From Code to Classroom: A Game Developer's Exploration of Edutainment

Edutainment, educational games, game development, self-ethnography

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The issue of entertainmentization of education is a challenge for cultural researchers, especially in the face of the development of new media technologies, which raises concerns about obscuring educational values. The learning vs. playing tension is widely discussed in the literature, usually addressing the perspectives of teachers and students. The third group of people involved in the edutainment – game developers – is usually omitted. Therefore, although the educational view on edutainment is widely represented in social sciences and humanities, the game developers' perspective remains a research gap. Using the self-ethnography approach and literature review, this study discusses edutainment from the perspective of the game developer. Describing the examples of educational video game design and development, the study shows how educational values guide every step of the game creation process, from the preproduction and production, through launch and collaboration with the receivers at the end. Each of these stages brings different challenges for game developers, who aim to support the learning and memory skills of future players. The article discusses the author's own experience against the background of edutainment literature. The role of users' feedback is also discussed, both for players and teachers, as the educational games are designed and created for them.

Introduction

Education is undergoing a significant transformation with traditional teaching methods increasingly giving way to more engaging, dynamic approaches. This shift is largely driven by the concept of "entertainmentization," where elements of entertainment are integrated into educational practices to make learning more appealing and effective (Singhal & Rogers 2002). From gamified learning platforms to interactive simulations and multimedia-rich content, the boundaries between education and entertainment are becoming increasingly blurred (Loeckx 2016). This trend reflects a broader societal shift toward prioritizing engagement and accessibility in all forms of communication (Rana et al. 2010) and learning (Seale & Cooper 2010; Seale 2013).

The entertainmentization of education stems from the recognition that traditional, lecture-based approaches may no longer resonate with today's learners, who are accustomed to highly interactive and visually stimulating digital environments. By incorporating storytelling (Gallagher 2011), gamification (Oliveira et al. 2023), and immersive technologies (Baxter & Hainey 2024), educators aim to foster deeper engagement and motivation among students. These methods not only make learning enjoyable but also cater to diverse learning styles, ensuring that education becomes a more inclusive and adaptive process. However, this approach also raises questions about balancing entertainment with the depth and rigor required for meaningful learning (Egenfeldt-Nielsen 2006).

As this trend continues to evolve, it is reshaping the role of educators, the expectations of learners, and the tools used in classrooms and beyond. This is a challenge not only for teachers and learners, but also – or maybe above all – educational game developers. They are under pressure to follow assumptions of both education and entertainment at every stage of game design and development. This article explores the implications of edutainment on a game design process, from my personal experience based on the conducted literature review.

Literature review

To provide a theoretical background for my self-ethnographic analysis, I have conducted a systematic literature review using the Scopus database. I used the search term *educational video games* which resulted in 359 documents. Limiting the results to English decreased the sample to 328 titles. Then, the subject area criterion was applied, limiting the sample to social sciences and

arts and humanities, which resulted in 153 documents. Exclusion of conference reviews, books and editorials resulted in 148 documents. The 148 abstracts were chosen for initial reading. The initial qualitative analysis resulted in exclusion of 4 publications. Finally, 144 publications were included in the literature review and the results are organized thematically as it best serves the purpose of the article. I do not aim to cite all of the studied papers, as the review is not the main aim of this article, but it provides the background for my self-ethnographic analysis. The review of selected samples resulted in recognition of 4 main themes. These themes are not mutually exclusive and may overlap in each paper, however their recognition outlines some of the main thematic trends in the studies on educational video games.

Learners' perspective

Lots of studies were devoted to players' experience in educational video games. A study by Terzeieva et al. (2022) had proven that players spend on a weekly basis much more time playing entertainment games than playing educational games. According to their respondents, the educational material should align with the players' initial knowledge of the learning domain, their ages, and, at a minimum, their learning styles. The necessary condition for players' positive attitude towards educational video games is perceived relevance (Martí-Parreño et al. 2018).

Studies were largely focused on the motivational role of video games. Enjoyment was identified as a motivational factor (Ebrahimzadeh & Alavi 2016; Amaya-Olarte et al. 2024). Educational video games positively affect not only players' motivation, but also acquisition, and application of learning (Cachay-Gutierrez & Cabanillas-Carbonell 2024). The incentive structure of points awarded is successful (O'Rourke et al. 2016). Learners prefer game-based learning over traditional teaching (Lopez-Fernandez et al. 2021). The motivation was studied both in-game, as well as in large scale, such as pursuing professional careers due to the gaming experience (Fonseca et al. 2018). Students assessed educational video games used in online courses as helpful in understanding course content (Cartwright & Fabian 2017).

