

Designing a Non-digital Game for Entrepreneurial Education: Case Study of Biznes na Medal

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Abstract: Growing recognition of educational games and their impact on developing competences emphasizes the need for practical and theoretical knowledge on the process of designing effective games for education. Existing approaches emphasize motivational factors, alignment between learning objectives and game elements, learner-specific needs, and domain-specific requirements. The literature offers several frameworks for serious educational game design. However, further research is needed to establish evidence-based design principles, clarify the role of educators in the development process, and extend current findings to less explored learning domains and skills. This paper aims to address this knowledge gap by describing the specificity of the design process of a business education board game for young and adult players with no prior business experience, developed by an academic teacher in a university setting. The study employs a single-case study and autoethnography to explore the author's personal experience of a three-year process of designing the board game Biznes na medal (Business Worth Medal). The findings revealed four author roles related to designing the game and managing the design process: innovator, creator, entrepreneur, and leader. The interconnection between the roles is explained by organizational ambidexterity. As a result, an ICEL framework of author roles in educational game design was proposed.

Keywords: Business simulation games, Entrepreneurship education, Educational game design, Board game, Non-digital game design, Serious game

1. Introduction

Education is a central concern of public management. It encompasses primary and secondary schooling, academic teaching, vocational training, and lifelong learning. The growing recognition of educational games and their role in competence development highlights the need for both practical and theoretical knowledge on how to design effective games for educational purposes (Dörner et al., 2016, Göbel et al., 2024). The literature shows that educational game design is supported by a wide range of conceptual frameworks, taxonomies, and theory-informed models that seek to integrate pedagogical goals with engaging game mechanics. These include approaches grounded in self-regulated learning, motivational theory, and serious game design principles (Annetta, 2010, Jiang and Shangguan, 2022, Tahir and Wang, 2020). Existing frameworks emphasise motivational factors, alignment between learning objectives and game elements, learner-specific needs, and domain-specific requirements, for example in STEM education, medical education, and serious games for children (Asadzadeh et al., 2024, Videnovik et al., 2023, Xu et al., 2023).

In game-based entrepreneurship education, business students are probably the most extensively researched group. This focus is understandable, as they deliberately choose educational programmes intended to support their future careers in business. Consequently, there is considerable interest in using games in academic business programmes (Faria et al., 2008). Business and entrepreneurship education, however, concerns not only business students. Students enrolled in non-business programmes may also pursue, or at least consider, business careers, either by choice or necessity. Moreover, decisions about a business-related future are often influenced by experiences in primary and secondary school, and outside formal schooling. These groups remain underexplored in the context of game-based entrepreneurship education, a gap explicitly identified by Tchokoté and Bawack (2024).

Further research is therefore needed to develop evidence-based design principles, clarify the role of educators in the development process, and extend current findings to less explored learning domains and skills (Dimitriadou et al., 2020, Videnovik et al., 2023). This paper examines the design process of a business education board game intended for young and adult players with no prior business experience, conducted by an academic teacher in a university setting. In particular, it addresses the following research question: what is specific about the design process of a business education board game when it is initiated and run by an academic teacher in a university context?

2. Design Frameworks for Entrepreneurial Education Games

There are at least several general frameworks that may support designing non-digital educational games for entrepreneurial education, including the flow framework (Kiili et al., 2014), the LEAGUE Framework (Tahir and Wang, 2020) and six “I’s” (Annetta, 2010), among others.

The concept of flow is one of the most popular constructs to describe the playing experience. The flow experience is described by some or all of the following characteristics: concentration, time distortion, rewarding experience and loss of self-consciousness (Kiili et al., 2014). Kiili et al. (2014) examined empirically this conceptual framework and argued that it may serve for analysing and designing educational games. In particular, the dimensions of flow experience help to capture the quality of educational games and also to reveal ways to optimize learning effects and user experience. This framework distinguishes flow antecedents (clear goals, challenge, feedback, sense of control, payability), flow state (concentration, intrinsic rewards, loss of self-consciousness, time distortion), factors affecting the design of the learning experience and game-based learning artefacts (representation of content, learning objectives, learner characteristics, pedagogy, context) and mind lenses (sensing mind, processing mind, integrating mind, relating mind, transferring mind) (Kiili et al., 2014).

