Digital games as a research subject in the discipline of media science

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digital games, serious games, communication potential, games instrumentalization, communication as an interaction, discipline of media science

ABSTRACT

The text presents digital games (including serious games) as medium of communication, considered as subjects in the discipline of media science. Under certain conditions, games are suitable for the effective transfer of theoretical and practical knowledge which can affect users. According to this, the theoretical article undertakes the issue of games evolution, illustrating why and how digital games started to be a research subject for communication and media researchers.

Digital games have almost a fifty-five-year history. Initially, as experimental programs, too expensive and graphically primitive, they did not find many applications and could not reach a mass audience. But already in the mid-1970s, with the development of technology, it turned out that they have features that could be used in communicating with users. It was planned to transfer to the users theoretical and practical knowledge and to influence them in order to shape and change their attitudes. The characteristics of digital games were interesting for communication and media experts. It was debated what for, apart from providing entertainment, their communication potential could be used, and whether communication through them, taking into account the processes of making meanings, could be effective. The presented article is a voice in the discussion in which the above questions are asked and a theoretical study devoted to the conditions making digital games multifunctional media with applications other than just providing entertainment.

Digital games in popular and scientific discourse

When in 1962 the Massachusetts Institute of Technology designed a software presenting the computing capabilities of the DEC-PDP1[1] computer, television dominated the medias. It is then the combination of an oscilloscope, whose round, celadon screen used to function as a well-known computer monitor, with controllers that allowed to change the position of shining points visible on its surface, deserved to be one of the breakthrough inventions in the history of the media evolution of humanity. The program, which was called *Spacewar*, initiated the history of digital games[2] and interested scientists, thanks to which games gradually became the subject of research in many fields and disciplines of knowledge. However, before digital games, initially just a technological fun fact, became interesting for the representatives of the world of science, much attention was paid to publicists and politicians.

Dual, popular and scientific perception of digital games was not a coincidence. It resulted, respectively, from external factors (e.g. stereotypes and ideas about games) and internal factors (related to contemporary technology). Both established a different context of consideration, and as it turned out in subsequent years after 1962, also analyses. It was precisely expressed by Lars Konzack, who explained that digital games can be considered on seven levels of analysis, taking into account: 1) relation between the hardware and the software necessary to run it; 2) characteristics of the artificial programming language; 3)

[1] Ch. Gere, *Digital culture*, London, 2008, pp. 103, 180–181.
[2] Digitality is a superior feature of games that refers to the properties of the code created by the programmer.

device and program support by the user; 4) entertaining values; 5) meanings that occur during operation in the user's mind; 6) reference character meaning the manner in which the content of the games corresponds with the content transferred by other means of communication; 7) social effects of the impact of digital games on individuals and groups[3]. The presence of external factors revealed itself only when digital games were taken out of research laboratories and started to be widely used. Initially, it was possible in shopping malls and in fast food restaurants, in places where large, slot machines could be installed. Then, thanks to the miniaturization of devices, the games were widely used and went to the homes of those who were previously cinema visitors, TV viewers and radio listeners. The two aforementioned contexts of reception of digital games meant that the popular discourse, in which games first appeared, was later accompanied by a scientific discourse.

Since the technological novelty was intriguing for journalists who wrote and talked about it very often, the games took up much more space in popular conversations than in scientific debates, and the way in which they were discussed contributed to their negative perception. Due to the media cover and how the first games were promoted and how their contents[4] were exposed, they experienced a situation similar to that of cinematography, which at the beginning of the 20th century was called the school for criminals[5]. Speaking and writing about digital games, it was stressed that they are detrimental to minors, they demoralize them, cause attention deficits, disrupt educational processes and demoralise. Opinions of this kind appeared, among others, as game comments: *Gotcha* of 1973, *Death race* of 1976 or *Softporn adventures* of 1979. The software, which was accused of bad influence on children and adolescents, was extremely primitive graphically and did not allow to portray either violence or pornography in a way even similar to the realistic one, e.g. In *Gotcha* one luminous point followed the other. This did not, however, prevent the opponents of digital games from claiming "Shame on the people who produce that trash... It is child abuse..."[6].

