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# Serious Games and Board Games Versus Cultural Changes

ABSTRACT

The impact of computer games on human functioning has become the subject of many studies and scientific reports. With the development of technology, games have transcended boards and become part of the video entertainment industry. However, technology did not end traditional games. It was only a matter of time before games were extended to other areas of life. Because games were so popular, educators found that students engage quickly with educational games. The article explains the aspects of serious games (SG), which are defined as digital games used for purposes other than entertainment. It describes the areas in which games can be used in the educational process, their effectiveness, and controversies regarding their use.

KEYWORDS:    serious games, board games, video games, educational process, cultural changes

STRESZCZENIE

Gry poważne i gry planszowe a przemiany kulturowe

Wpływ gier komputerowych na funkcjonowanie człowieka jest przedmiotem wielu badań i doniesień naukowych. Wraz z rozwojem technologii gry wykroczyły poza ramy konwencji planszowych i stały się częścią przemysłu medialnego i rozrywkowego. Postęp technologiczny nie oznacza jednak końca tradycyjnych gier. Jest tylko kwestią czasu, zanim strategie i zachowania typowe dla gier komputerowych rozprzestrzenią się na inne dziedziny życia społecznego. Ponieważ gry cieszą się tak dużą popularnością, współcześni pedagogowie odkrywają, że uczniowie łatwo angażują się w gry edukacyjne. Artykuł objaśnia aspekty gier poważnych (SG), które definiuje się jako gry cyfrowe wykorzystywane do celów innych niż rozrywka. Niniejszy tekst zakreśla obszary, w których gry mogą być wykorzystywane w procesie edukacyjnym, ich skuteczność oraz kontrowersje związane z ich wykorzystaniem.

SŁOWA KLUCZE:  gry poważne, gry planszowe, gry wideo,
                proces edukacyjny, przemiany kulturowe

## Introduction

For centuries, people have looked for ways to spend their free time to ensure fun and pleasure, which is why games were created. The history of games dates back to the times of ancient Egypt, Mesopotamia, India, and China (Donovan, 2017; Jorma, 2019). Each nation has created ways to ensure joy and satisfaction through cards or on a board. With the development of technology, games have transcended boards and become part of the video entertainment industry. However, technology did not put an end to traditional games; on the contrary, technology took games to another level, enabling the combination or transition of board games into a new, digitized dimension.

The impact of computer games on human functioning has become the subject of many studies and scientific reports. Interestingly, there has been no research regarding the negative effects of traditional board games. Most of the attention has been paid to the consequences from the overuse of video games. Researchers describe the consequences of video game addiction, especially among young people (Lee & Morgan, 2018). These consequences include interpersonal conflicts and difficulties controlling impulsive behavior. In fact, in 2018 video game addiction was designated as a mental disorder in the International Classification of Diseases (ICD-11) of the World Health Organization (2018).

When combined with the ease of access to the internet, individuals willingly transfer their relationships online, thereby losing one of the most important traditional advantages of games: that of improving social relationships. Regardless of the consequences of video games, they are a popular way of spending free time among children, adolescents, and adults. During the COVID-19 pandemic of 2020, the World Health Organization recommended online gaming to maintain social distancing, while at the same time noting online gaming as a potential addictive mental disorder (Canales, 2020).

Starting from solely entertainment purposes, it was only a matter of time before games were extended to other areas of life. Because games proved to be so popular, educators found that students engage quickly with educational games. Thus, serious games (SG) were born.

## Serious Games, Gamification, e-learning, and Traditional Board Games: Difficulties with Definitions

According to the simplest definition, SGs are digital games used for purposes other than entertainment (Susi et al., 2007; Djaouti et al., 2011). The concept of game-based learning, which includes SGs, is related to this definition. In this sense, the two definitions could be considered one and the same. The wording opens up a range of possibilities for interpretation and practical applications. On the other hand, it narrows the issue to only games based on electronic devices (computers, tablets, and mobile phones), completely ignoring their "analogue" counterparts. Therefore, for an electronic game, the preferred term is digital game-based learning, which focuses exclusively on electronic games. It is believed that SGs cover all aspects of education—teaching, training, and information—and are appropriate for people of all ages (Michael & Chen, 2006). Thus, the definition of SGs has expanded to include additional types of games, such as traditional board games or any activities that combine entertainment and education.

