Torun Business Review

# BETWEEN MARKET LOGIC AND SOCIOLOGY: DESIGNING EDUCATIONAL VIDEO GAMES FOR LITERATURE EDUCATION

**Abstract**:
Drawing from two fundamental aspects of sociology of video games: economic behavior influenced by gaming industry and use of video games in education, this article discusses the socio-economic tensions in designing educational video games, on the example of games designed for literature education. Educational values of games do not exempt them from market logic, therefore educational game designers need to keep up with expectations of not only the market, but also teachers and players. This article aims to bridge the gap between education, market and game design in an ongoing scientific discussion.

**Keywords: gaming market, educational games, game design, sociology of video games**

**JEL Codes**: I20, I21, L10
**DOI**: 10.19197/tbr.v22i1.369

Although video games have been present on the market and in social life for over half a century, the sociology of video games is a relatively new subdiscipline. Due to the rapid development of video games industry, gaming is now not a luxury good. The ubiquity of the video games is observed not only in houses, schools or workplaces, but also 'outside' due to the mobile games and apps. The blending of gaming with everyday life draws the attention of sociologists. There are plenty of studies about the social impact of games and human-computer interaction. However, little is known about sociological perspectives on game development and design, especially in educational video games, which – despite constant market increase – constituted less than 2% of the global games market in 2020 (Kings research, 2023; Newzoo, 2020).

Game developers and designers are under the influence of many forces, which are often contradictory. These tensions are especially observable in designing educational video games (Egenfeldt-Nielsen, 2006), which are meant to both educate and entertain, to be sold but also to teach. The market logic doesn't give any concessions for educational video games: in order to

get sold, they need to be entertaining, engaging and ingenious – which is often the opposite of what one may think about education.

This article attempts to fill the gap in sociological and economic discussion on educational video games design. Drawing from our experience and expertise, we characterize the tensions between market logic and sociological perspective in designing video games for education in literature.

## 2. The sociology of video games

The culture of video games is considered a suitable topic for sociological investigation (Boulton & Cremin, 2011). The sociology of video games pays attention to representation in games: how they reflect and/or reproduce societal norms and structures. This could be implemented at many levels, starting from individual features such as gender, race, age (Williams et al., 2009), disability (Stasieńko et al., 2021), or global values such as cultural heritage (Balela & Mundy, 2015).

Another aspect of games and gaming is community building and social interactions. The study by Seay et al. (2004) revealed that social contacts are the third most often declared main reason for on-going play in massive multiplayer online games. The sociology of video games discusses how communities of digital game players are associated with physical health and well-being (Mäyrä, 2015). These online communities may serve social support but also become a source of harm. Gaming online communities are forced to follow platforms' rules, but also often based on additional self-regulations. However, Xiao et al. (2023) found that current, punitive online moderation processes do not effectively stop the perpetuation of harm.

Sociological perspective on video games also considers aspects of post-gaming behavior. This is usually connected to mechanisms of violence and aggression (Anderson & Bushman, 2001), however modern sociology is distanced from simplified criticism of video games (Gałuszka, 2019).

Another sociological point of interest in games and gaming is gender dynamics. Sociology researches gendered cultural practices of gaming, gendered predictions to play and perceptions about gaming (Thornham, 2008). The relationship between gender dynamics and social structures are also studied (Bryce & Rutter, 2002).

Social identity formation and how it's affected by gaming experience are subjects also studied by sociologists. Lots of studies draw from social identity theory (Tajfel & Turner, 1979) or self-categorization theory (Turner et al., 1987). Travaglino et al. (2020) studied these concepts in the context of problematic engagement with video games. Study by Setterstrom and Pearson (2019) supports social identity theory's potential to explain how

social influence occurs for massively multiplayer online games' players. Krane et al. (2002) investigated social psychological benefits of participation. Massive multiplayer online games were also studied in the context of social identity by Guegan et al. (2015) and O'Connor et al. (2015).