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[3] L. Konzack, *Computer game criticism. A method for computer game analysis* [in:] *Proceedings of computer games and digital cultures conference*, ed. F. Mäyrä, Tampere, 2002, pp. 91–98.

[4] For example, the theme of the game *Softporn adventures* was presented in TV commercials, exposing silhouettes of half-naked women on the packaging of this game; Interestingly, the game itself did not contain such images.

[5] P. Levinson, *Telefon komórkowy. Jak zmienił świat najbardziej mobilny ze środków komunikacji* [Cellphone: The Story of the World's Most Mobile Medium], trans. H. Jankowska, Warszawa, 2006, p. 121.

[6] R. DeMaria, *Reset. Changing the way we look at video games*, San Francisco, 2007, p. 5. Such opinions were formulated in the United States in the 1980s and 1990s. by senators Joseph Lieberman, Herb Kohl and Byron Dogan, and legitimised by medical authority, surgeon Everett Koop, who argued that the content of games contains orders to eliminate, deprive of life and destroy – so contributes to aberration in the behaviour of children.

Negative opinions about digital games, although not confirmed empirically, turned out to be valuable in a sense. They made the researchers verify them, thus again reaching the scientific institutes. This time, scientists wanted to check whether games have such a detrimental effect on the public, as the publicists and politicians argued. Their point of view was interesting for psychologists, sociologists and cultural scientists. The studies undertaken at that time led to the creation of a research trend known as *active media*. Although the research focused on the search for connections between the content of games and negative manifestations of their users' behaviour, including aggressive ones[7], and tried to verify whether in the analysis of games we can use, for example, cultivation theory[8] and social learning theory, indirect attention was paid to the main, as it turned out, value of digital games – their communication potential.

Thanks to the *active media* trend, it was noticed that the information that is received by the player while handling the games is evidence of the ongoing communication process. The hardware and software emits video and audio signals differently from cinema and television, as this two-component system must be operated by the user through controllers (interfaces). It was therefore noticed that the game system is functionally interactive[9], and the player produces meanings by manipulating images of objects seen on the display (and later on the monitor). Initiated communication processes taking place in the game and in the communication model in which the player appears, from that moment could be identified not only with interaction, but also with influence and understanding[10]. In this approach, the game system was promoted to the rank of a semiotic system, generating meaning, which meant that it was becoming a medium of communication. At the initial stage of technological evolution, it was one-to-one communication (one player received messages sent by the game system, i.e. hardware and software). When digital games reached the internet, communication gained a new status. In the network variant, communication became returnable and multidirectional, "many to many" type (many players communicated not only with the system, but also with each other).

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[7] S.E. Nielsen, J.H. Smith, S.P. Tosca, *Understanding video games. The essential introduction*, New York, 2008, p. 227, 228.

[8] George Gerbner's cultivation theory was applied to television, arguing that TV broadcasts influence the shaping of ideas about the world.

[9] R.W. Kluszczyński, *Sztuka interaktywna. Od dzieła-instrumentu do interaktywnego spektaklu* [Interactive art. From work-instrument to interactive performance], Warszawa, 2010, p. 162. Other options are cognitive interactivity, explicit interactivity and meta-interactivity (ibid.).

[10] T. Goban-Klas, *Media i komunikowanie masowe. Teorie i analizy radia, telewizji i Internetu* [Media and mass communication. Theories and analysis of radio, television and the Internet], Warszawa, 2004, p. 42.

