

II. PRACE BADAWCZE I DOŚWIADCZENIA

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'WHY ARE THEY SO BORING?' - THE EDUCATIONAL CONTEXT OF COMPUTER GAMES FROM A DESIGN AND A RESEARCH PERSPECTIVE

ABSTRACT. Stasieńko Jan, 'Why are they so boring?' - *the educational context of computer games from a design and a research perspective* [„Dlaczego one są takie nudne?” - edukacyjny kontekst gier komputerowych z projektowej i badawczej perspektywy]. „Neodidagmata” 35, Poznań 2013, Adam Mickiewicz University Press, pp. 47-64. ISBN 978-83-232-2685-7. ISSN 0077-653X.

Można powiedzieć, że gry elektroniczne od samych swoich początków miały istotny kontekst edukacyjny. W przeszło czterdziestoletniej historii wielokrotnie spierano się o to, czy mogą one mieć takie walory, czy też wręcz przeciwnie, nie mają ich lub też przynoszą odwrotny skutek, który niewybrednie określano jako „ogłupiająco-demoralizujący”. W artykule dokonano przeglądu najważniejszych osiągnięć w dziedzinie gier edukacyjnych, uwzględniając zarówno stanowiska badawcze, jak i praktykę kreacji gier. W tekście przedstawiono takie zagadnienia, jak wymiary edukacji w grach czy dyskusja nad wartością edukacyjną gier w perspektywie opinii ich przeciwników i zwolenników. Dokonano przeglądu ustaleń terminologicznych oraz opisano typy gier edukacyjnych i kryteria ich wyróżniania. Odniesiono się do relacji między gatunkiem gry a kwestią jej edukacyjności. Przeanalizowano technologiczne aspekty gier edukacyjnych, a także możliwości budowania wartości edukacyjnej w grach za pośrednictwem strategii rywalizacyjnych.

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From the very beginning, electronic games have played an important educational role. However, throughout their 40-year history, it has been debated whether games have educational qualities or if they have an adverse effect on people which can be indiscriminately described as “stupefying and demoralizing”. This article reviews the major achievements in the field of educational games by taking into account research approaches as well as the practice of game design. In this paper I address issues such as the educational aspects and educational value of electronic games as seen

from the perspective of their opponents and supporters. I review the key terminology and describe various types of educational games as well as the criteria that are used to differentiate between them. Additionally, I examine the relationship between the game genre and its educational value and analyze the technological aspects of educational games as well as the opportunities for creating games with educational values through gamification strategies.

Even the first, simple electronic game which was developed by scientists at Brookhaven National Laboratory under the direction of William Higinbotham in 1958 was set in an educational context. Higinbotham believed that the annual open house events in the laboratory, which were organized for the general public, were overly static and non-interactive. He realized that "it might liven up the place to have a game that people could play, and which would convey the message that our scientific endeavors have relevance for society" (after J. Gettler <http://www.bnl.gov/bnlweb/history/higinbotham.asp>). The first game, i.e. "Tennis for Two", was part of an educational show that attracted large audiences. The further development of the global gaming industry revealed the characteristic duality that had already been present in Higinbotham's game. In order to be attractive to consumers games should provide entertainment but, at the same time, they are also frequently used for educational purposes. However, it appears that attempts to make electronic games an educational medium were often unsuccessful, while some very entertaining titles turned out to be the best teaching aids. In the text that follows I will describe different aspects of the relationship between the entertaining and the educational function of games as well as the network of relations between various conceptual categories that are used in games and the issue of their educational value. This study presents a review of knowledge on electronic games both from a scientific perspective, which involves an analysis of theoretical concepts, and from a professional perspective, which investigates the attitude of game designers toward the educational value of their work.

EDUCATIONAL ASPECTS AND CONTEXTS OF GAMES

There are many different educational aspects and contexts of electronic games and this review should begin with a presentation of these elements. This is necessary mainly because the educational value of a game is usually measured by its effectiveness as an educational tool; however, games also have other educational qualities that are not easily recognized by the users and designers or by those who remain critical of such games.

