

Meta-Analyzing Experiential Game-Based Learning in Entrepreneurship Education

Tharrenos Bratitsis¹, Marta Ferreira Dias², Joana Carrilho³, Verónica Kryvohubchenko² and Marlene Amorim³

¹University of Western Macedonia, Florina, Greece

²GOVCOPP, DEGEIT, University of Aveiro, Portugal

³DEGEIT, University of Aveiro, Portugal

bratitsis@uowm.gr

mfdias@ua.pt

joanacarrilho@ua.pt

veronicak@ua.pt

mamorim@ua.pt

Abstract: This paper presents a meta-analysis grounded on a previously conducted systematic literature review on game-based learning (GBL) in Entrepreneurship Education (EE), with a particular focus on comparing the design principles, pedagogical value, and learning outcomes of experiential versus non-experiential game-like methodologies. While existing literature provides rich taxonomies of GBL tools and learning intentions, there is a gap in understanding how differing instructional approaches shape entrepreneurial competence development—particularly in terms of depth, engagement, and transferability of knowledge and skills. Experiential GBL approaches — such as role-playing scenarios, makerspace projects, entrepreneurial challenges, and serious games — immerse learners in problem-centered, often collaborative environments that mirror real-life entrepreneurial dynamics. These formats emphasize learning through doing, reflection, and iteration, and are deeply rooted in constructivist and transformative learning theories. In contrast, non-experiential approaches — such as gamified quizzes, flashcards, point systems, and digital badges — aim to increase engagement and motivation through extrinsic rewards, but often limit the learner’s active agency and emotional investment in the process. Our analysis indicates that experiential methodologies consistently show stronger results in fostering higher-order entrepreneurial competencies, such as creativity, opportunity recognition, resilience, and decision-making under uncertainty. These formats promote not only cognitive learning but also personal growth, self-efficacy, and teamwork. However, their implementation requires greater time, instructor preparation, and contextual adaptability. Non-experiential formats offer scalability, consistency, and ease of assessment, making them suitable for foundational knowledge acquisition or large-scale learning environments, yet may lack the depth needed for transformational outcomes. The paper concludes with implications for course and curriculum design in higher education, drawing on an applied example from a university-level entrepreneurship course that embodies experiential GBL principles. This serves as a case study for translating meta-analytic insights into actionable educational practice and provides a roadmap for educators and institutions seeking to enhance EE through game-based strategies tailored to their specific goals and constraints.

Keywords: Entrepreneurship education, Game-Based learning, Experiential learning, EntreComp, Transversal competences

1. Introduction

In today’s volatile, complex, and knowledge-driven global economy, entrepreneurship is widely regarded as a key driver of innovation, competitiveness, and societal transformation. While its precise definition remains debated (Hessels & Naudé, 2019), most perspectives agree that entrepreneurship involves recognizing and acting on opportunities to create economic, social, or cultural value. The European Commission’s EntreComp framework translates this concept into a structured model of entrepreneurial competence, offering a practical guide for educators and policymakers (Bacigalupo et al., 2016). Consequently, Entrepreneurship Education (EE) has gained momentum in higher education—not just to promote startups, but also to equip graduates with transversal competences for thriving in diverse careers (Hynes & Richardson, 2007; Boldureanu et al., 2020).

Despite this growing emphasis, higher education often struggles to effectively develop entrepreneurial competence. Traditional lecture-based methods frequently fall short in fostering the integrated skillset—such as opportunity recognition, creativity, and teamwork—required for entrepreneurial action. In response, experiential and game-based approaches to EE have gained traction (Neck & Corbett, 2018; Haneberg et al., 2022). Among these, game-based learning (GBL) stands out for its ability to engage cognitive, emotional, and behavioral aspects of learning through interactive experiences.