The learners' experience was studied in various aspects of education, including learning mathematics (e.g. Beserra et al. 2019), languages (Ebrahimzadeh & Alavi 2016), computer science (Lopez-Fernandez et al. 2023), astronomy (Herder & Rau 2022), or interest in theatre (Manero et al. 2015).

Teachers' perspective

At the other end of the spectrum of studies on educational video games, there is research on teachers' experience and attitudes. Older studies were focused on challenges of video games' implementation in the classroom (Tüzün 2007; del Blanco et al. 2012). Teachers' intentions to use educational video games in their classes depend on perceived usefulness. Age was found to influence the relationship between teachers' perceived ease of use and the perceived usefulness of educational video games (Sánchez-Mena et al. 2017). However, another study suggests that gender and age were not found to moderate teachers' attitude and behavioral intention (Sánchez-Mena et al. 2019). Teachers' perception of ease of use highlights the need for targeted training and resources. The moderate view of usefulness compared to the difficulty of use suggests that without proper training, it may be challenging for teachers to effectively integrate games into their teaching (Babazadeh et al. 2024).

Effectiveness

Literature often raises the question of how effective educational video games are. I treat this as a separate issue, as it does not refer to either attitudes, intentions or experiences, but the knowledge and skills acquisition.

The effectiveness of educational video games is multifarious. They facilitate learning but also affect the perception of the attractiveness of the subject, e.g. , statistics in general (De La Hoz Ruiz & Hijon Neira 2023). Not only they incorporate educational content but also convey the educator's pedagogical and moral messages, delivering them to learners through an entertaining format (Dankov & Dankova 2023). Educational video games are proven to be effective tool not only for basic school education, but also in case of specific topics regarding various aspects of life, including disaster risk management (Caroca et al. 2019) or tapeworm prevention (Trevisan et al. 2023).

An effective approach to supporting students' scientific understanding involves integrating video games with hands-on activities, where each activity informs and enhances the other (Trindade et al. 2019). Also, games are more effective in shaping intended behavior when they do not focus on narrow aspects of the subject (Underhay et al. 2016). The educational video games created by teachers are highly effective in enhancing knowledge acquisition and motivation in both face-to-face and online settings (Lopez-Fernandez et al. 2023). Moreover, game-based learning through educational video games is a practical and effective method for training teachers as well (Gordillo et al. 2021).

Few studies have focused on learners with special needs. Educational video games may serve as an effective tool for improving speech skills of adolescents with Down Syndrome (González-Ferreras et al. 2017). Playing educational video games makes learning more enjoyable and engaging for children with ADHD, enhancing their study skills and knowledge acquisition (Rebollo et al. 2024). Incorporating randomness into educational engineering video games can help autistic children engage with unpredictability and enhance their cognitive behaviors. Significant improvements are observed in their attention span, memory, response to random processes, and ability to manage parallel information (Al-Hammadi & Abdelazim 2015).

Game design

The way educational video games are designed affects the learners' and teachers' experience, as well as games' effectiveness. For example game-embedded animations as learning support are more effective than in case of the same game without support, yet they do not affect players' enjoyment (Bainbridge et al. 2022). Researchers call for games that immerse players in exploring and experimenting with personally meaningful questions related to domain-specific representations (Holbert & Wilensky 2019) or even create new frameworks for design of educational video games (Legerén Lago 2017). Writers of the story and designers of the game must create an interactive narrative that remains engaging and high-quality regardless of the player's decisions (López-Arcos et al. 2016). Designers are advised to incorporate a variety of game modes during development, as learners often engage with multiple modes. Additionally, gameplay sessions should be limited to no more than one hour (Khouna et al. 2020). Analyzing motivational factors of educational video games, Chen et al. (2024) prepared following recommendations for game designers: "(1) provide clear and straightforward tutorial instructions, (2) make the game more intuitive to understand, and (3) reduce the repetitive elements of the game".

Postulates like these are constructed on the basis of players' and teachers' experiences and opinions (collected in experiments, surveys or interviews), but omitting the game developers' perspective.