The beginnings of SGs are considered to be the 1990s, but the official date is 2002, when the U.S. army published the computer game *America's Army*. It was a realistic combat simulator of infantry soldiers, which was meant to facilitate tactical training, and to encourage young people to join the army (Wilkinson, 2016). In the same year, the Woodrow Wilson International Center for Scholars founded the "Serious Games Initiative," which resulted in the term being spread (Tan & Boo, 2019).

The other definition, often treated as a synonym for SGs, is gamification. It is defined as the use of game elements in a non-entertainment context.

The identity of this term with SG is only apparent, because gamification only uses elements of games in the educational process, while SGs are entire games focused on the educational process. Gamification is not a new idea and it is used in marketing, management, and ecology. The basic goal is to encourage the user to exercise a specific behavior (Huang, Soman 2013). This could include receiving points for purchases which can then be redeemed for rewards or ranks that the user receives for participating in a loyalty program.

Gamification is becoming increasingly popular in education. Learning objectives can be replaced by in-game tasks for which the user/student will receive points, experience levels, or virtual goods. The element of competition and unlocking further goals raises additional motivation. Another important element is the freedom to choose the way of achieving the goal and not risking failure; this can be accomplished by providing multiple approaches to the same task (Dicheva et al., 2015), which is also known as divergent discovery (Mosston & Ashworth, 1990).

Gamification is not the same term as e-learning. It should be perceived as a very general concept, related to computer-based learning or supported by computer technology. It is most often associated with distance learning (Hodson, 2001). E-learning is a process of acquiring knowledge where technology is used as a facilitator. E-learning uses many tools, such as communication and visual technologies (Aparicio et al., 2016). In this sense, gamification can be one way to transfer knowledge, and e-learning can be the base for gamification.

SGs often use traditional board games or adapted card games. The system for rewarding progress in gamification is often borrowed from existing games. Nakao (2019) defines a board game as an activity which consists of moving elements in a strictly defined way on a specially marked board. However, this definition is a generalization, aptly defining traditional board games such as chess. It does not cover other "modern board games," whose mechanics are much more complex and contain additional elements such as cards or other pieces. Sometimes, the whole traditional board game can be transferred to the virtual world. The concepts of SGs, gamification, and e-learning cover similar issues, but they are not the same. The remainder of the article will focus on the issue of SGs and traditional board games.

## Areas of Use for Serious Games

When describing the effectiveness of games, SGs and traditional board games should be distinguished, due to the different ways they are used and the aspects of social communication that occur in board games but usually do not exist in video games.

Naysayers typically point out the consequences of game-playing: health (inactivity, headaches, fatigue, or poor posture), psychosocial (social isolation, poor social relationships, or a lack of inhibition), or the negative effects of violence in games (aggressive behavior, altered brain development and function, or a negative impact on personality development) (Sanger et al., 2019). However, one should not forget about the positive aspects, which include the improvement of analytical and strategic thinking skills, psychomotor features, or enhanced attention (Mitchell & Savill-Smith, 2004; Durkin & Barber, 2002; Boyle & Hainey, 2016). These effects are not conclusive because meta-analyses of video game effectiveness showed little or no effect on cognitive performance (Sala et al., 2018). Games also support the development of spatial imagination, or mental rotation (De Lisi & Wolford, 2002). Game players also have more developed analytical thinking than non-players, who use trial and error (Hong & Liu, 2003).