A recent systematic literature review (Casau et al., 2023) synthesizes research at the intersection of GBL and EE, identifying several effective pedagogical strategies—such as simulations, serious games, and collaborative projects—that enhance learners’ motivation, entrepreneurial attitudes, and problem-solving skills. Yet, it also

highlights persistent challenges, including inconsistent competence alignment with frameworks like EntreComp, and issues of cost, scalability, and access. Building on these findings, this paper explores how the Game It Away! International Entrepreneurship Training Programme (ETP) applies GBL to operationalize EntreComp in higher education. The programme incorporates hands-on game design, collaborative ideation, and makerspace environments to engage students while developing key competences. It goes further by mapping learning activities to EntreComp's three dimensions—Ideas and Opportunities, Resources, and Into Action—ensuring a structured, scaffolded approach to entrepreneurial learning.

The programme's use of hands-on game design, collaborative ideation, and makerspace environments mirrors many of the high-impact practices identified in the literature. However, *Game It Away!* extends these practices by mapping specific learning activities to the EntreComp dimensions—Ideas and Opportunities, Resources, and Into Action—in a deliberate effort to scaffold competence development. This integration supports the cultivation of transversal skills such as creative thinking, initiative-taking, ethical reasoning, and teamwork, thereby addressing the interdependent nature of entrepreneurial competences.

The paper is organized as follows: Section 2 reviews key insights from the literature; Section 3 outlines the Game It Away! programme; Section 4 examines its alignment with EntreComp. The conclusion discusses implications for curriculum design, scalability, and future research in EE.

2. Game-Based Learning in Entrepreneurship Education Framework

Recent studies highlight the shift in higher education toward active methodologies, particularly in EE, where students become active learners. Lee and Yu (2025) advocate for Game-Based Learning (GBL) in business education, integrating flow theory and intrinsic motivation to foster complex skills through immersive, engaging simulations, outperforming extrinsic reward-based gamification. Scroccaro, Engzell, & Norrman (2025) compared cases in Italy and Sweden, emphasizing coaching, constructive feedback, formative assessment, the Entrepreneurship Competences model, and tailored assessment tools for individual and team skills.

A study by León et al. (2025) shows that GBL, via structured board games, enhances communication and socialization of children with ASD in regular classrooms, promoting inclusive collaboration through clear, consistent game structures.

2.1 Summary of Previous Systematic Review: The 7 Categories

A systematic literature review (Casau et al., 2023) identified seven key categories through which gamification and GBL have been applied to EE. These reflect diverse approaches aligned with varying learning goals and skill development needs:

1. *Simulation-based environments* place students in realistic business scenarios, fostering strategic thinking and risk management through decision-making and problem-solving.
2. *Digital serious games* are designed for educational use, embedding entrepreneurship challenges in interactive formats to support practical, engaging learning.
3. *Role-play and narrative driven formats* involve students in story-driven business scenarios, helping them build social and emotional competences such as communication, empathy, and teamwork.
4. *Competitive game mechanics* like leaderboards and point systems boost motivation, though they may not always lead to deep learning.
5. *Makerspace and design thinking challenges* engage students in solving real problems through prototype creation and idea development, promoting creativity and innovation.
6. *Point-and-badge systems* track progress and encourage participation via rewards, commonly used in online or large-scale learning contexts.
7. *Blended models* combine multiple approaches, offering flexible, comprehensive learning experiences.

Together, these categories form a useful framework for analyzing GBL in EE and highlight critical questions about engagement and educational impact.

2.2 Meta-Analysis of Implementation Methods

Following the identification of the 7 main categories, this meta-analysis examines how they are implemented—focusing on common game mechanics, interaction types, and levels of experiential engagement.

Experiential methods like simulations, role-play, and makerspace challenges tend to use immersive mechanics—like complex problem-solving, storytelling, and feedback loops—that promote active participation and critical

reflection. These approaches help develop transversal skills like creativity, empathy, and strategic thinking by placing learners in realistic, decision-making scenarios.

In contrast, simpler models like point/badge systems or gamified quizzes rely on extrinsic motivators—scoring, levels, visual rewards—that capture attention but often lack depth. As noted by Deterding et al. (2011), these mechanics typically drive short-term behavior rather than transformative learning.

