools which can be utilized for political marketing purposes. The authors believe that these media have to be thoroughly explored, because of the great potential of these platforms to become very useful tools for setting up political messages and the outreach capacity to the voting segment being difficult to achieve if only traditional media are used. The paper provides a set of theoretical views on political marketing in digital games. There are many examples analyzed in the paper, proving that the techniques of political marketing can create big benefits and that they can help politicians achieve their goals. So, we hypothesized a new phase of political marketing, underpinned by the utilization of digital games. As a methodology, we used content analysis of various digital games. The aim of this paper is to offer a better understanding of the benefits of political marketing campaigns in the digital gaming industry and to explore the role and impact of these techniques, as well as to provide potential future directions of this form of marketing.

KEY WORDS:
digital games, future directions, political marketing, political messages.

Introduction

Nowadays in many countries, political marketing is becoming an unavoidable strategy of political communication. Modern times require more advanced approaches. Political and marketing experts are aware that the traditional techniques of communication are not enough to win elections. Holding speeches in front of a television audience, organizing political rallies in city squares, or using posters and newspaper articles in order to promote political ideology does not have the sufficient leverage anymore to provide politicians any substantial advantage during the elections. For more effective media positioning, politicians are required to pay deeper attention to new kinds of digital media, that seem to appear and develop at an accelerated pace. In recent years, in many countries, political marketing has taken a greater role in the digital gaming industry. The creators of political campaigns have been starting to recognize that digital games are becoming a central part of our cultures and daily routines, which affects various aspects of our everyday lives, including consumption trends, communities, and the formation of identity.[1] Today, digital games, as the world's fastest-growing and newest mass medium, are part of everyday life for many people.[2] Digital games have the ability to be political products and to reflect, interpret, and sometimes even redefine the political dynamics with which we engage every day. The knowledge that it is the platform of the future, for shaping young brains and ultimately guiding young people to form 'desirable and acceptable' attitudes toward political issues, creates the need for this topic to be studied in greater detail. Modern political marketing has quickly noticed that digital games have the potential of becoming one of the main tools of political communication. In the middle of the 20th century, mass marketing

1 For more information, see: HALL, S.: *The Origins of Cultural Studies: A Lecture.* Northampton, MA : Media Education Foundation, 2006.
2 ROKOŠNÝ, I.: Digital Games as a Cultural Phenomenon: A Brief History and Current State. In *Acta Ludologica*, 2018, Vol. 1, No. 2, p. 49-60.

was very popular, using mass media like television or the printed press. At the end of the 20th century, direct marketing has slowly started to assume the leading role by developing phoning, mass mailing, and use of surveys.[3] For political marketing, digital games are still not a key medium in the political media landscape, but it is just a matter of time until these platforms will be recognized as a fruitful political medium which has the capacity to generate new voters.

In this study, we primarily reflect on the theoretical approach to the field of political marketing and we discuss the use of digital games as a new media tool not only for political campaigning, but also for placement views on different social issues and ethical dilemmas, which is supported by a range of examples. Finally, the paper provides possible future directions of political marketing development. The article aims to provide explanations of the new phase of political marketing, underpinned by the utilization of digital games.

Political Marketing

Political scientists have used the term political marketing in the context of political communications in immediate pre-election periods.[4] Political Marketing is not just related to political advertising; it is a set of strategies and tools for studying public opinion before and during elections, in order to develop campaign communications and to evaluate their impact.[5] Political Marketing is the mix between marketing and politics as "it represents the permeation of the political arena by marketing".[6] The use of marketing in politics may help "political parties to address diverse voter needs through marketing analyses, planning, implementation and control of political campaigns",[7] and "the main goal of political marketing is to enable voters and political parties to make the most satisfactory decisions".[8] However, Bannon, Johansen, as well as Henneberg and O'Shaughnessy argue that a relationship-building approach by political marketing could establish a solid foundation for more fruitful interactions between voters and political institutions.[9] Political marketing is often associated with something negative and is assumed to be harmful to politics and democratic systems.[10] Political marketing can utilize many techniques and tools used by the other forms of commercial marketing, in the case that they are used to market a political idea, rather than a specific product or

3 See also: LENDREVIE, J., LEVY, J.: *Mercator 2013 – Théories et nouvelles pratiques du marketing.* Paris : Dunod, 2012.

4 For more information, see: HIMMELWEIT, H., HUMPHREYS, P., JAEGER, M.: *How Voters Decide*. Milton Keynes : Open University Press, 1985.

5 See: KAVANAGH, D.: *Election campaigning: the new marketing of politics*. Oxford : Blackwell Publishers, 1995.; KAVANAGH, D.: New campaign communications: consequences for political parties. In *Harvard International Journal of Press and Politics,* 1996, Vol. 1, No. 3, p. 61-75.

6 LEES-MARSHMENT, J.: The marriage of politics and marketing. In *Political Studies*, 2001, Vol. 49, No. 4, p. 693.

7 O'CASS, A.: Political marketing and the marketing concept. In *European Journal of Marketing,* 1996, Vol. 30, No. 10-11, p. 48.

8 Ibidem, p. 59-60.

9 BANNON, D. P.: Relationship Marketing and the Political Process. In *Journal of Political Marketing,* 2005, Vol. 4, No. 2, p. 86-100.; JOHANSEN, H. P. M.: Political Marketing: More than Persuasive Techniques, an Organizational Perspective. In *Journal of Political Marketing,* 2005, Vol. 4, No. 4, p. 86–103.; HENNEBERG, S. C., O'SHAUGHNESSY, N.: Political Relationship Marketing: Some Micro/Macro Thoughts. In *Journal of Marketing Management,* 2009, Vol. 25, No. 1-2, p. 6-20.

10 MOLONEY, K., COLMER, R.: Does Political PR Enhance or Trivialise Democracy? The UK General Election 2001 as Contest between Presentation and Substance. In *Journal of Marketing Management,* 2001, Vol. 17, No. 9-10, p. 957.

a brand.[11] Politics is being largely influenced by marketing; the same methods used by companies are also being used by politicians to market their ideologies.[12] The concept of political marketing is usually discussed in the context of election campaigns. Nowadays it is clear that marketing is not only about the product, but also applies to politics. Theory tends to ignore the fact that marketing is about organizational and political-philosophical principles and communication.[13] Pew Research Center in January 2016 found that 78% of US adults learn about the presidential election through TV, local news, cable news or late-night comedy shows. Though TV dominates as the leading channel for information on the presidential election, digital content is not far behind:

- 78% of US adults learn about the presidential election through TV.
- 65% of US adults turn to digital channels to gather information about the election.
- 41% of US internet users think they see too many political ads on TV.
- 43% of US registered votes searched for more information about a candidate after seeing a digital ad.[14]

A new survey conducted July 8-21, 2019, among 5,107 U.S. also by Pew Research Center collected data about Americans' perceptions of the social media. „As large majorities say that the tone of American political debate has become more negative in recent years, about a third of U.S. adults (35%) say that uncivil discussions about the news are a very big problem when it comes to news on social media. Additionally, about a quarter (27%) say that the harassment of journalists is a very big problem associated with news on social media".[15] The report Trust in Media 2019*,* showed that broadcast radio and TV are the most trusted media throughout Europe. According to the report the internet is trusted by only 32% of citizens and social media by 19%, which is down from 36% and 21% respectively from 2014.[16]

Political Marketing and Digital Games

There are more than 2.5 billion video gamers around the world. 72% of gamers are older than the age of 18. The average gamer is 34 years old.[17] This number is expected to rise to over 2.7 billion gamers by 2021.[18] According to Lerner, digital games are used for many political purposes in both analogue and digital formats. He proposes three main

11 O'CASS, A.: Political advertising believability and information source value during elections. In *Journal of Advertising*, 2002, Vol. 31, No. 1, p. 63-74.

12 SPEED, R., BUTLER, P., COLLINS, N.: Human branding in political marketing: Applying contemporary branding thought to political parties and their leaders. In *Journal of Political Marketing*, 2015, Vol. 14, No. 1-2, p. 130-149.

13 For more information, see: WRING, D.: *The Politics of Marketing the Labour Party*. Hampshire : Palgrave MacMillan, 2005.

14 *Political Advertising Report*. [online]. [2019-11-25]. Available at: <https://www.home.neustar/resources/whitepapers/digital-political-advertising-report>.

15 SHEARER, E., GRIECO, E.: *Americans Are Wary of the Role Social Media Sites Play in Delivering the News*. [online]. [2019-11-25]. Available at: <https://www.journalism.org/2019/10/02/americans-are-wary-of-the-role-social-media-sites-play-in-delivering-the-news/>.

16 FOSTER, A.: *Broadcasters remain most trusted, says EBU report*. [online]. [2019-11-25]. Available at: <https://www.ibc.org/consume/broadcasters-remain-most-trusted-says-ebu-report-/3805.article>.

17 YANEV, V.: *Video Game Demographics – Who Plays Games in 2019*. [online]. [2019-11-25]. Available at: <https://techjury.net/stats-about/video-game-demographics/#gref>.

18 *Number of active video gamers worldwide from 2014 to 2021 (in millions)*. [online]. [2019-11-25]. Available at: <https://www.statista.com/statistics/748044/number-video-gamers-world/>.

categories: games about politics; play as political action and games as political action.[19] Games about politics are not so creative and they are not providing any contribution to political disclosure. These are very simple games, with a very short circulation period, about general political issues whose main goal is just to inform and motivate players without delivering any significant analysis.[20] Play as political action involves incorporating game design principles into political practice. Sicart argues that play creates a much stronger expression of political ideas and it can progress in situations of tyranny, and can also enable personal and collective expression.[21] Games as political action, are not about politics, but are a way of doing politics. These types of games are developed around specific rules and should be considered as tools for making decisions in politics.[22] Digital games, as a modus of cultural expression, can provide culturally dominant views on different social conflicts and ethical dilemmas.[23] According to Chris Crawford, the digital game Balance of Power[24] is considered the first political game. The game offers numerous options to the players: diplomacy, international espionage, and military force as the last option. The goal of the game is to avoid a nuclear war. In 1991, Larry Barbu created a digital game about the Cold War called Crisis in the Kremlin[25]; players were challenged to stay in power and to avoid conflict with the Soviet Union. A few examples illustrate how players of digital games could be affected by the political context and settings. China's Ministry of Culture banned the game Battlefield 4[26] as 'an illegal digital game, with content that endangers national security'. It pointed out that the game's narrative was an aggressive attack on their culture.[27] In Russia, politicians decided to ban a game with negative images of Russia after Call of Duty: Modern Warfare 2[28] (chapter called 'No Russian') featured Russian nationalists committing domestic terrorism. The mass murder that is found in this chapter serves a very clear narrative purpose: to explain Russia's invasion of the US. The narrative's authors wanted to create a game where Russia invades USA for a justified reason, and they found a way – by creating/repeating well known 'Russians are evil' stereotype patterns. This also added emotional connotation to the story.[29]

Similarly, in Venezuela a game known as *Mercenaries 2* [30] was banned with the explanation that the game was enriched with U.S. propaganda.[31] Another interesting example is the game *Counter-Strike*[32] modification in Argentina, in which the British are represented

19 See also: LERNER, J.: *Making Democracy Fun: How Game Design Can Empower Citizens and Transform Politics*. Cambridge : The MIT Press, 2014.
20 For more information, see: SICART, M.: *Play Matters*. Cambridge : The MIT Press, 2014.
21 Ibidem.
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23 BOURGONJON, J., RUTTEN, K., SOETAERT, R., VALCKE, M.: From Counter-Strike to Counter-Statement: Using Burke's Pentad as a Tool for Analysing Video Games. In *Digital Creativity,* 2011, Vol. 22, No. 2, p. 92-100; RUANE, A., JAMES, P.: The International Relations of Middle-Earth: Learning from the Lord of the Rings. In *International Studies Perspectives,* 2008, Vol. 4, No. 9, p. 378-392.
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27 LIEN, T.*: Report: China bans Battlefield 4 on grounds of national security endangerment.* Released on 27th December 2013. [online]. [2019-05-20]. Available at: <https://www.polygon.com/2013/12/27/5249178/report-china-bans-battlefield-4-on-grounds-of-national-security>.
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29 LIEN, T.*: Report: China bans Battlefield 4 on grounds of national security endangerment.* Released on 27th December 2013. [online]. [2019-05-20]. Available at: <https://www.polygon.com/2013/12/27/5249178/report-china-bans-battlefield-4-on-grounds-of-national-security>.
30 PANDEMIC STUDIOS: *Mercenaries 2.* [digital game]. Redwood City : Electronic Arts, 2008.
31 See: APPERLEY, T.: *Gaming Rhythms: Play and Counterplay from the Situated to the Global*. Amsterdam : Institute of Network Cultures, 2010.
32 VALVE L.L.C.: *Counter-Strike*. [digital game]. Los Angeles : Sierra Studios, 1999.

as terrorists invading Falkland Islands.[33] The reaction in the United Kingdom, after this modification, was instant and even hackers launched a cyber-attack against the servers in order to shut down the game.[34] The game *Antiwargame*[35] was released after the events of September 11, as a simulation of dynamically depicting the link between homeland politics and foreign war. The game was created by former Ars Electronica Golden Nika winner Josh On and his the Futurefarmers collective. The game *John Kerry: Tax Invaders*[36] was released in March 2004 at the height of the second Gulf War. At the beginning of the game, the opening text announces, 'Only *you* can stop the tax invader', and invites players to 'Save the United States from John Kerry's tax ideas'. When playing the game, players must step inside the skin of the taxation opponent, viewing taxes as a foreign enemy. The player actually does battle against taxes, in a literal sense, and we can say that this game offers an unusual view on the conservative frame for tax policy itself.[37] *Democracy 3*[38] is a game where players can configure the government of their own choice. In the game *Tropico*[39], the player is in the role of a president of Latin American government and can win the game if enough plunders are collected on a Swiss account.

Maybe the best example is the well-known game *Civilization*[40] launched in 1991. In the game, the player leads a nation from the Bronze Age to the colonization of the Universe. There are many tasks ahead of the player, from building cities, developing advanced technologies, and creating military forces to conquer new frontiers and fight against rivals. The popularity of Civilization lies in its captivating presentation of human progress (from the invention of the wheel to dispatching starships to Alpha Centauri) like in no other game. Games addictive capacity is further stimulated by the options provided to players to mix and match ideologies and economic systems to customize a nation according to their preferences. It is possible to create a pacifist monarchy, a fascist state with freedom of speech or a free-market theocracy. The chance to shape and control an entire society seems to have a fascinating appeal to people.[41] Ten years ago, U.S. military bases banned sales of the game Medal of Honor[42]. The game, published by Electronic Arts, from California, stopped selling in the stores because this game allowed their users an opportunity to choose to play as Taliban characters and in that case, to attack American forces.[43] A few years ago, Google Play banned the game Bomb Gaza[44] from its online store. The game Bomb Gaza, developed by PlayFTW, simulated Israeli forces attacks on the Gaza Strip. This game caused outraged comments on the Facebook and the Google app store review page.[45] It is important to note that the digital game

33 ALEXANDER, H.: *Argentine Company Creates Video Game for 'Police' to Retake Falklands from 'Terrorists'.* Released on 26th March 2013. [online]. [2019-06-28]. Available at: <https://www.telegraph.co.uk/news/worldnews/southamerica/falklandislands/9955588/Argentine-company-creates-video-game-for-police-to-retake-Falklands-from-terrorists.html>.

34 *Falklands 'Counter Strike' online game has 'British terrorists' eliminated by 'Argentine patriots'.* [online]. [2019-06-28]. Available at: <https://en.mercopress.com/2013/03/27/falklands-counter-strike-online-game-has-british-terrorists-eliminated-by-argentine-patriots>.

35 ON, J.: *Antiwargame.* [digital game]. San Francisco : Futurefarmers, 2001.

36 GOP: *John Kerry: Tax Invaders*. [digital game]. Washington D.C. : Republican National Committee, 2004.

37 For more information, see: BOGOST, I.: *Unit operations: An approach to videogame criticism.* Cambridge, MA : The MIT Press, 2006.

38 POSITECH GAMES: *Democracy 3.* [digital game]. London : Positech Games, 2013.

39 POPTOP SOFTWARE: *Tropico.* [digital game]. New York : Gathering of Developers, 2001.

40 MICROPROSE: *Civilization*. [digital game]. Hunt Valley : MicroProse, 1991.

41 PECK, M.: *The Hidden Politics of Video Games. How your Xbox shapes the way you see the world.* Released on 26th April 2015. [online]. [2019-05-28]. Available at: <https://www.politico.com/magazine/story/2015/04/xbox-video-games-politics-economic-theory-117289>.

42 DREAMWORKS INTERACTIVE: *Medal of Honor.* [digital game]. Redwood City : Electronic Arts, 1999.

43 *GTA 5 and 5 other video games banned from stores*. [online]. [2019-11-09]. Available at: <https://www.cbc.ca/news/technology/gta-5-and-5-other-video-games-banned-from-stores-1.2860191>.

44 PLAYFTW: *Bomb Gaza*. [digital game]. PlayFTW, 2014.

45 *GTA 5 and 5 other video games banned from stores*. [online]. [2019-11-09]. Available at: <https://www.cbc.ca/news/technology/gta-5-and-5-other-video-games-banned-from-stores-1.2860191>.

