

DreamScape: Fostering Financial Cognition through a Serious Game

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Abstract

Financial literacy is critical for economic empowerment, yet access to effective financial education remains uneven. Serious games provide an interactive and accessible approach to financial education, fostering decision-making and cognitive development through immersive gameplay. In this demonstration, we present DreamScape, a narrative-driven serious game designed to teach financial literacy through interactive storytelling and puzzle-based mini-games. By leveraging narrative immersion and problem-solving mechanics, this online demo illustrates how interactive systems and creative design can foster economic empowerment, contributing to a more financially literate and equitable society.

CCS Concepts

• **Human-centered computing** → **Human computer interaction (HCI)**; • **Applied computing** → *Interactive learning environments*.

Keywords

Financial Literacy, Serious Games, Education, Financial Behaviour

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1 Introduction

Serious games have gained significant recognition as effective educational tools, providing engaging and interactive learning experiences that extend beyond traditional instructional methods [17]. These games foster experiential learning by integrating gameplay mechanics with educational content, allowing players to actively apply knowledge in simulated, risk-free environments. This approach has proven particularly effective in fields requiring practical decision-making, such as financial literacy (FL) [11, 22].

FL is a fundamental component of economic empowerment, yet many individuals, especially in marginalized communities, lack access to effective and engaging financial education [18, 22]. Traditional financial education often relies on theoretical instruction, which may fail to engage learners or provide meaningful real-world applications. Previous research suggests that interactive, scenario-based learning leads to better financial outcomes by promoting active participation and critical thinking [7]. Serious games can be a step to democratize financial knowledge, equip players with essential life skills, and ultimately contribute to reducing financial inequality [10]. A key aspect of enhancing engagement in serious games is interactive storytelling, which allows players to make decisions that shape their experience. Narrative-driven gameplay provides context, motivation, and emotional investment, leading to deeper learning and improved retention [15]. Additionally, serious games reinforce key financial concepts by fostering problem-solving skills and encouraging analytical thinking. By combining these elements, serious games can transform financial education into an engaging and immersive experience.

This demo introduces DreamScape, a narrative-driven serious game designed to enhance financial literacy through interactive storytelling and puzzle-based mini-games. Players navigate experiencing the financial struggles of the protagonist while making financial decisions that shape their future, engaging with fundamental financial concepts in an interactive, risk-free environment through logic-based puzzles, decision-making tasks, and contextualised challenges. Our work highlights DreamScape's design and core mechanics, showcasing how interactive storytelling and puzzle-based gameplay can be leveraged to foster financial engagement

and resilience. This demonstration re-imagines financial education through the lens of creativity, and how it can empower individuals to make informed financial decisions, promoting long-term economic stability and social well-being. DreamScape is of interest to researchers exploring the use of play as an educational tool, as it combines engaging and immersive content with the development of financial decision-making and cognitive skills. Furthermore, it explores how interactive systems and creative processes can make financial literacy more accessible and engaging, contributing to a more equitable and financially literate society.

2 Related Work

Serious games have been recognized as effective tools for enhancing creativity, motivation and cognitive development in education [21, 24]. Their interactive and immersive nature fosters engagement, making learning enjoyable, and reinforcing positive attitudes toward education [2, 9]. Creativity plays a crucial role in serious games, as these environments encourage problem-solving [25], exploration, and the application of knowledge [5, 25] in novel contexts. Through interactive storytelling, adaptive challenges, and exploratory learning, serious games stimulate creative thinking and innovation [6]. Additionally, they align with constructivist learning theories, where learners actively engage with content, fostering deeper cognitive processing [23] and knowledge retention [3].

The cognitive benefits of serious games extend beyond engagement. They enhance working memory, problem-solving skills, and metacognitive awareness by requiring players to strategize, adapt, and reflect on their decisions [5]. However, achieving an effective balance between educational content and entertainment remains a challenge, as overly structured learning experiences can diminish essential motivation [8, 25].