Discussing the theoretical lenses used to understand Game-Based Learning (GBL) Tahir and Wang (2020) point to several problems affecting the designing process. On the one hand focusing on exploring any single aspect of GBL makes it difficult to identify all core dimensions, but on the other hand using diversified set of elements for designing and evaluating educational games hinders identification of any clear pattern. They also point to the inconsistency in definition, usage, scope and terminology (e.g. dimensions, factors, etc.) of elements in GBL literature (Tahir and Wang, 2020). For these reasons Tahir and Wang (2020) developed the LEAGUE Framework, which defines core GBL components, such as: Learning, Environment, Affective-cognitive reactions, Game factors, Usability, Usability in a hierarchy of scope. This concept can be applied for the analysis, design and evaluation of learning games (Tahir and Wang, 2020).

The six “I” framework distinguished such design components, as: identity, immersion, interactivity, increasing complexity, informed teaching, instructional (Annetta, 2010). Another proposition of serious-game design framework, that stems from the literature review, was developed by Al-Awadai (2024). This framework draws on seven functional categories (pedagogy/learning, rules, interaction and communication, assessment, goals, adaptation, and representation) and offers 16 functional requirements for developing serious games. However, further development of the framework resulted in the concept more useful for digital games. Additionally, Tchokoté and Bawack (2024) offer two conceptual paths to understanding how and why business games impact entrepreneurial intentions and entrepreneurship self-efficacy. The second model conceptualizes that business games attributes (physical attractiveness, perceived usefulness, perceived playfulness, perceived enjoyment, system quality, service quality, model-reality fit) affect learning attributes (learning support, learning effectiveness, learning motivation, learning performance) which, in turn, affect individual attributes (user satisfaction, business game continuance) than impact entrepreneurial self-efficacy.

3. Methodology

3.1 Research Design and Methodological Approach

This paper draws on author’s personal experience of the three year process of designing the board game “*Business na medal (Business worth medal)*” in the field of entrepreneurial education, and employs a single case study to explore the process and its results through analytical lens adapted from Barzelay (1993) such as: scenarios, problem-solution pairs, and role frames. Scenarios “track possible interconnections, even if not generalized as fixed or probable interconnections” (p. 309). Role frames are part of a practitioner’s system of knowing-in-action, that guides a practitioner’s actions to bring about change in problematic situations” (p. 311). Exemplary solutions to recurring problems is “an oft-prized form of knowledge (...), evident from any defence of case method teaching and much of professional education in general” (p.310).

In order to collect the data, autoethnography was applied as a process of introspection and an act of self-narration, “in which the narrator analyses own experiences, reflects on personal life experiences, while at the same time relating them to the social context in which they emerged”, as well as a personal document created by the narrator in the act of self-narration, taking the form of a note (Kacperczyk, 2014).

3.2 Data Collection and Analysis

The analytical procedure comprised six stages and covered the period from March 2022 to May 2026. First, due to the length of analysed period and possible memory bias, I collected artefacts to restore the right chronology of the design process and guide the introspection. In particular, the artefacts include various data sources, such as:

- email correspondence with employees of: the Centre of Technology Transfer (CTT) CITTRU (the director and broker), the Academic Business Incubator, as well as with the company responsible for designing the game's graphic materials;
- illustrations, such as boards, cards, and tokens, saved in computer programs (Miro, Canva), which recorded the file creation dates;
- documentation in the form of agreements with contractor and files containing calculations of the profitability of companies managed by players;
- results of opinion surveys conducted among testers and workshop participants, in the form of preserved spreadsheets and online questionnaires;
- Academic Business Incubator's website in relation to conducted workshops.

As a result, a document consisting of 61 rows was created. Each row referred to one or more artifacts within a specific date range, arranged chronologically and accompanied by a description of what had occurred. It covered the whole design process, from the very beginning to the very end. An excerpt is presented in Figure 1.