The communication potential noticed in digital games has contributed to the improvement of opinions about them. Thanks to new knowledge in the scientific discourse, questions have been asked about the functions that can be assigned to them, goals that could be implemented using them, and finally results that may result or already are resulting from participating in the game. Answers to the questions formulated were not unequivocal. They depended on what Paul Levinson called the side technology[11], and it was improved: computing power of computers increased, video consoles began to be used, games became clearer and more graphically advanced. After creating and developing internet games, thanks to them, it was also possible to establish social relations. In the new form, games contributed to the establishment of the fifth type of network created during the communication of people[12] - the global network - and promoted the emergence of supranational player communities. This was demonstrated in 1993-1994 when *MediaMoo* multiplayer game players created a community of over a thousand players from 29 countries[13]. In connection with the subsequent stages of technological evolution, the thoughts on digital games were not dominated only by opinions and stereotypes anymore. In scientific debates, it was believed that the communication potential and characteristics of games make them communication media. This meant another change, as the communications specialists and media experts became interested in digital games. The media forms that have been undervalued until now, were analysed within media sciences, proving that the subject matter of research on them is multithreaded and goes beyond the initial stage of negotiating meanings and theorising. Thanks to the development of Clark C. Abt titled *Serious games*, published in the United States in 1970, and knowing the nineteenth century examples of using board games for purposes other than entertainment[14], it was already assumed that digital games can also be used in a way similar to exploitation of mass media. Relevant examples were provided when the so-called *serious games* began to be included in information campaigns carried out in such entities as the United Nations (the secretariat called International Strategy for Disaster Reduction), European

[11] Side technology is a technology thanks to which the main invention can be quickly developed and disseminated. See P. Levinson, *Miękkie ostrze. Naturalna historia i przyszłość rewolucji informacyjnej* [The Soft Edge: A Natural History and Future of the Information Revolution], trans. H. Jankowska, Warszawa, 1999, p. 115.

[12] Previous types of networks are: 1) network of tribes, 2) metropolitan network, 3) old world network, 4) cosmopolitan network. See J. van Dijk, *Społeczne aspekty nowych mediów. Analiza społeczeństwa sieci* [The Network Society: Social Aspects of New Media], trans. J. Konieczny, Warszawa, 2010, pp. 39–40.

[13] A. Bruckman, M. Resnick, *The MediaMOO project. Constructionism and professional community*, „Convergence" Vol. 1 (1995), no 1, p. 3.

[14] In the USA in 1830 and in the following decades, board games available for sale were: *Mansion of happiness* (1830); *The checkered game of life* (1860); *The Landlord's game* (1898); *Game of the little volunteer* (1898). See D. Parlett, *The Oxford history of board games*, New York, 1999.

Commission, British Red Cross, United States Environmental Protection Agency, World Wide Fund for Nature. The interest in games of such significant institutions has not escaped attention of strictly market-oriented corporations, which resulted in the presence of digital games in communication strategies with potential and current clients, e.g. Chevron Corporation or Allianz.

Research on games and media towards development stages of these games

The issue of analyses, in the course of which digital games were devoted attention, was dependent on the developmental stages of these games – in the early 1970s, it was not even known whether these games could be used for anything other than simple entertainment. The status of the games in question reflects the theory of research on mass communication media. According to her authors, "the demand for each research medium grew according to a similar pattern[15]": in the first phase of the discussion, what were the games, how they work, what techniques their creators use, in what way they reflect things people already have and how they are different. They also asked what elements of human life games can change[16]. Without sufficient examples and data, the "technological caterpillar" was criticised before becoming a "butterfly", the so-called Ellul's mistake[17] was made. Thus, their media potential and advantages of games were omitted. Data necessary for the first analyses, and then also for in-depth research, was initially provided by digital game developers. Their activity, depending on the side technology, determined the main development directions in the study of a new type of media.

Initially, as already mentioned, digital games were too primitive, so that the visual and sound signs transmitted by them could be referred to non-media reality, using the probability or even similarity of reproduction. Devices used to run the software were objects with a large area that could be printed – and in colour. It was first used by the dispatchers of products and services, placing brand logos on the casings of automats, consoles and controllers' surfaces, or by colouring available surfaces so that they would associate with these brands. In this sense, digital games have been exploited in a manner reminiscent of *product placement*[18]. The new

[15] R.D. Wimmer, J.R. Dominick, *Mass media. Metody badań* [Mass media research: an introduction], trans. T. Karłowicz, Kraków, 2008, p. 11.
[16] Ibid.
[17] "Ellul's mistake" is a critique of the invention before its applications are known and described. See P. Levinson, *The Soft Edge*…, op cit., p. 173.
[18] *Product placement* is the display of logos and brand names of products in visible places and on visible products, shown, for example, in a film.

application was named *advergame*[19], it was used, among others, to strengthen the brand recognition of CocaCola. For this purpose, special controllers have been prepared for a series of sports games named Coke Pong[20].