Since the beginning of the digital revolution, sociology has concerned the issue of digital divide and digital exclusion, which is proved to lead to social exclusion (Popiołek, 2013). The digital exclusion may occur on two levels: access (possession of technology) and use (skills to take advantage of technology possessed). The ubiquity of games (also mobile ones) may lead to social exclusion of those without access or skills. As proven by Śledź (2022), lack of proper equipment forces players to watch gaming livestreams instead of playing themselves, in order to still be familiar with game's content.

The fast developing gaming market and omnipresence of games in everyday social life resulted in new economic models such as microtransactions. Sociology of video games pays attention to the economic impact of games and gaming, examining how game industry influences economic behavior (Cai et al., 2022).

Since video games are increasingly used as educational tools, sociology often concerns educational aspects of games and gaming. The engaging and interactive nature of video games is their advantage in learning facilitation and social development (Egenfeldt-Nielsen, 2006).

Discussed above areas of interest of sociology of games are not an exhaustive juxtaposition. However, what is crucial for the sociology of games, is the scope of social rather than individual. According to Kutianin (2021, p. 144) "the study of the way scientific knowledge can be imparted from one participant of the game to another without direct interpretation would become one of the fundamental researches for the entire sociology". In this article, we focus on the last two discussed aspects: economic implications of the gaming industry and educational games.

## 3. Gaming market

Video game industry (VGI) is defined as "a highly innovative and rapidly growing sector that has become the dominant force in the entertainment industry, with significant economic and social implications" (Goh et al., 2023, p. 1). The participants within the video game industry are developers, publishers, distributors, retailers, customers and consumers (Zackariasson & Wilson, 2012). However, some authors define the game industry solely as game production (Marszałkowski et al., 2021). Even in such understanding, industry is closely related to market tensions.

Gaming market constituted 6,1% of the global entertainment and media market in 2019 (PwC, 2020). Worldwide data reveal that consumers spend most money on mobile games, followed by home consoles (which exceeded

PC/Mac gaming expenses in 2020), and least money on handheld consoles (Byshonkov, 2023). These global statistics do not reflect the differences between regions. For example, home game consoles and handheld game consoles are most popular in North America and Western Europe, while Asia-Pacific region players spend most money on mobile gaming and PC/Mac gaming (Byshonkov, 2023). There is also a visible rise of cloud gaming, both in terms of revenue and gameplay hours (Byshonkov, 2023).

There is no doubt that Covid-19 pandemic affected human-technology relationships by forcing people to stay at home. Lots of social interactions moved online, and everyday social contacts were sustained thanks to digital infrastructure. The restrictions about social distance also affected how people spent their free time. Therefore, there was a rapid shift in patterns of consumer behavior and acceleration of platforms adoption (PwC, 2020).

Since the pandemic, the number of players worldwide increased year by year, and reached 3.38 billion in 2023, of which 53% represent Asia-Pacific, 17% Middle East and Africa, and 13% Europe (Newzoo, 2023). Again, in 2023 mobile games segment earned most of the market revenue – 49%, i.e. $92.6 billion (Newzoo, 2023). There is an observable trend of growth of the gaming market globally, and players spend more and more money on games, devices and microtransactions (Gibson et al., 2023). Projections for 2024 state that the games category will become the third largest consumer of data (PwC, 2020).

## 4. Educational video games

Studies on educational video games stress their learning benefits, as well as challenges and limitations. One of the most often emphasized advantages of educational video games is lowering the barrier between education and real entertainment (Bellotti et al., 2009). Players are engaged with the interactive (Lieberman, 2006), goal-oriented learning (Erhel & Jamet, 2016), especially thanks to the in-game microworlds (Egenfeldt-Nielsen, 2006). The engagement comes along with motivation to play, and therefore to learn (Sun & Gao, 2016). However, the ‘learning vs. playing’ tension, described by Egenfeldt-Nielsen (2006) reveals the teachers’ concerns that fun will suppress the learning, as well as their beliefs that fun and learning are somehow contradictory.