Okres	Artefakt	działania
Marzec-czerwiec 2022		Przeprowadzenie wywiadów ze studentami UI.
Lipiec 2022		Pierwsza próba konceptualizacji własnego pomysłu.
Lipiec-sierpień 2022		Pierwsze prototypy, granie z dziećmi. Nabranie wiary w sens projektu.
Listopad 2022		Fragment sprawozdania finansowego, połączony z elementami gry. Jedna z wersji.
Listopad-Grudzień 2022		Rozwój planisy, szukanie koncepcji gry i powiązania z polami na planszy, w których sprzedawane są produkty
Listopad-Grudzień 2022		Pierwsze testy z grupą studentów w ramach projektu IDUB
Grudzień 2022		Wyniki testów – badanie doświadczenia za pomocą zasklepionej aplikacji, map podczas ostatniej sesji.
Styczeń 2023		Wprowadzenie elementów zarządzania, ponieważ uczyć podstaw zarządzania i wydawało się to bardzo zasadne.
Marzec 2023		Pojawiła się możliwość realizacji warsztatów dla dzieci podczas ferii zimowych w Żółtym Łobzie w Krakowie. Przygotowywałem wersję w formie maty na podłogę. Ostatecznie warsztaty się nie odbyły, ale wersję przetestowałem ze studentami na zajęciach z metod projektowania.
Marzec 2023		Pierwsze testowe warsztaty dla Akademickiego Inkubatora Przedsiębiorczości. Rozwijałam ścieżkę Badań i Rozwoju którą omawiam pod kątem strategii konkurencyjnych M. Portera.
Maj 2023		Moment zwrotny. Po testach z doświadczonymi emerytowanym prezesem dużej spółki produkcyjnej wyłoniły się niespójności logiczne i dwie gry w jednej (startup vs lokalne MSP). Decyzja o MSP.
Maj 2023		Testowanie układów planszy do wersji MSP oraz testowanie sposobów zarabiania pieniędzy (sprzedaż B2B, zamówienia publiczne, kontrakty).
Marzec-maj 2023		Testowanie gry na zajęciach i warsztatach APZ, zbieranie informacji zwrotnej poprzez gnet, Ocena gry i warsztatów za pomocą skali oraz opisu słownego (po trzy słowa kluczowe).
Czerwiec 2023		Wersja przed wakacjami.

Figure 1: Example view of the document with artifacts supporting introspection and self-narration

Next, I used artefacts to recall memories of situations and experiences from the design and commercialization of the game between March 2022 and May 2026. I wrote my memories down in a form of self-narration document, covering the whole process. After that, I coded the document in a similar way the interviews are coded using condensation of meaning [Kvale, 2010 #705]. The process of artifact analysis, introspection and self-narration was bidirectional. Artefacts evoked memories, which were then written down and coded. Conversely, some codes evoked memories and guided the search for artefacts for confirmation. Then, I interpreted the codes through the categories proposed by Barzelay (1993). Finally, I conducted a synthesis encompassing the integration and assessment of research findings and knowledge adopted in my case from management literature. The whole process is visualised on Figure 2.

