Exploring the Impact of Transmedia Storytelling on Financial Literacy: A Pilot Evaluation with Young Adults

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Figure 1: Three media that compose the transmedia storytelling experience. The first media from the left shows a computer with one of the web game's screens. The media in the middle shows a mobile phone with the social media page. Finally, the media on the right shows the board for the board game.

Abstract

Financial literacy is an essential skill for all young adults. However, conventional education practices may not always effectively motivate young adults to learn about finances. The combination of different forms of narrative and visuals in transmedia storytelling provides an engaging solution to this problem. Our approach consisted of a web-based game, a board game, and a social media page. The web game has a stronger storytelling aspect where users need to find the characters on a map according to their financial struggles; the social media page goes hand in hand with the web game because it gives further clues to find the characters; and the board game focuses more on the financial concepts and the collaborative aspect of the game. We conducted a pilot study to evaluate the effectiveness of our design approach. Our findings highlight the transformative potential of transmedia storytelling to create innovative financial learning experiences.

CCS Concepts

• **Human-centered computing** → **Interaction design**; • **Applied computing** → **Education**; **Computer games**.

Keywords

Financial Literacy, Young Adults, Entertainment Education, Transmedia Storytelling, Interactive Media

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1 Introduction

Financial literacy (FL) is a critical skill essential for the financial well-being and decision-making of people, allowing them to navigate complex economic landscapes effectively [13]. Research highlights that FL is key to fostering responsible financial habits, including effective retirement planning, debt management, and informed investment decisions. [17, 18, 20]. However, many young adults lack basic financial understanding due to limited access to engaging and practical financial education since traditional teaching methods often fail to capture their attention, leaving them unprepared for real-world financial challenges [2, 5, 14].

Transmedia Storytelling (TS) involves delivering interconnected narratives across multiple media platforms, creating an immersive and engaging learning experience [3]. Our research endeavours indicate that previous approaches have primarily relied on single-platform education tools, which often lack the interactivity and engagement needed to retain young adults' interest [11]. To overcome these limitations, our research explores TS as an innovative approach to financial education, which inspired us to develop "Where's the Finance?" a transmedia educational experience that incorporates three distinct components: a web-based puzzle game, a social media platform with clues, and a collaborative board game. This unified approach leverages narrative-driven engagement, interactivity, and multimedia elements to captivate young adults and improve FL. The following research question guided us in creating the TS experience for FL: "How can a TS experience contribute to an increase of knowledge of FL topics among young adults?". This work makes two key contributions. First, it presents an innovative and engaging tool for financial education, offering an artefact contribution, and second a pilot evaluation of the transmedia experience artifact that shows promising results on how TS can foster FL engagement and comprehension.

2 Related Work

This section explores the related work under the concepts of edutainment and TS, then the current approaches used for FL awareness, and finally, it examines interactive media and character-driven persuasion.

2.1 Edutainment and TS: Innovative Approaches

Edutainment blends education and entertainment, leveraging engaging media elements to make learning more enjoyable, accessible, and effective [6]. This approach uses tools like video games, simulations, and multimedia to captivate learners, enhance understanding, and accommodate diverse learning styles, some studies have explored the efficacy of edutainment across various educational domains. For example, Lien et al. used edutainment in a museum using smartphone games to engage visitors in interacting with artifacts [15]. Another example by Loertscher et al. [16] showed that TS can be utilized by librarians to inspire students to engage in creative activities, offering an alternative for those who struggle with traditional learning methods. Connecting to TS, a method where narratives unfold across multiple media, studies demonstrate its efficacy across different disciplines, such as Rodrigues et al. [25] who presents a prototype for learning English, as a second language, through TS, the study found that the prototype was effective in promoting language learning and that students enjoyed the experience, concluding that TS offers an opportunity for beneficial educational purposes; another example is Ekaterina Tour [26] who provides an overview of the emerging field of TS in education, defines the concept, and explains how it differs from other forms of storytelling, it also explores the potential and limitations of TS for educational contexts and concludes with outlining future directions for research and practice. Another example would be the research by Nisi et al. [22], which investigates the transmedia aspects and implications of "Echoes of Nature" (EoN), an interactive platform functioning as a touch point for a range of diverse experiences, the transmedia channels include a mobile application, a website, and a series of interactive installations, they also discuss the potential of EoN in promoting natural heritage.

2.2 Financial Literacy

FL involves cognitive, emotional, and behavioral dimensions. Cognitively, it includes understanding concepts such as budgeting, saving, investing, debt, calculating interest, and interpreting financial statements. Emotionally, factors like fear, greed, and optimism can influence financial decisions, sometimes leading to irrational behavior. Behaviorally, FL entails applying knowledge in real-world situations, such as managing spending, saving habits, and overall money management. Educational initiatives in schools, universities, community organizations, and financial institutions aim to equip individuals with financial knowledge and tools. Norman [23] emphasizes the importance of financial education programs in making informed decisions on spending.