As the natural consequence of engagement, active learning is pointed out to be another value of educational video games. Approaches promoting active learning are focused on learners’ activity (e.g. reading, writing, playing) instead of than simple transmission of knowledge. Therefore, they are promoting development of students skills rather than knowledge (Brame, 2016). The participatory design of video games enhances players’ higher-

order thinking (Moshirnia, 2007). Learners' own exploration and construction of meaning is crucial in educational video games experience (Egenfeldt-Nielsen, 2006).

One of the greatest advantages of educational video games emphasized in literature is immediate feedback. The feedback in education itself is perceived as crucial (Schartel, 2012) and necessary to improve one's performance (Langer, 2011). In scientific discussion on educational video games the opportunity of constant, precise and adaptive feedback is noted (Rosas et al., 2003).

Educational video games are also recognized as a tool for personalized learning (Bontchev et al., 2020). Therefore, they fit into the major trend of personalized learning in education system transformation (Zhang et al., 2020). Properly designed personalization takes into account both initial user's data and in-game performance, and therefore recognizes parameters such as player's skills, performance, as well as learning and playing style (Terzieva, 2019).

While many studies concern learners' perspective on educational video games, teachers' beliefs, experiences and attitudes were also discussed, but not in such a wide range. The systematic literature review conducted by Sánchez-Mena & Martí-Parreño (2017) revealed that teachers' acceptance of educational video games is driven by four main factors: 1) perceived learning opportunities, 2) personal factors such as innovativeness, 3) student-related factors and 4) teachers' previous gaming experience. In the same study, authors have pointed out four barriers in teachers' acceptance, which are 1) integration into curriculum concerns, 2) lack of technical and organizational support, 3) classroom management (e.g. noise in the classroom) and 4) lack of teachers' skills. These results show that systemic solutions to incorporate video games into education are required. Otherwise, the presence and performance of games in classrooms will depend on a particular teacher's skills, experience and attitude.

The vast majority of studies only pay attention to advantages and disadvantages of educational games in education, without business context. Unless fully sponsored by authorities or NGOs, educational video games are still deeply rooted in market logic.

### 4a. Video games for literature education

The potential of video games in literature studies education is still not fully explored. In Poland, for example, there is no official discipline of "game studies" and gaming topics are often studied by researchers from literary studies. However, in such cases, games are rather a subject of study than a tool for literature education.

Video games may incorporate literature in various ways. The most evident example is an adaptation of classic literary work, such as "Ballads and Romances" published by Adam Mickiewicz as a volume of poetry in 1822, and released as a video game 200 years later by Astrolabe Stories. Another example of use of video games in literature studies is in-game literary work, an example of which are poems and songs in "The Witcher". Games may also incorporate strong narrative elements (Dondlinger, 2007) suitable for literary analysis, such as „The Last of Us", in which players may explore the themes of loss, parental love, difficult moral choices (who will die and who will not). Last but not least, video games may provide an interactive storytelling experience – an in-game performance may enhance students' engagement with the literature. The game based on literature may inspire players to deepen the presented world and provide relatable narration allowing players to "experience" what characters are dealing with – such as with the games from the "Metro" series.

Although used differently as educational tools, all four cases mentioned may benefit both teachers and learners, by adding dynamics and interaction to exploring literary concepts. There are various strategies of implementation games in a literary learning process. Comparative analysis of original work and its game adaptation may enhance interpretation skills and provide knowledge on genres. Students may also create storytelling projects using games or games' characters. Studies on specific themes in literature may be expanded to include games as well, and tackle the issue of visual representation and verbal descriptions.