Method

History of ethnography shows different approaches to what self- or autoethnography is (Reed-Danahay 2020). Following the assumption that "auto-ethnographies can be and are written by

scholars with many diverse interests and backgrounds" (Hayano 1979, 100), and that ethnographic self can be the only informant involved (Collins & Gallinat 2010) in this article I apply first-person narrative told by a commoner (Brandes 1979). In this approach, the method is used for understanding human actions and concerns (Roth 2009). Self-ethnography invokes an imbrication of history and memory (Russel 1999). Further in the text I present my perspective on edutainment.

The mechanics-dynamics-aesthetics (MDA) framework for game research (Hunicke et al. 2004) may also be applied to studies on game development (Flamma & Para 2023). Mechanics, dynamics and aesthetics are terms I use in my analysis, therefore it might be helpful to explain them for an uninitiated reader. The algorithmic structure of a game, along with its rules and foundational systems, is referred to as the game's mechanics. The interaction with a game's mechanics gives rise to behaviors that emerge during gameplay, which are referred to as dynamics. Aesthetics refers to the emotional responses and experiences that players have while interacting with the game (Hunicke et al. 2004; Flamma & Para 2023).

Author's experience in educational game design

My game design experiences are quite varied. On the one hand, the VR experience, which is intended to simulate decision-making and the effects of decisions as faithfully as possible, and teaching how to perform the so-called protocol, i.e. a checklist of activities in a specific order to perform a given task well. For example driving vehicles on a logistics site, conducting job interviews or designing warehouse space in accordance with Polish rack load standards.

The second type of experience involves the development of a language application specifically designed for teaching English, tailored to meet the needs of a public university. This application was crafted to serve as an educational tool for students, helping them navigate communication within an intercultural group. It focused not only on language acquisition but also on teaching the essential social skills required for effective interaction in diverse environments. The application included lessons on campus etiquette, addressing the nuances of academic and social behavior in a university setting. Furthermore, it emphasized the most important rules for engaging in respectful and effective communication, preparing students to interact confidently and appropriately with peers from various cultural backgrounds. By integrating both linguistic and cultural aspects, the application aimed to provide a well-rounded educational experience, fostering both language

proficiency and cultural awareness among students. This comprehensive approach ensured that users were equipped with the necessary skills to thrive in an international academic environment.

Last but not least, I worked on [game title anonymized], where our goal was to introduce the poet and his fate and to show characteristic elements of the cities he lived in. Here, the goal was to remember images and facts, but the most important goal was to show the specificity of the poet's work and their atmosphere through graphics, lighting, and horror. We chose the visual novel form because we had serious concerns that focusing the game on gameplay would not cause the memorization of insignificant details, and the overall educational outline would be lost. The concerns were quite real, because we wanted to teach something related to visual memory (elements of cities) and impressions and their character (romanticism and its characteristics). Gameplay could focus players excessively on facts or details that were a less important part of the entire educational path.

Game Developer's Perspective

Preproduction

How does entertainmentization of education affect the process of game development? In case of educational games, each title has its own educational purposes defined in advance. At the preproduction stage, game developers have to apply educational principles in game environment, mechanics and core loop, and at the same time design the learning path.

Various methods can be employed depending on the specific goals that need to be achieved. Each objective may require a unique approach, tailored to address the desired outcomes effectively. In the context of game design, this often involves carefully selecting techniques that align with the intended purpose, whether it's fostering problem-solving skills, encouraging collaboration, or promoting individual creativity.

Designing game mechanics involves crafting them in a way that ensures they are clear and intuitive for the player to understand. It is important that these mechanics actively support the player's learning process, making it easier for them to grasp concepts through memorization and repetition. By reinforcing these elements, players can naturally internalize the rules and strategies of the game as they continue to engage with it. Additionally, well-designed mechanics should spark curiosity, encouraging players to explore and experiment within the game world. This sense of

discovery can keep players motivated and invested in the experience. Furthermore, the mechanics should provide a tangible sense of progress, allowing players to feel a sense of accomplishment and growth as they overcome challenges. Altogether, these aspects work together to create a cohesive and engaging gaming experience that is both rewarding and enjoyable.

The game developer is also responsible for designing the core loop, gameplay loops, or looping and repeating mechanics in such a way that the player acquires knowledge, repeats it and executes it in the form of completing tasks in the game. At the same time, the appropriate flow of the game must be maintained. The appropriate level of flow guarantees the level of concentration and in games that are, for example, for humanities subjects, where you have to remember a lot of knowledge, and not necessarily understand it, it can help by arousing curiosity. In turn, STEM subjects are based more on the use of knowledge in practice and action-reaction learning, which is easier in games, because knowledge used in practice contributes to the player's progress, and this is the basis of satisfaction.