The educational aspects and contexts of games are:

- education through games;
- education inherent in games;
- education for game development; and
- education as a result of working on games.

Education through games

Certainly, the first and most recognizable educational aspect of games is connected with their construction and use as an educational tool. Here it is worth noting that games can serve as both a direct and indirect didactic tool, which significantly extends the range of potential educational applications of games. There already exists a remarkably vast body of scientific literature that is devoted to reflections about the educational potential of many commercial games. Let us consider, for example, K. R. Pierce's "World of Warcraft" (2007); K. Squire and S. A. Barab's "Civilization" (2004) and S. Slota's "Deamon's Souls" (2010). One should take into account the fact that a video game can be a medium that shapes various types of knowledge and skills.

Education inherent in games

At this point the questions arise as to how players learn about the game environment and what are the possible outcomes for the theory of education and for the theory of game design. Getting to know a given game is a specific act of acquiring knowledge; this information can be useful for the designers, for example, when they plan the initial stage (e.g. in the form of a tutorial) at which the player learns how to handle the interface and discern the depicted world (P. Sweetser, P. Wyeth, *GameFlow*, 2005). On the other hand, games can be a tool for acquiring knowledge about the users, which might later contribute to greater effectiveness in designing them (e.g. a performance test of gestures made by using haptic interfaces in specially designed games; compare S. Cheema, J. J. LaViola Jr., 2011). Finally, games also make it possible to come to more general conclusions about the theory of education (B. Paras, J. Bizzocchi, 2005).

Education for game development

This area includes two subdomains. The first one involves developing game design skills. Currently, mainstream academic programs in designing computer games are highly advanced. The institutional and theoretical background of this process is also being developed. Our attention should also be drawn to the activities of game industry producers who give their

recommendations with regard to training in this field (e.g. IGDA Curriculum Framework, 2008).

The second domain comprises all the types of activities that are associated with a critical and conscious acceptance of games, which appears to be important for adult independent gamers as well as for adult guardians of child players. The development of competence in selecting games that are appropriate for a particular age group underlies the launch of the PEGI system and its various promotional activities. However, the age rating of games is sometimes a double-edged sword because young players may treat PEGI as a guide as they reach for the forbidden fruit, that is, games that seem attractive because they are targeted at older audiences.

Education as a result of working on games

The process of designing games can also mean acquiring skills that are not connected to the game environment. Game design can be a tool for developing competence in the area of interaction or team problem-solving. The KODU system, which has been developed by Microsoft, is an example of such an environment – it allows children to make their own game by using a visual editor where all of the game's components are represented by intuitive icons. This system not only inspires children to design games but it also fosters the development of interpersonal skills.

TERMINOLOGY-RELATED QUESTIONS

Defining educational games is as difficult as defining education. The definitions of educational games may vary depending on the criteria that one adopts to determine what should be taught and on the forms of education that are implemented by using educational games. I would like to outline a set of concepts which may help one look for the educational value of games. During the Digra 2011 conference and a debate on gamification R. Khaled, D. Dixon and S. Deterding (2011) sketched out a map of the definitions of games that seemed to have an educational context; however, they understood the term 'educational game' in a very narrow sense. According to their typology, educational games are part of a category that might be described as serious or mature games (full-fledged games). They are aimed to be something more than just entertainment. According to another team of researchers (D. Djaouti, J. Alvarez, J. P. Jessel, G. Methel, P. Molinier, <http://serious.gameclassification.com/EN/about/bricks.html>), a serious game has defined objectives and it is intended not only for the entertainment market, but also for at least one additional market. This trend is de-