Grand Theft Auto V[46], also faced problems in Australia, where 'Target' stores rejected selling the game because of the encouragement of violence against women.[47] The theme of the game Grand Theft Auto V revolves around the society of pop culture and American politics. This game offers to their players the opportunity to use tanks and planes, and contains a gun shop known as 'Ammu-Nation'.[48] At the beginning of 21st century, political digital games became legitimate. Political candidates and party groups created officially endorsed games to support their political activities.[49]

Many contemporary digital games are designed with politics in mind. Square examined the answers of African Americans ninth-graders asked after playing the game *Civilization III*[50], that the game is about advantageous geographical conditions that provide access to global trade networks, resources, technologies, and limited opportunities for population expansion.[51] After playing the game, students asked "Why is it that the Europeans colonized Americas, and why didn't Africans and Asians colonize America or Europe? The majority of the students were given a historical narrative of the steady march of Western liberty, democracy, and rationality. It is clear that games are introducing players to powerful ideas. Students also said that this game demonstrated to them the ways in which materialist goods determine how history plays out".[52] With the development of technology digital games as a medium are becoming more advanced, definitely they are used and will be used for learning but the question is: for whom and in what contexts? Like the military, private businesses and non-profit groups use games to spread their ideology, it is crucial to start examining the medium's potential to spread influence.[53] Steven Poole argues that when the digital game *Space Invaders*[54] offers the player a bonus life for reaching a specific score, the game directly conveyed the idea that survival is the most important virtue and at the same time that killing to achieve this goal is acceptable and justified.[55] In 2008, the Democratic presidential nominee Senator Barack Obama made political history by placing the first political ad in online digital games. The senator promoted his online voter registration by using Internet ads, featured in 18 games through Microsoft Corp's Xbox Live service, like *Guitar Hero III: Legends of Rock*[56], *The Incredible Hulk*[57], *NASCAR 09*[58], *NBA Live 08*[59], *NFL Tour*[60] etc. The ads appeared as banners and billboards, with Obama`s portrait and the slogan 'Early voting has begun'. The targeted audience in this digital game were young adult males, between 18 and 34-year-old. Usually, it is hard to reach this segment through traditional media because they do not read so much, and rarely watch TV.[61]

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46 ROCKSTAR NORTH: *Grand Theft Auto V*. [digital game]. New York : Rockstar Games, 2013.

47 *GTA 5 and 5 other video games banned from stores*. [online]. [2019-11-09]. Available at: <https://www.cbc.ca/news/technology/gta-5-and-5-other-video-games-banned-from-stores-1.2860191>.

48 *The Political Settings Around Video Games*. [online]. [2019-11-08]. Available at: <http://www.antiescualidos.com/the-political-settings-around-video-game>.

49 See also: BOGOST, I.: *Persuasive Games. The Expressive Power of Videogames*. Cambridge, MA : The MIT Press, 2007.

50 FIRAXIS GAMES: *Civilization III*. [digital game]. Paris : Infogrames, 2001.

51 For more information, see: SQUIRE, K. D.: *Replaying history.* [Dissertation Thesis]. Bloomington : Indiana University, 2004. [online]. [2019-06-20]. Available at: <https://www.learntechlib.org/p/125618/>.

52 DUNN, R. E.: Constructing world history in the classroom? In STEARNS, P. N., SEIXAS, P., WINEBURG S. (eds.): *Knowing teaching and learning history.* New York : New York University Press, 2000, p. 123-138.; See: MANNING, P.: *Navigating world history: Historians create a global past.* New York : Palgrave Macmillan, 2003.

53 SQUIRE, K. D.: Toward a theory of games literacy. In *Telemedium,* 2005, Vol. 52, No. 1-2, p. 10-14.

54 TAITO: *Space Invaders*. [digital game]. Tokyo : Taito, 1978.

55 See also: POOLE, S.: *Trigger Happy: The Inner Life of Videogames*. London : Fourth Estate, 2000.

56 NEVERSOFT: *Guitar Hero III: Legends of Rock*. [digital game]. Santa Monica : Activision, 2007.

57 EDGE OF REALITY, AMAZE ENTERTAINMENT: *The Incredible Hulk*. [digital game]. Tokyo : Sega, 2008.

58 EA TIBURON: *NASCAR 09*. [digital game]. Redwood City : EA Sports, 2008.

59 EA CANADA, HB STUDIOS: *NBA Live 08*. [digital game]. Redwood City : EA Sports, 2007.

60 EA TIBURON: *NFL Tour*. [digital game]. Redwood City : EA Sports BIG, 2008.

61 GORMAN, S.: *Obama buys first video game campaign ads*. Released on 18th October 2008. [online]. [2019-05-25]. Available at: <https://www.reuters.com/article/us-usa-politics-videogames/obama-buys-first-video-game-campaign-ads-idUSTRE49EAGL20081017>.

The team of Hilary Clinton in her 2016 election campaign launched an app, where users can accumulate points and stars by finishing different kind of tasks. Players who earn enough stars are rewarded with physical gifts such as souvenirs signed by Hilary Clinton.[62] Current US President Donald Trump is the inspiration for dozens of indie games which can be found on the PC game store Steam. A former creative director at the website Buzzfeed, Chris Baker, launched a series of satirical mini games that oppose and mock conservative attitudes in the US. These web-based games have more than one million players to this day. Two titles stood out as the most popular: *Thoughts & Prayers: The Game*[63], a game that focuses on gun control and, increasingly, tragedies in the real world, and the second title *Bomb the Right Place*[64], the game, which according to Chris Baker, helps players better understand the geography of the Middle East.[65] On the website AddictingGames, one can find many games that have either government or famous politicians as the subject of the game, such as *Dress up Hillary*[66], *Presidential Candidate or EveryJoe?*[67], *Presidential Knockout*[68], *UN Weapons Inspector*[69], *Trump Run*[70], *Downing Street Fighter*[71], *Escape from the Oval Office*[72], and many more.[73] In-game advertising in digital games is quite different from advertising in traditional media. The biggest difference is the element of interactivity. Research has shown that the 'encounter' of product brands in virtual digital game space leads to a more favourable attitude towards the characteristics of the product brand.[74] In his study of the differences of product placement in digital games and direct advertising Dahl finds some interesting information: products advertised as part of a product placement method cause more positive association and greater credibility than those advertised in direct advertising.[75] When product placement is properly implemented, it is possible to improve the gameplay experience, making the virtual world of the game more realistic.[76] Product placement is generally accepted if we exclude the reserved attitudes towards ethically suspicious products, such as cigarettes or firearms.[77] Digital game

62 JOY, T.: *Gamification in Elections (from Howard Dean to Hillary Clinton)*. [online]. [2019-11-08]. Available at: <https://callhub.io/gamification-in-elections/>.
63 EVERYDAY ARCADE: *Thoughts & Prayers: The Game*. [digital game]. [2019-11-25]. Available at: <https://everydayarcade.com/games/thoughts-and-prayers-the-game>.
64 EVERYDAY ARCADE: *Bomb the Right Place*. [digital game]. [2019-11-25]. Available at: <https://everydayarcade.com/games/bomb-the-right-place>.
65 BARANIUK, C.: *Video games become political as US election looms*. [online]. [2019-11-08]. Available at: <https://www.newscientist.com/article/2110736-video-games-become-political-as-us-election-looms/>.
66 ADDICTINGGAMES: *Dress up Hillary*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/girl-games/dress-up-hillary>.
67 THE ARTICLE 19 GROUP: *Presidential Candidate or EveryJoe?*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/funny/presidential-candidate-or-everyjoe>.
68 MINICLIP.COM: *Presidential Knockout*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/sports/presidential-knockout>.
69 SECTION8STUDIOS.COM: *UN Weapons Inspector*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/funny/un-weapons-inspector>.
70 CLOUD GAMES: *Trump Run*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/action/trump-run>.
71 HAPPINESSSAM: *Downing Street Fighter*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/funny/downing-street-fighter>.
72 GJERTSEN, D.: *Escape from the Oval Office*. [digital game]. [2019-11-08]. Available at: <https://www.addictinggames.com/puzzle/escape-from-the-oval-office>.
73 *Political games*. [online]. [2019-11-08]. Available at: <https://www.addictinggames.com/tag/political-games.jsp>.
74 GLASS, Z.: The Effectiveness of Product Placement in Video Games. In *Journal of Interactive Advertising,* 2007, Vol. 8, No. 1, p. 25-30.
75 DAHL, M. N.: The Medium as a Contextual Cue: Effects of Creative Media Choice. In *Journal of Advertising*, 2005, Vol. 34, No. 3, p. 90-96.
76 EDERY, D., MOLLICK, E.: *Changing the Game – How Video Games Are Transforming the Future of Business.* Upper Saddle River, NJ : FT Press, 2009, p. 42.
77 DE GREGORIO, F., SUNG, Y.: Understanding Attitudes Toward and Behaviors in Response to Product Placement – A Consumer Socialization Framework. In *Journal of Advertising,* 2013, Vol. 39, No 1, p. 84.

players are more politically engaged than most Americans. It`s estimated that 100 million of them will vote in the next presidential election, according to a survey commissioned by the Entertainment Software Association (ESA). "100 million gamers will vote next year", said Michael D. Gallagher, president and CEO of ESA, the trade association that represents the U.S. digital game industry. "Gamers are engaged, informed and hold strong opinions on critical issues. From both sides of the aisle, and in every state across the country, they will influence the course of our nation's future".[78] The study conducted by The Diffusion Group showed that nearly 80% of digital game consoles are connected to the Internet. This enables the possibility to receive dynamic content updates on a regular basis. Now marketers can change and segment their advertisements easily, choosing the target and timings of the ads that show up.[79]

The Emerging Trends of the Digital Gaming Development

The digital gaming industry is heading towards uncharted territory, always exploring and pushing the limit. The development of technology is moving the boundaries in the creation of digital games and as a consequence, the way this industry operates is increasingly changing. Digital game users will play a more important role in creating digital games. The possibilities are endless for interactive entertainment and we have only seen the tip of it.[80] Digital gaming consoles are no longer a platform for digital games only, now manufacturers are offering many other forms of entertainment such as music, movies, Internet browsing - that are offered through third-party services such as Netflix, HBO, YouTube, etc. Digital games will continue not only to provide new, unworldly experiences but also will become platforms to train, teach and help people across the world.[81] Virtual reality until recently existed only in science fiction books and movies, but today it looks like it is already at our doorstep with plans to stay here for a long time. With this technology still in its developmental stage, it seems the future possibilities in the digital gaming industry are limitless.[82] With the accelerated development in gaming technology, virtual reality headsets will be able to render 3D graphics that are almost not possible to distinguish from real-life. The hardware capabilities that are currently keeping gamers from hyper-immersive gameplay will soon be able to fully support this wonderful eventuality.[83]

For thelast few years, gamers are not only players who play digital games, but they also can watch them. Like on Tvitch.tv which is a popular webpage (over 45 million viewers per month) where users can stream their sessions and also talk to other players. The eSports world even had an impact on US immigration protocol. Danni 'Shiphtur' Le was

78 *New Study Finds Video Game Players Are Highly Engaged Politically*. Released on 5th November 2015. [online]. [2019-05-26]. Available at: <https://www.prnewswire.com/news-releases/new-study-finds-video-game-players-are-highly-engaged-politically-300173374.html>.

79 *In-Game marketing*. [online]. [2019-05-26]. Available at: <https://www.marketing-schools.org/types-of-marketing/in-game-marketing.html>.

80 HADZINSKY, C.: *A Look into the Industry of Video Games Past, Present, and Yet to Come*. [Master Theses]. Claremont : McKenna College, 2014, p. 26. [online]. [2019-05-29]. Available at: <http://scholarship.claremont.edu/cmc_theses/842>.

81 Ibidem, p. 27.

82 Ibidem, p. 31.

83 WHITE, D.: *Future Gaming Technology Predictions for 2020*. Released on 12th October 2018. [online]. [2019-05-25]. Available at: <https://www.techfunnel.com/information-technology/future-gaming-technology-predictions-for-2020/>.

the first eSports player to receive the P-1A visa. P-Visas are routinely approved for athletes so they can live and earn in the United States without citizenship. International eSports athletes, for many years, have been trying to get visas unsuccessfully.[84] "Cloud gaming refers to a new way of delivering computer games to players, where computationally complex games are executed on powerful cloud servers, the rendered game scenes are streamed over the Internet to gamers with the clients on heterogeneous devices, and the control events from input devices are sent back to cloud servers for interactions".[85] Deloitte Global predicts that in 2019, companies will accelerate the usage of cloud-based artificial intelligence (AI) software and services, and by 2020, penetration rates of enterprise software with integrated artificial intelligence and cloud-based platforms will reach 87%, among companies that use artificial intelligence software.[86] Handheld game consoles are returning, they have a huge potential to become an important part of gaming technology in the near future. They would appeal to nostalgic older gamers, who played those consoles, two decades ago, and to gamers who are looking to play without any distraction of apps on their smartphones or tablets.[87] Likewise, Google's Stadia is proposing an idea of making games playable on any device. The liberating of digital games from expensive consoles is driving investment in game streaming. Streaming would open games up to billions of players who can't afford or don't want to buy equipment which can cost sometimes a huge amount of money.[88]

A not so pleasant perspective for players is a set of competitive services, all with a few exclusive games that we might want to play, and all of them require a monthly subscription. Most probably the subscription services for gaming will replace gaming consoles and physical disks, but it is unlikely that this will happen for some time.[89] As regards procedural backgrounds and narratives, today computing power is greater in the average home computer or games console. Procedural backgrounds are becoming an option that means that locations, backgrounds, assets, characters and quests won't be planned in advance, but will be generated in accordance with pre-set rules every time they are played. This will lead to much less predictable gameplay. In future, it might be that central and side-quest plotlines are also generated in this way, so playing will be much more dynamic and interesting because it will not be possible to play the same storyline twice. The same technology could also allow modifications, players will be able to supply the ideas, but their computer supplies the programming. To create a character's face by uploading a photo is a possibility with today's technology, but more advanced options, for example, to completely change the characters and game dialogues isn't possible yet, but definitely, will be available soon.[90]

84 PARESH, D.: *Online game League of Legends star gets U.S. visa as pro athlete*. Released on 7th August 2013. [online]. [2019-06-25]. Available at: <https://www.latimes.com/business/la-xpm-2013-aug-07-la-fi-online-gamers-20130808-story.html>.

85 CAI, W., SHEA, R., HUANG, C. Y., CHEN, K. T., LIU. J., LEUNG, V. C. M., HSU, C. H.: A Survey on Cloud Gaming: Future of Computer Games. In *IEEE Access*, 2016, Vol. 4, No. 1, p. 7605.

86 *The democratisation of artificial intelligence.* [online]. [2019-06-23]. Available at: <https://www.deloitte.co.uk/consumer-review-digital-predictions/themes/artificial-intelligence>.

87 WHITE, D.: *Future Gaming Technology Predictions for 2020*. Released on 12th October 2018. [online]. [2019-05-25]. Available at: <https://www.techfunnel.com/information-technology/future-gaming-technology-predictions-for-2020/>.

88 MACDONALD, K.: *Apple Arcade v Google Stadia: which is the future for video games?* Released on 27th March 2019. [online]. [2019-04-25]. Available at: <https://www.theguardian.com/games/2019/mar/27/apple-arcade-v-google-stadia-which-is-the-future-for-video-games>.

89 Ibidem.

90 *Seven Exciting Trends from the Future of Video Games*. [online]. [2019-05-22]. Available at: <https://www.oxford-royale.co.uk/articles/7-exciting-trends-future-video-games.html>.

The Future Directions of Political Marketing Development

Recently, several studies of political campaigns have shown that traditional methods used by politicians to promote themselves are producing very bad results, and don't lead to more votes. That means there might be no connection between TV ads and votes, as one study by Kalla and Broockman suggests.[91] It is no secret that political marketing professionals are using data to understand voters, this is the same as in traditional marketing – many of the techniques used for the needs of political parties were first developed by commercial marketers. Artificial intelligence might one day prove that it can be much faster and more effective than humans in defining who should be targeted, when, and with what content, of course in order to maximize persuasive potential. It would be able to collect and sort together vast amounts of data from various sources, and, maybe, to recognize some new relationships that are currently hidden and invisible to human eyes. In the coming years, it is likely to move to automated marketing with automated content generation for specific users adapted toward their interests and needs. This could lead to personalized messages, regularly updated, and prepared for each voter based on previously conducted A/B testing.[92] With recent technological innovations and industry advances, political campaigns have started using micro-targeting techniques, which utilize an array of personalized and other data sets and marketing applications to influence the actions of individuals.[93] Specialty organizations like *Nielsen, Adobe*, or *Oracle* are offering, nowadays, more extensive resources for data mining and targeting voters, like data marketing clouds. Marketing clouds collect data on detailed consumer information, like personal interests, credit card use, TV viewing or consumption patterns.[94] Social network websites, like *Google, YouTube* or *Facebook* now play a crucial part in political operations, offering different digital marketing tools and techniques, along with specialized ad 'products' designed especially for political use.[95] The digital marketing industry has developed these methods, taking advantage of techniques of neuroscience, cognitive computing, data analytics, behavioural tracking, etc.[96] The new tool, recently promoted by *Google*, 'Emotion Analytics' is able to offer new types of data and new tracking methods, which can help marketers to better understand, on an emotional level, the impact of their campaigns.[97] The company *Cambridge Analytica* from the United States, responsible for data analytics and

91 KALLA, J., BROOCKMAN, D. E.: The Minimal Persuasive Effects of Campaign Contact in General Elections: Evidence from 49 Field Experiments. In *American Political Science Review*, 2018, Vol. 112, No 1, p. 150-165. [online]. [2019-05-25]. Available at: <https://www.cambridge.org/core/journals/american-political-science-review/article/minimal-persuasive-effects-of-campaign-contact-in-general-elections-evidence-from-49-field-experiments/753665A313C4AB433DBF7110299B7433>.

92 ROSE, A.: *The hyper-personalised future of political campaigning*. [online]. [2019-03-25]. Available at: <https://capx.co/the-hyper-personalised-future-of-political-campaigning/>.

93 RUBINSTEIN, I.: Voter Privacy in the Age of Big Data. In *Wisconsin Law Review,* 2014, Vol. 8, No. 5, p. 862-934. [online]. [2019-04-29]. Available at: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2447956>.

94 *Third-party data marketplace*. Released on 13th June 2019. [online]. [2019-06-25]. Available at: <https://konsole.zendesk.com/hc/en-us/articles/217592967-Third-Party-Data-Marketplac>.

95 BOND, S.: *Google and Facebook build digital ad duopoly.* Released on 14th March 2017. [online]. [2019-05-21]. Available at: <https://www.ft.com/content/30c81d12-08c8-11e7-97d1-5e720a26771b>.

96 CRUPI, A.: *Nielsen buys neuromarketing research company Innerscope.* Released on 27th May 2015. [online]. [2019-05-25]. Available at: <http://adage.com/article/media/nielsen-buys/298771/>.

