

VIDEO GAMES AS A COMPLEMENTARY TOOL FOR EDUCATION

Considering changes influencing the ways of using technology taking place in the media landscape we can experience feelings that Alvin Toffler called *the shock of the future*.¹ The dynamics of change, especially in the field of interactive media, makes us feel ‘constantly flipping between wild euphoria and deep concern, we have a right to feel confused’.² According to the new media, especially games, we are teetering between a sense of enthusiasm and anxiety. A number of publications and research show a contradictory picture of virtual reality. In the literature we find extreme opinions on the issue, from the terrible forecasts of Thomas Feibel, the author of *The Killer in the nursery. Violence and video games*,³ to Miroslaw Filiciak’s *Virtual playground*,⁴ which describes a culture of players’ participation pointing to a number of positive aspects of the medium’s use. The lack of a consistent opinion on video games among scientists and researchers does not surprise. Polish literature on the subject is dominated by publications indicating the negative impact of games on the emotional, intellectual, and physical development of the player. The authors present a one-sided image of electronic entertainment, claiming that it contributes to the promotion of violence, desensitization and social isolation. Moreover, they claim that the game reduces interest in other forms of culture, resulting in a decline in readership and viewing movies.⁵ Sharply drawn antagonist character appearing in the games provokes the players to aggressive

¹ A. Toffler, *Szok przyszłości*, transl. W. Osiałyński, E. Ryszka, W. Woydyło – Osiałyńska, ed. Zyski i S-ka, Poznań 1998

² H. Jenkins, *Kultura konwergencji. Zderzenie starych i nowych mediów*, transl. M. Bernatowicz, M. Filiciak, Wydawnictwa Akademickie i Profesjonalne, Warszawa 2007, p. 7

³ T. Feibel, *Zabójca w dzieciennym pokoju. Przemoc i gry komputerowe*, transl. A. Malinow, Instytut Wydawniczy PAX, Warszawa 2006

⁴ M. Filiciak, *Wirtualny plac zabaw. Gry sieciowe i przemiany kultury współczesnej*, Wydawnictwa Akademickie i Profesjonalne, Warszawa 2006

⁵ J. Ankudowicz, G. Straus, *Książki i ludzie na przełomie stuleci [w:] Kultura i sztuka u progu XXI wieku*, red. S. Krzemień – Ojak, Trans Humana, Białystok 1997, p. 134

behavior, resulting in increased criminality among minors. Some authors describing the impact of games on the behavior of their users believe that ‘there is a risk of transmission of certain beliefs, laws governing in computer games and incorporating them into their own concept of reality. Facilitated by the high level of game realism and strong emotional involvement of the player, the line between fiction and reality may be blurred.’⁶ Virtual world through the use of hyper-realistic graphics mixes with reality and a young player may not be able to distinguish one from the other.

The fact that among academics video games do not have a good reputation probably stems from the fact that the research system concerning the field in Poland is not yet formed, and a generation of young scientists in the field of interactive media for whom they are a natural component of the media reality has barely started forming. They represent another view on the games. They question the behind-desk-research methods and favor the participant observation and analysis supported by their own experience deriving from individual involvement in the described medium. The fact that the researcher of the interactive entertainment is also an active member is the most desirable attitude. The games cannot be described from the observer’s distance. It is a cultural phenomenon requiring internal recognition and active involvement. Balanced combination of theory and empiricism allows creating a credible and reliable description of the explanations of phenomena related to participation in the field of audiovisual culture. The recognition of the diverse nature of the games reception and their impact on the attitudes and actions of users of interactive entertainment is only possible if the researcher is personally involved in the field of popular culture and has a wealth of knowledge covering cyber-entertainment. This is the subject to a similar process of interpretation as other cultural texts. The reception of a game, as well as literary instantiation⁷ ‘is the outflow of the meeting of two different factors: the work itself and the reader, and in particular his creative and restorative activities while reading.’⁸ Therefore, the description of the relationship between the video game and the user must take into account not only the components of the interactive program, but also the horizon of the

⁶ M. Braun – Gałkowska I. Ulfik- Jaworska, *Zabawa w zabijanie*, Wydawnictwo Archidiecezji Lubelskiej „Gaudium”, Lublin 2002, p. 184

⁷ comp. M. Głowiński, *Style odbioru. Szkice o komunikacji literackiej*, Wydawnictwo Literackie, Kraków 1977 p. 93-115

⁸ R. Ingarden, *Szkice z filozofii literatury*, Znak, Łódź 1947, p.67

recipient's expectations. The game, its rules, the content and presentation of the virtual world, determines the nature of the player's activities, but does not limit him to the digital universe. Participation in the game is an experience that goes beyond the time frame of receipt, has an impact on other spheres of the player's life and is reflected in it. The reception should be regarded as the result of the transformation of the message by its active user, which involves including and interpreting media content in the context of their own experience and knowledge. In the description of the reception of video games are therefore key questions about the cognitive competence of the recipient and the context of interpretation. These two factors determine the functionality of games, especially from the point of view of their educational use.