veloping intensively in the world of games, which gives games the potential to become a medium for conveying non-trivial content. Among serious games Khaled, Dixon and Detering distinguish categories such as: health games, news games, persuasive games, simulation and training games, games with a purpose¹, design games and the already mentioned educational games. However, Djaouti, Alvarez, Jessel, Methel and Molinier also identify subtypes of such games, i.e. advergames, newsgames, edugames, exergames and edumarketgames. Both typologies assume that educational games are only those that have an educational context in a traditional, "school" sense². It is hard not to notice that all the remaining subcategories of mature games play a significant educational role (e.g. in the sphere of creating values – persuasive games) or that they are developed for the purpose of specific educational processes (e.g. simulation and training games). Therefore, virtually all serious games should be taken into account when searching for educational value. This hypothesis is confirmed by A. Derryberry who explicitly treats serious games as an umbrella term covering the whole group of educational games: "Serious games also have other names, including immersive learning simulations, digital game-based learning, gaming simulations, and 'games you have to play', to name a few. While some distinctions may exist between these, I use 'serious game' as the über-term for any kind of online game for learning." (2007, p. 3).

TYPES OF EDUCATIONAL GAMES AND THE CRITERIA FOR IDENTIFYING THEM

At this point I will discuss the types of educational games that are identified based on three kinds of criteria. The first one is the thematic-formal criterion, the second one is the age criterion, and the third one is associated with a given type of educational activity. These are examples of how the criteria that one adopts may influence the design of a taxonomic division. Obviously, it is possible to adopt other criteria, such as the technology or genealogy of games. Those areas will be dealt with in the subsequent parts of the article.

¹ The authors provide interesting examples of games with a purpose. These are games aimed at achieving a measurable scientific goal. "EteRNA", "Phylo", and "Foldit" are games in which devising new RNA, DNA and amino acid configurations were built into the gaming convention where the player experiments with their construction according to certain rules, see R. Khaled, D. Dixon, S. Detering (op. cit.).

² The same is true of the typology proposed by B. Sawyer and P. Smith (2008) who list the following types of serious games: games for health, advertising games, training games, educational games, scientific and research games, production games, and games as work.

The classification of games according to the thematic-formal criterion:

- newsgames;
- games connected with political and social activism;
- ecological games;
- medical games;
- vehicle simulations;
- military games; and
- games connected with particular scientific disciplines (mathematics, chemistry, geography, biology, etc.).

Newsgames³

Newsgames is a genre that is based on reports from the media. The narrative or syntactic structure of such games refers directly to information in the news. "You Shall Know the Truth" is an example of such a game. In this game one takes the role of a secret agent whose task is to obtain documents and biometric data from an anonymous Wikileaks employee's apartment. The game draws attention to sleazy voyeurism which is an intrinsic part of a CIA agent's work and responds critically to the question of surveillance. It is worth noting that the game is a part of a larger project which was developed by Wikileaks under the name "Wikileaks Stories". The aim of Wikileaks Stories was to create a whole series of independent games that would be based on this organization's functioning.

Games connected with political and social activism

This category encompasses a very wide range of persuasive games for which the sphere of political and social activism serves as the background. For example, there are projects such as "Sweatshop" – a strategic and management game in which the player takes the role of a sweatshop's manager. This sweatshop is a factory that produces goods for well-known corporations located in third-world countries. Characteristic elements of the capitalistic "labor camp" appear in the game: workers cannot keep up with production demand, they have their limbs cut off, they die of exhaustion, etc.

Ecological games

Among persuasive games one can also find a large group of games whose subject is ecology. A variety of games fit into this category, ranging

³ A thorough study of newsgames is provided by Ian Bogost (2010) in his book: *News Games: Journalism at Play*.

from simple computer tests⁴ and flash games that involve protecting the Earth from global warming or protecting endangered species to complex productions like "Okaubu" for PlayStation 3. It is worth noting that ecological games are a very important factor in building activities around well-known non-governmental organizations that pursue environmental protection initiatives. Games that appear on PETA's (People for Ethical Treatment of Animals) and Greenpeace's websites are notable examples of this game genre. Games that are published on both of these websites raise ecological questions but also critically refer to mainstream games. "Tofu Boy" is a recognizable title on the PETA website; it is a parody of the "Meat Boy" game where the main character is a bloody piece of meat. "Duke Anti-Nuke" is a game that appeared on the Greenpeace website. The main character is meant to be the opposite of the iconic Duke Nukem, that is, a steroid infused defender of the world. This time it is a boy who saves the world from nuclear contamination by deactivating nuclear power stations and nuclear missile silos which are at risk of a terrorist attack.