97 KELSHAW, T.: *Emotion analytics: A powerful tool to augment gut instinct. Think with Google*. [online]. [2019-03-29]. Available at: <https://www.thinkwithgoogle.com/nordics/article/emotion-analytics-a-powerful-tool-to-augment-gut-instinct>.

behavioural communications is using a five-factor personality model, known as 'Ocean', in order to determine "the personality of every single adult in the United States of America".[98]

The model 'Ocean' is able to rate individuals based on five key criteria: openness, conscientiousness, extroversion, agreeableness, and neuroticism. By using digital data, history of voters, and other marketing resources collected from specialized companies like *Nielsen, Aristotle, Facebook, Acxiom*, or *Experian*. After that, the *Cambridge Analytica* is developing an internal database with a very large number of data points, per person, which enables them to shape the advertising content launch through the multiple digital channels.[99] The Advertising Research Foundation recognized the company *Cambridge Analytica* as a leader in this field, providing 'Gold' award in 'Big Data' category in 2017.[100] Frasca pointed out that digital games "will become an increasingly popular platform in the future for political and social comments and activism, as they are becoming more and more present in the households",[101] while Raessens argued that the use of games is in the forefront of social and political issues, a platform for pure fantasy would turn into a medium for social realism and criticism.[102] Many websites and applications today cover politics. Digital media are becoming a leading force in politics in the near future. Apps like *Allyus* are providing a platform that allows users to vote anonymously on issues, putting together petitions. Benjamin Shahin, CEO and Founder of this App said that when a petition reaches a certain level, it may be sent to the right legislator. He also added that Allyus is supported by Block chain technology; therefore, as decentralized technology, it is able to provide the paradigm for the future political process.[103]

It is important to mention that many Apps exist today, that offer politicians an opportunity for cheaper advertising, persuading voters, and fund-raising. One of the most popular tools for fund-raising is CallTime.ai. This tool allows politicians to quickly gain direct access to attention and fund-raising through the application of artificial intelligence to attracting donations.[104] NGP VAN is a web service provider and database with information on democratic voters in the United States. NGP VAN can be used to target messages to voters, within a specific region, on social media. NGP VAN enables members of a political campaign to virtually knock on doors in an area which is impossible to physically visit.[105] Among the software used for political campaign purposes worth mentioning are: *Ecanvasser* (An App that helps in mapping and connecting with a community), *CampaignSidekick* (software for contacting voters and data management), *Crowdskout* (a platform that powers campaigns and advocacy), *Filpac* (software which helps organize the party) etc.[106]

98 ALBRIGHT, J.: *What's missing from the Trump election equation? Let's startwith military-grade psyops*. Released on 11th November 2016. [online]. [2019-04-25]. Available at: <https://medium.com/@d1gi/whats-missing-from-the-trump-election-equation-let-s-start-with-military-grade-psyops-fa22090c8c17>.

99 *Cambridge Analytica: Make America number one.* [online]. [2019-03-27]. Available at: <https://www.warc.com/content/paywall/article/cambridge_analytica_make_america_number_one/110517>.

100 *Cambridge Analytica Receives Top Honor in the 2017 ARF David Ogilvy Awards*. [online]. [2019-03-25]. Available at: <https://www.prnewswire.com/news-releases/cambridge-analytica-receives-top-honor-in-the-2017-arf-david-ogilvy-awards-300426997.html>.

101 FRASCA, G.: *Geeks not just game for a laugh*. [online]. [2019-05-19]. Available at: <http://www.theage.com.au/articles/2005/03/21/1111253952027.html>.

102 RAESSENS, J.: Reality play: documentary computer games beyond fact and fiction. In *Popular Communication,* 2006, Vol. 4, No. 3, p. 214-222.

103 ARMSTRONG, P.: *How Technology Is Really Going to Change Politics in The Next 20 Years*. [online]. [2019-11-09]. Available at: <https://www.forbes.com/sites/paularmstrongtech/2018/03/01/how-technology-is-really-going-to-change-politics-in-the-next-20-years/#1d1593331eb3>.

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Conclusion

Rapid changes in technology and new media require scholars to update their knowledge and the direction of future approaches in the field of political marketing. Marketers should focus their research and development efforts on new technologies, such as artificial intelligence, virtual reality, cognitive computing, digital gaming, in order to better understand digital practices and their influence on the political process for advertising purposes. Modern political marketing has quickly learned that digital games could be one of the main tools of political communication. Today digital game players have a high degree of political engagement. Digital games "will become an increasingly popular platform in the future for political and social comments and activism, as they become more and more present in the households".[107] Political candidates, in the near future, may be able to interact with voters in virtual worlds and customize the political message to each voter separately. With recent technological innovations and industry advances, political campaigns have started using micro-targeting techniques, which use an array of personalized and other data sets and marketing applications to influence the actions of individuals.[108] Neuroscience represents another scientific field that might help political marketing professionals in the near future to recognize hidden thoughts and aspirations of their voters by using methods of neuromarketing, data analytics or behavioural tracking. "Neuromarketing provides important methodological advantages over the traditional methods of qualitative consumer research. However, like the other cases with the use of any developing technology, the excitement and optimism must be balanced".[109] It is hard to expect that people will abandon television and print newspapers, and completely replace traditional sources with new media, but it is of great importance to adapt to new contemporary challenges. Almost two decades ago, Joost Raessens argued that the use of games is at the forefront of social and political issues, a platform for pure fantasy would turn into a medium for social realism and criticism.[110] With the technology still in its developmental stage, it seems future possibilities in the digital gaming industry are limitless.[111]

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Easter Eggs in Digital Games as a Form of Textual Transcendence (Case Study)

Zdenko Mago

Mgr. Zdenko Mago, PhD.
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Námestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
zdenko.mago@ucm.sk

Zdenko Mago is an assistant professor at the Faculty of Mass Media Communication at the University of Ss. Cyril and Methodius in Trnava, Slovakia. He particularly focuses on interconnections of games studies and marketing communication. In 2014 and 2017, he was a program committee member of the international scientific conference Central and Eastern European Games Studies. At the beginning of 2018, he acted as a visiting researcher at Ritsumeikan University in Kyoto, Japan. Currently he is editor-in-chief of the scientific journal Acta Ludologica.

ABSTRACT:
Easter eggs are a well-known and popular phenomenon throughout the whole of pop culture, and the interactive nature of digital games unleashes the full potential of their implementation, as well as integrating them into the gamers' experience. The study focuses on Easter eggs in digital games from a structural point of view to understand them on the fundamental text level. With this aim, the analysis consists of applying Genette's textual transcendence to a specific digital game, The Talos Principle. The paper represents part of the introductory theoretical framework to the following research on comprehensive Easter eggs' classification.

KEY WORDS:
digital games, Easter eggs, textual transcendence, The Talos Principle, transtextuality.

Introduction

Easter eggs are hidden elements implemented particularly in outcomes of pop culture (comics, movies, etc.), but can also be discovered in other spheres, such as computer software (e.g., the hidden flight simulator game in MS Excel 97). They are, however, usually associated with digital games.[1] This figurative (media) meaning of Easter eggs is more recent, coming from the Easter traditions of Western Europe and the United States, which contain non-Christian elements like the myth of the Easter bunny and practicing Easter egg hunts. The establishment of these traditions is associated with the late 19th century, although decorating eggs' traditions are represented in some form within history, cultures, and folklore across Europe, going back to the Hebrews and the Persians.[2] Easter eggs are intended to be found and, in digital games, act as a certain reward for gamers who willingly spend their time playing any game, not just for its basic purpose – to win (beat the game), but trying to uncover everything that the game offers. The first Easter egg in a digital game was created by W. Robinett in 1979, who hid a simple text, an author's signature, 'Created by Warren Robinett' in the Atari game *Adventure*[3].[4] Since then, Easter eggs have become a common part of digital games, the interactive nature of which enables their implementation in numerous ways. Their integration into the gamers' experience has also expanded. For some specific types of gamers like 'Easter egg hunters', the search for Easter eggs becomes even the primary motivation for playing digital games.

Definitions of Easter eggs are unified regarding their hidden, secret and surprising characteristics, but they often diverge in their general naming of these elements, e.g., messages, objects, interactions, tricks and unusual behaviours.[5] The reason is that Easter

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5 BOGOST, I., MONTFORT, N.: *Racing the Beam: The Atari Video Computer System*. Cambridge : The MIT Press, 2009, p. 59.; NOONEY, L.: Easter Eggs. In RYAN, M.-L., EMERSON, L., ROBERTSON, B. J. (eds.): *The Johns Hopkins guide to digital media*. Baltimore : The Johns Hopkins University Press, 2014, p. 165.

eggs have no constant form. Their design is subject to the game in which they are implemented, and their final processing also depends on the intended purpose of each Easter egg. One of the ways to research their existence within digital games might be to think about them as one would think about a text. According to J. Švelch, digital games can be considered as media, because they are characterized by typical methods of production, distribution, and marketing, and by specific content, differentiating them from other software and traditional media.[6] Within media practice, any media product (including digital games) consists of a media text that can be examined. From the ludological perspective, E. Aarseth defines digital games as *cybertext* – a specific form of text also reflecting interactivity, a fundamental part of games.[7] Because Easter eggs are an integrated part of digital games, from both communication-related as well as ludological points of view, they can be considered as a text that is in some relation with other texts either internal or external (outside the game). Such an approach shifts research of Easter eggs in digital games to the structural level.

Easter Eggs and Textual Transcendence within The Talos Principle

For a better understanding of Easter eggs in digital games in terms of text, we focus on identifying intertextual relationships, which exist between Easter eggs, digital games in which they are integrated, and out-game texts (e.g., other pop culture artifacts) as well. Easter eggs have already been marginally interpreted as intertextual recognitions and surrounding texts (paratexts),[8] but it does not seem to be a comprehensive enough approach. Therefore, we apply to this issue the entire theory of *textual transcendence*, still considered the most comprehensive system describing intertextual relationships. G. Genette defines transtextuality as everything that brings text into relation (manifest or hidden) with other texts.[9] The research question is formulated as follows: *Is it possible to characterize Easter Eggs in digital games by all types of transtextuality?* Genette distinguishes five types of transtextual relations, namely *intertextuality*, *paratextuality*, *metatextuality*, *hypertextuality*, and *architextuality*, which reflect increasing abstraction, implication, and comprehensiveness.[10] We use these types as categories for the qualitative content analysis of Easter eggs within a specific digital game's case – *The Talos Principle*[11]. It is a philosophical narrative-based first-/third-person puzzle digital game developed in 2014 by the Croteam studio, with average ratings over 80%. During gameplay, the player controls an unnamed android and explores a mysterious calm world, in which he has to deal with a number of puzzles. It includes a lot of features, mechanics and visual settings (dimension, perspective, etc.), typical for many games and game genres, therefore

6 ŠVELCH, J.: Počítačové hry jako nová médiá. In *Mediální Studia*, 2008, Vol. 3, No. 1, p. 13-14.
7 AARSETH, E.: *Cybertext: Perspectives on Ergodic Literature*. Baltimore : The Johns Hopkins University Press, 1997, p. 216.
8 CONWAY, S.: A circular wall? Reformulating the fourth wall for videogames. In *Journal of Gaming and Virtual Worlds*, 2010, Vol. 2, No. 2, p. 146-154.; CONSALVO, M.: *Cheating: Gaining Advantage in Video Games*. Cambridge : The MIT Press, 2007, p. 240.
9 GENETTE, G.: *The Architext: An Introduction*. Berkeley : University of California Press, 1992, p. 81.
10 GENETTE, G.: *Palimpsests: Literature in the Second Degree*. Lincoln : University of Nebraska Press, 1997, p. 1.
11 CROTEAM: *The Talos Principle*. [digital game]. Austin : Devolver Digital, 2014.

despite the qualitative character of the analysis, its results might be valid in the wider context of understanding Easter eggs in digital games.

Intertextuality

Intertextuality defines the most common intertextual relationships, which are present in all functional styles of language and text types. G. Genette understands intertextuality as a simultaneous occurrence of two (or several) texts, thus the presence of one text in another. He determined three forms of intertextuality – quoting, plagiarism, and allusions.[12] Although intertextuality cannot describe the first Easter eggs, like Robinett's, it certainly describes the most prevalent Easter eggs' implementations in the present. Simple extradiegetic references or gags incorporated in games are often referred as Easter eggs by gamers themselves.[13] In The Talos Principle – World B-6, after climbing columns on the roof of an Egyptian temple, the door to a modern living room appears containing *Serious Sam*[14] game series items – photos of the main character, showcases with weapons and heads of monsters like trophies. There are dozens of Easter eggs alluding to Serious Sam in The Talos Principle because both games have the same developer, but there are also references to other media products. The Talos Principle – World B-5, a small part of the temple is sticking out of the water wherein a player can discover a sightseeing binocular machine. When he looks through it, he sees half of the Statue of Liberty on the opposite shore, obviously referring to the iconic movie *Planet of the Apes*[15].

Some Easter eggs may be created as multiple references, like the secret room in The Talos Principle – World B-7. The gamer must find the crowbar marked as 'CRObar' (a reference to developer Croteam), and then use it to knock down a wooden door to an underground room, where cubes (thematic items) from several games are exposed, e.g., *Portal*[16], *Minecraft*[17], and Serious Sam. Even not so hidden references, as Easter eggs used to be, belong under intertextuality. In such cases, the hiddenness is supplanted by the implicitness of reference meaning, which often requires considerable knowledge of pop culture as a whole or notable experience with various pop-cultural products. After solving the secret puzzle in The Talos Principle – World B-5, the gamer will enter a dark cave, where an outline pyramid bends a light beam into the colour spectrum as a glass prism. The scene is a representation of Pink Floyd's eighth album cover, *Dark Side of the Moon*[18], the meaning of which is as similarly mysterious as The Talos Principle.

Paratextuality

Paratextuality is probably the simplest way to define the relationship between digital games and Easter eggs. According to G. Genette, paratexts are texts accompanying the

12 GENETTE, G.: *Palimpsests: Literature in the Second Degree*. Lincoln : University of Nebraska Press, 1997, p. 1-2.
13 NOONEY, L.: Easter Eggs. In RYAN, M.-L., EMERSON, L., ROBERTSON, B. J. (eds.): *The Johns Hopkins guide to digital media*. Baltimore : The Johns Hopkins University Press, 2014, p. 166.
14 CROTEAM: *Serious Sam: The First Encounter*. [digital game]. New York : Gathering of Developers, 2001.
15 SCHAFFNER, F. J. (Director): *Planet of the Apes*. [DVD]. Los Angeles : 20th Century Fox, 1968.
16 VALVE CORPORATION: *Portal*. [digital game]. Bellevue : Valve Corporation, 2007.
17 MOJANG: *Minecraft*. [digital game]. Stockholm : Mojang. 2011.
18 PINK FLOYD: *Dark Side of the Moon*. [CD]. London : Abbey Road Studios, 1973.

original text, e.g., a title, author's name, a table of content, an introduction, notes, covers or illustrations, which provide the main text and extend recipients' experience with it.[19] M. Consalvo considers Genette's conceptualization of the paratext as a better way to think about texts surrounding the game industry, and includes Easter eggs to paratexts, along with cheats.[20] "The Easter egg and its eager reception set the stage for a paratextual industry to spring up, to alert players about what to look for in games, help them through the games, and in the process, shape and stabilize a game market that would need assistance after the crash of the industry in the early 1980s".[21] Numerous QR codes placed across the entire The Talos Principle belong to the most obvious examples of paratextual Easter eggs. They contain various types of texts (notes, epitaphs, etc.) extending the main game storytelling, nevertheless, some of them are not so easy to find. A different example is situated in World C-4. There is a secret square with a balcony with photos of game developers hanging on a clothesline (the printed part of the photos is visible only from the wall side). In a semiotic sense, the image is just another text, thus this Easter Egg represents a similar (if not the same) paratext to Robinett's signature in Adventure.

An interesting example is a floppy disc labelled as 'Top Secret' that can be discovered in The Talos Principle – World A-4 when the player takes the trial of the walls' tops. The disc content can be displayed on a nearby computer, and (among others) contains photos of some kittens. The white cat is a philosophical part of the game's central theme, included in the game's cover and posters. As developers from Croteam posted later, a cat should originally have had a bigger role in the game. Although this plan got scrapped, they still wanted the already made poster to communicate the idea of an android with feelings, hinting at the whole premise of the game.[22] The abovementioned floppy disc Easter egg is thus in line with Genette's understanding of paratext, as an accompanying text that makes it easier to reveal or understand the meaning of the text, a part of which it is.[23] This Easter egg refers to another appearing later within gameplay (World B-7) – the secret room, where the player can release the cat from a box as a result of which the secret ending of the game becomes available to him. However, that Easter egg already has more metatextual character.

Metatextuality

The next transtextual relationship, *metatextuality*, "unites a given text to another, of which it speaks without necessarily citing it (without summoning it), in fact sometimes even without naming it".[24] Regarding metatextual relations, Easter eggs usually refer to the game in which they are implemented (including features, mechanics, etc.). As an example, we might consider the Easter egg in The Talos Principle – World B-7. There is a palm tree next to an Egyptian obelisk not too far from the main route to the pyramid. A table with the inscription 'DONT LOOKUP' is nailed to the trunk. When the player directs the camera up, a coconut immediately falls on the player's character, and the blurred vision will be simulated for a short time. A specific metatextual case occurs, when an Easter egg alludes to itself, in

19 GENETTE, G.: *Paratexts: Thresholds of Interpretation*. Cambridge : Cambridge University Press, 1997, p. 427.
20 CONSALVO, M.: *Cheating: Gaining Advantage in Video Games*. Cambridge : The MIT Press, 2007, p. 240.
21 Ibidem, p. 20.
22 *The cat is (not) a lie*. [online]. [2019-03-30]. Available at: <http://www.croteam.com/cat-not-lie/>.
23 GENETTE, G.: *Paratexts: Thresholds of Interpretation*. Cambridge : Cambridge University Press, 1997, p. 427.
24 GENETTE, G.: *Palimpsests: Literature in the Second Degree*. Lincoln : University of Nebraska Press, 1997, p. 4.

both literal and figurative meanings of Easter Eggs. S. Conway uses the term 'meta-eggs'.[25] S. Conway uses the term meta-eggs. For example, in The Talos Principle – World A-4, a bird's nest with a decorated Easter egg can be found. Similar Easter eggs in digital games are uncommon, but not so rare. A different metatext is situated in the part 'Tower'. The gamer has to jump over the railing and, after a long fall, lands on the roof of the third floor to discover the hidden QR code. Unlike other QR codes in-game, the message of this one looks like partially encrypted or damaged information. Nevertheless, phrases like 'fall down here', 'this area look very gl#tchy', 'secret/easte&$egg here' were purposely readable.