In a study by Lusardi et al. [19], four innovative online educational programs were developed and evaluated to teach risk diversification, a critical aspect of financial decision-making. These programs included an informational brochure, a visual interactive tool, a written narrative, and a video narrative. Participants engaged with the program and completed assessments on FL—particularly risk literacy—and self-efficacy. Results showed that all programs effectively enhanced self-efficacy, with several also improving FL, demonstrating the potential of such programs to support better financial decision-making. In the research field, Platz et al. [24] explore the effectiveness of serious games in financial education for upper secondary school students, focusing on how the instructional design of these games can enhance learning outcomes. The research specifically investigates the impact of different game mechanics and reflection prompts on students' perceived utility value and financial interest. The results indicate that students who played with strategic game mechanics and direct reflection prompts showed a significantly higher increase in utility value. There was a general increase in interest among all participants immediately following the intervention. Another research initiative by Wang et al. [28] explores the impact of gamified financial education on decision-making skills and FL. The authors developed a gamified financial simulation and conducted two experiments to test its effectiveness. Overall, the findings suggest that gamified approaches have the potential to enhance financial education, but improvements in investment clarity and more realistic scenarios are needed to optimize user experience and learning outcomes. Another example is "Next Gen Personal Finance" which has several web games about many financial topics [1]. To better understand how FL is being explored in the game industry, we played and reviewed 24 games. Games like "Money Lessons" [2], and "Money Wise" [3], both leverage interactive interfaces, providing comprehensive overviews of personal finance. However, these games do not teach how to apply these concepts in real life. The issue of specificity comes with games like "Credit Clash" [4] and "Cashflow" [5]. While "Credit Clash" focuses solely on credit-related topics, potentially limiting its scope, "Cashflow" caters to a very specific audience interested in making investments and escaping the rat race.

2.3 Interactive Media and Character-Driven Persuasion

Storytelling and narrative are tools for persuasion, influencing audience beliefs, attitudes, and behaviors. Character identification is the audience's ability to empathize with or see themselves in a character, and it plays a pivotal role in this process. Studies reveal that audiences are more likely to sympathize with characters they find relatable or likable, often based on shared demographics, beliefs, or experiences. One example is an article by Graaf et al. [9] that uses identification as a mechanism of narrative persuasion, they found that identification with both characters mediated the effect of perspective on attitudes. Games uniquely amplify narrative persuasion through interactive elements such as player choice, character customization, and consequences of actions, which deepen character identification and investment. Features like detailed backstories, emotional challenges, and interactive storytelling create a sense of agency, making characters feel alive and relatable. For example, Dickey [10] found that intrinsic motivation, curiosity, and plausibility were first supported by the game-like environment and then sustained through the narrative and the environment.

2.4 Research Opportunities

Although transmedia experiences and games are widely available, few focus on FL, a crucial topic that remains underexplored. While some of the FL games mentioned above show potential, we found a shortage of compelling storytelling games or board games targeting young adults. Furthermore, with FL being such a complex and multilayered topic [21], we propose that it is a topic better suited to be disseminated across multiple platforms using TS. These observations open up a lot of research opportunities to explore and address these gaps in the gaming industry as well as the research field, fostering the development of transmedia experiences that are not only financially inclusive but also rich in narrative depth, thereby enhancing the overall entertainment and educational landscape for young adults. Hence, in this research, we aim to uncover the potential benefits and shortcomings of using TS as a dynamic and innovative approach to FL education for young adults.

[1]https://www.ngpf.org
[2]Brightchamps, Money Lessons
[3]https://play.google.com/store/apps/details?id=com.DotDotFireLimited.TheNeighborMood
[4]https://creditclash.com/
[5]https://www.richdad.com/products/cashflow-classic

3 "Where's the Finance?": Transmedia Experience Design

Our transmedia experience takes place in a story world called "Goldcrest", and it is spread along three different media channels: (1) the Web game 'Where's the Finance: Goldcrest Curse'; (2) the Instagram Page 'Where's the Finance: @goldens.fromgoldcrest'; and (3) the Board Game 'Where's the Finance? The Comeback'. The preferred order for audience interaction would be to start by playing the web game along with the social media channel and then playing the board game in groups to build upon one's financial knowledge. In the web game, users navigate through the fictional town of "Goldcrest" and help five different characters, each with their own financial struggles. Levels have a focus on different financial concepts such as - emergency funds, budgeting, gambling, and retirement saving. The characters' stories follow a braided narrative structure [7], where their individual storylines intertwine and converge. This approach establishes the characters as family members whose lives are interconnected, allowing them to influence and impact each other's decisions and experiences. The Instagram social media element allows the audience to gather essential information to unlock clues within the web game. Engaging art styles and stories revolving around the characters and always different Instagram posts ensure consistent engagement. In the board game, players are divided into two teams. Players start on the same square and aim to reach four buildings in a specific order, according to their objective card. The winner has to reach all four buildings. They take turns casting dice, moving, and performing challenges related to savings and expenses to achieve a share of knowledge between players and make it an easier topic to discuss. The board is color-coded, with red squares for expenses and yellow for savings, each triggering themed challenges when players land on them. The four types of challenges are: drawing, forbidden words, questions about savings, and questions about expenses.