Medical games

In this category there are many examples of games with the purpose of stimulating a variety of activities that are related to medicine. The educational value of such games involves acquiring knowledge about medical procedures, handling stress and learning to make quick decisions in life-threatening situations. "Air Medic Sky One" is an example of this type of games; it won a gold medal in "The 2011 International Serious Play Awards" competition. The game uses an innovative interface with biofeedback that is sensitive to the players' emotions while they are performing rescue procedures. The user acquires communication skills while taking part in teamwork activities, through minigames and lectures as well as through participation in complex simulations of situations that can happen to novice physicians.

Vehicle simulations

Among games that fall within this category are all the simulators that are used in military training and civil aviation as well as when learning to drive a car. The high-tech design of these simulators and their extremely utilitarian (non-entertaining) character make it difficult, in this case, to speak of them as typical games. On the other hand, they are closely related to typically entertaining vehicle simulators such as "Flight Simulator" (airplanes) and "Steel Beasts" (tanks).

⁴ See <<http://gamequarium.com/ecology.html>>.

Military games

Simulated battle conditions for military purposes make the category of military games similar to the previous game model, particularly because games that have been specially developed for military purposes may be juxtaposed with their very popular entertainment counterparts such as "Call of Duty" and "Medal of Honor". Also, one should not forget about the success of "America's Army" as a tool for army recruitment as well as training.

Games connected with particular scientific disciplines

The thematic criterion may be used to identify groups of games that are connected to basic fields of knowledge for which games serve as tools of educational support. Many of these titles concern mathematics, such as older games like "Math Blaster" and newer ones like "Timez Table", "The Incredible Machine" (physics), "Electric Box" (mechanics), "Foldit" and "EteRNA" (chemistry). "Where in the World is Carmen Sandiego" is a special case of an educational game that is related to a specific discipline. Released in 1985, the game is recognized as one of the most successful educational games that are commercially distributed.

Age-specific games:

- aimed at children;
- aimed at teenagers and adults; and
- aimed at elderly users.

Games aimed at children

Games already seem to be a widespread and accepted type of educational activity for children. Educational games are developed in response to a child's natural need for play as well as for gaining experience and knowledge through play, which is referred to as "play as progress" in Brian Sutton Smith's typology (2001, chapter titled "Rhetorics of Animal Progress", pp. 18-35). Here, however, a problem arises, which can be summarized in the phrase: "a child can bear anything". This problem concerns situations where the ostensive need for playing electronic games leads to the acceptance of games that are admittedly educational but poorly and sloppily designed. Since children are not very picky when it comes to workmanship, educational qualities of games are used as a ploy to achieve an easy success.

Games aimed at teenagers and adults

Teenagers and adults are undoubtedly most critical of game designers' educational ambitions. The problem which can be exemplified by the

phrase: “educational games suck”⁵ arises because advanced players, who are sensitive to the disruption of games’ entertaining qualities, are not willing to accept tawdry, intrusive didacticism. Therefore, as for this age group, it seems that the intentional creation of an educational game context represents the greatest challenge for game designers. However, surprisingly enough, educational value can be achieved indirectly in games where an educational context is only occasionally, and not overtly, present. This can be seen from the popularity of series such as “Medal of Honor” and “Assassin’s Creed”, the latter being greatly appreciated for its suggestive historical background.