Both in academic studies and in public debate on games educational values of electronic entertainment are usually omitted. Only the most obvious benefits of gaming, such as the ability to efficiently use the keyboard and mouse, saving files and similar activities related to using the computer are occasionally mentioned. There are also voices indicating that games develop visual motor coordination and decision-making abilities. However, the research conducted on users of electronic entertainment in the United States and Western European countries show that video games are attractive psychological background for teaching and can successfully be used in the process of education and upbringing.⁹ Many studies conducted on the players show that playing games contributes significantly to young people's intellectual development, enriches their vocabulary, teaches how to create the necessary artifacts in the game or systems thinking that involves matching the events in the cause - effect logical sequences. According to Adam Carstens and John Beck, the authors of *Get ready for the Gamer Generation*¹⁰ players focus more on solving problems, they are more creative and self-reliant, and their focus on competition makes it more likely to succeed in school and work. Adult players are more likely to choose compensation system based on their work, not hours spent than people who are not players. The report *Essential Facts About the Computer and*

⁹ Comp.. J. Millestone, *National Survey and Video Case Studies: Teacher Attitudes about Digital Games in the Classroom*, 2012, <http://www.joanganzcooneycenter.org/Reports-34.html> available on 10.09.2012; A. MyThai, *Policy Brief: Game Changer: Investing in Digital Play to Advance Children's Learning and Health*, New York 2009

¹⁰ <http://johnbeck.com/gotgamebook/Get%20Ready%20For%20The%20Gamer%20Generation.pdf> available: 10.09.2012

*Video Game Industry*¹¹ states that people using games tend to spend free time reading, doing sports and actively participating in social and cultural events. In this article I aim to focus primarily on the educational qualities of video games, taking into account the age of the recipient and the type of games. These studies show that games have a positive impact on the mental, emotional and intellectual development of children. A prerequisite for cyber entertainment to perform cognitive and educational functions, however, is to develop the correct habits and proper selection of games for the young recipients' age and skills. By the correct habits I mean first of all maintaining basic safety precautions regarding the use of interactive media. The most important here is to carefully select games appropriate for the age of the player, determine the time allowed to play, proper room lighting, provide companionship as well as make sure that personal data is protected in network encounters and report any inappropriate behavior of other players and interlocutors. Another condition for electronic entertainment to become an attractive tool in terms of education is the right choice of games to the perceptual possibilities of a child. Different types of games allow developing different abilities, and players in all age groups have a higher interest in specific types of games. The results of my research indicate that young players are more eager to use a varied range of games, reach for a variety of species and pay less attention to individual titles than older players, with shaped preferences.¹² Young game fans are more willing to spend the time playing games with a lower degree of complexity, which do not require a high level of knowledge in various fields. Users of electronic entertainment in the age group 6-12 years are most likely to choose logic games, simulation and adventure. They are in fact a continuation of traditional children's games. It is worth recalling, what Roger Caillois pointed out, that the process of placing the concept of order in human entertainment in the form of rules is closely related to the maturity of the player. According to Caillois 'paidia' - play is primal to 'ludus' – game. Forms of entertainment characteristic for early childhood are spontaneous, exuberant, often random, based on imitation and mystification. The idea of creating and abiding by the rules appears later in life. 'Plays have more open ending, the solution is made in stages and there are no agreed settlement options, in the game the whole procedure was subordinated to a clear goal, the result is measurable and associated with the opposition, juxtaposition of two