Interaction styles also vary. Collaborative formats, common in simulations and design thinking activities, foster interpersonal skills and collective knowledge-building. Individual approaches, often found in digital games or quizzes, provide less opportunity for social learning.

Delivery format also matters. Digital tools offer scalability and flexibility, while face-to-face formats—like board games or classroom role-play—deepen emotional and social engagement. Hybrid models combine both benefits.

In sum, while GBL is widely used, its effectiveness depends on aligning mechanics with sound pedagogy. Simpler, more scalable models remain common but often lack the depth needed to cultivate complex entrepreneurial competences.

2.3 Analysis of Experiential vs. Non-Experiential Nature

Tran (2024) conducted a systematic review on GBL, focusing on hotel management, including an empirical study with students at FPT University Danang. It contributes by grounding GBL on experiential learning theory, proposing a conceptual model for future research, and introducing a curriculum that progressively integrates experiential methods. It emphasizes the importance of linking theory to practice, enhancing engagement and teaching effectiveness.

A study at the Lebanese International University implemented GBL in the Pharmacy Practice Experience curriculum, addressing limited data on its role in pharmacy education. Conducted in July-September 2021, the study found that students exposed to GBL scored significantly higher on exams ($MD=7.152$; $p<0.001$). A validated motivation scale (ALMAS) also showed a strong correlation between motivation for GBL and academic performance, highlighting motivation as a key factor in learning outcomes (Dabbous et al, 2022).

Martina and Göksen (2022) explored educational escape rooms (EERs) as non-digital GBL tools. Though common in STEM and health education, EERs are underused in EE. Their study identifies 11 validated design elements for integrating EERs into experiential entrepreneurship programs.

The distinction between experiential and non-experiential GBL is based on the degree of immersion and practical applicability. Experiential GBL involves students in realistic and challenging contexts, promoting skills through action and reflection. Non-experiential GBL is limited to more superficial recreational activities, with less impact on meaningful learning. The literature shows that the experiential nature of CLB is decisive in increasing motivation, engagement, and pedagogical effectiveness.

2.4 Critical Discussion and Identification of the Gap

This analysis highlights the limitations of traditional teaching methods in EE, which often rely on passive content delivery and summative assessment. By emphasizing memorization and theoretical knowledge, these approaches overlook key entrepreneurial competences such as strategic thinking, creativity, decision-making under uncertainty, and teamwork (EntreComp).

In contrast, the reviewed studies demonstrate the benefits of GBL, particularly when applied experientially. These methods enhance intrinsic motivation, emotional and cognitive engagement, and knowledge retention—especially when students are actively solving real problems, taking on roles, and collaborating, as in simulations, serious games, or design thinking activities.

Despite this, traditional models remain widespread, even though they fail to support the transformative learning needed in EE. This gap has fueled interest in hybrid approaches that combine experiential learning with the motivational game dynamics, offering more immersive and effective pedagogical formats. The *Game It Away!* project arises from the need to update teaching methods through entrepreneurial skills such as communication, teamwork and creativity, among others. It aims to raise awareness and teach both teachers and students about teaching entrepreneurial skills through games, promoting GBL in EE.

3. The Game It Away! Approach

Transversal competences like creativity, collaboration, and resilience are increasingly seen as essential outcomes of formal education. However, a gap persists between abstract frameworks and their practical implementation. While models such as EntreComp provide structured pathways for competence development, translating them into measurable, student-centered learning experiences remains a challenge.

The Game It Away! ETP addresses this gap by integrating experiential, game-based learning into educational practice. Grounded in the EntreComp framework, the programme uses it not just conceptually but as a practical scaffold for developing entrepreneurial skills, knowledge, and mindset. By combining theory with hands-on engagement, the ETP enables learners to embody entrepreneurial values and processes in meaningful, immersive ways. The following sections detail the programme's pedagogical foundations, structure, and learning environments.

Game it Away! - Entrepreneurship Education through Game Design & Maker-Centred Learning" is a project funded through the Erasmus+ programme of the European Union (Proj. No 2022-1-PT01-KA220-HED-000087026). Its main goal was to design an Entrepreneurship Education Programme for higher education students, regardless of their cognitive and disciplinary background. It is founded on EntreComp and focuses on the cultivation of the corresponding competences.