Games aimed at elderly users

Educational games for seniors constitute a special kind of games for two principal reasons. First, such games can play a highly significant role in developing elderly people’s digital literacy. Second, games are an excellent tool for psychomotor activation, especially if they are equipped with modern haptic interface platforms such as Wii, Kinect or PS Move.

Based on the type of educational activity games can be divided into those that:

- impart knowledge – they usually reconstruct one’s knowledge; their educational value is based on recreating a particular environmental reality, ecosystem or historical period;
- impart skills – these are connected with the idea of simulation which entails performing active operations, thus allowing one to acquire proficiency in performing certain tasks; and
- impart values/shape attitudes – a game presents positive role models and criticizes negative attitudes, as is the case with the already mentioned persuasive games.

GAME GENRES AND EDUCATION

Game genres cover a variety of groups. There are different definitions of genres and different ways to distinguish among them. In this section I am interested in how various game genres may be connected with the issue of educational values. It seems that one can identify specific genres or types of games that are more likely to include more educational elements than oth-

⁵ Compare with the part of the article which deals with players’ feedback concerning games’ educational value, A/N.

ers. For example, adventure games usually contain an attractive and complex story line that has such potential because it is easy to set a plot in a particular historical reality or associate it with a specific geographical context. I will look for educational values in game types such as puzzle, simulation or strategy games rather than in genres such as 3D shooting, fighting and platform games. However, it appears that even the second group of game types can be perceived as containing a certain set of stylistic rules which may have educational value on a creative level. These, for example, can be found in "Timez Table", i.e. an attractive platform game for children that teaches multiplication, as well as in "Re-mission", i.e. a 3D shooting game which allows the user to adopt the role of a killer whose aim is to eliminate cancer cells. These examples demonstrate that virtually none of the genres is a natural carrier of educational content and that such content may be found across the whole field of gaming.

TECHNOLOGICAL ASPECTS OF EDUCATIONAL GAMES

The development of hardware platforms on which games are available make it possible to use technical solutions when designing dedicated educational systems. I would like to present several examples of such solutions.

The Internet is certainly the most important of such platforms. Virtual worlds on the Internet function as intermediate environments between a sophisticated social tool, instant messenger and a given game. At this point it would be difficult to comprehensively describe the educational potential of the most complex virtual world, i.e. "Second Life", because this subject has been extensively explored in both scientific literature and educational practice (D. Livingstone, J. Kemp [eds.] 2006; M. N. K. Boulos, L. Hetherington, S. Wheeler, 2007; A. De Lucia, R. Francese, I. Passero, G. Tortora, 2009). Therefore, I will point to projects that are aimed to create a virtual world for educational purposes from scratch. Such solutions include "Quest Atlantis", which was created by scientists from Harvard and developed at Indiana University, and the "River City". "Quest Atlantis" is an educational environment which is aimed at children and adolescents aged between 9 and 16 and which has already attracted more than 65 thousand users. There is a whole range of quests to embark on with clear educational purposes. Players can visit a variety of historical or geographical locations and perform tasks that are integrated into the curriculum for each age group. River City, in turn, is a nineteenth-century town where players must deal with its citizens' health problems and where they occasionally train

their ability to make and confirm medical diagnoses while performing certain experiments.

As far as games' educational aspects are concerned, consoles equipped with a haptic interface constitute another platform on which games are available. Such games primarily serve as a tool for psychomotor activation. However, one should note that the success of games such as "Brain Academy" is due to the fact that haptic consoles perfectly combine the qualities of logical puzzles with activating motor skills of the people who are involved in the game.

The development of tablet PCs may, in turn, contribute to the design of educational games, which use values that are associated with these devices. So far, it appears that the educational values of one of the most popular games that have been designed for tablets and smartphones, i.e. "Angry Birds", has not gone unnoticed. There already are quite a few physics teachers who treat this game as an ideal teaching tool at the secondary and university levels (L. Dwyer 2011).