¹¹ http://www.isfe.eu/sites/isfe.eu/files/esa_ef_2011.pdf available 10.09.2012

¹² D. Urbańska – Galanciak, *Homo players. Świadectwa i style odbioru gier komputerowych*, Wydawnictwa Akademickie i Profesjonalne, Warszawa 2009, p. 198-200

parties.¹³ Described above difference between a game and a play explains different preferences of users in different age groups. This is also reflected in the results of research on strategies for the use of video games. They show in fact that with the age of the player, or rather with his maturity to enjoy games, there is a growing need to structure entertainment. In practice this means that the mature players expect and are more likely to choose games with a higher level of complexity, with strictly explicit rules and aims. They also need clearly defined rules of running the game. Therefore, players aged 13-16 are interested in strategic and simulation games, while those over 16 rather reach for strategies, action and role-playing games. The research also shows that for younger kids playing video games has purely entertaining features, typical for fun. Therefore, all the elements and teaching tools, which games for children are equipped with, from the child's point of view, are transparent. They remain unnoticed, making the process of educating children with games in passing and easy to implement. Dynamically changing configurations of objects and phrases reduce the effect of fatigue, and the plot effectively camouflages the educational values of the game. In this way children feel that they are participating in an interesting play, engage emotions that support cognitive and memory processes. Education through entertainment is of great importance, especially in the case of experiments and problems that are difficult to carry out and visualize in reality. The opportunity to experience simulated phenomena provokes young players to seek answers to questions such as *how?* Thus the vast majority of games aimed at players in preschool and early school present issues in an attractive form of quizzes, trivia, puzzles, mazes and stories. These games are often based on storylines well known from other forms of communication. This clever trick provokes a child to seek and verify information gathered while dealing with other sources: books, cartoons, movies, TV programs. Using characters from other media in games for the youngest is to focus more attention on the game and strengthen the motivation of the player. For every successful action the player is rewarded with praise, a song or a subject to enable the successful completion of the game. Differentiated reward system and the introduction of an easily recognizable story encourage players to search for the best solutions for the desired result, and strengthen their self-esteem. Children, moving from the simplest level to increasingly complex and demanding the use of already assimilated information become somewhat self-teachers. No external forms of supervision, so important for a sense of participation in the play, are apparent. The role of

¹³ R. Caillois, *Żywioł i ład*, transl. A. Tatarkiewicz, PIW, Warszawa 1973, p. 331

teachers motivating to focus on set tasks and evaluating the effects and progress is played by known and popular characters of the game.¹⁴ Interactive entertainment designed for the youngest players can be successfully used as a supplement to traditional forms of education since they teach logical thinking, seeking non-standard solutions, noticing details, memorizing words and images, thanks to which the vocabulary develops. Games aimed at the youngest contain numerous strictly educational elements. In many of them there are mathematical exercises involving the laying of geometric figures, identifying numbers, linguistic exercises, such as learning the alphabet, creating semantic opposition, and finally the task of art: coloring, repeating melodic line, etc. Designers of children's programs often provide games with elements in forms of non-interactive videos on selected topics. Typically, they describe the world of nature, the laws of physics and the history of objects in the game. Popular among children adventure games refer to other cultural texts also show a variety of ways of constructing narratives arising from the choices they made during the game. They teach how to create a coherent story, solve puzzles, and careful observation.¹⁵ Built-in options of cooperation or rivalry stimulate social contacts. They contribute to initiation and perpetuation of relationships between peers or siblings. They often become an inspiration to the traditional playground plays with friends, and this also enables the development of physical or manual skills. The socialization of children through fun does not have to be limited to the group of peers. Joint participation in the game perfectly eliminates the intergenerational gap. Children love playing with their parents or even grandparents, regardless of the adults' ability to efficiently manipulate the same controller and navigate the digital universe. Most games aimed at children promote collective behavior and encourage cooperation. A parent or a guardian playing with a child not only shows interest in modern forms of entertainment, but also has the opportunity to observe the child's interests, and a chance of proper assessment of his emotional and intellectual abilities. It is also a perfect excuse to talk and shape a healthy value system. The use of games by parents and teachers in the process of education and upbringing cannot be overestimated. Playing time is not necessarily, as we used to wrongly believe, time wasted. At school, the emphasis is on individual teaching and independent problem solving. Searching for information from other people or the use of teaching aids is

¹⁴ e.g.: series of games: Kindergarten Pooh, Finding Nemo: Submarine playground, Mickey Mouse: scientific battles with ghosts, Disney Universe, Bolek and Lolek on the trail of the lost book of spelling and other series