The positive effects of video games justify their use in various aspects of life. Researchers have found a positive impact from SGs. The benefits include

- increased physical activity, with games that require movement, dance, and sports simulation, using additional equipment or virtual reality (VR). Such games can help a player master new moves (Nyberg & Meckbach, 2017) or fulfill some of the daily physical activity recommendations (Polechonski & Mynarski, 2018).
- acquiring health knowledge about healthy eating habits in children, preventing childhood obesity (Dias et al., 2018), or supporting good habits among the sick or cancer patients (Thomas et al., 2019). SGs have also been used with people with asthma, though the increase in knowledge was not accompanied by increased motivation for treatment (Drummond & Monnier, 2017).
- distraction, which can be helpful in coping with pain or reducing the anxiety associated with painful medical procedures. VR games are particularly useful here (van der Spek & Roelofs, 2019).
- rehabilitation associated with the restoration of executive functions, particularly after a heart attack, brain injury, or stroke (Bonnechere, 2018; Maijer et al., 2018).
- training and simulation for medical students or student pilots, e.g., laparoscopic surgery or flight simulators. According to some researchers, the use of SGs in teaching is better than nothing, but not as good as traditional teaching (Gorbanev et al., 2018).
- diagnosis and treatment of mental diseases and other disorders of the nervous system, PTSD therapy in veterans, or working on concentration in children with ADHD; biofeedback can also be included in this group. The concept of using SGs is associated with virtual reality

exposure therapy, which aims to simulate real-life situations in order to treat a specific type of disorder, e.g., anxiety (Lau & Smit, 2017).

One of the four ways in which self-efficacy can be increased, according to Albert Bandura (1997), is through mastery experiences, which can be accomplished through VR games. The example Bandura used to describe these mastery experiences was through gradual exposure to a snake from a picture, to a toy, to a real one at a distance, to eventually touching one. VR can realistically enact each of the scenarios, apart from the real snake. According to Bandura, individuals create their self-efficacy beliefs by interpreting information regarding their own capabilities. This information has four sources:

- Mastery experiences provide information about one's successes and failures. Successful speaking experiences increase self-efficacy beliefs, and experiences of failure lower them.
- Vicarious experiences provide information about the modelled achievements of others, which influence one's self-efficacy beliefs by demonstrating and transferring competencies (called model learning).
- Verbal persuasion can convince people of their capabilities, especially if this persuasion comes from a credible source.
- The improvement of cognitive functions, using games for training the memory, and developing analytical and strategic skills, is especially useful for patients with dementia. First-person games have proven to be the most effective, steering through gestures, adapting to the needs of a particular patient, or combining cognitive and motor skills (Dietlein & Bock, 2019).

Bandura emphasized the importance of the cognitive processing stage. According to him, mastery experiences generally have the strongest effect on the development of self-efficacy (Bandura, 1997; Pfitzen-Eden, 2016). The examples listed above do not exhaust SG' possible applications. Games can reinforce and improve many areas of human activity. Undoubtedly, they are a valuable addition to traditional education, but the question is, could they replace it?

## The Effectiveness of Board Games

Board games differ from electronic ones primarily in the element of social interaction, although some exist as solo games—like puzzles or competing against the game itself. However, some of the greatest advantages of board games are improving the communication process and learning actively based on interaction with other players (Bochennek & Wittelind, 2007).

Researchers have noted the positive effect of board games, particularly for older adults. Over a 20-year longitudinal study of French senior citizens, game players had a 15% lower risk of dementia, higher scores on the Mini-Mental State Examination, and lower depression scores (Akbaraly et al., 2009). Board games can reduce or delay changes associated with dementia because they require planning and logical thinking. The effectiveness of games in patients with Alzheimer's disease has also been documented, especially in the area of depression and anxiety symptoms co-occurring with the disorder (Lin et al., 2015). An additional protective element is the aforementioned social interaction—because players have a better chance of socializing, which creates social bonds, a factor known to promote longevity.

Board games can also be an effective method of coping with stress by helping discharge negative emotional states (Nakao, 2019). Traditional board games can be a part of psychotherapy. Studies on people with depression and anxiety have reported a decrease in both conditions after six weeks of a stress management program in which a traditional Japanese board game, Shogi, was played (Nakao et al., 2017).

However, board games are most often associated with their educational value through their effect of boosting players' interest. Most often, the purpose of educational board games is to change habits. For example, in a Swiss study, smokers used the specially designated educational board game in the process of therapy. After the therapy, the game-playing smokers had lower readdiction rates than those from the control group (Khazaal & Chatton, 2017).