Augmented reality technology can be considered an educational tool because of projects such as MITAR. This project, which is being implemented at MIT, uses augmented reality and geolocation to create a series of educational games strongly embedded in the real urban environment. Among others, the project consists of games such as "Zoo Scene Investigators" in which students solve the mystery of a fictional crime associated with the illegal trade in wild animals. In "Environmental Detectives" game players investigate the case of a toxic spill by interviewing virtual witnesses and making contamination measurements over a large area.

Among educational applications that are available for mobile phones are games such as "Garden of Life". In this project, the user's task is to restore life to planet Wellness by developing landscaped gardens on a fragment of land drifting in outer space. The game conveys a significant ecological message and allows one to become familiar with plant growth cycles while making full use of iPhone touch-screen advantages.

EDUCATION FROM THE PERSPECTIVE OF OPPONENTS AND SUPPORTERS OF GAMES

The debate on the educational value of games in a way takes place "diagonally" as part of the dispute between supporters and opponents of games. This means that, on the one hand, critics create a whole set of arguments against games that are not related to the sphere of education; however, there are many examples that demonstrate how these arguments can

be refuted based on the design of educational games. On the other hand, proponents of games, surprisingly, pose a range of arguments against educational games. I will try to look more closely at these two phenomena.

Among the primary arguments of that are used by game opponents are the following:

- games include violence;
- games stupefy;
- games perpetuate stereotypes;
- games are addictive; and
- games isolate people socially.

Let us see how the practice and theory of games responds to these arguments in the context of education. Undeniably, the hypothesis about violence in games has been widely argued in the literature (S.B. Silvern, & P. A. Williamson 1987; N. S. Schutte, J. M. Malouff, J. C. Post-Gorden & A. L. Rodasta 1988; J. R. Kirsch & E. D. Esselman 1985; D. Graybill, M. Strawniak, T. Hunter & M. O'Leary 1987; J. R. Dominick 1984; J. Cooper & D. Mackie, 1986). There are also research studies that undermine this hypothesis in various ways (R. Egli, D. Myers, 1984; J. McClure, W. Mears, 1986; T. Greitemeyer, S. Osswald, 2009). At this point I would like to draw attention to educational projects aimed at designing games that are against violence. This is the first way in which critics of games could be "disarmed".

A Facebook game connected with the campaign against violence which has been waged by the Ukrainian organization Ves Rivni under the slogan "Stay Human" is an example of such a project (**Błąd! Nieprawidłowy odsyłacz typu hiperłącze.**). In this game the players are placed in different conflict situations in which they are witnesses, victims or aggressors. The player must make a choice regarding his or her behavior during events such as a party at one's friend's house where the friend beats his wife in the presence of a child. The player is awarded points for appropriate choices.

A game which was developed by lecturers and students of the game design faculty at Champlain College, USA, and which is titled "Breakaway" responds to the issue of stereotype perpetuation. It is a football game that combines elements of simulation and football management with elements of adventure, which is the most important in terms of the game's educational value. The world presented in the game is a small village where youth football tournaments are held. A player becomes a member of a football team when a new season is being opened. In subsequent episodes the hero is to face special ethical choices that are connected with emerging football hooliganism and confront gender stereotypes, which may be manifested in male sports culture. In one of the episodes, the appearance of a new footballer who is a girl provokes opposition from most of the team members. The hero

is rewarded for advocating positive social attitudes, including opposition to aggression. This game juxtaposes elements of arcade games with elements of a simulation of social interaction.

Another important argument that game critics use is that games are “stupefying”, which might be a direct negative reference to the educational value of games. This specific criticism of games as being “stupefying” may concern casual games which, by definition, are designed to provide uncomplicated entertainment. Casual games have simple graphics, are unsophisticated in terms of narration, non-time-consuming and undemanding, and thus fit into the “stupefying” image of games. Meanwhile, one can also find examples demonstrating that the conventions of casual games are willingly used for educational purposes. It turns out that they are a good carrier of valuable content for museums and galleries, as exemplified by the large gaming section at the Tate Kids Gallery (<http://kids.tate.org.uk/games/>) where one can find simple games that allow users to get to know the work of a painting conservator (“Art Lab”) or to become a Cubist painter who presents the Paris bourgeoisie in the form of cubist shapes (“Cuboom”).