Another issue on the border between education and entertainment, which is the responsibility of a game developer, is creating an appropriate learning path. When creating an educational game, the developer actually creates a learning path, because the entire gameplay and interaction with the software is to support the process of effective learning. It is exactly the same in the case of casual games, where the player must first be taught, for example, in the form of a tutorial or prologue, the mechanics, their application and the rules of the game world. Educational games are not only games aimed at children and young people, but also at adults preparing for specific professions. In games testing manual skills, e.g. VR welding or VR logistics site, or other games supporting vocational education, the aim is also to teach good preparatory practices for performing a given activity, e.g., taking care of equipment, safety, shaping appropriate attitudes, etc.

Production

At the production stage, the need to combine entertainment and educational goals results in continuous testing of implemented solutions. This is the stage of checking to what extent the method and form of implementation and selected means stimulate concentration are presented clearly, appropriately and understandably to the indicated group of recipients. The regular testing process supports iterative design, where the production of the game is based on regular iterations,

which are the result of analysis and testing of the game by professional testers and at a later stage by blind tests of players representing the target audience groups.

Creating educational games presents a significant challenge, particularly when it comes to the production process. One of the primary difficulties lies in ensuring that the tools and methods employed are not only effective but also do not inadvertently distract players from their learning objectives. It requires constant evaluation to confirm that these tools support the educational goals rather than disrupt or destabilize the intended learning path. For instance, flashy visuals or overly complex mechanics might draw attention away from the core material, making it harder for players to focus on the educational content.

At the same time, it is equally important to design elements that actively enhance the learning experience. This involves incorporating features that stimulate cognitive engagement, such as interactive challenges, problem-solving tasks, or feedback systems that encourage players to reflect on their progress. By doing so, the game can maintain its educational purpose while also fostering curiosity and motivation.

Furthermore, despite the emphasis on learning, the game must still be visually appealing and mechanically engaging to the player. Striking a balance between educational value and entertainment is no small feat, as both aspects need to work in harmony to create an enjoyable yet meaningful experience. Developers must carefully consider the visual design, gameplay mechanics, and overall user experience to ensure the final product is both captivating and effective in achieving its educational objectives.

Launch

At the stage of launch and game support, the MDA [mechanics-dynamics-aesthetics] structure is implemented in a real and practical way, where a) player feedback, b) actual player behavior in the game environment, and c) connected analytics (e.g. Google Analytics systems and statistics of distribution platforms regarding game time or other systems for collecting information about player behavior) indicate what developers did effectively and what not.

This is where the significant challenge arises as feedback from players plays a crucial role in refining and enhancing the game. The purpose of this feedback is to help improve the game's overall design, ensuring it supports the educational objectives and maximizes its potential to achieve its

most important learning goals. Player feedback can provide valuable insights into aspects that are working well and those that need adjustment. However, there is a critical distinction to be made: for the player, the game is still primarily a form of entertainment, and their responses may reflect their desire for more engaging or enjoyable features, rather than those that serve the educational purpose. This can lead to the point where the feedback, while valuable from an entertainment perspective, could actually suggest changes that would detract from the game's educational focus. For instance, players might suggest adding more visually stimulating elements or increasing the complexity of certain mechanics, which could inadvertently create distractions from the core learning objectives. These types of changes might seem appealing from the player's point of view but could undermine the game's ability to effectively stimulate memory, reinforce concepts, and develop essential skills. Therefore, it's important to carefully analyze player feedback to ensure that any adjustments made do not compromise the educational integrity of the game.

Conclusion

This article sheds light on the overlooked perspective of game designers in the field of edutainment. The systematic literature review revealed a predominant focus on learners, teachers, game effectiveness, and game design, with little to no attention given to the voices of game designers themselves. This gap in the research overlooks the unique challenges and insights designers face throughout the development process.

To address this, a self-ethnographic study was conducted, offering a first-hand account of the tensions encountered during three critical stages of game development: preproduction, production, and launch. By exploring these phases, the study highlights the complexities of balancing educational objectives, entertainment value, and practical constraints, providing a nuanced understanding of the development process.

This work emphasizes the need for future research to include game designers as active contributors, through interviews or collaborative studies, to foster a more holistic understanding of edutainment. Bridging this gap can lead to more effective and innovative educational games that meet the needs of both educators and learners while addressing the practical realities of game development.

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All links verified 16.9.2025.

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