The application of serious games in FL education leverages their cognitive and motivational benefits to enhance engagement and comprehension [4, 12, 19]. Gamified platforms like Fincraft aim to bridge the gap between financial knowledge and user interest, although their impact on learning outcomes remains underexplored [13, 14]. By immersing players in realistic financial situations, financial literacy games promote experiential learning, enabling users to practice financial decision-making in a risk-free environment [1]. Additionally, serious games support professional financial training by blending theoretical knowledge with interactive learning experiences, demonstrating their adaptability across educational and corporate environments [22]. By integrating creativity, cognition, and engagement, serious games present a promising avenue for improving financial literacy and equipping learners with essential financial skills in an evolving economic landscape.

3 Design & Implementation

DreamScape is a computer-based online serious game designed to enhance FL among young adults by fostering critical thinking and cognitive development. Recognizing that FL is essential for informed decision-making, yet often underdeveloped, the game focuses on two key areas: savings and budgeting. These topics were identified through a workshop with 25 master students, where common struggles with financial planning and budgeting strategies emerged. During the workshop, when asked to discuss the most

important financial topics, all 25 participants mentioned savings and budgeting, while other topics, such as loans and investments, were mentioned only three to five times.

To translate these insights into an interactive learning experience, DreamScape integrates FL concepts through structured cycles of narrative and gameplay. The players navigate story-driven scenarios where their financial decisions impact the game's progression, reinforcing financial concepts through active participation. One of the core mechanics is the sleep sequence, where players solve puzzles distinguishing between essential and non-essential expenses. This mechanics promotes critical evaluation of spending habits, reinforcing the importance of assessing financial decisions before spending money outside a planned budget.

The game was developed using Unity ¹, with Yarn Spinner ² managing branching dialogues and narrative choices. The branching structure enhances engagement by allowing players to explore multiple financial decision-making pathways. To reinforce learning, DreamScape incorporates several interactive mechanics:

- **Budget Allocation:** A drag-and-drop system allows players to assign values to the correct position, evaluating their understanding of the budgeting method shown.
- **Decision-Making:** Players interact with financial dilemmas by making choices that shape the outcome of the character's journey.
- **Savings management:** A numeric input mechanic helps the player manage withdrawals and efficiently allocate the character's salary.
- **Sleep Sequence Puzzles** Players categorize essential and non-essential expenses, fostering a deeper understanding of financial priorities.

Beyond FL, DreamScape is designed to stimulate cognitive skills through problem-solving, strategic thinking, and decision-making. By engaging with financial scenarios, players develop analytical skills as they compare budgeting options, enhance problem-solving abilities by responding to financial challenges, and strengthen executive functions, such as planning, through goal-driven decision-making. Additionally, players improve memory retention by repeatedly applying different financial concepts.

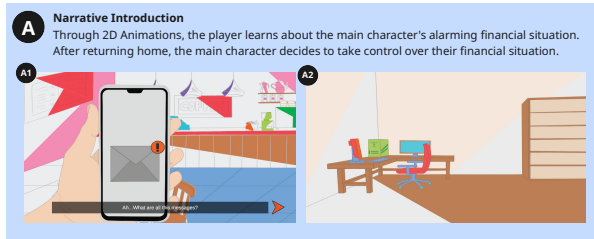
4 Gameplay

In DreamScape, the player steps into the role of a character struggling with financial stress. The game begins in a coffee shop (A1 in Figure 1), where overdue bill notifications highlight the character's growing anxiety. Motivated to take control, the character returns home (A2 in Figure 1), and the player takes over, exploring the character's room (B in Figure 1). This phase encourages players to identify objects that symbolize impulsive financial decisions, fostering cognitive reflection on spending habits and their long-term consequences. Once all five objects are found, the narrative prompts the player that it is time for bed (C in Figure 1). As the character falls asleep, they enter a sleep sequence representing their financial concerns. In this state, players engage with puzzles designed to differentiate between needs and wants (D in Figure 1), requiring critical thinking and reinforcing financial awareness.