Hypertextuality

Hypertextuality is defined by G. Genette as any relationship of newer text (hypertext) to an older one (hypotext), but not like a commentary. He distinguishes two basic types – transformation (deformation) and imitation, realized by ludic, satiric, or serious methods, combinations of which six techniques (genres) of architextuality are formed (Table 1).[26]

Table 1: The structure of Genette's concept of hypertextuality

	Relation type	Function	Technique (genre)
Hypertextuality	transformation	ludic	parody
		satiric	travesty
		serious	transposition
	imitation	ludic	pastiche
		satiric	persiflage, caricature
		serious	forgery

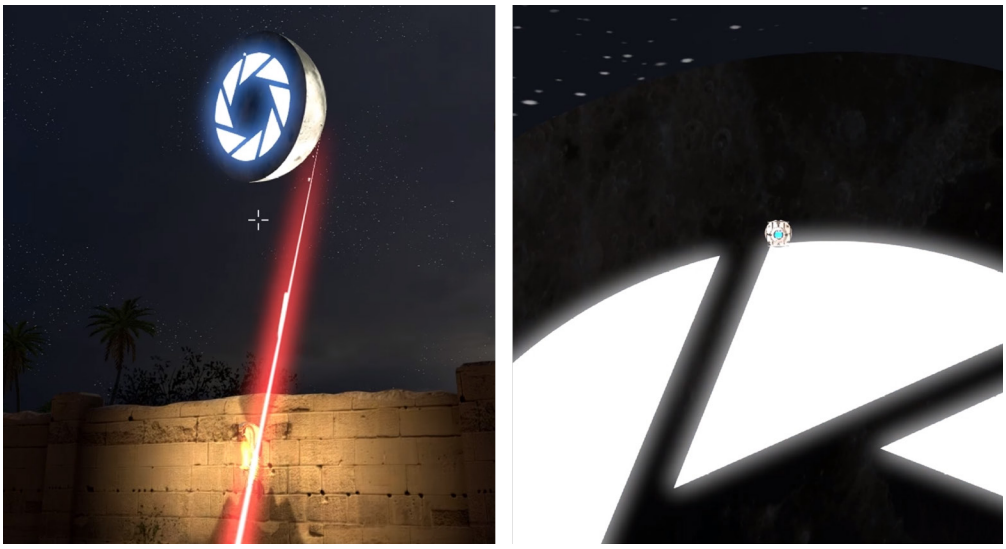
Source: own processing; GENETTE, G.: *Palimpsests: Literature in the Second Degree.* Lincoln : University of Nebraska Press, 1997, p. 490.

Easter eggs as hypertexts are generally very frequent in digital games, especially regarding a form of parody, thus they are sometimes defined as joyful parodic allusions.[27] For example, at the beginning of The Talos Principle – World C-3, Gnaar (one of the Serious Sam's monsters) hanging from the cliff may be discovered. When the player comes to close him, Gnaar says 'Fly you fools!' and then falls, apparently parodying the scene of Gandalf's fall from the movie *The Lord of the Rings: The Fellowship of the Ring*[28]. Also not so far from there, in the cave under the cliff, the player can find some high-tech sarcophagus of a man wearing sunglasses with raised hands. The man's appearance indicates referring to the main character of the Serious Sam game series, and at the same time, parodying Han Solo frozen in carbonite from another iconic movie *Star Wars: Episode V – The Empire Strikes Back*[29].

25 CONWAY, S.: A circular wall? Reformulating the fourth wall for videogames. In *Journal of Gaming and Virtual Worlds*, 2010, Vol. 2, No. 2, p. 152.
26 GENETTE, G.: *Palimpsests: Literature in the Second Degree*. Lincoln : University of Nebraska Press, 1997, p. 5-12.
27 URIBE-JONGBLOED, E., SCHOLZ, T. M., ESPINOSA-MEDINA, H. D.: The Joy of the Easter Egg and the Pain of Numb Hands: The Augmentation and Limitation of Reality Through Video Games. In *Palabra Clave*, 2015, Vol. 18, No. 4, p. 1179.
28 JACKSON, P. (Director): *The Lord of the Rings: The Fellowship of the Ring*. [DVD]. Burbank : New Line Cinema, 2001.
29 KERSHNER, I. (Director): *Star Wars: Episode V – The Empire Strikes Back*. [DVD]. Los Angeles : Twentieth Century Fox Home Entertainment, 1980.

Architextuality

G. Genette sees *architextuality* as the most abstract and implicit of all transtextual relationships. It includes the entire set of transcendent categories (types of discourse, modes of enunciation, literary genres, etc.) to which individual texts belong and take over certain characteristics from them. Due to that, he was originally using the term architextuality instead of transtextuality but later classed it as a type of transtextuality. G. Genette also emphasizes that an architextual relationship is not obvious, rather expressed by other transtextual relationships, mostly paratexts.[30] An affiliation to the genre (literary, film, game, etc.) is perhaps the best observable illustration of architextuality regarding Easter eggs in digital games. The Easter egg located in The Talos Principle – World B-2 consists of two parts. First, when the player aims a connector at the side of the Moon in the night sky, it starts to rotate, and a luminous symbol will appear. The symbol refers to the logo of Aperture Science Laboratories from the game Portal. Then, if the player finds a key, he can use a sightseeing binocular machine placed on the wall to look closer at the Moon, now actually on the Portal logo. On its top, a small spherical robotic eye (so-called 'personality core') named Wheatley, from *Portal 2*[31], can be seen (Picture 1). It could be initially considered as an intertextual reference, but it just articulates an architextual one, referring to the mutual genre of both games, and possibly to the significantly similar design, including androids, puzzles, artificial intelligence, etc.



Picture 1: Architextual Easter egg in the game The Talos Principle

Source: author's screenshots; CROTEAM: *The Talos Principle.* [digital game]. Austin : Devolver Digital, 2014.

Additionally, other interesting transtextual relationships should be identified here as well. The puzzle title 'Moonshot' is a paratext to the game The Talos Principle, referring to the mentioned Easter egg in an intertextual way. Further analysis of this example even indicates that the previously mentioned Easter egg, Pink Floyd's Dark Side of the Moon,

30 GENETTE, G.: *Palimpsests: Literature in the Second Degree*. Lincoln : University of Nebraska Press, 1997, p. 1-4.

31 VALVE CORPORATION: *Portal 2*. [digital game]. Bellevue : Valve Corporation, 2011.

placed earlier in the game, might act as another clue or inspiration for players to find out how to look at the other side of the Moon. That can be interpreted as an intertextual, paratextual, even metatextual relationship.

Discussion

The conducted analysis showed that Easter eggs can be described by all five types of textual transcendence. It means that transtextuality seems to be the more effective and comprehensive tool to define the Easter eggs phenomenon, rather than just paratextuality as stated by M. Consalvo,[32] or the simplest understanding of Easter eggs through the widest conceptualisation of intertextuality,[33] among others reflected in the most common approach of gamers towards them (based on the observation of gaming portals' content including Easter eggs). Additionally, as The Talos Principle case proved, individual Easter Eggs' implementations even within one digital game may reflect all types of transtextual relationships. Evidence that the relationship between Easter eggs and digital games can be understood within the transtextuality suggests their deeper mutual structural interconnection. On the one hand, this can explain the frequent linking of the Easter eggs' existence just with digital games in general, possibly in the sense of self-reference.[34] On the other hand, the last analysed Easter egg example, 'Moonshot', included in multiple transtextual relationships at the same time – between Easter eggs and digital games, between Easter eggs themselves, and between Easter eggs and pop culture. It seems these relations are not being created just within the inward structure, but outwards at the same time, particularly related to pop culture and its artifacts. In the context of pop culture, transtextuality could be understood as a tool or way that contributes to creating fictional canons, and it would mean that Easter eggs might have the same purpose.

Conclusion

Easter eggs are popular phenomena throughout the entire pop culture; however, they are currently usually associated particularly with digital games, which enable the utilization of their whole potential. Taking into account that on a structural (textual) level, Easter eggs can be considered as a text from both the communication-related as well as the ludological points of view, they might be analysed based on intertextual relationships. To examine if it is possible to characterize Easter Eggs in digital games by all types of Genette's theory of textual transcendence, the study utilized a qualitative content analysis of Easter eggs in digital games within categories of intertextuality, paratextuality, metatextuality, hypertextuality, and architextuality, utilizing the game The Talos Principle as the research material. The results show that all transtextual relationships are applicable to describe individual Easter eggs' integrations in digital games, even within a single game. We further found an implementation of an Easter egg that included multiple

32 CONSALVO, M.: *Cheating: Gaining Advantage in Video Games*. Cambridge : The MIT Press, 2007, p. 240.
33 KRISTEVA, J.: *Sèmèiotikè. Recherche pour une sémanalyse*. Paris : Seuil, 1969, p. 145-173.; BARTHES, R.: *Le plaisir du texte*. Paris : Seuil, 1973, p. 112.; CONWAY, S.: A circular wall? Reformulating the fourth wall for videogames. In *Journal of Gaming and Virtual Worlds*, 2010, Vol. 2, No. 2, p. 146-154.
34 SANTAELLA, L.: Computer Games: The epitome of self-reference. In NÖTH, W., BISHARA, N. (eds): *Self-reference in the Media*. Berlin : Walter de Gruyter GmbH & Co., 2007, p. 206-217.

transtextual relations between it, the game and other Easter eggs. It indicates deeper structural interconnections both inwards (to the game and its design elements) and outwards (to other artifacts or eventually to the entire pop culture). Referential examples from the game The Talos Principle, used as illustrations within the analysis, revealed that the meaning of Easter eggs, as well as their intended purpose (even commercial), might play an important role during the process of their design and following their implementation. In conclusion, transtextual relations on their own might not be sufficient to base on them the classification of Easter eggs in digital games, but we consider them as an important part of a fundamental theoretical framework that we must extend by Easter eggs' levels of meanings, functions and the pragmatics (or purposes), to be able to later create a comprehensive classification of Easter eggs in digital games.

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In-World Marketing in Second Life

Alexandra Alföldiová, Andrej Trnka

Mgr. Alexandra Alföldiová
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Námestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
alexandra.alfoldiova@student.ucm.sk

Alexandra Alföldiová is a PhD student of the Theory of Digital Games. She focuses on several topics, primary eco-innovations in the digital game environment aimed at raising public awareness of the possibilities of environmental protection and her dissertation thesis elaborates the issues of the incentives of gaming in the virtual environment of Second Life. As a lecturer, she was involved in the international project LoGaSET, which teaches seniors to work with touchscreen smartphones and mobile applications. She is actively engaged in 3D modelling, photoshop editing, virtual marketing, new technologies, and the gaming industry.

assoc. prof. Ing. Andrej Trnka, PhD.
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Námestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
andrej.trnka@ucm.sk

Assoc. prof. Andrej Trnka specializes in statistical data processing, data mining and its applications in marketing, and research in online consumer behaviour. Currently, he is the head of the Department of Digital Games, Faculty of Mass Media Communication at the University of Cyril and Methodius in Trnava, and teaches courses of mass media informatics, media informatics, and the fundamentals of algorithmization.

ABSTRACT:
The aim of this exploratory study is to identify the main advertising tools used in-world the in the virtual world Second Life. The main categories of products and services available within the world were defined and divided: the advertising opportunities into free marketing tools, official tools and in-world marketing tools. Second Life creates a unique platform, which allows the creation of a virtual business with profits in real life. Advertising and in-world marketing offers them the option to promote virtual goods. The main marketing tools within the virtual environment are defined and elaborated with specific cases. The lack of literature related to Second Life is visible in the sources and the environment is still unexplored, therefore we used personal experience from our 11 year presence within the virtual environment and virtual business in Second Life.

KEY WORDS:
advertising, in-world, marketing, marketing tools, second life, virtual business, virtual world.

Introduction

The contemporary age allows people to simulate many experiences that would otherwise be out of reach. These simulations mainly revolve around sports, some of the most common being contact sports and motor sports for entertainment. Other simulations can be more focused on therapeutic needs used in the treatment of trauma or phobias such as arachnophobia, for example. More uncommon is to simulate the experience of a human life, one of the most famous and successful simulations of this type was introduced to audiences via the video game *The Sims*[1] in 2000 by Maxis, EA.[2] The Sims can perhaps be better described as a God type game, this is a genus of games where the player assumes the position of an omnipresent entity that controls simulated life forms within the simulation with varying degrees of micromanagement. In the specific case of The Sims, the player had the opportunity to create individuals within the simulation better known as Sims, these Sims are semi-autonomous and have simulated needs such as sleep or eating, but a great level of control exists regarding their interactions with other Sims within the simulation, or their activities at any given time. The player can also choose the career path of their Sims that would earn them in game currency to be used for home improvements. The player could then simulate a human life, even if very limited in scope. The original game didn't have an aging system; a Sim wouldn't grow old no matter how long it existed. Another limitation The Sims had when it came to simulate a human life was the fact that it was a single player game, therefore the Sims created and controlled by a player could never have social interaction with other players' Sims.

The American corporation Linden Research led by Phillip Rosedale, released the virtual world *Second Life*[3], in 2003, which allowed people to create a virtual character, known as an avatar, join in the virtual environment for free, meet other users, interact with them, create objects, build things like structures, vehicles, apparel among others and expand

1 MAXIS: *The Sims*. [digital game]. Redwood City : Electronic Arts, 2000.
2 *The Sims*. [online]. [2019-11-01]. Available at: <https://www.ea.com/news/history-of-the-sims>.
3 LINDEN LAB: *Second Life*. [virtual world]. San Francisco : Linden Lab, 2003.

the virtual world shaping it and making it their own. The virtual world Second Life is not categorized as a digital game, due the lack of attributes a digital game has to meet that definition and are absent from Second Life.[4] Second Life is a social 3D platform, which offers unlimited options of activities for users to experience. The difference between the virtual world Second Life and other virtual worlds is primarily the economic aspect of the environment, the user can build things and sell those things to each other making this platform almost entirely user created. The adaptation of rights of the author on created objects encourages its users to develop their creations and market them to each other. This possibility allows Second Life users to join the virtual market and build a virtual business along with experiencing advertising within the virtual environment.[5]

Second Life Virtual Business

The beginning of awareness of the virtual world Second Life was in 2007, when the TV series CSI New York released an episode called 'Down the Rabbit Hole'[6], which was entirely located in Second Life. The Second Life statistics state the number of users before the episode was released was 10,256,844 and within a month the number of members increased to 11,081,556. While the average of new accounts registration since Second Life was released till 23rd October 2007 was 661 members per day, from 24th October 2007 till 23rd November 2007 the average of new account registration was 26,603 per day. The increase in account registration was 3924.5%.[7] The total number of Second Life users is over 60 million, and around 900,000 accounts log in daily.[8] The Second Life users when joining the market by offering virtual goods created by them or buying goods created by others in the form of objects/products or services use the virtual currency called Linden Dollars used specifically in Second Life. Based on the available market rates, the average exchange rate of the Linden Dollar is L$253/US$1. According to Linden Lab, in 2009, "the total size of the Second Life economy grew 65% to US$567 million, about 25% of the entire U.S. virtual goods market".[9] The main forms of virtual products sold in Second Life are:

- *Avatar Appearance and Components* – body parts that personalize the avatar: mesh heads, mesh bodies, hands, eyes, hair, make up, tattoo,
- *Apparel* – objects that style the avatar's appearance: clothing, shoes, costumes,
- *Accessories* – detailed styling of avatar: earrings, bracelets, watches, bags, hats,
- *Animals* – as simple decorative static objects to enrich the virtual environment visually or advanced objects that can be script driven to animate, move and be interacted with,
- *House and Garden* – objects created specifically to be placed in the world with living or decorative purposes shaping the environment: buildings, trees, furniture, decorations, vehicles,

4 *Second Life*. [online]. [2019-11-01]. Available at: <http://wiki.secondlife.com/wiki/History_of_Second_Life>.
5 BARTLE, R.: *Designing Virtual Worlds*. Boston : New Riders Publishing, 2003, p. 45.
6 VON ANCKEN, D., SCOTT, O., GLASSNER, J., BAILEY, R., MOORE, C., DANTE, J., HUNT, J., HEMINGWAY, A., ADAMS, M. (Directors): *CSI: NY The Fourth Season.* [DVD]. Monica : CBS Television Distribution, 2008.
7 NINO, T.: *Population Statistics*. [online]. [2019-11-01]. Available at: <http://taterunino.net/raw_population.txt>.
8 NINO, T.: *Second Life Statistics*. [online]. [2019-11-01]. Available at: <http://dwellonit.taterunino.net/sl-statistical-charts/>.
9 BOELLSTORFF, T.: C*oming of Age in Second Life an Anthropologist Explores the Virtually Human.* Princeton : Princeton University Press, 2015, p. 212.

- *Scripts and technical gadgets* – scripts based on coded algorithms written in LL proprietary language, Linden Scripting Language, abbreviated as LSL that add functionality to objects, and allows them to give features to the objects or parts of an avatar,
- *Service* – services offered in world for members to hire in order to learn, style, entertain, such as: assorted courses, landscaping, live performances,
- *Real Estate* – offering virtual land or sims for rent or sale.[10]

A user who creates a virtual item is automatically marked in the description of the object as the creator and has the fundamental right to decide on the permissions allowed to be used by other users who purchase the product. Each object has three permissions – Copy, Modify and Transfer, which are set by the creator. The Copy permission allows other users to create unlimited number of copies of the item. The Modify permission allows users to modify the object, including re-texturing, resizing, adding scripts, and link them with other objects. The Transfer permission allows the users to send the object to someone else, therefore the object can be sold again this produced a sizable second-hand market for these virtual objects with some users even making investments for later profit.[11] The preferred permissions set on most of the objects are Copy, Modify and No-Transfer, meaning the person who purchased the product can create copies of it, and modify those. The ability to create copies allows not only to account for any mistakes made when the object is being modified but it also allows a number of different copies with different modifications to be had. Once the object is marked as No-Transfer, the members are unable to trade the objects and they remain in their inventory. In case the item has all three permissions allowed, the item becomes what is described as 'full perm' meaning the other users can edit, trade or resell the object in most cases unless the original creator has made a provision for its use disallowing the item to be resold as is without modifications.