Board games are also used in the process of education, especially for students of medicine and healthcare. There are many advantages in this area:

- the ability to teach complex issues without a risk to patients or the need for expensive equipment
- participants can practice without anyone suffering the consequences of novice medical decisions
- games bring an element of pleasure and can reduce anxiety and distract users from stressful clinical situations
- students are active in the learning process
- teamwork and team-building are promoted as participants share their knowledge and engage in teaching each other
- students can combine theory and practice (Gibson & Douglas, 2013).

Games used in teaching medicine have been mainly based on quizzes created especially for this purpose, aimed at facilitating mastery of the material (Abdulmajed et al., 2015). Most often, students were interested in this type of activity, which means that they were motivated to play. In

their opinion, the games facilitated clinical thinking and benefited relationships within the group (Karbownik & Wiktorowska-Owczarek, 2016). Especially in the case of games used in medicine and healthcare education, the need for categories of games beyond the traditional ones has been noted. Bochenek and Wittekindt (2007) proposed a typology for games used in medical education depending on their complexity (the level of player involvement) and type (dice and luck, outlay games, thinking games, quiz/communication games, roleplay and simulations, and manual dexterity games).

The main advantage of board games is that they are usually independent culturally and linguistically (Noda & Shirotsuki, 2019). This opens up many possibilities of therapy for people with speech problems or for small children. Board games can facilitate the acquisition of knowledge and promote behavioral changes, but they do not have a large impact on changing attitudes (Gauthier et al., 2019).

## Controversy in the Use of SGs

Serious games and all gamification methods, despite their many advantages, have provoked some controversy. For one thing, the question of the extent to which the learning process should be turned into a "playground" should be asked. Critics suggest that SGs can lead to the infantilization of the learning process, which might be harmful and could cause learners to downplay learning, placing more emphasis on play than on education. There is a need to strike a balance between fun and education. Without a doubt, SGs cannot replace traditional teaching completely. The consequences of being addicted to computer games are well-known. In the era of progressing digitization and the growing role of electronics, it cannot be avoided in the education process. Young people are accustomed to video/electronic entertainment and expect the same from the educational process. The modern user expects a wide range of stimuli, fast-paced changes in the situation, while simultaneously wanting the process to be pleasurable.

In board games and computer games alike, there should be an element of fun associated with education (Michael & Chen, 2006). The order in which the two terms should appear is controversial. According to some, SGs' primary goal is to educate, while pleasure is a by-product of the whole process. Another definition emphasizes that SGs were created to entertain players in the process of education, training, or behavioral change (Stokes, 2005).

SGs sometimes exclude the basic feature of games, i.e., the voluntary involvement of the individual in the game, especially when they are used in

connection with school or education. In this case, an important element is to motivate the learner to become engaged. Then, the learning takes place as if accidentally and without the student's awareness. A proper balance between fun and learning assists in correctly structuring the teaching process.

Another issue that Gorbaney (2018) drew attention to is the effectiveness assessment of SGs. The process of learning or changing habits is so complex that the relationship between the benefits obtained is not always clearly associated with SGs. Future research in this field will require a good methodological structure based on randomized trials (Noda & Shirotsuki, 2019). Otherwise, it would be difficult to conclude unequivocally whether SG or board games are effective. Another challenge is to determine whether the game can be an independent intervention or whether it should be part of a larger strategy.

## Board Games or Serious Games: Which are More Effective?

It is difficult to determine which of the selected methods are better: board games are more effective in terms of gaining knowledge, but video games yield better results when it comes to motivation, self-efficacy, or skill enhancement (Gauthier et al., 2019). It seems that each type of game is effective in a different aspect and should be used in the area where it is most effective. Board games and SGs should be considered different ways to achieve the same goals—teaching, training, and informing.

Digital learning is still in its formative stages. During the COVID-19 pandemic, most schools, universities, and businesses either closed or abruptly transitioned to being entirely online. Will the new delivery method increase the use of SGs in the educational process? We still do not know the threats of digitization and the transfer of the teaching process to a digital level. Will it increase "digital dementia" and hamper creativity? We still do not know the answer to this question.

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