As mentioned earlier in this article, the active learning potential of video games enhances engagement and strengthens interpretation skills. Unlike in case of written work, games provide multisensory learning, by combining visual, auditory and kinesthetic learning styles. Hence, research has found that game players have greater spatial abilities and visual capacity (Aguilera & Mendiz, 2003). Games may also adapt to players' learning preferences, even with such simple details as color grading settings or size of the subtitles. All these small adjustments may facilitate learning experience. The lessons on understanding of literature characters may also be enriched by games with character development.

## 5. Socio-economic tensions in educational video games design

In this section we discuss how different economic and social expectations affect game designers and what they do to try to reconcile these expectations. We discuss our research problem using the MDA framework for game research: mechanics, dynamics and aesthetics (Hunicke et al., 2004).

5a. Mechanics

The algorithmic architecture of a game, as well as rules and underlying systems is called game's mechanics. It describes particular components of the game at the level of data representation (Hunicke et al., 2004). Mechanics establish the fundamental workings of a game, outlining what actions are possible for players and what limits exist. Designers use them to create boundaries and opportunities for interaction within the game. Scoring systems may enhance entertainment and therefore positively affect players-learners motivation. However, scores based on skills and in-game performance may be supplemented with scores or score bonuses provided thanks to microtransactions, called IAPs (in-application-purchases), e.g. improvements, progress accelerators etc. Therefore, designers of educational video games need to balance between students/teachers and market expectations. So, the sociology of games adopted in game design is really a set of practices aimed at taking into account the educational needs of the player in terms of designing a learning path so that the player understands the game and its operation. However, designers aim to enhance player's willingness to continue playing and spend money on IAPs, but also to continue playing to learn new information and consolidate it and check the state of acquired knowledge. Therefore, in terms of obtaining information on whether the intended processes are taking place and the chosen techniques for their implementation are appropriate, MDA is the most sensible form of design, which also worked in already mentioned "Ballads and Romances", for example in the decision to segment the game in the same way as a lesson is divided at school, to subordinate images and backgrounds to specific locations, so that students recognize objects from Kowno and Vilnius.

Games differ in their objectives, and different genres may serve different learning goals, e.g. defeating enemies or collecting points. Objectives are a way of navigating players and explaining to them what to do to progress in the game. In the case of literature education a variety of mechanics are useful. An interesting example is the "Assassins Creed: Valhalla", where players were able to participate in rhyme fights (called *flyting*) with game characters – choosing right rhymes was a way to defeat the enemy. Objectives are often connected with in-game economics, especially in the case of mobile games. They are designed in a way to affect the players' subconscious in such a way as to indicate to them that they must do something to progress the game, but they cannot do it as quickly as they would like (at the same time the objective is still visible and nagging, e.g. by shimmering or blinking slightly), so players must either wait until the resources are renewed. Waiting generates FOMO (fear of missing out) very strongly (Tanhan et al., 2022), which pushes the players to monetize.

Curiosity and the desire to bypass FOMO often immediately causes monetization. So it's about directing the players' thoughts and presenting them with objectives in graphic form, e.g. through shaded icons, boards, etc., so that they want to achieve it. The way in which objectives are defined and graphically presented has an impact on in-game sales.

Game's mechanics also refer to physics rules in the game. The virtual world may have its own rules, yet these need to be coherent along the gameplay. As we discussed above, games may serve as a subject for thematic analysis of literary themes. One of the in-game motifs already studied in the literature studies is the mountain motif (Flamma, 2014, 2015). Mountains in games are currently an element of landscaping, which is designed at the stage of defining the land and physics for a given map (the entire game world like in a classic open world or like in already mentioned "The Witcher" - several smaller maps). The mountains are currently an element that allows you to add an element of exploration to the game, i.e. building FOMO, thanks to which the players are more focused on exploration and spending more time in a given game. Above all, adding mountains causes the parkour mechanic to automatically appear, which increases the value of the game. Currently all open-world games contain mountains. It is not a coincidence, because mountains are an element that builds the environment and serves as a potential, thanks to environmental findings, puzzles and props, they have narrative potential. It is monetized by providing paid bonus content: new levels, new missions, and new locations. Mountains are also interesting and engaging because they allow players to test new mechanics, functionalities, e.g. paragliding for fast travel, etc., thanks to which it can be monetized as well.