¹⁵ e.g.: Lego Harry Potter, Madagascar, Ice Age, Toy Story, Cars and other

considered fraud or cheating. Meanwhile, the modern working model is more and more often based on cooperation and teamwork. 'We are surrounded by knowledge culture based on the collective intelligence. Schools do not teach what it means to live within the community, but there is a chance that popular culture does.'¹⁶ For many young people games, especially the ones favored by those aged 13-16, simulations and strategies, are a foretaste of how they work in larger teams. They teach how to combine the acquired information and work together on solving problems. Multiplayer games that require cooperation show the essence of cooperation, which means not only an exchange of knowledge, but also confidence in the actions taken by others. In multiplayer or massive games the players learn rapid response and decision-making, and the need for exchange of information and cooperation in the group makes them 'feel more confident, more capable, more expressive, more involved in everyday life.'¹⁷ Simulators for both sports and racing develop reflexes and knowledge of physical phenomena. They teach discipline, respect for the rules of the game and sport strategies. Social simulations like The Sims, SimCity provide practical knowledge about the political, social, economic and cultural phenomena. The player acquires from them a range of information on the history, geography or economics. Participation in the game enables to develop managerial skills, crucial in jobs that require managing a group of people. Similar values can be found in strategy games that allow users not only to extend knowledge of a historical period, but also develop negotiation skills. These games are the perfect background for tactical training and testing strategies used in everyday life and business. The aim of the game is to win. Veteran players will not, however, be satisfied with Pyrrhic victory. They will always try to search for optimal solutions, which often means the repetition of the same level or part of the game. And here we find a reference to an important part of education, which is the need to experiment and learn from mistakes. Constructivist learning theory assumes that the student is an independent and active subject constructing own system of knowledge, using a variety of different sources of information. This activity encourages students and strongly reinforces the commitment in a particular field of knowledge as well as motivation to deepen it. Video games are designed for entertainment and not all of them have a clear educational

¹⁶ H. Jenkins, *Kultura konwergencji. Zderzenie starych i nowych mediów*, transl. M. Bernatowicz, M. Filiciak, Wydawnictwa Akademickie i Profesjonalne, Warszawa 2007, p. 127.

¹⁷ J. McGonigal, *Alternate Reality Gaming*, <http://www.avantgame.com/McGonigal%20ARG%20MacArthur%20Foundation%20NOV%2004.pdf> available on: 10.09.2012

character. However, the undeniable advantage of games is their ability to engage the players and motivate them to succeed. To a large extent it resembles the teaching process assumed by cognitivism. A student, similar to a player, experiencing confusion must identify the source of his failure, formulate a theory about the causes of the failure, and then come up with a solution to avoid the problem. It is a natural process of educational autonomy. With age students should gain independence, and the more information they are able to find and verify, the less help they should be provided with. The principle of developing meta-cognitive skills is reflected in video games that offer a similar learning curve. It involves adjusting difficulty levels of the game to suit players' cognitive competence, usually coinciding with the age difference. The introduction of games in the educational process, therefore, would be practically responsible for verifying the knowledge they have acquired, testing it, deepening and development of specific interests. Knowledge frame itself should be constructed in the traditional manner, using existing teaching methods. However, a properly chosen game and the gradual introduction of various levels of difficulty adequate to the knowledge and age of players will encourage students to self-education and responsibility for their own development. The countries of Western Europe run an educational program based on entertainment entitled Games in Schools. It brings together more than thirty ministries of education, and its actions are aimed not only at students. They also include teachers' training for the implementation of new technologies in teaching and learning processes. Children participating in this pioneering program use both purely educational games, as well as commercial titles with content developing their knowledge. Parallel research is conducted on teachers to check the purposefulness of using electronic entertainment in schools. It shows that educators consider playing games a helpful tool and valuable source of knowledge in such fields as history, geography, mathematics, science, physics and foreign languages. It is worth mentioning that the game Civilization III was used as early as 2004 in many American schools during the lessons of history. In Denmark in 2007 the game Europa Universalis II was introduced to study history. With The European Schoolnet project many countries conducted experiments based on the use of games such as Racing Academy, which allows students to understand the basics of engineering, SimCity, through which young people learn about the process of urbanization and the basic phenomena of socio-economics or Age of Empires and Age of Mythology which provide valuable information on history, mythology, financial management and human resources. Serious Games - the scientific movement that promotes the use of video games in education - was created to meet the demands of a new generation of