The virtual environment allows two markets to sell the items, in-world selling where there is a presence of the store in the virtual world and though the online Marketplace which can be viewed in any modern browser or the built in one on the Second Life viewer. One other option that is used more as a novelty than anything else, is the ability to have an object in the virtual world 3D modelled to look like a table, phone or computer and then use the screen of such an object to browse the web, including the Second Life Marketplace which creates a situation where an avatar in the virtual world is using a virtual object's screen to browse the internet to access a webpage of the virtual world's market to buy a virtual item.[12] In Second Life, the world is divided in regions, 256 by 256 meters in surface area and 4096 meters high. Each region has a limit of objects it can contain; different objects will contribute to this limit in different amounts, the metric of which is called 'Land Impact' abbreviated to LI. These regions are often called 'sims'. These sims can be sub-dived into parcels by their owners, these parcels will not only create a surface area but will have their own LI limits allocated to them. These parcels can then be rented out to individuals, their perceived value is not just dependent on the surface area, but as much if not more about their allocated LI limit. Selling in-world requires a virtual store or a rented showroom, where the creator displays the items for sale. The most common practice is to rent a parcel in a shopping district with higher traffic of potential buyers or rent an entire sim alone or with other brands and create their own shopping district. This system is flexible enough to accommodate the needs of any creator which can vary depending on the

10 GAJENDRA, S., SUN, W., LU, Q.: Communication in Second Life and E-business Opportunities: A Case Analysis. In *Information Technology Journal*, 2011, Vol. 10, No. 3, p. 501-502.

11 DE MESA, A.: *Brand Avatar: Translating Virtual World Branding Into Real World Success*. New York : Palgrave Macmillan, 2009, p. 32.

12 HUCKLEBERRY, H.: *Second Life is a Place We Visit.* Morrisville : Lulu Press, Inc., 2015, p. 40.

nature of the specific products they are trying to sell. While business owners that trade in smaller objects such as clothes or shoes can do so in small parcels with pictures alone while providing demos for other users to sample the products in their own avatars, other creators that trade in larger objects such as buildings, motor vehicles or decorative flora prefer to rent larger parcels or even full sims so they can display their items in world at their full size for the customers to see exactly how they look.

The second market is the online webpage Second Life Marketplace, which is the only official online website connected to Second Life used to purchase products out-of-world. The Marketplace allows the users to upload their products, add them to categories and let the members search the product based on set keywords. Creating a virtual store in the marketplace is for free, but there is a 5% fee from sales, which is applied directly to every purchase. The advantage of having a store in the marketplace is the creator does not have any expenses while maintaining it and the only the applied fee from the actual purchases. One of the disadvantages of having a store in the marketplace only is the categorization of products and in case the product does not have a set of correct key words, it will not be displayed in the search results, therefore the profits will be low. The best solution is to have a mix of both in-world stores with a supported up-to-date marketplace, where all the items will be listed for sale as well. Since the in-world store is limited to Land Impact, retired releases can be moved to the marketplace only and recent releases be made available in world.

Methodology

The exploratory study focuses on the types of marketing tools available in the Second Life virtual world and the way they are applied. Based on the analysis of secondary sources, we define the basic concepts associated with the virtual environment and the ways of using marketing tools. The data is furthermore collected from structured interviews with the owners of L'Homme Magazine and Miss Organisation, who give deeper insight into the pricing and forms of advertisement in their types of virtual media. Lastly, we examine the ways of advertising in-world and gather knowledge from main sources and possible marketing tools and options inside the virtual environment by participating observation within the virtual world for over 10 years. We formulated the following research question: *Which of the available marketing tools are the most applicable for promotion in Second Life?*

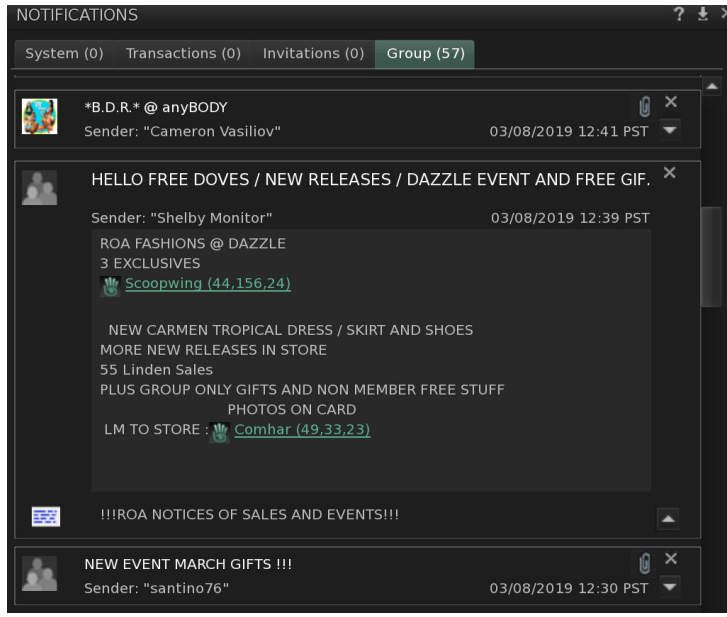
In-World Marketing Tools

Second Life offers multiple marketing tools to be used to spread information within the gathered community. One of the main communication tools, as well as a marketing tool, is a Group. A Group can be created by anyone and everyone in the community and it costs 100 L$. Each user has a limit of groups they can join, 42 for a free basic Second Life account or 70 for a premium Second Life account,[13] the cost of which is 99,99 USD/year.[14]

13 LINDEN, L.: *Group Limits Update: No Changes for Basic Members*. [online]. [2019-11-01]. Available at: <https://community.secondlife.com/blogs/entry/2559-group-limits-update-no-changes-for-basic-members/>.

14 *Premium Account Pricing*. [online]. [2019-11-01]. Available at: <https://secondlife.com/premium/>.

A Group can be set to allow in users in three different ways. Open for anyone to join freely, set with a joining fee which is a one-time payment a user must make to join that group, or by invite only. One of the features of a Group is the ability to create Roles within it; the Group owner can create several Roles and specify what abilities each Role has within the group from a wide range of managing features. Members of the group can be assigned to these Roles by the owner and some Roles can even have the ability to assign members themselves. Another feature of a Group is the ability to send out Group Notices, these notices pop-up in a window for the members (provided they didn't opt out of receiving them) and can include attachments such as text files or objects (Picture 1).



Picture 1: In-World Group Notices

Source: author's screenshots; LINDEN LAB: *Second Life*. [virtual world]. San Francisco : Linden Lab, 2003.

Since the notice feature itself has a low character limit, text files can be attached to the notice when there is such a need for a larger body of text. Objects like demos for the users to try on their avatars or to see how they look in world can also be sent as well as full featured gift items. Landmarks, the Second Life version of a common web browser bookmark, can also be sent, these when used allow an avatar to auto transport itself to a location in world, described in Second Life as teleporting. The Group has an option to create a group chat within the community to meet and greet the creator, chat about the brand, or have the customers help each other. When a user belongs to a group in Second Life, there are also other abilities that can be set or unlocked, for example, a parcel can be set to only allow inside avatars that belongs to a certain group, or objects can be set to only allow themselves to be interacted with if an avatar belongs to a certain group. Having these abilities a Group can further help promote the brand via group gifts located in world and set to the brand Group, meaning only the members can claim these gifts thus alluring people to join these and stay as members so they can be exposed to Group Notices when these advertise new products.[15] Some users create Groups with the specific intent of

15 MAHAR, S. M., MAHAR, J.: *The Unofficial Guide to Building Your Business in the Second Life Virtual World: Marketing and Selling Your Product, Services, and Brand In-World.* New York : AMACOM, 2009, p. 91.

general advertising; these do not belong to a single brand, and instead focus on themes which can range from fashion, discounts or gifts among others. When such a group successfully attracts a significant number of users, they can be used to send paid promotional notices, brand owners use these to reach a larger or a different audience than the one they might have on their official groups. The fee per promotional notice ranges depending on how many users the group has, usually being around 500 L$/week.[16]

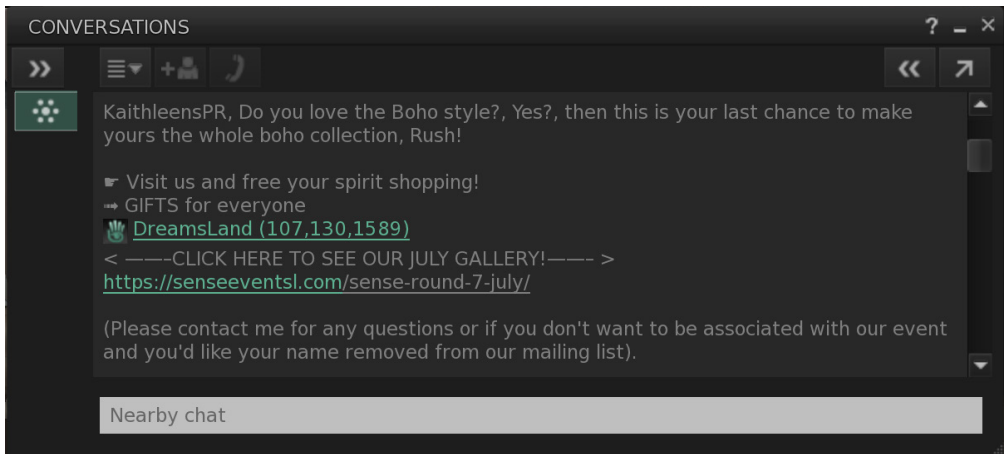
Another marketing tool used for promotion is Land Listing in the search function. Land Listing has a 30 L$/week fee which is paid to LL. The search function operates with keywords, and the search results are sorted by the Traffic. In Second Life, Traffic is a numeric value that is calculated in set time intervals per avatar in a parcel for a 24-hour period. The more visitors a parcel receives, and the longer they stay there, the higher the Traffic value will be for the following 24-hour window. Having high Traffic is very desirable since it will mean that place will be shown higher in the search queries in which it is displayed. A third marketing tool provided by Second Life is listing the store in a profile of an avatar. Having the store classified in a profile costs 50 L$/week and allows the users to see the store linked to specific avatars, which verifies the reliability of the store. The Second Life official website includes a member section, where the users see detailed information on their account, once they log in. Besides information related to the account, the website includes a destination guide and a calendar of upcoming events and offers, where creators are able to promote their events or services.[17] The online Marketplace powered by Second Life offers four types of promotion and advertising of specific products. These advertising slots are paid weekly and allow the designers to display their products in 4 different locations:

- *Feature item on home page* – displays the item on the top of the initial home page where everyone lands first and it costs 899 L$/week,
- *Feature item on category landing page* – the marketplace is sorted by categories and sub-categories, each item is linked to a category and when someone enters that specific category, the item will be displayed at the top of that page. The advantage of this category is that costumers who visit a specific category are more likely to purchase the promoted product, but the disadvantage is the reach of the advert, having an item displayed on a specific category has less visibility and costs 399 L$/week,
- *Feature item on the checkout receipt page* – displays the item on the last page, where users are ready to pay, the customers are less likely to purchase the product due to being in the process of finishing the payment for what they wanted, but the product has high exposure and is only displayed to paying customers of Second Life, not window-shoppers and it costs 799 L$/week,
- *Feature item on the L$0 cart checkout ads page* – the 0L$ checkout is any invoice that doesn't have a cost, these can be for demos and/or free gifts, but with no guarantee thereare users willing to pay for products it costs 299 L$/week to advertise here.

Besides the official marketing tools provided by Second Life, creators have the option to use marketing tools designed by users that are sold in-world.[18] Another common marketing tool for spreading updates is a Subscriber (Picture 2). A Subscriber is a script driven object that delivers messages to users who are part of its list. They are provided by many different companies, two of the most used are Subscribeomatic and SasTech

16 PORUMBEANU, O. L.: References in the Digital Age: Marketing and Services in Virtual Worlds. In *Studii de Biblioteconomie şi Ştiinţa Informării*, 2008, Vol. 3, No. 12, p. 111.
17 LINDEN LAB: *Second Life*. [digital game]. San Francisco : Linden Lab, 2003.
18 *Marketplace rates*. [online]. [2019-11-01]. Available at: <https://marketplace.secondlife.com>.

Subscriber. The advantage of using a Subscriber is it does not take slot in the limited Groups list, so customers that are interested in subscribing to information regarding a brand can still do so without having to worry about a limit. The way these two services work are similar, and the differences are mainly in the payment. While SasTech has one-time purchases for 3,999 L$ with free lifetime updates,[19] Subscribeomatic is more well-known and charges 5,990 L$ a month for the unlimited version, offering a free version for non-profit organizations.[20]



Picture 2: Subscriber Notice in Local Chat

Source: author's screenshots; LINDEN LAB: *Second Life.* [virtual world]. San Francisco : Linden Lab, 2003.

Advertisement in Second Life Media

Just as in real life, Second Life has different types of media including radio, print, streaming and new media. None of these media are owned by Linden Lab and are created by users. The virtual print medium is mainly targeted at fashion and lifestyle, cooperating with top brands on the market. Placing an advert in a high-end magazine gives credit to the brand and exposes it to the target audience with the likelihood of profit. One of the most known magazines is L'Homme[21] by Hikaru Enimo, which focuses on male fashion and lifestyle, bringing the latest arrivals to the consumers. In Second Life, the lack of products for men creates high demand for apparel which this magazine targets and capitalizes on the low competition. On this magazine an advert placement can cost anywhere between 7,000 to 20,000 L$, depending on the size and length and page placement. Other magazines including Avenue Magazine focused on female fashion have similar pricing and placement of an advert in the furniture magazine called LTD – Love to Decorate is approximately 10,000 L$.[22] Second Life does not have television, but some organisations

19 STEINBECK, S.: *SasTech Pricing*. [online]. [2019-11-01]. Available at: <https://marketplace.secondlife.com/p/SasTech-KioskNet-Subscriber-Edition/8874830>.
20 *Subscribeomatic Pricing*. [online]. [2019-11-01]. Available at: <http://subscribeomatic.com/pages/pricing>.
21 For more information, see: *L'Homme Magazine SL November 2019*. [online]. [2019-11-01]. Available at: <https://issuu.com/lhommemagazinesl/docs/lhommemagazinesl_november2019>.
22 ENIMO, H. (Editor-in-Chief): *Possible ways of promoting within L'Homme*. [Personal interview]. Released on 01. 11. 2019. 2019.

hold events broadcasted live. These shows are mainly targeted at fashion and one of the most famous live shows is MR Second Life and MISS Second Life, pageant shows, held by *Miss Organisation – Marcus Lefevre-Enimo*. The organisation allows the brands to advertise their products on more levels. Sponsorship of the event can be active – based on providing the contestants outfits for the show, creating in-world placement, or passive – displaying logos, without additional exposure of the brand. The sponsorship of fashion shows costs from 5,000 to 20,000 L$ and is divided into several packages including specific options for the sponsors.[23]

Using radio as a medium for advertisement is not common in Second Life and when used, it is mainly used by estates and services, who want to introduce their products. One of the active radio stations in Second Life is *ENT sl talk radio 69.9*, which provides slots for advertising between the talk shows and music and a pack of 10 slots of 30 seconds costs 4000 L$ including 4 peak and 6 off-peak adverts. Since Second Life is world-wide, users in different time zones listen to the radio and the peak hours with the most listeners are between 11:00AM to 3:00PM SLT, which is Pacific Standard Time, the real lifetime zone of Linden Lab. The largest website out-of-world, which offers the latest updates on new products is SeraphimSL, with millions of views, which offers many categories including new events, promotion, sales, hunts, free items, thematic products and many others. Exposure on this website is demanded and designers book the side adverts a year ahead. The website offers one-time promotion or permanent promotion with annual renewal. Promoting costs from 2000 L$/day or 10,000 L$/month and offers a wide range of options to choose from to fit the goal of the campaign.[24]

Free Marketing Tools in Second Life

Word of mouth works the same way as in real life and is the strongest marketing tool. If the costumers are happy, they share their experience on social media or leave a review on marketplace. The group chats allow people to communicate and hiring a CSR team allows the companies to moderate the group and encourage happy customers to share their experience with the brand. Beyond that and due to the specific nature of Second Life, users can inspect any object, either decorations placed in world or apparel attached to an avatar to get the name of the original creator, from there and following the profile of the original creator they can find where that item is being sold. Creating a Facebook page or Flickr account to display and promote the products are most common options. Second Life users are active on Flickr and upload edited images with products. These social media allow the customers to interact with the brand and comment, like or share the advertisement. Maintaining these pages is for free and paying Facebook ads is not recommended, since Second Life users are a specific target group, which Facebook is unable to locate and the likes and views would hit regular people, who do not have Second Life accounts. Another tool to promote products is by creating a blogging team, a group of bloggers, who will promote the products to their already established audience, mainly on Flickr, by creating pictures as placing the products into the image, referring to them in the description or tagging the company. Having a group of devoted bloggers known by the public is

23 *Miss Organization Sponsorship*. [online]. [2019-11-01]. Available at: <https://mrsl.missslorganization.com/org/sponsorship/>.

24 *Advertising Rates*. [online]. [2019-11-01]. Available at: <http://seraphimsl.com/advertising/>.

an advantage and encourages the costumers to buy products. Second Life bloggers can be compared to real life influencers, since their mission is the same. They influence the Second Life audience, become their role models and recommend products. Bloggers are usually paid with products of the brand that they receive for free and do not create additional expenses.[25]

Advertising Real Life Product in Second Life

Placement of real-life companies in Second Life was extremely popular between 2010 and 2012, where international brands such as Reebok,[26] Dell,[27] Sony Ericsson[28] and others owned entire sims to display their products in world. This type of advertising is no longer used by real-life brands and they are not displayed in-world. Until recently, when JimmyPaul x Hello Kitty celebrated its 45th anniversary, the Japanese company Sanrio cooperated with a Second Life designer Astralia and created a virtual event and product line including clothes, furniture, decorations and accessories that were the same as the real-life products (Picture 3).[29] The 45th anniversary is accompanied by a thematic event at the Hello Kitty amusement park with live music, store, games, hang out area and gifts for the visitors. The event is running between 1st to 15th November 2019 and the product line is available for sale only through the duration of the event. The event is being adverted on social media platforms, official Second Life home page and in world on multiple locations.