Another problem is the technological optimization of the game so that as many people as possible can play it, and this is something that really affects development and economy. Often, using some solutions is expensive because it forces greater use of CPU and GPU memory, which increases the costs of equipment for the company, electricity consumption, and it limits the possibilities of testing and often generates further costs during optimization, e.g. by purchasing solutions to optimize e.g. terrain or memory usage. This can also be designed by yourself, but it takes more hours of work, because it is a whole system. Generally, games consist of systems, designing each of them takes time, and time means money.

### 5b. Dynamics

The interaction with game's mechanics results in behaviors emerging during gameplay, which is defined as dynamics. Game's dynamics have their basis

usually in psychological needs. Dynamics affect players' motivation and actions (Education Alliance Finland, 2022). As stated by Hunicke et al. (2004), „dynamics describes the run-time behavior of the mechanics acting on player inputs and each others' outputs over time."

Designing the dynamics of an educational game is not an easy task. Designers need to balance between playability and learning opportunities provided by game, taking into account if the game will be played in-class or not, with or without teachers assistance (Egenfeldt-Nielsen, 2006). Game dynamics will set the rules of how a player may strategize to win a level. Dynamics also include emergent gameplay – unintended patterns may form based on the mechanics. Allowing different strategies is often more attractive for players but also facilitating education, since learners' differ in their needs and skills (Liu, 2003). Therefore, dynamics may also regulate users' feedback loops, including difficulty scaling adaptable to player's performance. However, as noted by Antonova et al. (2019, p. 1), "the design of adaptable solutions such as educational video games is a challenging and demanding task". In the game design process, adapting to the player means scaling gameplay elements to the player's capabilities and needs. For example, rival levels, difficulty scale, spawning objects, etc. On the other hand, it is adding a lot of options to customize the gameplay for the player. Building feedback in games is a form of building communication, e.g. through contextual tutorials. Therefore, adapting and scaling the game or its functionality to the player's needs is the norm today and results from the fact that within the designated target group, we have to allow all players to play. In addition, a trick to blur this and hide it from the player is to release as many elements of the games as possible for the player as early as possible. For example, things to get, build, etc. The fewer things you block the player from progressing in the game or the story, the more you stimulate their creativity and generate more ways to complete a given part of the game, for example, a mission. This is cheaper to do and gives the player more freedom.

Today games are designed with this dynamics in mind, because we have a demo, early access, and then version 1.0. Feedback is collected all the time and improvements are made for players, just like the development of the game.

5c. Aesthetics

Aesthetics refers to the emotional experiences and reactions that players feel when engaging with the game (Hunicke et al., 2004). Educational games have simplified aesthetics, because they can't be a distraction: it disrupts the processes of memorization. This involves the appropriate psychology of colors, user interface design, and planning the entire user experience as an element in which aesthetics should a) be functional b) not get in the way, c)

help as much as possible. Also, a poorer graphic layer means that making a game accessible to people with visual or hearing disabilities is cheaper. Accessibility is an expensive matter.

The economic force influencing designers will always be to use what they already have in the game, especially animations, because they are expensive. The same with assets, i.e. 3d objects in the game, it is easier and cheaper to change their texture or paint it, than to make a new asset.

## 6. Conclusion

In this article, we have discussed the issue of game design, drawing from two fundamental issues of sociology of games: economics and education. Our goal was to contribute to the ongoing academic discussion by including market demands in the discussion on educational game design. We have emphasized that there are different forces, sometimes contradictory, that affect designers' work. The expectations to produce games quickly and cheaply, but also to make them engaging and stimulating in-game purchases need to be reconciled with games' educational capacity. These forces influence game designers in terms of mechanics, dynamics and aesthetics.

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