Progress in graphical representation of objects visible on displays and screens prompted the development of the *advergame* concept. To make this possible, however, digital games had to transmit images that are even more reminiscent of real ones, are representations of reality, not its equivalences (symbolic representations)[21]. It happened around 1976. Then in the digital game called Datsun 280 Zzap, associated with the car driving simulator, the first vehicle advertisement of the mentioned brand appeared. This development direction of games began to be referred to as *advertainment*[22]. Gradually, it turned out that games do not have to be associated only with entertainment. The already known cases of exploiting them in advertising communication undermined the definition determinants, which in terms of entertainment and fun were described by Johan Huizinga[23]. Non-productiveness was the most questioned issue. If games and fun, as defined, should not produce goods or wealth and lead to a situation identical to the initial situation, then digital games in the described applications have escaped this finding. It was also undermined in the next stages of development of digital games.

In the late 1970s devices for playing games en masse went to ordinary users. They had to be attractive, because it guaranteed producers maximisation of income. Consoles connected to TVs started to be equipped with additional attachments. They allowed to simulate independent sports training or training conducted under the supervision of a trainer, aerobic exercises, cycling, sports like tennis or football. Starting from the intention to create an alternative to passively spending time in front of the TV, a trend known as *exergames*[24] was initiated, which then evolved, changing into a *rehabilitainment*[25]. Fully at home, new

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[19] *Advergame* is the display of logos and brand names of products in visible places on the packaging, game, on its housing, in the game, provided that in the latter case the name will not move. The term was created from the combination of the words advertisement and game.

[20] R. Mileham, *Powering up. Are computer games changing our lives?*, West Sussex, 2008, p. 268.

[21] A. Mencwel, *Ekwiwalencja zamiast rzeczywistości* [Equivalence instead of reality], "Przegląd Kulturoznawczy" 2006, no. 1 (1), p. 12.

[22] L. Michalczyk, *Advergaming jako internetowe źródło strategii marketingowych* [Advergaming as an online source of marketing strategies], "Marketing i Rynek" 2011, no. 12, p. 22. It was made by joining the words *advertisement* and *entertainment*.

[23] J. Huizinga, *Homo ludens. Zabawa jako źródło kultury* [Homo ludens. A study of the play-element in culture], trans. M. Kurecka, W. Wirpsza, Warszawa 1967, pp. 17–28. See also R. Callois, *Żywioł i ład* [Element and order], trans. A. Tatarkiewicz, Warszawa, 1973, pp. 295–467.

[24] See. M.A. Liebert, *News from the field*, „Games for Health Journal" Vol. 1 (2012), no. 1, p. 5. The term was made by joining the words: *exercise* and *games*.

[25] The term was made by joining the words *rehabilitation* and *entertainment*. The earliest articles about digital games in medical therapies are dated to 1983 and 1984. In 1983, in the bimonthly "Gerontologist", Shulamith

applications were used only in the 1980s, when the games were distributed: *Dance aerobics*, *Video jogger* or *Yourself! Fitness*. *Rehabilitainment* games were used in hospital conditions. "Back in 1988, a study with upper-limb burn victims found good rehabilitation results using computer games controlled by a range of large and small joysticks. Therapists found that games helped their patients overcome fears, as well as distracting them from pain. Far from being sterile or artificial, players found the computer-based therapy encouraged natural hand and arm movements by providing feedback"[26].

In the following years new applications were found for digital games. It turned out that they may be less and less related to providing entertainment, and more and more to influence users. The initiatives of game developers undertaken in this respect allow this impact to be considered negative or positive, depending on the worldview. The negative was revealed when games were engaged in ideological and political struggle, which led to the emergence of the trend known as *islamogaming*. Exploiting games involves using various cultural mechanisms in population management techniques and their views. In such initiatives, the Afkar Media group was the leader. "Yet Afkar Media feels the games are important as they offer an alternative story of Arab conflicts. As stated on the official Under Siege Web site: »When you live in middle-east, you can't avoid being part of the image. As a development company we believe that we had to do our share of responsibility in telling the story behind this conflict and targeting youngsters who depend on games and movies (which always tell the counter side) to build their acknowledgement about the world«"[27].