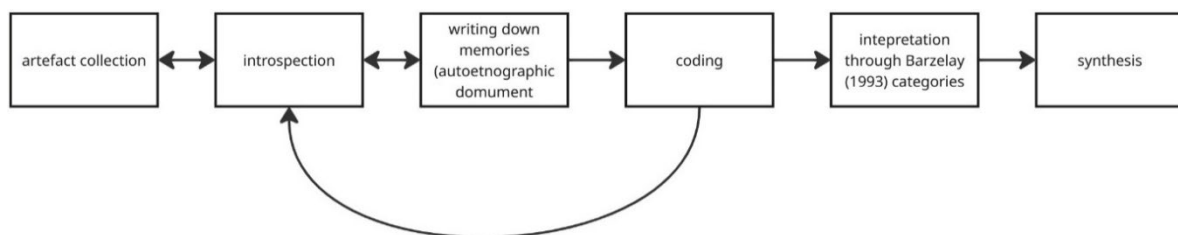


Figure 2: Analytical process

3.3 Description of the Game

Business Worth Medal (Biznes na medal) is an innovative board game developed at the Faculty of Management and Social Communication of the Jagiellonian University. It simulates running a small business. Players make a variety of business and management decisions, plan their actions according to market conditions, manage finances and company growth, and strive to expand a network of restaurants across the city. The game draws on academic knowledge from economics, management, and marketing, while preserving the realism of running a small business. Educational content is integrated into the gameplay, board, cards, and tokens. No specialist knowledge is required to start playing. Players absorb educational content already while learning the rules of the game. During gameplay, they experience realistic situations that serve as the basis for reflection and discussion, and the conclusions drawn are then tested in the next round of play, in line with Kolb's cycle. A key assumption of Biznes na medal is that the strategies learned during gameplay should prove effective in running a small business in real life. The game can be successfully used for educational purposes in schools, universities, business incubators, and employment offices. Teachers or workshop facilitators can guide players' reflective observation and explain chosen theories during abstract conceptualisation. The game allows for coverage of such topics as: decision making, market strategies, resource management, supply and demand, competitiveness, revenue and costs, business scaling, marketing mix, risk management, sources of financing, technological development, team management, knowledge management, and accounting, among others. Biznes na medal (Business Worth Medal) is also suitable for family or social play with educational benefits. Parents can play with children aged 10 and above, while independent mastery of the game is recommended for players aged 14 and above. Combining the game experience with the game knowledge map may support pupils in home education. The game is designed for 2 to 5 players. The board is presented in Figure 2.

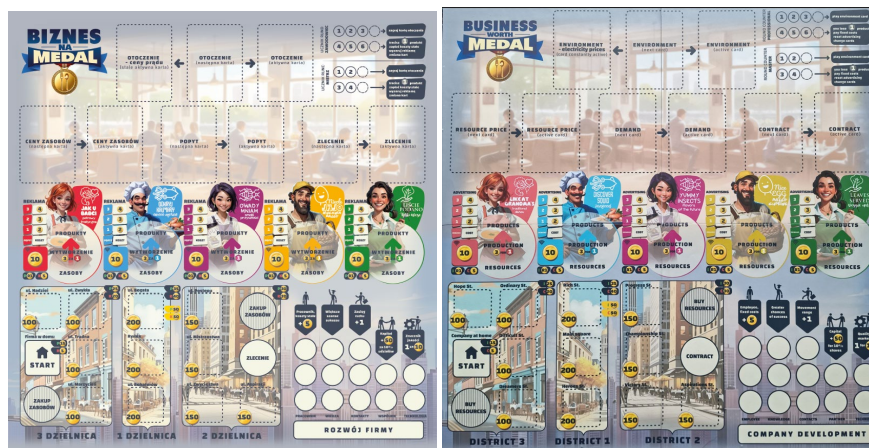


Figure 2: The boards of Biznes na medal – Polish and English version

4. Results and Discussion

4.1 Autoethnography – a Retrospection of Designing Biznes na Medal

In the spring of 2022 I conducted in-depth interviews with several students of non-business programmes at Jagiellonian University, to collect material for the design course I was teaching. The aim was to explore how they perceived entrepreneurship as a possible career path and what educational needs they had in this area. During the course, one group of students came up with an idea of educational business game. After the course their concept inspired me to develop my own prototype. I created it in July 2022 and tested with my seven- and eight-year-old sons. I noticed that my children intuitively understood concepts such as fixed costs through the instruction and mechanics of the game. This experience convinced me that such a game has enormous educational potential and motivated me to develop it further. At this stage, the project was entirely bottom-up, with no formal schedule, budget, or reporting requirements.

In autumn 2022, I received small funding from the IDUB programme at the Jagiellonian University. It helped me to conduct several testing sessions with a group of six students in November and December 2022. These sessions helped me develop the rules and mechanics of the game. Further development in 2023 was supported by testing during university classes and workshops organised for the Academic Business Incubator. A particularly important test was conducted with a retired CEO of a large manufacturing company. The feedback pointed some critical inconsistency regarding two possible development paths: innovation-based start-up and local SME. In

consequence I decided to focus on the SME path, as it seemed more universal and better suited to the entrepreneurial competences I wanted the game to develop. This decision required a substantial rethinking of the game concept and its mechanics. In May and June 2023, I tested new version of the game during university classes and workshops organised for the Academic Business Incubator. These tests confirmed both its educational and entertainment potential, while also showing the need for further improvements. During this period I started considering commercialisation of the invention. In particular, I identified secondary schools as potential users.