students. The needs of digital natives connected with learning seem to be quite different than in the case of people for whom computers and consoles are technological innovations that require training how to operate them. In the process of learning these students expect analogous methods to those known from virtual reality. They acquire information in a non-linear way, using a variety of sources. They do not divide information by subject, according to school subjects, but form a network structure and logical relationships. New experiences and messages are integrated in existing areas and are subject to constant revision. For students born in the era of digital media, collaborative learning is a natural process. Educational anti-individualism is based primarily on the creation of interest groups and sharing knowledge using ICT tools such as social networking, blogs, discussion forums, and thematic portals. With those students in mind Serious Games makes games focused on specific social problems, fully designed to be used in education. These include titles such as Global Conflict Palestine, the Global Conflict Latin America, in which the player takes the role of a journalist in search of reliable information about the social - political conflicts or economic problems of the region. Given the natural desire of young people to use games, the Department of Teaching Chemistry at Adam Mickiewicz University in Poznan, Poland, prepared packages of various games supporting chemical education at middle school. Games included in the book *Ciekawa Chemia (Eng: Interesting Chemistry)*¹⁸ met with great interest among the subject teachers and their students, and the means enhancing the use of the game was an interactive whiteboard. The authors of foreign language schoolbooks also offer similar teaching aids, and the use of games in language pedagogy and speech therapy is becoming more common and recommended by researchers. The most important aspect of using video games in education is to find a program which aims match the objectives of the curriculum. An example of such a game can be a series of Emergency Fighters for Life. Its main theme is rescue and first aid. The player has to deal with such situations as car accident, fire in a tower and a lost hiker in the mountains. In each mission participant's task is to save as many people as they can, call appropriate services, minimize losses, assist the injured and ensure the safety of victims. Emergency is an example of a game that could successfully, and even should, be placed in the safety training. This is because it gives the opportunity to observe a number of emergencies and life-threatening conditions that cannot be expressed in the traditional mode of education. Moreover, the game shows a whole range of circumstances in which first aid should be

¹⁸ H. Gulińska, J. Smulińska, *Ciekawa Chemia*, Wydawnictwa Szkolne i Pedagogiczne, Warszawa 2006

instantly applied. Furthermore, it contains educational features because it draws attention to tragic consequences of students' careless ideas and actions. Another example of a perfect game for use in education is *Mount & Blade: With Fire and Sword*. It is a very successful combination of strategic and role-playing game set in the realities of the plot known from a Polish classic Henryk Sienkiewicz's *Trilogy*. Player has five fractions: the Polish Republic, the Kingdom of Sweden, the Crimean Khanate, Grand Duchy of Moscow and the military Zaporozhian. Each of them has their own units and players need to decide which one to choose and which strategy to adopt in the conquest of Eastern Europe. They can concentrate solely on the military aspect or gaining strongholds, but for the best results they cannot downplay the economics, urban and rural development and trade. The game perfectly captures the atmosphere of the seventeenth century of the Polish Republic, the characters and the reality described by Sienkiewicz. Neat representation of costumes and weapons is of huge importance here, essential for history and native literature fans of this period. Among the commercial games with high educational values I should also mention other titles referring to specific historical periods, such as: *Pharaoh*, *Cleopatra: The road to the throne*, *Medieval Total War* or *Empire Total War*. They move the player to the times of ancient civilizations, turbulent period of the Middle Ages, and the eighteenth-century colonial conquests of the modern world's greatest empires. Pointing to the teaching functions of games I cannot ignore the titles logically using formulas of game shows, such as, *Buzz: Quiz World*, *Brain Challenge* and digital versions of board games such as *Monopoly*, *Scrabble* and *Chessmaster*. According to the teachers involved in the project *Games in Schools*, video games encourage teamwork and solving tasks requiring creative thinking and cooperation. They help to improve the dynamics and variety of lessons, activate a group, develop a competitive spirit, and have a positive impact on communication and language proficiency of students. Most of them unanimously admit that video games should be introduced into the teaching and learning processes, since children use them anyway, acquiring additional knowledge and experience, which can be used in classroom. Unfortunately, the vast majority of teachers participating in the project deplore the fact that the curriculum does not provide the time to enable the introduction of these attractive to children and young people tools that support and vary traditional teaching methods. Many schools also face the problem of the lack of technical resources to integrate the interactive games with education or insufficient training of the teaching staff in this area. These and other problems cause that in many schools the education of children and young people continues to keep up with the Nuremberg funnel metaphor,

which is a stand-alone method which does not take into account the educational needs of today's students, and does not allow the use of innovative tools, where the source of knowledge is not only a teacher. Model of educating students develops disproportionately to the technological changes that generate more and more sources of information. Contemporary media enable students' complete independence and individualized learning process. In the era of new technologies both science and work have been deprived of any restrictions. Everyone can participate in distance or interactive education and learning takes place at any time and place appropriate to the preferences, lifestyle and other determinants of people using this form of learning. Schools should be prepared for these changes. Therefore, we should benefit from the educational potential of video games, which children and young people are so eager to use. Games appropriately matched to the age and cognitive capabilities of students can successfully serve as a complement to traditional teaching. These did not cease to be either important or effective. But we should keep in mind the rapidly changing media environment and the reality in which students grow and the most important principle of *verba docent exempla trahunt* guaranteeing educational success.

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