3.1 The EntreComp Framework

Over the past decades, the entrepreneurship concept has evolved from a focus on innate traits—e.g. risk-taking and leadership—to a more inclusive view of entrepreneurship as a set of competences that can be learned and developed. This shift reframes entrepreneurship as a dynamic combination of knowledge, skills, and attitudes, accessible to a broader population through education and experience (Chouhan & Srivastava, 2014).

This reconceptualization has major implications for education policy and practice. As entrepreneurial learning is increasingly integrated into educational systems of all levels, one persistent challenge has been the lack of coherence across the existing frameworks. Without a common understanding of what entrepreneurial competence entails, efforts to assess or compare learning outcomes are often fragmented and inconsistent.

To address this, the European Commission introduced the EntreComp (Entrepreneurship Competence Framework) in 2016 (Bacigalupo et al., 2016). EntreComp provides a comprehensive model for developing and assessing entrepreneurial competence across formal, non-formal, and informal learning contexts. It supports educators, policymakers, employers, and learners by offering a shared language and flexible structure applicable to diverse educational and occupational settings.

At its core, EntreComp defines entrepreneurship as the ability to turn ideas and opportunities into value for others (economic, social, or cultural). The framework is organized into three interconnected competence areas:

- Ideas and Opportunities – including creativity, vision, and opportunity recognition
- Resources – encompassing self-awareness, motivation, and resource management
- Into Action – involving planning, initiative, teamwork, and implementation

Each area comprises five competences, totaling 15, with eight proficiency levels that describe progression from novice to expert. A user guide and adaptable learning outcomes accompany the framework, aiding in curriculum design and assessment.

Importantly, EntreComp promotes entrepreneurship as a transversal competence, relevant not only to business but also to civic engagement, social innovation, and personal development. It aligns with broader EU goals related to lifelong learning, innovation, and sustainability, and is compatible with other frameworks like DigComp and LifeComp (European Commission, 2018).

In sum, EntreComp offers a powerful, flexible tool to support entrepreneurial learning and mindset development, helping individuals take initiative and create value in an increasingly complex world.

3.2 Embedding Game-Based Learning in Entrepreneurship Education: The "Game It Away!" Approach

Transversal competences like creativity, collaboration, and resilience are increasingly seen as essential educational outcomes. However, a gap persists between abstract competence frameworks and their practical application. While frameworks such as EntreComp provide structured pathways, translating them into actionable, student-centered learning remains a challenge.

The *Game It Away!* ETP addresses this by integrating experiential, GBL into education. It uses EntreComp not just as a reference but as a scaffold for building practical skills, knowledge, and an entrepreneurial mindset.

By combining theory with immersive, hands-on experiences, the ETP helps learners internalize entrepreneurial values and processes. The following sections detail its pedagogical foundations, learning structure, and enabling environments.

3.3 Game Design as a Pedagogical Vehicle for Entrepreneurship

Game It Away! emphasizes learning-by-doing by using game design as both content and method in EE. This approach engages students in authentic tasks that simulate real entrepreneurial activities.

The programme views game design—through analog board games or escape rooms—as a way to foster entrepreneurial behavior by mirroring real innovation processes. It encourages learners to spot opportunities, create solutions, manage uncertainty, and iteratively develop ideas within a safe educational setting (Gatti Jr. & Kim, 2019; Fergusson, 2022). Students actively collaborate, make decisions, and solve problems, embodying key entrepreneurial competences (Daniel et al., 2024).

This experiential format promotes not only cognitive understanding but also emotional engagement and behavioral change. Aligned with EntreComp, it helps learners build initiative, teamwork, resilience, and resource management through hands-on, immersive experience (Yang et al., 2022).