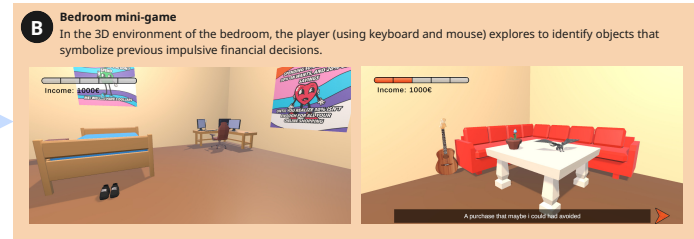
¹<https://unity.com/>

²<https://www.yarnspinner.dev/>

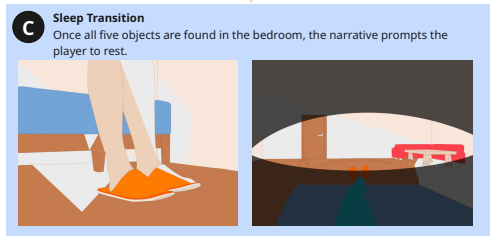
Learning about your Financial Situation



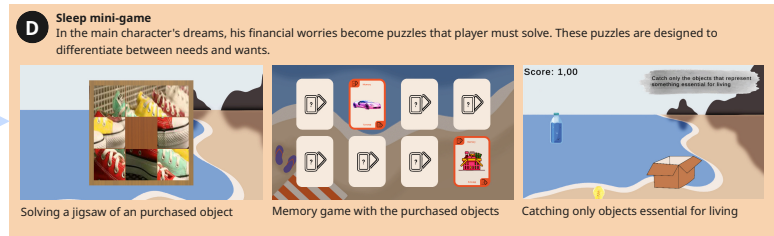
Identifying Impulsive Spending



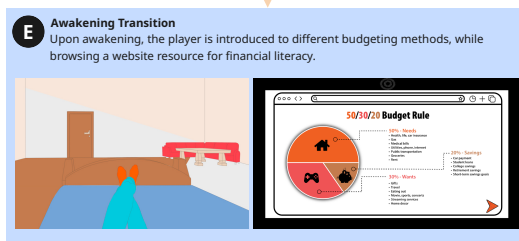
No quick fixes



Identifying Needs vs. Wants



Using FL Resources



Allocating Money

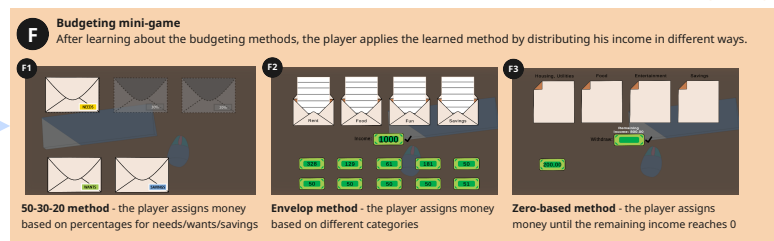


Figure 1: Gameplay cycle of DreamScape prototype

Upon awakening (E in Figure 1), from the first sleep sequence, the player is introduced to the 50-30-20 budgeting method [16, 20]. Following this instructional phase, the player proceeds to a mini-game (F1 in Figure 1) where they apply this method, testing their ability to allocate resources effectively. A similar structure follows in subsequent cycles. After the second sleep sequence, players learn about the envelope budgeting method [16]. Once the concept is understood, a new mini-game (F2 in Figure 1) challenges players to correctly allocate their funds, taking into consideration the budgeting method. The third sleep sequence introduces the zero-based budgeting method [16], this concept is then reinforced through another mini-game (F3 in Figure 1), where the player must carefully distribute all available income, ensuring that no money is left unaccounted for. By structuring gameplay around a learn-and-then-apply model, DreamScape improves FL and enhances cognitive skills.

5 Conclusion

In this work, we present DreamScape, a serious game designed to teach FL through interactive storytelling and puzzle-based mechanics. The game was tested with promising results in engaging users and introducing them to key financial concepts such as budgeting

and savings. However, further research is needed, particularly involving a larger sample size and long-term evaluation mechanisms, to better assess knowledge retention and behavioural change over time. The future development of DreamScape will focus on refining the system based on insights gathered from the usability tests. Key improvements will aim to enhance user engagement, expand the educational content, and assess the long-term effectiveness of the game in teaching financial literacy.

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