In addition to the negative manifestations of influence on users, the positive ones were also known. One of the first games of this type was the game from the early 70s entitled *Save the whales* for ATARI VCS computer (later also ATARI 2600 console), which was devoted to the activity of Green Peace members to save whales caught for profit. In the 1980s and 1990s, other games were also created in which the entertainment function was more and more restricted. Depending on the subject and the goal that the player had to reach, the researchers divided them into *social games*, *activist games*, *games for change* and *social impact games*[28]. After 2000, the creation of digital games has become easier thanks to easily accessible programs, the so-called editors. Then each user was able to develop his/her own application

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Weisman published a study titled *Computer games for the frail elderly*. A year later, in the quarterly "Activities, Adaptation and Aging", Francis A. McGuire published the document *Improving the quality of life for residents of long term care facilities through video games*.

[26] R. Mileham, *Powering up. Are computer games…*, op cit., p. 17.

[27] H. Campbell, *Islamogaming: digital dignity via alternative storytellers* [in:] *Halos and avatars. Playing video games with God*, ed. C. Detweiler, Louisville, 2010, p. 69.

[28] M. Flanagan, *Critical play. Radical game design*, Massachusetts, 2009, pp. 223–247.

without knowing any programming language. This contributed to the emergence of information, infographics and documentary games (all these games were called journalism of the digital era)[29]. The digital games were also used in election campaigns, encouraging or discouraging to vote for a particular candidate[30]. This is how political games emerged, often being metaphors of the latest reality.

The presence of so many varieties of digital games, previously mentioned only briefly, required efforts to create a coherent typology, as a result of which there was a proposal to consider them on a theoretical basis, which was called *critical play*. Qualifying a given game for it meant that the game must have certain functions. Gonzalo Frasca, one of the most renowned critics of *critical play* trend, recognised that these functions, and at the same time distinguishing features are: 1) initiating discussions on topics dominating in social awareness in a given place; 2) the so-called effects of veracity, or the results of activation of the player visible after the end of the game. Programs that meet these basic criteria, referring to the already mentioned Abt publication from 1970, began to be called *serious games*. Influencing the player with them, making the communication process an interaction helping to understand the phenomena, processes occurring in the real world, meant that they are identified with the media and must have media features that make them effective and meaningful communication. Considerations about their essential features were also accompanied by problems with terminology and language needed to describe new processes. In the analysis of games and media, terms had to appear from several specialist discourses: the science of communication, media studies, social psychology and the type of debate that described the processes occurring in their audio-visual, thus virtual space. One of such terms is the communicativeness of the game-medium.

Main factors decisive for communicativeness of the digital game

Using a digital game is always a part of the communication situation. Essentially, it consists of three main components: content of the game, set of rules describing what, how and by what means can be achieved in the course of interaction (these rules are referred to as game mechanics)[31] and the player. Addressing messages to the player, e.g. with the intention of informing him/her, preserving his/her views, changing them or striving to pass him/her

[29] I. Bogost, S. Ferrari, B. Schweizer, *Gry informacyjne. Dziennikarstwo epoki cyfrowej* [Information games. Journalism of the digital era], trans. J. Gilewicz, Kraków, 2012.
[30] Gonzalo Frasca and Ian Bogost created in 2003 the computer game *The Howard Dean for Iowa game*, which was supposed to make the campaign of Howard Dean applying for the office of the governor of Iowa state more dynamic.
[31] J. Schell, *The art of game design. A book of lenses*, New York, 2008, pp. 136–152.

knowledge other than theoretical, is the most important goal of the creators of digital games in the *critical play* trend. Achieving this goal depends on the content of the game and the rules of communication with the recipient. According to David Michael and Sande Chen, "all games, from the simplest match-three casual game to the most complex story-driven 3D surround-sound experience, single player or multi-player, have something to say"[32]. In this sense, each game has communication potential. Game content and communication rules affect this potential by strengthening or weakening it.