3.4 Programme Design and Learning Trajectory

The “Game It Away!” programme is structured into six modular units, each corresponding to a particular stage in the entrepreneurial journey. This scaffolded design ensures that students progressively build competences in a coherent and integrated manner (Bratitsis et al., 2025). The six modules include:

- *Module I: Let’s Game It!*. Introduces core principles of game design and entrepreneurial thinking, contextualized within the EntreComp framework (3 hours).
- *Module II: GameCraft – Elevate, Collaborate, Aim for Great!*. Focuses on collaborative creativity through brainstorming and user-centered design exercises (3 hours).
- *Module III: ProtoPlay – Master Prototypes, Budget Grooves, Creative Moves!*. Encourages the creation of game prototypes, highlighting resource management and sustainability through iterative practices (6 hours).
- *Module IV: TestCraft – Level Up Your Game, Learn, and Earn!*. Emphasizes testing, feedback collection, and redesign, promoting adaptability and resilience (3 hours).
- *Module V: PitchCraft – Rock the Show, Steal the Glow!*. Develops communication and presentation skills through persuasive pitching strategies (4 hours).
- *Module VI: Public Presentation and Reflection*. Culminates in a public event where students present their final game products, fostering leadership, reflection, and engagement with real-world audiences (3 hours).

This modular progression mirrors the lifecycle of an entrepreneurial project—from the identification of an opportunity through inspiration, the ideation and development to testing and market presentation. Each phase builds upon the previous, reinforcing knowledge and enabling iterative skill development. The programme thereby creates a flexible, yet logically sequenced, learning environment that enables deep engagement and authentic competence acquisition.

3.5 Makerspaces as Catalysts for Experiential and Entrepreneurial Learning

A key feature *Game It Away!* is the use of makerspaces —open, flexible environments equipped with tools and materials that foster creative, collaborative work. These spaces reflect constructivist and experiential learning principles, offering students hands-on access to rapid prototyping resources, experimentation, and teamwork.

Makerspaces embody the openness, tolerance for failure, and innovation typical of entrepreneurial ecosystems (Hui & Gerber, 2017), allowing students to learn by doing, failing, and iterating. They serve multiple educational roles by encouraging creativity and adaptation, enhancing collaboration through team problem-solving, supporting iterative feedback and redesign, and connecting theory with real-world practice.

Within this context, the makerspace serves multiple educational functions (Li et al., 2022; Soomro et al., 2023). It fosters creativity and innovation by encouraging divergent thinking and experimentation, but also adaptation to the available material. It enhances collaboration and communication through team-based problem-solving

and design/construction. It supports iterative learning, promoting feedback cycles and reflective redesign. It bridges theoretical frameworks and lived experience, enabling learners to enact the EntreComp competences in real-world-like contexts. Thus, the makerspace is more than just a backdrop for learning; it is an active driver of competence development. The convergence of experiential spaces, GBL, and structured frameworks such as EntreComp positions *Game It Away!* as a forward-thinking and impactful model for EE in higher education.

3.6 Aligning Game It Away! with EntreComp: A Framework for Transversal Competence Development

The *Game It Away!* ETP was designed as a dynamic interface between structured competence frameworks and experiential, learner-centered pedagogies. Central to this design is EntreComp, offering a holistic model for entrepreneurial competence development. By embedding EntreComp's dimensions into each stage of the ETP, the programme transforms abstract descriptors into tangible experiences that foster transversal competences across cognitive, social, and behavioral domains.

Early in the design process, EntreComp competences were mapped to phases of the Design Thinking approach, reflecting the lifecycle of real-world product development. This guided the creation of the ETP modules (section 3.4), ensuring that learning activities scaffold competence development through engagement, reflection, and iteration.

Initial modules—*Let's Game It!*, *GameCraft*—let students explore entrepreneurial thinking through collaborative game ideation. They correspond to *Ideas and Opportunities*, fostering competences like *creativity*, *spotting opportunities*, *valuing ideas*, and *vision*. Structured brainstorming and imaginative scenario-building allow learners develop divergent thinking and opportunity recognition skills, essential for entrepreneurship and innovation in any context.