Casual educational games play a significant role on the website of the educational television program PBS Kids. On this website one can find simple games that allow the users to develop a variety of skills such as learning the alphabet or communicating information related to various disciplines, for example, mathematics, geography and biology (e.g. “Now You See Me, Now You Don’t” contains information about mimicry and “Migration Adventure” takes up the subject of bird migration). Casual educational games are divided into several categories, including the following: reading games, letter games, number games, science games, math games, literacy games, spelling games, estimation games, puzzle games, coloring games, vocabulary games, super hero games, and rhyming games. A large majority of these categories apply to certain types of competence or the nature of knowledge that is acquired when playing a given game. Some games, such as super hero games, are centered around famous educational cartoon characters that are shown on PBS Kids, like “Cat in the Hat”, “Supereaders” or “Word Girl”.

The argument about the addictive nature of games cannot be completely refuted indeed since even those researchers who acknowledge that games impart many values confirm that games are addictive. However, it is emphasized that primarily it is players with a general tendency toward addiction that become addicted to gaming whereas game addiction is practically non-existent among players without such inclinations (D. Brian, P. Wiemer-Hastings, 2005). The issue of addiction is so significant because it allows game critics to deny all the educational value of games as they regard even the slightest risk of addiction as a disqualifying criterion.

The argument concerning the social isolation of players is often refuted by showing the socializing nature of MMO games that may encourage cooperation and the maintenance of contacts in the “real world”. These qualities have been observed in games like “World of Warcraft” (V. H. H. Chen, H. B. L. Duh, 2010) and in the complex strategy game “Ogame”, in which a large part of social activity causes players to interact on a game forum which, according to the purposes and objectives of the game, represents another plane of joint action.

Now let us consider the opinions of those who believe that games have educational value. Among these one can find positive and, surprisingly, also negative opinions. Positive feedback is related to the belief that a large group of commercially published games such as “SimCity”, “Zork”, “Age of Empires”, “Civilization” and “The Sims” undoubtedly have positive qualities. This brings one close to formulating extreme judgments and attributing educational value to all games (K. Becker, <http://www.digra.org/dl/db/06278.23299.pdf>).

On the other hand, “hard-core” players sometimes make completely opposite comments. Sophisticated tastes and a profound insight into the structure of games make them unwilling to accept the shortcomings and often low-level implementation of games. This is why one can often find statements titled “Educational games suck”⁶ on the Internet. What is the reason for this? The most common complaints relating to educational games concern their low playability and low quality, simplified structure as well as unpleasant graphics. There are also other arguments such as about the artificial addition of educational elements to arcade games, as exemplified by shooting at mathematical formulas in “Dimension M”.

Other problems include the wordiness of games, low dynamism of gameplay and a lack of an engaging storyline, which affected one of the most ambitious projects of educational games, i.e. “Arden: The World of William Shakespeare”. L. Kajiwaru Ackerman, K. Kong, and C. Desiato (2011)⁷ examined the players’ opinions concerning educational games and, apart from confirming the appropriateness of the above-mentioned arguments, they became convinced that such games train but they do not teach.

⁶ Compare: e.g. C. Baker, “Trying to design a truly entertaining game can defeat even a certified genius”, <http://www.wired.com/gaming/gamingreviews/magazine/16-04/pl_games>; D. Raves, “Simulating wild animals for a video game; why do educational games suck?”, <<http://wolfquest.org/wordpress/?p=5>>; T. Burke, “Why some learning games continue to suck” (Games + Learning + Society Liveblogging), <<http://blogs.swarthmore.edu/burke/2008/07/11/why-some-learning-games-continue-to-suck-games-learning-society-liveblogging/>>.