Picture 3: JimmyPaul x Hello Kitty & Astralia Adverstiment

Source: Astralia Hello Kitty Collection. [online]. [2019-11-02]. Available at: <https://www.astraliaworld.com/shopping>.

25 *Marketing tools*. [online]. [2019-11-01]. Available at: <http://wiki.secondlife.com/wiki/Advertising_in_Second_Life>.

26 *Reebook*. [online]. [2019-11-01]. Available at: <http://adverlab.blogspot.com/2006/10/reeboks-store-in-second-life.html>.

27 MENCHACA, L.: *Dell Gets a Second Life*. [online]. [2019-11-01]. Available at: <https://blog.dell.com/en-us/3555/>.

28 *Should You Pursue a "Second Life"?*. [online]. [2019-11-01]. Available at: <https://light-the-fuse.com/wait-a-second>.

29 *Hello Kitty and Astralia*. [online]. [2019-11-01]. Available at: <https://www.astraliaworld.com/shopping>.

Summary

The exploratory study introduced the available marketing tools that are used in the Second Life virtual world. We divide them into two main categories: *provided by Second Life*, *provided by the community*. The marketing tools provided by Second Life include group notices, land listing, profile classification and marketplace advertisement and are built in the system, therefore they are available for everyone. The second category includes tools that are created and offered by the community in a form of a product, or a service, such as subscribers, bloggers, media (radio, magazine), agencies and external websites, social networks and word of mouth. These types of marketing tools are not promoted to the community and it is necessary to search them. The following table displays the list of 12 defined marketing tools that are offered by both Second Life and the community with listed form of reach, cost of maintenance, form of advertising, pros and cons. Each of the marketing tools has a unique purpose and a way of advertising, yet we consider five of the marketing tools essential for every virtual business (Table 1).

Table 1: Available Marketing Tools in Second Life

Marketing Tool	Cost	Reach	Pros	Cons	Form
Word of Mouth	free	in-world/ out-of-world	powerful, customer opinion, without expenses	possible rumours	Text
Flickr/ Facebook	free	out-of-world	reaches target group, who follows the brand, without expenses	not possible to apply paid adverts	Text, image, video
Bloggers	free	in-world/ out-of-world	exposes products to wider audience, without expenses	low quality images, not reaching desired target audience	Text, image
Subscriber	from 3999 L$	in-world	unlimited, reaches customers in-world, one time or monthly expanses	appears in local chat as a notification, people may not notice it or crash without seeing it	Text, attachment (image, landmark, DEMO)
Magazine	from 7000 L$/ advert	in-world/ out-of-world	high exposure, reaches a specific target group	expensive, reaches the readers of the magazine only	Text, image, landmark
Radio Advert	from 4000 L$/ 10spots	in-world	expands the target group	risk of not reaching the target group, unable to measure it	Audio

Miss Organisation	from 5000 L$/ event	in-world/ out-of-world	live streaming, different forms of advertisement – logo, product display, word comments	limited to fashion only, possible lag or low-quality image	Image, video
SeraphimSL	2000-10000L$/ advert	out-of-world	reaches wide audience and different target groups	waiting list, need to require for adverts months in advance	Text, image
Group Notices	one time 100 L$	in-world	one-time fee, allows to build own target audience and link store promotion to the group	group limitation in-world, text size limitation	Text, attachment (image, landmark, DEMO)
Marketplace Advert	299-899 L$/week	in-world/ out-of-world	reaches customers shopping on marketplace, high visibility	relatively expensive, each advert linked to one product only.	Direct product offer
Land Listing	30 L$/ week	in-world	exposes the landmark in search based on set keywords, low cost	large number of land listings, visibility depending on traffic	Listing in landmarks
Profile Classification	50 L$/ week	in-world	verification of a place, low cost	low visibility, customers don't focus on profile classification	Landmark in profile

Source: own processing

To answer the research question, *Which of the available marketing tools are the most applicable for promotion in Second Life?,* we target the following marketing tools. It is essential for every starting virtual business to create an official group to promote the products and inform potential customers about new releases though group notices, which later on turns into the official platform for the target audience. The supportive marketing tool is a subscriber for customers, who are unable to join the group due to lack of empty group spots, yet they want to be informed and updated. According to the author, these two marketing tools are the most important tools used in-world. The third recommended in-world tool is Land Listing, which allows the customers to search the virtual business in-world landmark browser. The two recommended out-of-world marketing tools are creating official accounts on social sites like Facebook and Flickr, which help to reach the target audience when not being logged in and forming an official blogger's team. These tools are free of charge and greatly help to build a platform for the target group by displaying the adverts outside the virtual world. Lastly, the rest of the marketing tools can be considered as expansional and advanced for an already established and running virtual business, which desires to expand and broaden the target group.

Conclusion

After almost 17 years of Second Life existence, it is still a platform with no equal, a world of opportunities still unexplored and if nothing else, the lack of literature related to this specific virtual environment demonstrates so. This virtual world offers a great number of options for running a business, promoting it and becoming a successful and profitable operation. It is necessary to remain up to date with the latest innovations and display these to the users that might be potential customers. The variety of marketing tools allows the creators to reach their audience and set a functional plan for their specific products to secure profits. The main and most used marketing tools are Group advertisement, active social media and a blogging team. By using these three marketing tools, the store can be displayed to the costumers in-world, out-of-world and reach new target groups through the bloggers. The key to success is to know the community, understand it and be a part of it in order to be able to develop a product of interest, otherwise no marketing tool will be functional. We conclude the importance of staying attractive to the audience; Second Life must continue developing and expanding advertisement techniques out of the virtual environment. Advertising beyond the virtual world in the form of videos, where people are able to see the diversity of activities can bring more users into the world and widen the virtual business. It is necessary to point out the advertising options to the existing virtual business, because some of the older businesses are not making use, likely due to the absence of information, especially classification tools and listing land tool, which are paid weekly, and can bring more traffic to the stores. Lastly the update of groups supporting multimedia or drag in adverts could help the advertisement, so the costumers could see the advert without downloading the attachment of the notices. There is still enough space to improve the advertising tools within the virtual world and more to come out-of-world.

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Game Studies as a Subject for Academic Approach and Its Significance in Terms of Cultural Heritage

Interview with Jaroslav ŠVELCH

Mgr. et Mgr. Jaroslav Švelch, Ph.D.
Charles University
Faculty of Social Sciences
Smetanovo nábřeží 6
110 01 Prague 1
CZECH REPUBLIC
svelch@fsv.cuni.cz

Jaroslav Švelch is a researcher, author and lecturer interested in theory, history and design of video games. Currently, he works as an assistant professor at Charles University and recently his monograph *Gaming the Iron Curtain: How Teenagers and Amateurs in Communist Czechoslovakia Claimed the Medium of Computer Games* has been published by MIT Press. His work also includes research on other various topics, such as humour in games, representation and reception of monsters in video games, the Grammar Nazi phenomenon, and language use online.

Interviewer

Mgr. Alexandra Kukumbergová
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Námestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
alexandrakukumbergova@gmail.com

Alexandra Kukumbergová is a PhD. candidate at the Faculty of Mass Media Communication at the University of Ss. Cyril and Methodius in Trnava, currently working on her thesis focused on gamification.

Alexandra Kukumbergová (A. K.): After high school, you chose journalism as the field of your studies. As a vivid player, did you always have in mind games as an option for academic study and journalism and media was the closest subject field for doing so, since there were no study programmes directly dealing in games back then?

Jaroslav Švelch: That is a good question to start with. I was an avid player when I graduated high school in 1999, but I did not envision I would study games – there was no such option and I don't even know if I'd go for it if there was one. I was a big fan of rock and alternative music and for some time saw myself as a music journalist – a profession that has by now more or less ceased to exist. I also pondered studying computer science, but my dad, a programmer himself, convinced me not to do it, saying it's an unhealthy job. I was a decent writer, so I applied to get into a journalism program, and I got in. Later, I also studied linguistics and translation studies, because I didn't find the journalism program intellectually challenging – it was mostly just about the craft. I only got to studying games much later, when I started doing my PhD.

A. K.: Imagine you were 18 again; if you were choosing again, would you be considering game-oriented fields? Do you see a future in such studies?

Jaroslav Švelch: That's a tough question. I appreciate having the diverse humanities and social scientific education that I have, and it has certainly helped me in my academic career. Even for people who want to work in the game industry, I think it's important to have a wide and varied background. In these times of increasing specialization, I'm all for interdisciplinarity and giving people a broad foundation they can build on, not just training them for their future jobs from day one. I do see a lot of potential in in game development, game design and game studies education, but I don't think someone should spend five years of university education studying 'only' games.

A. K.: Do you see a significant difference between how game oriented studies are perceived in the west or Scandinavia and Baltics in comparison to middle and eastern Europe? There sure is a quality gap, such as in most of the other fields, but question is what you think of the tempo of growth and if we can still blame the later start due to soviet era.

Jaroslav Švelch: In Central and Eastern Europe, game studies have been on the rise for some time now, and I'm happy to see more and more scholars from the region at international conferences. In the early 2010s, it was usually just one or two people and that was quite sad. The CEEGS conference, which I co-founded in 2014, certainly helped launch some of these researchers to successful international careers and/or worldwide recognition. In the past, access to international publication venues was complicated by the lack of experience and language skills. But I wouldn't blame it solely on the Soviet era. The big issue here is resources. For a long time, it was considered a luxury having people research something as 'obscure' as digital games, and therefore these fields first developed in richer countries. And if doctoral students and early career researchers aren't able to earn a decent living, they will continue to flee to richer countries or give up on academia.

A. K.: Last year, your book Gaming the Iron Curtain got published by MIT Press, which is of course a prestigious happening, but one can think of a little contradiction in it – on one hand, it sure is rewarding in some sense but on the other, don´t you think it indicates some lack of interest in this topic from local institutions?

Jaroslav Švelch: The book will in fact come out in a Czech translation next year, through the Akropolis publishing house. Before I got the contract with MIT Press, I was talking to several Czech publishers and they were not interested in publishing the book in Czech, with the exception of Karolinum, the publishing house of my university, which is obliged to publish any book that is approved by a faculty committee. I don't want to be too negative though. It is still a pretty new topic and academic publishers are underfunded and overburdened. During my research, I did get some funding from my department at Charles University for interview transcriptions, proofreading and such. Not a lot of money, but it did help.

A. K.: In your research and work on the book, did you encounter some significant help from Czech cultural institutions? Do you feel games have enough interest and recognition from the state and general public, maybe in terms of academic approach?

Jaroslav Švelch: Well, archivists and librarians were generally helpful, and I really appreciate their – often inadequately paid – work. I also got support and help from the Institute of Contemporary History of the Czech Academy of Sciences, who funded three conversions of 1980s activist games to modern systems, now available on their website: http://www.studenti89.usd.cas.cz/pocitacove-hry/. That was a great and fun project that I very much enjoyed working on. But Czech memory institutions like the National Technical Museum or the National Film Archive are not particularly interested in the history of games and hobby computing. Or to be more precise, they are somewhat interested but lack the funding and manpower to do anything about it because they don't see it as a part of their primary mission. The Slovak Museum of Design, on the other hand, seems to have done some actual work to preserve Slovak computer games from the 1980s.

A. K.: In Slovakia, there seem to be two main ways how to look at video games. Common opinion is that it's just child's play – that's mostly the view of the older generation that did not grow up playing video games, but rather witnessed their children doing so. The second common approach is understanding games as a business opportunity. Perception of games as part of cultural heritage is still missing; at least in state institutions and this job falls on individuals and hobbyists. Do you think that the Czech Republic is doing better at supporting of preservation of games? Should it even be perceived as a independent field?

Jaroslav Švelch: I think that Slovakia or Poland are currently doing better than the Czech Republic in preserving and exhibiting the national history of games – but the example to follow is that of Finland, which has an amazing and well-curated national games museum in Tampere. The Finnish game museum is an independent, publicly funded institution. That's a good model, but at the same time, I think that the National Technical Museum, the

National Film Archive or even the National Technical Library could also do the job. It just takes some funding and some will to do it. There are some private collectors and private museums, and I'm happy that we have them. But they tend to show hardware without the context needed to educate and to help people understand the significance of the artifacts that they're showing. Moreover, they rarely show Czechoslovak hardware and software because it's neither attractive nor popular. Online fan archivists do an amazing, admirable job collecting and exhibiting digital copies of 1980s games online. But their archives are precarious. I'm afraid what's going to happen if, one day, one of them forgets to pay server fees. I believe that systematic preservation of old games requires and deserves institutional support.

A. K.: We know there are some unsettled issues surrounding video game history (you talked about a few unknown authorships). For example, we know that Jaro Filip (mostly known as a musician and comedian, but also one of the first fans of computer technology), did actually write and make at least one video game, but it's yet to be found. In your research for the book, have you encountered some other unresolved questions, maybe in form of some game that was just mentioned, but never found?

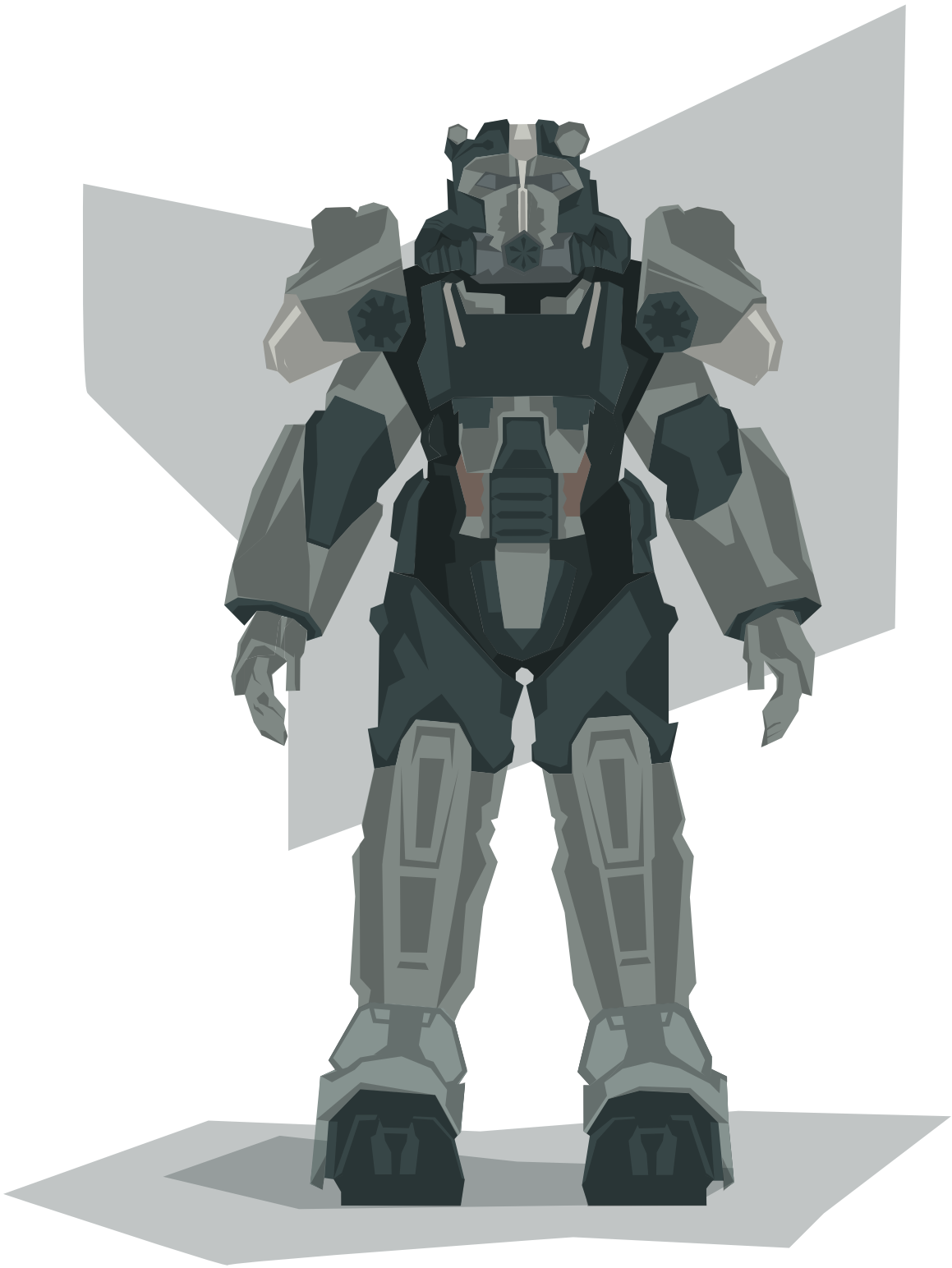
Jaroslav Švelch: Many of the games that were produced have been lost. The 300 to 400 games that have been preserved from the 1980s are but a fraction of what people wrote at the time. That is also true of games for minicomputers and mainframes. To my knowledge, none of the Czech minicomputer/mainframe games are available today, but we know that some existed based on interview material. As for microcomputers, there are titles that are mentioned in club newsletters or magazines but haven't surfaced. There is one particular game which I would love to track down – it's called *Pepa v dole* (Joe in the Mine) and I played it in the early 1990s on the ZX Spectrum. If I remember correctly, it was made as promotional material for an actual mine. That would make it quite a special case. But, alas, I never had my own copy and the game hasn't been found so far. At the same time, it is important to note that dedicated fan archivists unearth new games every now and then by digitizing tapes and disks. Maybe they will come across Joe in the Mine.