Between July 2023 and June 2024, I focused on refining mechanics that reflected the realities of SME operations and connected them with concepts from management, economics, and marketing. During this period, the game was embedded in an abstract and universal business context. Then I moved the prototyping process from Miro to Canva to create more realistic visual materials. The introduction of photographs and a city map changed the business context of the game by adding specific space and more concrete business conditions. This opened new possibilities and imposed new requirements for mechanics related to economic conditions and managerial decisions of the player. The prototype reached the level of a Minimum Viable Product (MVP) and allowed me to conduct numerous workshops for the Academic Business Incubator. I used the game to teach so I was able to verify how well it served educational goals of the workshops. During this period, I refined the pricing mechanism, the types and contents of cards, the visual design, and the relationships between the main components of the game.

The third stage of development, from July 2024 to September 2025, was when the game took its final form. In July 2024 I obtained funding from CTT CITTRU to increase the technological readiness level (TRL) of the invention. The funds were allocated to professional graphic design, video instruction, and the production of the first batch of copies. In cooperation with CTT CITTRU, we prepared the contract with the graphic designer and looked for potential contractors. From October 2024 to February 2025 I participated in the pilot Acceleration Programme of the Academic Business Incubator of the Jagiellonian University. This experience helped me decide that placing the game in a very specific business context is better, than keeping the universal but more abstract one. The Acceleration Programme encouraged me to incorporate brand archetypes to develop the brand of the game and the companies managed by players.

At the end of 2024 and the beginning of 2025, the game was tested for education value during the workshops for the Academic Business Incubator and in two primary schools. The feedback was very positive, 86% pupils declared that they would like to play again and expressed opinions indicating how the game influenced their thinking about running own business. I also observed how the children involved in the game and thought carefully about their business choices, while having a lot of fun. This coincided with the signing of the contract with the graphic designer, from December 2024 to January 2025. There was no time to lose, as I was bound by the deadline of the grant I had received from CTT CITTRU.

In January 2025, shortly before finalising the graphic design, I organised additional tests with experienced game testers, some of whom had worked for game publishers. Their feedback led me to implement important last-minute changes. For example I added new spaces on the board and removed some old ones, and introduced a second pawn, and decided to keep cards face up in order to better stimulate strategic planning. Final tests, organized under time pressure, confirmed that the new version increased both the attractiveness and realism of the game. Although the late changes caused considerable stress, the graphic designer's experience and flexibility made it possible to incorporate them into the final version.

In September 2025, the first copies of the game were delivered and stored at the Faculty of Management and Social Communication. At the same time, official information about the game and the educational programme for schools was published, which led to a short news segment prepared by TVP Kraków. In March 2026, online sales were launched through the university's official store, and the game was promoted at a board game fair in Kraków.

4.2 Findings

4.2.1 Scenario

The design process of Biznes na medal was shaped by numerous factors and decisions that may be grouped into two major dimensions:

- Design scenario – embracing (1) design thinking, understood as a general framework, which defined the main stages of the process, including research, synthesis of research data, identification of the

key need to be addressed, prototyping, testing, and iteration, and (2) graphic design provided by a professional graphic designer;

- Management scenario – encompassing (1) coordination of the project, acquiring necessary resources, and assuring deliverables, (2) following knowledge-transfer procedures related to treating the game as an invention, including intellectual property protection, procurement, and raising the game's Technology Readiness Level (TRL), and (3) dissemination and commercialisation of the game in the post-production phase.

These dimensions influenced one another throughout the development of the game.