⁷ The article is related to Scott McLeod’s blog entry titled “Do most educational games suck?” (2009, July 23).

GAMIFICATION

The current trend related to the educational value of games is exemplified by a group of projects and a design philosophy that are collectively referred to as "gamification". This category entails using mechanisms that are known from games (especially the mechanisms of competing and rewarding) to modify individual and group behavior in real life and in its various spheres. Education, which is one of the aspects of gamification ventures (J. J. Lee, J. Hammer 2011), postulates that elements of gamification should be introduced to schools in the form of, for example, badges, rankings and levels that are similar to those found in games. It is believed that children who are used to forms of receiving awards that are typical of playing games will be willing to acquire knowledge and skills in a similar manner at school. Other postulates include the implementation of simulation game conventions during classroom lessons by giving academic titles to children and by using puzzles as well as a point system. It is also worth paying attention to projects such as "Mathletics" in which the acquisition of mathematical knowledge takes place by using the conventions of Olympic Games; i.e. students from all over the world compete individually or as classes and schools. "Codecademy" is another interesting project. This is a platform that allows users to learn programming by using gamification tools. Its users gain knowledge through interactive courses and they can compare their achievements with the results obtained by others via social networking sites such as Twitter and Facebook, among others.

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The educational context of games which is presented in this essay, on the one hand, indicates that the educational potential of games is reflected in the possibility of developing a large number of competencies and values as well as considerable knowledge. On the other hand, one must note that the educational value of games should be accompanied by its entertaining aspects because the primary function of games is to entertain. Therefore, every time game designers decide to include educational elements in their products, i.e. in those that are directly or indirectly dedicated to educational purposes, they need to bear in mind the fact that a game must be entertaining. This problematic proximity of an educational and an entertainment context results in a situation in which the commercial market is distrustful of such types of games and does not perceive them as an opportunity for profit (although games such as "Brain Academy" sold in a large number of

copies). On the other hand, these types of projects which are developed by bodies with a social mission (academic centers, NGOs and educational institutions) take the form of “games that suck”, i.e. games that are poorly developed or those which use entertainment conventions that are artificially “patched” with learning tasks. The main problems associated with using games as educational tools, with which educational communities will need to cope soon, have been pointed out by the authors of the report titled *Moving Learning Games Forward* (E. Klopfer, S. Osterweil, K. Salen, 2009). The questions they raise in the report are connected with the difficulties in adapting games to the traditional curriculum, adults’ negative attitude toward games which contrasts with children’s enthusiasm, and with logistic matters – it is difficult to play an engaging round of a game during traditional 45-minute lessons and given the lack of support for teachers who often have lower competence in playing games than their students. Further difficulties include: the incompatibility of the test-oriented progress evaluation system with the real educational value of games, a limited number of research projects confirming the genuine educational value of games, a small number of successful applications of games to the curriculum, a limited range of games that are known to be educational as well as the hardly modifiable social and cultural structures in which school education, learning and play take place (op. cit. pp. 18-19). Apart from the above-mentioned issues one can also point to barriers that are associated with the design process itself: the high cost of game production, the process of developing games which is not open to collaboration with educational societies, the limited possibilities for testing products in schools and the reluctance of financial institutions to support projects that are considered to be unprofitable or risky⁸ (op. cit.). Let us hope that all these limitations will not prevent games from being used effectively in education, which now appears to be an area where activities that are closest to real-life situations are carried out, as evidenced by the popularity and rapid development of gamification.

⁸ The authors also mention problems that are associated with the issue of loyalty and innovation – it is hard to keep children’s attached to one title for a long time, technology is aging fast, online games especially require cost in use; other problems are connected with the fact that researchers can only have a limited knowledge about commercial games, the paradigms of traditional learning are not easily modified, there is a lack of researches studying the patterns of play that are associated with certain models of education and, finally, designers’ “ambitions” are limited, i.e. they develop a limited range of solutions and for limited audiences.

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