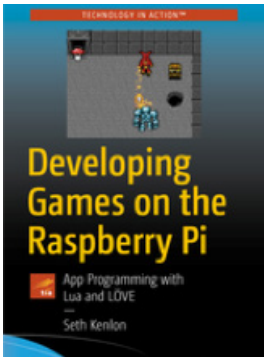
A. K.: Do you find parallels between dissident parts of gaming culture in socialist Czechoslovakia and pro-democratic tendencies in current events on the gaming scene? Or are the situations beyond comparison, maybe because of better comprehension of technology by the governments, or even because of the interest of enormous tycoons such as Tencent?

Jaroslav Švelch: The common thread here is that games have always been political. They contain politics; they are entangled in politics and can be used for political purposes, including activism and dissent. The protesters in Hong Kong today, for example, use digital technologies and game culture in many playful ways that resonate with the playful protest some Czechoslovak authors engaged in in the 1980s.

A. K.: The last question is about the opening of the new study programme on FAMU. It was announced and discussed, but last public news is now almost one year old. You were presented as member of the preparatory committee; do you have any news regarding this? Is the delay somehow connected with the departure of Helena Bendová, who was behind the preparation of this programme for accreditation? And in this study itself, would you prefer more practical orientation, focused on the development of games, or maybe studies focused on theoretical reflection?

Jaroslav Švelch: The game design Master's program is still in development and scheduled to open in 2020 or 2021. It will focus primarily on teaching game design – meaning the art and craft of designing games – but it will have a theoretical and historical component, too. I'm personally very much looking forward to teaching the game history class, because I believe that so much inspiration for new work can be found in old games. We have some brilliant design instructors from companies like Amanita Design and a great team, including experts on sounds, screenwriting, graphics, production, and other elements of game making. There have been some delays and obstacles along the way because FAMU is a very complex institution and accrediting new programs is hard work. But the project continues and Helena Bendová is going to return to FAMU next year.





DEVELOPING GAMES ON THE RASPBERRY PI

KENLON, S.: *DEVELOPING GAMES ON THE RASPBERRY PI. App Programming with Lua and LÖVE*. New Zealand, Berkeley : Apress, 2019. 319 p. ISBN 978-1-4842-4169-1.

Patrik Voštinár

The games industry enjoys huge popularity with people of all ages. Students, pupils and even adults play games on computers, consoles and mobile devices. Working with computer science, especially with developing software is nowadays very popular. In almost the whole world there is a lack of specialists for computer science. The solution could be a motivation for studying programming, for example studying developing games. The book is focused on teaching how to develop games on the nowadays very popular and cheap computer Raspberry Pi. In answer to the questions "What is interesting about this book?", or "Why should we read this book?" this book does not require previous experience or skills with computers or programming. Everything you need to know, you can learn from this book. After reading this book it is possible that you will continue in studying programming, or in case you already have some programming skills, you will gain experience with developing games. The book is interesting also because it uses the very popular and cheap computer Raspberry Pi (35€) for programming.

The book contains 319 pages, which are divided into 14 chapters. Furthermore, each chapter contains homework - additional tasks, which you can do after reading the chapter. The first chapter describes some basic steps about the Raspberry Pi – how to install Linux, first boot and writing your first Lua Script. Through reading about developing games in this book, you will also learn basic Linux commands. To get through this book, you will use Lua as a programming language for developing games. Lua is a small, fast, modern programming language that can be used for everything from system maintenance to graphics and standalone games. It is a leading scripting language in the video game and visual effects industry, and it is used for front-end development in several popular game engines. The programming language C is known for its speed and extensive library support, but it is rarely categorized as easy to use. Compared to language C, programming in Lua is easy to use and fast, and it has the ability to interface smoothly with C libraries[1].

For developing games, it is common that developers use some types of game frameworks. In this book the LÖVE engine is used as the game framework, which is an open source framework that leverages the Lua scripting language for developing 2D games.[2] The other programs used for developing games in this book are GIMP (image editor) LMMS (digital audio workstation) and GIT (distributed version control system). During reading this book you will develop four interesting games: *Rolling Virtual Dice*, *Blackjack*, *Battlejack* and *Roguelike Dungeon Crawler*. The first game *Rolling Virtual Dice* is aimed at learning variables, user input, loop, GUI logic (graphic user interface), mouse events, etc.

1 For more information, see: KURT, J., AORON, B.: *Beginning Lua Programming*. Birmingham, UK : Wrox Press Ltd., 2007.

2 For more information, see: AKINLAJA, D.: *Love for Lua Game Programming*. Birmingham, UK : Packt Publishing Ltd., 2013.

In the second game *Blackjack* you will learn OOP principles and use a card dealer library. The game allows you to click an empty deck of cards to draw a card and compete against the computer in an effort to get as close to 21 without exceeding it.

The next game *Battlejack* is a modified version of Blackjack, the fantasy card game inspired by games like Magic: The Gathering, Hearthstone, Pathfinder Adventure Card Game, and other trading card games. During game play, you click your own deck to draw a card. During your turn, you click and drag cards to either the dealer's stash to cancel out a card in play, or to your own score box to add your card to your own stash. If you attempt to cancel a dealer card out with a less powerful card, nothing happens. You may add power-ups or additional cards to complete the action or click and drag the card back into your hand to continue.

The last game *Roguelike Dungeon Crawler* is an exploration (top-down dungeon or tomb in a fantasy) game with no story, randomly generated levels and monsters, and death is permanent. This game is a good example of how to demonstrate translating the same mechanics from dice and card games into a character-driven video game. Seth Kenlon is a teacher, artist, D&D dungeon master, free software and free culture advocate, and UNIX geek. He has worked in visual effects (VFX) (The Hobbit, Deadpool, Valerian) and computing industries (IBM, Red Hat), often at the same time. He is one of the maintainers of a Slackware-based multimedia production project.

The book is well written. The layout of the chapters and game examples are appropriately selected. The book is a good choice not only for beginners of programming, but also for software engineers, teachers and development professionals looking to upskill and develop games for Raspberry Pi, Android and iOS. There is only one weakness of this book found – the author does not very often use "comments" on the examples in the source code in the text (in my opinion, he could put more emphasis on using comments). The book has several strengths – for learning programming, it uses the cheap computer Raspberry Pi, the interesting programming language Lua and appropriately selected game examples.

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Author of the review

PaedDr. Patrik Voštinár, PhD.
Matej Bel University
Faculty of Natural Sciences
Tajovského 40
974 01 Banská Bystrica
SLOVAK REPUBLIC
patrik.vostinar@umb.sk

DEATH STRANDING

KOJIMA PRODUCTIONS: *Death Stranding (PlayStation 4 version)*. [digital game]. Tokio, Japan : Sony Interactive Entertainment, 2019.

Lucia Škripcová

Death Stranding was, by far, one of, if not the, most anticipated games of this year. Cinematic trailers, cryptic teasers, no clear-cut theme or gameplay trailers combined with a stellar cast of main characters fired something that can almost only be described as mass hysteria. After release though, the audience has since divided into two opposing factions – one part that continues to revere Hideo Kojima and the game and another part that does not seem to 'get' the game. The reason is rather simple – Death Stranding as a game does not really fall under any discrete definition, but on the other hand checks all the boxes that make an (arguably great) digital game. In the context of digital game genres, Death Stranding falls under multiple genres at once. It definitely can be considered an action game, but at the same time it's commonly referred to as a 'walking simulator' (this mostly stems from the gaming community at large). Furthermore, it has enough RPG elements to be defined as one, as well as an adventure game. The experience one can gain from playing this game depends rather heavily on one's experience in these genres and expectations of Death Stranding itself.

The narrative is made in the same hybrid vein. The basic premise is rather simple – in a dystopian future, America is fragmentized and the protagonist is the only person that can undertake the quest to make America whole again. The underlying narrative is much more intertwined and complicated, though. It goes into almost absurd details, where the actions of the protagonist not only influence what happens next, but past relationships between other characters as well. We would be hard-pressed to find a similarly complicated narrative in the digital games medium, as this is mostly a hallmark of movies and TV series, together with extraordinary actor casting. The trend to cast popular movie actors and MoCap them into digital games is very prevalent in Death Stranding, but Kojima went a step further and cast high-profile actors instead of the lower-tiered actors that usually get to work on digital games. The characters also refer to their past roles within the game, like Norman Reedus referencing his past TV series *Ride with Norman Reedus (Picture 1)*, Mads Mikkelsen referencing *Hannibal* etc. And then there are some easter eggs in the form of some characters which are actual developers from Kojima Productions.

The basic gameplay loop of the game – which is basically completing various fetching quests – by itself, does not sound the most intriguing or the most entertaining. But the way you have to work against the environment, which becomes apparent after the first few barren hours of the game, is very quickly brought to the extreme. The way you have to plan how you tackle various challenges in the environment, e.g. how to tackle slippery slopes, how to manage your load, which can upset your balance if not put on properly, how to use your ladder, how to walk on different types of ground (grassy, rocky, etc.), is completely unique and really can make or break your quest completion.

Picture 1: Ride with Norman Reedus reference
Source: author's screenshot

What really makes the game unique is how Kojima Productions works with the atmosphere. As the player, you feel constantly consternated, which sounds paradoxical, as Death Stranding is an open-world game, but it is true. The motifs used, as the name suggests, work a lot with darkness, death or the iconography of death and decay. What it accomplishes is to make the player feel a sense of slightness within the world. This is exacerbated by the sceneries the player has to walk through when playing the game, by the ambient music and by the frequent scanner checking. The scanner is used to check whether enemies, which almost look like Lovecraftian beasts, are anywhere nearby. This all is put into an excellent visual package, which almost evokes classic art pieces and their interpretations of humans within the time flow.

Another interesting facet of the game is how it breaks the fourth wall. One of the ways it does so is in-game advertising. While not as common in current games, Death Stranding has found how to use it in-game, as with the energy drinks brand *Monster Energy (Picture 2)*.

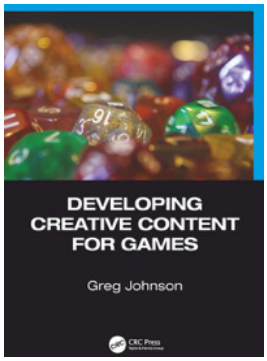
Picture 2: In-game advertising of Monster Energy drinks
Source: author's screenshot

Energy drinks from this brand in-game, when drunk, boost the player's stamina. Other than in-game advertising, there are a plethora of smaller references and Easter eggs on other games and movies. The most obvious ones are the references to Kojima's own *Metal Gear Solid* franchise, or to *Horizon: Zero Dawn*. The game also references the Guillermo del Toro movie *The Shape of Water*. And lastly, the interaction between the in-game protagonist and the player himself is also quite novel. There are instances, where Sam (the main character) will deliberately blink at the player, call him to see something closer up and interact in other slight ways towards the camera, and therefore the player. Probably the most unique interaction with the player is when Clifford (the antagonist) actually wishes you a happy birthday, if the PS4 system registers, that your birthday is, in fact, on said day.

Death Stranding is a greatly unique piece of digital game art, which might not be to everyone's taste. It is more a show of freedom than anything else and shows you the product that is created by detaching oneself from imaginative expectations. The atmosphere, narrative and the gameplay mechanics create a unique masterpiece, which some people might only start to appreciate only once they finish it and look back at it.

Author of the review

Mgr. et Bc. Lucia Škripcová, PhD.
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Námestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
lucia.skripcova@gmail.com



DEVELOPING CREATIVE CONTENT FOR GAMES

JOHNSON, G.: *Developing Creative Content for Games*. Boca Raton, FL : Taylor & Francis, 2019. 296 p. ISBN 978-1-4987-7766-7.

Nikola Kaňuková

Author Greg Johnson is a game designer, artist and Professor of Game Development and Computer Art. He has 20 years' experience in teaching thousands of students in game design, digital sculpture, programming, 3D modelling and animation. In the book *Developing Creative Content for Games* he offers a compilation of material developed from his introduction to game development lectures as well as much advice for game developers. Greg is also the author of the ENnie-nominated *TOONZY!*. It is a cartoon role-playing game where you can become your favourite cartoon character in funny and hilarious settings and in which you encounter bizarre scenarios.[1] The main purpose of the title *Developing Creative Content for Games* is to take a reader, especially a student, through the whole process of game development and make them able to create specific parts of their own role-playing games.

According to Greg's official website[2], the artworks and his publications reflect themes like aviation, science, history and science fiction as well a smattering of abstract and commercial pieces. Greg's interest in table-top role-playing games is devoted to the early edition of *Dungeon & Dragons* which is the game he mentions a lot in the book. Firstly, he is taking a reader through Definitions, Systems, Mechanics and Dynamics where he explains the basic characteristics of table top role-playing games (RPG) and massively multiplayer online role-playing games (MMORPG) regarding their common features. As it is written in the pre-face, the material in its complexity is suitable for students with no practical skills and the author himself wants the book to be an education in itself. A wide range of chapters and topics lead to way in teaching games to students. On the other hand the material is not for people who are interested in more complicated tasks, e.g., in making a full 3-D video game, because it takes a year or more to put together a pro title and it is a job for a whole professional team. Anyway, the book describes complicated processes of game development because every single element is covered in depth and it takes readers deeply into an understanding of those processes. Greg puts an emphasis on learning by doing methods and after each chapter there is a nice guide with tasks and assignments by which the author encourages readers to such practical actions as playing specific games, discussing the ideas in the group of people, creating an outline of the imaginary world, characters, obstacles etc. (p. 136).

After defining the history and basic features of the game development process, the reader can start to think about creating their own game. Chapter 4 (p. 31) helps at the beginning with some advice about choosing the right game and game system. This first step requires many weeks of playtesting. Before you can start working on your own adventure,

1 For more information, see: JOHNSON, G., LEWONSKI, A., SELTZER, J. J., BETANCOURT, M.: *TOONZY!*. Savannah : Genres Game System LLC, 2015.

2 For more information, see: *About the project*. [online]. [2019-11-15]. Available at: <www.gregtheartist.com>.

you will also need to choose which rule set to use. There are plenty you can choose from and over a few pages (p. 32-36) the author introduces a few of them. The second step after establishing the groundwork is to get creative and do a little brainstorming about adventure ideas for role-playing games. For better understanding your game you need to know everything including the whole background. Greg's example talks about the game Glory of Yore RPG[3] which is a fantasy role-playing game in the world of a legendary British leader. Since you are inspired by this game, you have to be educated and skilled enough to make your own adventure compatible with a somewhat generic King Arthur-based fantasy setting. Having a great idea does not mean it will be as easy as it seems. It takes considerable effort and a whole lot of trial and error (p. 39).

In chapter 6 the students receive such game design basics as knowing the most relevant game development theories, e.g., The Magic Circle which indicates the space containing a play-ground[4] which relates to the broader sense of human culture and various models of human psychology and sociology (p. 49). A great help for understanding the process of game design and development indeed is Mechanics-Dynamics-Aesthetics (MDA Theory)[5] which visualizes how information flows from the game designer to the player and how important are the roles of every single person in the team (p. 51). Understanding these kinds of processes you are able to create a final game concept document, set the philosophy of play and describe the principles behind your adventure. Coming up with a game concept document the reader is forced to identify the target group and the selling points of his/her product.

In order to take the readers deeply inside the topic they have to think about immersion. A game developer has to become immersed in his fantasy, in his game and make others forget the outside world for a while. They have several choices how to do so, playing with ideas, culture, places or using interesting plots or narratives. The book offers a wide range of detailed types of narrative for your story (p. 104) and one powerful method to weave the story into a game is by providing meaningful choices to the player. This occurs when the player cares about the outcome of each decision (e.g. the game *Paranoia*[6]) and this is the job of the story. Greg puts a big accent on developing elements like victory conditions and goals, encounters, locations, dialogue, rewards or story branches which are good and necessary to know, but students will not get a clear answer on how to make a good story as they may miss some advice or steps about how to proceed to achieve it. Readers find a lot of examples but the book tries to cover an enormous number of topics and it is too hard to do it properly. There are 25 chapters consisting of tens of subheads, some of them within 8 lines. There is no way to explain everything and the reader is missing many things. After reading the book you are not able to create fantastic content for a game, but it is inspirational for later education and development. The book makes students aware of plenty of unnecessary things which they have to think about before and during game development. However, it is really a nice guide for getting to know all the processes and for starting to think about our own business.

The last eight chapters belong to the game finalization phase but only for storytellers. After preparing a great story you have to transform it to the game and begin designing the individual parts. Beginning with writing down the scene list you have to create a map regarding laws of physics and bring your characters to life. The space does not permit the

3 NORELLE, A.: *Glory of Yore: Fantasy Roole Playing in the World of King Arthur.* USA : Mad Mutant Games, Inc., 2016, p. 12.
4 HUIZINGA, J.: *Homo Ludens.* London : Routledge & Kegan Paul Ltd., 1949, p. 10.
5 For more information, see: LEBLANC, M.: *Mechanics, Dynamics, Aesthetics: A Formal Approach to Game Design.* [online]. [2019-11-15]. Available at: <https://users.cs.northwestern.edu/~hunicke/MDA.pdf>.
6 COSTIKYAN, G., GELBER, D., GOLDBERG, E., VARNEY, A.: *Paranoia.* [digital game]. New York : West End Games, 1994.

inclusion of everything there is to know about page layout, design and production, readers should have enough information to get started and guide them through the process. Preparing the final product is about paying attention to hundreds of details.

Developing Creative Content for Games is designed for students and game developers and provides them with a solid understanding of game development, design, characterization and creation of the elements. Readers do find the analyses and critiques that have come from investigation over tens of years of Greg's experience in practical as well as in academic life. The book is rich, easy and a quick way of learning how to create interesting content for games and all you need to do so, is a notebook, pen or user-friendly text editor for your computer. The only thing left is to ask what kind of creative content for games the reader will learn from this book? Will he excel in the creation of stories, immersion or in design? All these activities are part of developing creative content for games, but it is very ambitious trying to teach it all in 300 pages. For more additional information about Greg Johnson's work and his enthusiasm for table top role-playing games, visit his website www.gregtheartist.com.

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Author of the review

Mgr. Nikola Kaňuková
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Namestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
nikakanukova@gmail.com

Digital Athletics in Slovakia

Michal Kabát

There is quite a rich history of competitive games being played on various levels in Slovakia. There were dozens of semi-professional teams in various games and even some professional organizations when eSport started to make waves. Now, just a few years later, most of them do not exist, as they were mostly run by teenagers that had to get a more 'serious' job and stop playing or organizing events. However, some have survived and many more are now starting again, as eSport is starting to be taken seriously on an economic level (Chart 1) as something people enjoy not only playing, but also watching.