Striving to avoid fluctuations in communication potential and maintain it at a high, positive level means the need to ensure that digital games are understandable to the user. This is achieved when their content is communicative. In turn, the understanding of the whole game depends on whether it goes into the cultural competence of the recipient[33]. If so, it is said to be intertext. If not – it is too difficult to understand and not communicative. The content should also meet the recipient's expectations. If it meets them, it is acceptable. If this feature is not present, the content is considered to be non-communicative. According to Debra Lieberman, acceptable games can have an impact on the recipient in a timeless and multifunctional way, provided that the content is relevant and adapted to the circumstances. The researcher believes that the conditions will be met when the topic is connected with the supra-unit problem[34] perceived in the player's environment, impossible to solve without gaining or developing appropriate competences. In addition, to make the content of the games communicative, it is worth using the arrangements made in the area of advertising communication. Thomas J. Russel and W. Ronald Lane argue that the message affects the recipient if it corresponds naturally with conditions dependent on instincts and senses[35]. The communicative content of a digital game should connect not only with the goal that the player can achieve, but also affect the instincts, e.g. self-preservation, associated with fear and the need for security.

All known, or even future goals set for users of games can be sorted by answering the question whether the effect of the communication situation is to be transfer of theoretical knowledge (so-called general heuristics) or practical (so-called algorithmic rules[36]). In the first case, it's about the "I know that" model. In the second case the "I know how to do that"

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[32] D. Michael, S. Chen, *Serious games. Games that educate, train and inform*, Mason, 2006, p. 23.
[33] S.J. Rittel, *Kultura w dyskursie obywatelskim* [Culture in civic discourse], Kielce, 2004, p. 180.
[34] D. Lieberman, *Designing serious games form learning and health* [in:] *Serious games. Mechanisms and effects*, ed. U. Ritterfeld, M. Cody, P. Vorderer, New York, 2009, p. 119.
[35] T.J. Russel, W.R. Lane, *Reklama według Ottona Kleppnera* [Advertising according to Otton Kleppner], trans. Biuro Tłumaczeń "The Mission", Warszawa, 2000, p. 500.
[36] J. Such, M. Szcześniak, *Filozofia nauki* [Philosophy of science], Poznań, 1997, p. 30.

model is taken into account. In the consideration of the goal of the game, one must also consider whether the problem illustrated in the program content is solvable. This is very important because solvable problem in the real world must remain this way in the game. This also applies to the insolvable situation[37]. Confusion of orders would mean that the digital game is not communicative due to the lack of a logical cause-and-effect relationship, which is defined as the lack of coherence[38].

The appearance in a project of digital game of coherence thread focuses attention on the next component of the communication situation, which is the mechanics mentioned above. Striving to create a communicative message, the situation variant must be chosen accordingly. If goals designed for the player are feasible, then we should choose the "*you always win*" option. In the second case only the "*you never win*" option may be chosen. If the game is to prepare for a specific behaviour, for example to a natural disaster, then we should be sure that the element can be opposed, and the threat neutralized, while training specific procedures.

The theory is reflected in real projects, when we consider digital games collected in the three thematic portals crucial in the *critical play* trend. On the Ecogamer.org portal *environmental games* can be found. Their administrators – foundations, associations, electricity producers – strive to provide the player with knowledge about the causes of climate change, pointing to natural processes and processes caused by the human. The creators are not limited to theoretical knowledge. Their games include both scenarios depicting sound resource management, as well as those that show behaviour patterns in life-threatening situations. These patterns are coded in the player's mind while performing specific tasks. Thanks to the *Eco mission* games and *Enviro boarder* games, players learn about the positive effects of resigning from car transport in favour of public transport, or those resulting from the segregation of municipal waste. In the games: *Climate change*, *Clim'way*, *Electrocity*, *Energyville*, *Windfall* players manage the simulations of cities and regions, taking care of sustainable use of electricity, water, low carbon dioxide emission, but also learn about the procedures to prepare a local community for a hurricane or flood disaster. When virtual disasters hit virtual places, players learn what specific behaviour protects health and life.