4.2.2 Role frames

The introspection and autoethnography I conducted allowed me to identify several complementary roles I simultaneously performed throughout the project, such as innovator, creator, entrepreneur, and leader. Each role involved distinct responsibilities and required different competencies. As an innovator, I was responsible for generating the original concept, finding or inventing new mechanics, game components, or new visual representations of game components addressing pursued educational effects and problems revealed during the tests. As a creator, I decided which game components and mechanics to use, to discard, or to restore, in order to maintain conceptual coherence and ensure that every element remained consistent with the overall vision while accurately reflecting established theories and concepts. Until a professional graphic designer joined the project, I also created all prototypes myself. The entrepreneurial role, in turn, involved recognising the need for a new educational game, identifying market opportunities, looking for testers, and initiating new contacts and collaborations with external stakeholders. Finally, as a leader, I was responsible for accomplishing successive design stages, initiating and supervising administrative procedures such as student contracts, procurement processes, and agreements with external contractors, applying for funds, preparing financial reports, maintaining communication with project partners, overseeing the project's website and marketing communication, and articulating and communicating the vision of the game to external partners.

4.2.3 Problem-solution pairs

The introspection and autoethnography I conducted revealed key challenges related to the author roles, along with different strategies for addressing them. For the innovator role, the major challenge concerned developing multiple new concepts for a single problem with the game design. I relied on my imagination and familiarity with the theories and small business reality (as an academic teacher and former business owner), and I sketched a lot. For example, the first prototype of the board copied Monopoly. Then I realised that I needed a board and game mechanics reflecting the real decision-making process. So I started imagining how the board and other components should look to resemble what business owners do in real life.

One of the biggest problems for the creator role was balancing education and fun. Educational goals, represented in the game through similarity with real-life situations and consistency of game components and mechanics with scientific theories, had to be balanced with sufficient players' entertainment. In order to reach equilibrium, I tested the prototype for entertainment and for education during workshops. When selecting the components of the game, I adopted a principle of simple symbols. It means that each theory is represented in the game by the lowest possible number of key aspects of that theory. Such symbols serve as an anchor for the teacher to unpack and explain the full concept, yet build on the in-game experiences of the player. For example, I incorporated into the game two types of credits (tokens), a few marketing-mix instruments (a place for a restaurant, advertising, a few types of products), and most of the components representing the Business Model Canvas (suppliers, resources, actions, product quality, market segments, costs, income, sales channels).

For the entrepreneurial role, one of the key challenges was acquiring information that initiated the sensemaking process, leading to the recognition of a need and the decision to undertake an action to satisfy this need. In this regard, general knowledge about the environment and the design process, screening internet sources, and maintaining contacts with relevant people were helpful. For example, I knew from past attempts that CTT CITTRU provided funds for university innovation through a competition, so I was aware of the opportunity. Thanks to my collaboration with CTT CITTRU, I knew about the competition's opening date a little in advance.

Finally, for the leader role, one of the biggest challenges was the coordination of multiple actions in the project. In some periods nothing happened for several weeks, and in other periods many interrelated actions occurred simultaneously. So the solution was a mix of flexibility and project management skills. For example, at the beginning of the project, I allowed myself to develop the concept and prototypes freely, at its own pace. I analysed many directions in which the game could develop. It took over a year. When I applied for funding in

the final design stage, I had a plan to stick to and a budget to keep and settle, but I organised tests and introduced changes into the game mechanics, rules, and brand until the very deadline.

4.2.4 Generalisation - developing a framework based on the case study

Barzelay (1993, p. 308) points out that one of the roles of a single-case study is to stimulate the author to offer empirical generalizations that may not have been stated before. The identified scenarios describe two main processes, and each of them may be attributed to particular role frames and relevant problem-solution pairs. Designing embraces the innovator and creator roles. It is an interplay between seeking innovative improvements and deciding whether to use already verified and approved game mechanics and components. Management embraces the entrepreneur and leader roles. It is an interplay between seeking environmental opportunities to develop and apply the game and keeping the process organised and moving forward. Importantly, there are interconnections between the main processes too – design imposes requirements that management needs to take care of, to enable progress in design. Organising prototype testing is a good example.