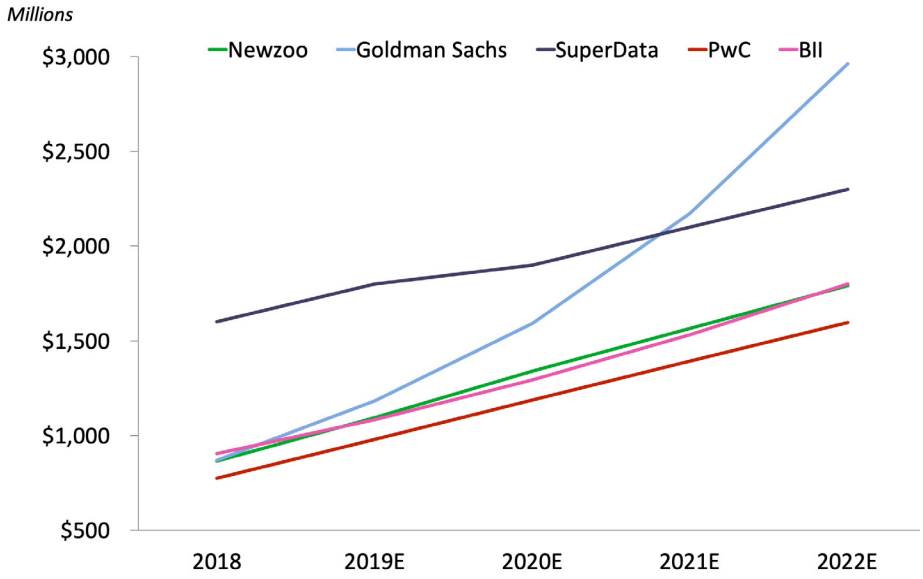

Chart 1: Global Esports Revenue Projections Through 2022

Source: REYES, M. S.: *THE ESPORTS ECOSYSTEM: The key players and trends driving the red-hot, fast-growing esports space that's on track to surpass $1.5 billion by 2023.* [online]. [2019-12-09]. Available at: <https://www.businessinsider.com/the-esports-ecosystem-2019-11>.

All this falls well in line with Gartner's hype cycle that suggests there is always much media buzz at the beginning and after expectations peak, there is always a fall in interest followed by a slow but steady rise into the mainstream. If we take a look at the local gaming scene, there is already a lot going on and there is more to come. As you may have already read in our last issue, the national eSport association (saes.sk) has been formed and we should see some official national representation teams in selected games competing at international events. Meanwhile, many semi-pro teams are forming and looking for funding. Many already compete in Czech(oslovak) or international leagues. There are also many local tournaments and even the Slovak national eSport championship offering titles in eight games.

Recent developments in order to systematically improve the chances of success for Slovak players are also happening at the university level. In September, the local division

of the Czech based eSport agency Lancraft announced the first Slovak university league under the name UniCup. Its aim is to help develop teams that will stand together to fight through semester-long winter and summer seasons that will lead to public finals held in Trnava during the UniCon and Game Days festivals. In November 2019, the qualification phase of League of Legends has started and organizers promise to add more games soon. The first round of the league started with 30 teams from 10 Slovak universities.[1] One of them, the University of Ss. Cyril and Methodius in Trnava is also offering students the chance to earn credits for training and competing in tournaments.[2] We hope that this trend will catch on and spread to high schools, so that we can soon see more talents representing our country at an international level.

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Game Days 2019

Ivan Rokošný

Game Days is the one and only Slovak international digital-game festival. This unique event highlights innovative digital games that have artistic value, and focuses on their comprehensive presentation. From May 30 to June 2, 2019, Nádvorie, the Place for Contemporary Culture in Trnava, Slovakia, hosted this event bursting with talks and presentations by prominent digital game developers from Slovakia and abroad. The festival's aim is to raise awareness about digital games and spread information about new exceptional games under development. It is also a platform that promotes networking among professionals from the game development industry. Prominent figures from the Slovak and international game development sector presented their invaluable experience with progressive digital game creation to industry professionals and the general public.

The festival program took place in the facilities of Nádvorie. Presentations, talks and workshops took place in the lecture halls; the co-working space hosted the game jam and the hackathon. Concerts and other accompanying programmes took place in the exterior. The unique extensive basement space with beautiful brick arches served as a gallery for exhibitions and installations, one of which introduced Czechoslovak historical games on anti-regime resistance. As promised by the organizers, exhibitions by digital game scientists were also an important part of the festival. Competing creatures fought for victory in a big digital game quiz, curious fans tried out rare Slovak retro games from digital gaming's prehistoric times, and the program also included fun and bizarre things such as cre-

1 VOBECKÝ, L.: *Unicup – univerzitní e-sportová liga v polovině skupin*. [online]. [2019-12-09]. Available at: <https://www.lancraft.cz/Clanek/39/unicup---univerzitni-e-sportova-liga-v-polovine-skupin>.

2 For more information, see: *Na TEDI začali vyučovať elektronické športy. Študenti vytvorili aj prvé súťažné tímy.* [online]. [2019-12-09]. Available at: <https://fmk.sk/e-sporty/>.

ating games in Power Point. Game developers also had an opportunity to showcase their work in progress during the Pitching Session. Their projects were assessed by an expert jury consisting of designers, producers and distributors. At night, the festival turned into a party featuring concerts and DJ sets by digital game music producers.

This year's Game Days focused on 'Gamers with Disabilities'. Accessibility in digital games for impaired gamers has evolved in recent years. One of the speakers to enlighten visitors on the subject was Sightless Kombat, a gamer who exploits the world of digital games while being completely blind. Bryce Johnson, who encouraged the development of inclusive design projects for disadvantaged players, also came to Trnava to report on the development of features and hardware for disadvantaged players. Game Days 2019 was prepared by the Slovak Game Developers Association (SGDA) in cooperation with the Faculty of Mass Media Communication, University of Ss. Cyril and Methodius in Trnava and the Trnava Game Guild. SGDA, aiming to highlight exceptional digital game projects, presented the Slovak Game of the Year 2018 award and the winner was *Shadows: Awakening* by Games Farm.

The European Conference on Game-Based Learning 2019

Sue Nugus

The European Conference on Game-Based Learning (ECGBL) is an annual conference attracting people from all corners of the globe who are interested in the current research into games-based learning. Now in its 13th year the conference has previously run in the UK, France, Austria, Norway, Ireland, Portugal, Greece and Germany. This year 250 people from 30 different countries participated in the conference in Odense at the University of Southern Denmark.

Enlightening keynote presentations were given by Simon Egenfeldt-Nielsen from Serious Games Interactive on the topic of Social Gamification in Blended Learning Games and Helle Marie Skovsbjerg from the Design School Kolding who spoke about Playful Play-Design: Balancing Danger and Safety in Children's Full Body Play. Academics representing a wide range of GBL related topics presented their peer reviewed research on topics ranging from games-based learning and 21st century skills to gender sensitive games-based learning and games-based learning with human movement interaction. The proceedings of the conference are published and indexed by Scopus and Clarivate Analytics Web of Science. Participants were also entertained by an interactive session on LEGO Education in collaboration with the LEGO Foundation.

The final rounds of 7th International Serious Games Competition was also run during the conference. There were three competition streams this year for fully developed games, games under development and for the first time a category for student developed games. The winners of the three competitions reflected the importance of both digital and non-digital applications for GBL with the overall winner of the fully developed game being Bilgen Demirdaş from Turkey with her game, *Master of Numbers*, a maths and strategy game using tokens and cards aimed at secondary school children. In the games in

development category there were joint winners with an innovative board game for raising awareness in young people of the issues faced by Coventry's rising homeless population called, *Homeless Monopoly* by Jackie Calderwood from the Distruptive Learning Media Lab at Coventry University in the UK and a digital card game to teach problem solving and maths concepts to primary school children called *Maths Duel* by Pierpaolo Dondio from the Technological University, Dublin. The student competition was won by students from the University of Ulster with their board game, Solar Race, that utilises Amazon Alexa as a quizmaster to teach primary school children about the solar system.

ECGBL 2020 is being hosted by the University of Brighton in the United Kingdom. More information about how to submit a paper to the conference and how to participate in the Games competitions is available at www.academic-conferences.org/conferences/ecgbl/.

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Installing Imagination as a Skill

Martin Engler

Mgr. art. Martin Engler
University of Ss. Cyril and Methodius in Trnava
Faculty of Mass Media Communication
Namestie J. Herdu 2
917 01 Trnava
SLOVAK REPUBLIC
mortrenengler@gmail.com

Martin Engler absolved his master's degree at the Academy of Fine Arts and Design Bratislava, the Studio of traditional printmaking and illustration. He focuses on illustrations for games and concept art, digital and analogue-based techniques for painting, drawing, sculpting, designing. He worked as a freelance concept artist and illustrator, is co-founder of the Pomimo magazine focusing on comics in Slovakia, lecturing and teaching art and design focused on games for four years. Currently, he is a PhD student at the Department of Digital Games, Faculty of Mass Media Communication, University of Ss. Cyril and Methodius in Trnava. He teaches 2D and 3D game art, concept art, fundamental art skills, visual development and creative thinking, as well as works within Hemisfera (Level UP) – game dev for high school students and indie game developers.

Imagine that we could all see the way one perceives reality. A thoughtful process with image and sound. Complete, with emotional and informational value. Pure and true. This has been happening throughout history by people with their own imaginative gift interpreted in all different media. Growing equally with the growth of our civilization, science and technology.

First of all we must clarify the position of imagination itself. Imagination goes hand in hand with fiction. It is the process of creating a thought, and taking shape in the real world simply by believing in its existence founded on one's knowledge. Even though, it may not be real, it fills a special space in the memory of its inventor. Fiction is also usually very tempting due to the fact, that it is something entirely new. Therefore it attracts observers to the story to be understood and to live its own life in their imagination. This is a very fascinating part, because it is not only a demonstration of human behaviour to create such fictions of possibilities that lead to creating ideas of religions, ideologies, utopias, mechanisms and constructs, but it also leads to its materialization in the physical world.

At our present time it leads to creating complex stories in complex environments mostly used in the game or movie industries, called by the name concept art. As complex as a new reality created by the rules of our world. This creative potential leads to questions: What is the true potential of a human mind? Why are we teaching people to absorb information, instead of teaching them to understand the core, therefore to create shapes (forms?) from chaos? Can we increase the potential of the human mind by using imagination? Throughout history we have witnessed that imagination has its special part in building civilizations. People with a gift of seeing the truth, future, untouchable entities, witnesses to their own 'celestial' imaginations were worshipped and followed. People memorizing powerful fiction that took shape not only in the mental sphere but also in the various scriptures that influenced viewers (worshippers) of the respective religions. Gifted people were believed to be touched by gods or even seen as gods themselves simply because it filled other people with satisfaction and a unique feel of fulfilling transcendence. This is where powerful thoughts manifested in stories, religions and ideologies presented by art, begin to mix together.

We can witness such courses of events in any civilization with any religion: from caves like Altamira to the first civilizations, ancient Egypt, Mayans, Christians, even in ideologies we can find a strong relation between understanding and using powerful ideas through art. Artists maintained positions of gifted people, who can solely see divine unimaginable things and the things they created became the closest reference to fiction. Perfection in interpretation and aesthetics became valued as proof and truth compared to truth in newspapers. For instance we may follow the lives and art of great renaissance artists like Albrecht Durer or Leonardo da Vinci who were considered to be among the greatest artists in the world in those times. They lived their lives during the ages of very strong Christian religious influence, yet we can see that their artworks were worshiped as relics. There are certain texts that mention worshipping gods through their art or making talismans or protection against the plague such as *Four Horsemen of the apocalypse* by Albrecht Dürer. It says that fiction perceived by the senses, can be very convincing when witnessing a piece of divine or fantasy like imagery, words or sounds accomplished in perfection to please the viewer. It can be so powerful that the greatest and the worst things ever done were covered in their perfection or a constructed lie supported by the imagination of viewer. For instance symbols of religions, books written by dictators or propaganda posters calling to arms. This underlines how powerful and important a role it plays in our life.We do not seek aesthetic satisfaction only, as referred to in Antic philosophers theories, but we crave for a way to see behind the curtain and to see the future. This is the point where the modern perception of imagination is taking place.

There is yet another reason why I mentioned the great artist himself, Leonardo Da Vinci, who is by my perception, father of the present fiction in concept art. We may notice, that where strong imagination, brilliant artistic skills and very high intellect fuse in one person, great things are about to happen. There are many examples in his countless paintings dedicated to the Christian religion, sculptures, design, architecture, but also in countless devices, machines and other inventions and studies of anatomy, physics, mechanics, principles of animation etc. that he created during his life. Creating a new way of perception for the future generations. Here is a smooth transition to the early mentioned concept art. Where artistic skills, design, knowledge of world and working with fictions are being applied to movies and games. This type of art dedicated to fiction, was 'officially' born around the 60´s, when the first mentions of word concept art started to appear in studios (Disney) dedicated to movies and cartoons. The term simply means, that art is created on behalf of a fictional story or in a different type of style than realism, where visualizations of the fictional world, things and characters in it, are made all in the condition of believability. This type of art is a beautiful lie which tells the possibilities or visions in such a high quality environment, where the viewer can easily immerse themself into a fictional world and its story. The conclusion is not only pure amusement at unbelievable things turned to living shapes by patterns taken from real life made in perfect order. It's also a possibility to ask questions, which would never occur in everyday life. Pushing the boundaries of human cognition.

So how does it work? How can someone just activate imagination? Is it something you must be born with, or can it be built? The truth about natural predisposition versus hard work, is somewhere in the middle. Of course each of us has a better predisposition to something else and that hard work and dedication is the way that takes you to the result. We must not omit the fact there is a big difference between craft and art. Is art something untouchable, which is given by god? Or is it some kind of a module that is called imagination built on perception and rules, which drives us to create something different? What I learned is that we undergo a process of evolution from our birth to the very end of our lives. The process is most transparent during the juvenile years of a human being, but is it true that we stop evolving at some point and we will never be better?

What I think is that our physical and mental potential has had enough time to build its structure, but there is a possibility for us to go further. Connections with neurons are made perpetually by learning, creating memories, thinking, connecting and deepening our senses. It is a practice where you should try and develop or in other words program your mind and create different processes and connections, that helps you understand or push your mental boundaries. And this is, where art and especially imagination in my perception, has a huge role. Real art is some kind of a never ending riddle, where you analyse, learn and connect pieces together and you can create something from chaos. That means, that you are constantly changing variables and you are trying to reach a conclusion which could result in various possibilities. It is a game with passion for knowledge and beauty of truth in fiction that satisfies. I would also say that to understand reality through art is very close to a scientific approach. You cannot build anything without knowledge and to draw means to analyse and take form in visual notes.

So, does anyone have it? How can it be tamed or can we learn how to awaken it? I say yes! But it takes ones time, concentration and will to find a way. My opinion of how it all works and can be enhanced, is that it is a combination of 3 parts and for each I created experimental studies on myself during my artistic study, career and teaching. The first one aims to exercise the ability to imagine pictures or scenes. Imagination is a function of everyone's brain. It is commonly active, when you dream or think about your memories, trying to relive them. Thinking about the shape of something or someone. This is also the

key to how to use it when you are not sleeping. Learning to visualize your own dreams, being half-awake and lucidly changing them or to try store your own visual memory simply by looking at them. Analyse them and draw them on paper or you may close your eyes and try to draw them in your imagination. There is a thing that some artists mention from time to time and it could be called the inner eye. It is simply the ability to dream whilst awake and visualize things that don't exist. This ability of course grows with practice and it is good to visualize in different ways. In lines, in shapes and in forms. Each and every way is very important for us to push your brain to details.

The second point of my studies is learning how things work, first of all perspective in three dimensional space, physics like light or movement and your desire for knowledge of the things that inspire you. It is necessary to find a conclusion for every information to build constructions and ways to draw. Way of drawing should be a way of thinking and it should appear that way. Why is that? It's just the way things are, if you want to create something and you do not understand it completely, nobody would believe or even understand it. You can try this by drawing something from your memory. When your brain reacts to a certain memory in a picture, it goes in the direction of facts you know first or simply what is perceived the most. That is why when most people who do not know how to draw are drawing the eyes, mouth, nose and hair very large and clearly but disproportionally, while other things are drawn by their personal interest. Mostly when other parts are drawn, they are totally inaccurate with proportions sorted by their own importance.

I suggest that one of the best practices for this is connecting lines with the inner eye on top of real objects when walking anywhere any time. Try to practise with closed eyes and make studies on paper as much as you can and of anything you find interesting. But the important thing to be reminded of is that if you do not analyse the problem, you cannot move forward. When you cannot imagine, draw or write something down, it means you didn't make a construction from the information. You do not understand it, therefore you cannot make it real. This could be both very frustrating and helpful. It can help to develop, to understand problems and methods of how to deconstruct, analyse to the core and construct again. The more you know about the real world, the better you can visualize things from any angle, it deepens details and functionality.

The third thing to practise is the ability to realize and connect your memories, feelings and senses with knowledge. To create is to understand them completely and to understand is to feel. Feeling here plays an important role. In order to create fiction you must put yourself into the state where your brain feels the fiction. It is not only a method to trigger imagination but also to achieve visual believability and storytelling. To understand this part is to watch people, action and reaction, studying senses and emotions, feeling them on your own. Study situations and deduce the possibilities of outcomes. Recalling them by trying to feel that situation from memory. The immersion process is a very important part for everyone and it can be used as a powerful tool in creating fiction. Or to store any of your information with value by turning it into memory attached with feelings.

The ultimate goal for all of these is for someone to build their own library, to deepen their brain functions by connecting their memories, stories, feelings, senses, dreams with additional information and context. Therefore they can make new patterns, designs, create new stories, understand people or nature. Their potential is growing hand in hand with every connection you make. This is how concept artists think, this is how innovators think, this is how to find a way for figuring out anything. And to walk towards the future.

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Faculty of Mass Media Communication
University of Ss. Cyril and Methodius in Trnava

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