Showing how to behave in the face of a natural threat is not the only goal of digital game developers. A different type of game is being collected at Molleindustria.org. Their creators also warn against threats. They result from cultural, social, political and economic processes. Through *Phone story*, *Tuboflex* or *Tamatipico* the player is informed about the

[37] For example, in the game *The end* each action of the player results in the game character's death.
[38] S.J. Rittel, *Culture in civic discourse*, op cit., p. 180.

reasons, manifestations and consequences of exploitation of employees, and by interacting with the game, the player can take part in the simulation. Playing as an exploited worker, the player perceives then that none of the orders performed protects against final dismissal and consequently – poverty. Imaging of these processes is also carried out in a supra-unit perspective. Then the player is the recipient of information about the rules and the course of the distribution of goods in society. By entering games such as *Oligarchy* and *The freeculture game*, the player will gain new knowledge. The games collected in the Molleindutria.org portal have the form of cues, because the vision of reality encoded in them is always the worst possible scenario. In this approach, the player has the chance to become familiar with the negative consequences of the previously mentioned processes.

The theoretical perspective, in which the recipient of the games is interested in processes important for individuals, groups, communities and societies is also reflected in the digital games collected on the Gamesforchange.org portal. Its creators organise games in 14 categories: *civics*, *conflicts*, *economics*, *education*, *environment*, *family*, *fitness*, *gender*, *health*, *human rights*, *learning*, *newsgames*, *poverty*, *recycling*. Although each of the category names allows to encounter a game containing specific information or allowing a specific scenario to be played, games from the *non-profit* organisation iCivics deserve special attention on Gamesforchange.org. Games originally addressed to the American recipient (*Do I have a right*, *Counties work*, *Bill of rights edition*) simulate the procedures and resulting necessary behaviour before American courts, other state and public institutions. Specific game allows players to learn about a specific system and the procedures applicable in it. Thanks to this, a citizen obliged to defend his/her property is not without a chance, e.g. if confronted with the state system.

Correctly selected problem, important for the player, and the purpose of the communication situation, do not make the game a fully communicative product yet. An important aspect of communication are competences. Using the game, you can gain or improve mental, physical and social competences. The first clearly correspond with the "I know that" variant. The second with the "I know how to do that" option. The third are effectively modelled only when the digital game is a multiplayer game and is attended by many players obliged to deliberately establish relationships. The effects resulting from the use of serious games are recognised by the previously mentioned *critical play* researchers for their greatest value. If the effects of veracity contribute to the consolidation of knowledge and skills to use them in the real world, then digital games gain a new value. They become the most perfect and the most effective types of media, so-called transgressive media whose

theoretical description and practical analysis were addressed in the publication *Pervasive games* by Markus Montola, Jaakko Stenros and Annika Waern[39].

Conclusion

The occurrence of games in the media was accompanied by the conviction that they would not find widespread use, beyond the immediate goals of presenting the advantages of computers going to research units. Thanks to the ideas of Nolan Bushnell, *Spacewar*, the first such software, after necessary changes, has become a commercial digital game and has gained immense popularity among users of slot machines. Unknown at that time, the product intrigued journalists, politicians and researchers. Initially, it was too primitive to use it for other purposes than providing uncomplicated, usually arcade entertainment. Technological progress and features of games, including their audio-visual form, and in particular interactivity, inspired experimentation of entities interested in advertising and political communication, propagation of social campaigns, and clinical applications. It was possible to go from plans to real applications in which digital games were treated as communication media, multifunctional and strongly engaging players' attention.

Although in the early stages of development, digital games were the subject of considerations almost exclusively in the popular discourse, in which they were perceived negatively, thanks to the ingenuity of the creators, the more and more interesting games became popular among communicators and media science representatives. Digital games have found a permanent place in the scientific discourse. Analyses of specific examples of game applications have proven that after proper design of the communication situation, they can stimulate specific reactions or even behaviour in players. They can be exploited in the transfer of theoretical and practical knowledge, and even become one of the essential tools in the so-called culture of transparency, helping to eliminate the "cultural, social, custom and physical barriers that have traditionally defined the field of perception and the range of phenomena we could experience"[40].

[39] M. Montola, J. Stenros, A. Waern, *Pervasive games. Experiences on the boundary life and play*, Burlington, 2009, p. 271.
[40] M. Krajewski, *Kultury kultury popularnej* [Cultures of popular culture], Poznań, 2005, p. 166.

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