Middle modules —*ProtoPlay*, *TestCraft*— deeply engage learners with *Resources*, as they work with limited materials/tools within makerspaces, manage time constraints, and engage in design and feedback loops. This fosters competences like *mobilizing resources*, *financial and material literacy*, and *self-awareness and self-efficacy*. Physical prototyping as learning strategy enhances understanding sustainability, constraint-based problem-solving, and resilience—key aspects of entrepreneurial learning.

Final stages—*PitchCraft*, *Public Presentation and Reflection*—map *Into Action*, focusing on strategic communication skills, persuasive narratives crafting, and engagement with audiences through pitching. They promote competences like *taking initiative*, *working with others*, and *learning through experience*, facilitating agency and critical reflection on both process and outcomes.

This progression mirrors the entrepreneurial learning journey—from guided ideation to independent, real-world action—promoting deep learning and competence transfer across life domains.

The programme also supports advancement across EntreComp proficiency levels—*Foundation*, *Intermediate*, *Advanced*—by increasing task complexity, learner autonomy, and stakeholder interaction. For instance, while initial tasks are scaffolded/supported by facilitators, later stages require independent planning, critical evaluation, and confident public presentation, reflecting learners' growing capacity to act entrepreneurially in uncertain/dynamic environments.

Crucially, this alignment enables the development of a broad set of transversal competences that extend beyond EE. These include:

- Creativity and Innovation: through open-ended design challenges and storytelling within game environments.
- Collaboration and Communication: via peer co-design processes, iterative team feedback, and audience engagement during pitches.
- Resilience and Adaptability: cultivated through trial-and-error prototyping cycles, encouraging learners to embrace failure as a learning opportunity.
- Critical Thinking and Ethical Judgement: embedded in the process of designing meaningful, inclusive, and socially aware game narratives.
- Strategic Thinking and Leadership: as learners plan, organize, and present their concepts, assuming roles of responsibility within their teams.

The physical and conceptual use of makerspaces as pedagogical environments amplifies the impact of the programme. These spaces provide the material conditions and collaborative culture necessary for hands-on, constructivist learning that is essential to the development of entrepreneurial mindset and transversal

competence (Hui & Gerber, 2017; Soomro et al., 2023). In this way, *Game It Away!* moves beyond the limitations of abstract instruction, offering a fully embodied learning experience that resonates with both the EntreComp framework and contemporary educational theory.

In sum, *Game It Away!* ETP exemplifies how structured frameworks like EntreComp can be effectively implemented through innovative pedagogical models that prioritize learner agency, creativity, and social engagement. By aligning each phase of the programme with specific EntreComp competences and progression levels, it ensures that transversal competences are not only addressed in theory but developed in practice—empowering learners to thrive as adaptive, responsible, and proactive citizens in an increasingly complex world.

4. Discussion

This paper reaffirms that experiential GBL represents a powerful pedagogical paradigm for the development of transversal competences within EE. By immersing learners in realistic, interactive, and often collaborative environments, experiential approaches—such as game design, role-playing, and makerspace projects—not only transmit entrepreneurial knowledge but also foster critical soft skills like creativity, resilience, collaboration, and strategic decision-making. These skills are increasingly valued across professional domains, underscoring the importance of embedding transversal competence development in higher education.

Contrasted with non-experiential, reward-based gamification models, experiential GBL emphasizes agency, reflection, and iteration—core principles of transformative learning. As illustrated in *Game It Away!*, such methods enable learners to enact entrepreneurial behaviors and mindsets in authentic contexts, closely aligned with the EntreComp framework. The deliberate scaffolding of competences, from ideation to public presentation, ensures a structured yet flexible learning trajectory that encourages deep engagement and meaningful learning outcomes.

In summation, the paper advocates for a shift in educational practice—from traditional, passive models toward active, experience-rich methodologies. Experiential GBL not only addresses the limitations of conventional instruction but also offers a vision for future-ready education. By integrating game-based strategies with robust competence frameworks, educators can cultivate learners who are not only knowledgeable, but also adaptive, innovative, and ethically grounded—capable of navigating the complexities of the 21st century with confidence and creativity, as described via the structured competence frameworks, evident in the literature.

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