However, there is another way to group the above role frames. This new perspective builds on the fact that designing an educational board game and managing this project is in fact a learning experience. The designer learns what works for the game and its educational goals, and what does not. The manager learns how to organise and run the design, production and dissemination of the game in the most effective way. Thus, the theoretical framework of exploration and exploitation in organisational learning, further developed into organisational ambidexterity (March, 1991; Tushman & O'Reilly, 1996), seems applicable. According to March (1991, p. 71), exploration "includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" and exploitation "includes such things as refinement, choice, production, efficiency, selection, implementation, execution." When manifestations of both exploration and exploitation appear in an organisation, we call it organisational ambidexterity (Tushman & O'Reilly, 1996). Regarding the analysed case, the theoretical lens of exploitation encompasses the role of a creator, ultimately pursuing the final game design, and the role of a leader, aiming ultimately to produce and disseminate the final game. Exploration, in turn, is related to the roles of innovator and entrepreneur. The innovator always seeks novelty in game design, tries to discover new improvements, no matter how advanced the project already is. The entrepreneur seeks new environmental opportunities to advance game design, its production or distribution.

The combination of scenarios (design and management) with the theoretical lens of exploration and exploitation offers a matrix ordering major author role frames. The revealed problem-solution pairs are exemplary and support conceptualisation of the four-role framework (Figure 3).

	Educational Game Design	Management of Educational Game Design
Exploration	Innovator	Entrepreneur
Exploitation	Creator	Leader

Figure 3: The framework of author roles in educational game design

4.3 Discussion

The case study conducted, based on introspection and autoethnography, allowed for the conceptualisation of a framework describing the main roles which the author of an educational board game performs. The framework can be named ICEL, from the first letters of the four roles: Innovator, Creator, Entrepreneur, and Leader. The roles are performed simultaneously, thus ambidexterity may be considered an important skill for game developers, teachers designing their own games, and students or pupils who learn through game design. In fact, Tushman and O'Reilly (1996) already suggested that ambidexterity in an organisational context is an important managerial capability. This research applies this concept to SEG design.

On the other hand, ambidexterity is also a trait of the game development process. A comprehensive systematic review of theories in research on gamification, serious games, and game-based learning indicated 81 frameworks (Krath et al., 2021), yet none of those referred explicitly to exploration and exploitation or organisational ambidexterity. Similar conclusions stem from other review studies (Ávila-Pesántez et al., 2017; Asadzadeh et al., 2024). In turn, models described in the literature, such as EMERGO (Nadolski et al., 2007), the

six "I's" (Anetta, 2010), LEAGUE (Tahir & Wang, 2020), the five phases of methodology to develop educational games (De Lope et al., 2017), and Flow (Kiili et al., 2014), focus mainly on digital games and provide guidance for game developers. Dimitriadou et al. (2021), however, incorporated the perspective of educators and administrative conditions of game design. Nevertheless, in the light of the reviewed literature, it remained unclear how ambidexterity manifests in educational game design.

5. Conclusions

This study explored the specificity of the design process of a non-digital educational game for entrepreneurial education, developed by an academic teacher in a university setting. Applying a case study approach based on autoethnography allowed for identification of four roles the author performs: Innovator, Creator, Entrepreneur, and Leader. Each has specific problems and strategies to tackle them during the design process. Two roles concern game design, while the other two are related to managing game design. Considering that educational game design is a learning experience for the author, these roles are also manifestations of exploration and exploitation, and of organisational ambidexterity, described in management research. As a result, the empirical findings and the adopted theoretical perspective are building blocks of the ICEL framework explaining author roles in SEG design. In particular, the ICEL framework sheds new light on the specificity of the process, indicating organisational ambidexterity as both a trait and an author's skill. Thus, it not only enriches theoretical perspectives, but also supplements other models and frameworks used in Serious Educational Game design and Game-Based Learning research.

Ethics Declaration: This research was conducted in accordance with the ethical and regulatory guidelines of the Ethical Board of Faculty of Management and Social Communication at Jagiellonian University in Krakow. The data used for this study are based on the introspection of the author of the game and did not require permission nor opinion of the Ethical Board.

AI Declaration: AI-powered tools were employed to support the translation from Polish to English or proof-reading and style-editing. Machine-generated translations and improvement suggestions were critically reviewed. Manual adjustments were introduced by the author to ensure technical accuracy and contextual coherence. This preserved academic integrity and enhanced the document's communicative clarity.

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