3.1 "Where's the Finance?" Development Process and Tools

Part of the initial design process was previously published [12]. This prior publication lays the groundwork for the current study, detailing the foundational stages of the transmedia storyworld's development and the pedagogical considerations that informed its design. The current article builds upon this foundation, focusing on the implementation and evaluation of the prototype as an educational strategy for financial learning. The implementation process of this experience involved several steps, starting with designing, storyboarding, developing, testing, and finally, refining the game. Firstly, we decided which financial concepts to teach, and for each concept, we created a character and its storyline. We also brainstormed game mechanics to use with this target audience. In the development stage, we used Adobe Illustrator [6] and Procreate [7] to create all the characters and assets, we also used the Unity game engine [8] to program the game.

[6]https://www.adobe.com/pt/products/illustrator.html
[7]https://procreate.com/
[8]https://unity.com

4 Pilot Study of "Where's the Finance?"

This section outlines a pilot study evaluating the "Where's the Finance?" prototype through both quantitative and qualitative methods, with detailed protocols, metrics, and results discussed in its subsections.

4.1 Protocol and Metrics

Participants were recruited using a convenience sample by asking colleagues to bring acquaintances to test the prototype.

The study began with the researcher introducing herself, explaining the study's purpose, and addressing participant questions before presenting a consent form. Participants then engaged with the web game using the "Think Aloud" technique [27], during which the researcher observed and noted their experiences, intervening only when necessary. Next, participants formed two teams to play a board game while researchers employed shadowing [4] to identify gameplay issues, usability challenges, and player frustrations. Observations provided insights into user experience beyond direct feedback. Following gameplay, semi-structured interviews were conducted in Portuguese to encourage detailed responses, recorded for transcription, and translated by a bilingual researcher. Participants also completed an online Mini PXI questionnaire [1] to evaluate player experience across functional dimensions (e.g., audiovisual appeal, challenge, ease of control) and psychosocial aspects (e.g., autonomy, curiosity, immersion, meaning, enjoyment). The entire session lasted approximately four hours. Regarding the semi-structured interview, we focused on four themes: 1) Experience with the media ("What was your initial reaction to the board game?", "How easy or difficult was it to collaborate with others?"); 2) Learning and Engagement outcomes ("Do you feel that playing the board game improved your understanding of FL?", "Can you give an example of something you learned?"); 3) Storytelling ("Was there a particular part of the story or any element of the transmedia experience that stood out to you? Why?"); 4) Future suggestions ("If you could change one thing about the board game, what would it be and why?", "How could the web game be improved to enhance your learning or engagement?"). Finally, we asked: "Is there anything else you'd like to share about your experience that we haven't covered?".

4.2 Data Analysis

All statistical analyses were conducted using IBM SPSS version 28. The Mini PXI questionnaire employed a Likert scale, normalized from the original Google Forms scale of 1 to 7 to a range of -3 to 3, aligning with the study's framework. Scoring instructions were followed to compute the overall Mini PXI scores, with individual scores and dimensions documented for each participant. Thematic analysis by Braun et al. [8] was applied to qualitative data from shadowing [4] and semi-structured interviews to identify key themes.

4.3 Quantitative Results

Four participants between the ages of 22 and 25 years, two females and two males, engaged with the TS experience. One participant was a student, and the other three were full-time employees. All participants are native Portuguese speakers.

From the quantitative data we were able to gather that:

- The Mini PXI results revealed a high score of 29 (close to the maximum of 36), indicating a highly positive game experience, while the lowest score of 14 (below the midpoint of 18) suggested a moderate experience.
- Functional Constructs (Figure 2 on the top): Participants ID1, ID2, and ID4 scored positively (1 to 3) in categories such as audiovisual appeal, challenge, and clarity of goals, indicating favorable perceptions. However, participant ID3 scored notably lower, with a -2 in ease of control and clarity of goals, highlighting dissatisfaction.
- Psychosocial Constructs (Figure 2 on the bottom): Most participants reported positive experiences across metrics like autonomy, curiosity, and immersion, with scores ranging from 2 to 3. Participant ID1 reported a lower score of 0 in immersion and meaning. Mastery scores ranged from 1 to 2, suggesting room for improvement in fostering a sense of mastery. Enjoyment scores were high across the board, except for ID1, which consistently reported lower scores.
- Participant Interaction (Figure 3): The figure illustrates the participants engaging with the board game, providing visual context for the study's interactive component.

4.4 Qualitative Results

While using the shadowing method [4], we collected data about the gameplay mechanics. For example, participants wanted to compete with each other on the web game scoring, most players preferred to use their phones to scan the QR code, and the board game cards featured challenging concepts. The overview that follows shows the analysis of our interviews; PT stands for participant in the transmedia.

Transmedia Engagement: The game's multi-platform feature was appreciated, and the transmedia approach improved the learning process by making it more dynamic and engaging. For example, *"It was a good idea. It was a dynamic idea because in a way we managed to not always be around the same thing, so we can interact with different technologies."* (PT1). The participants found that the incorporation of these various media kept the game from getting boring. They were able to switch between media with ease. *"I think it provided a good educational tool overall, the three of them together [referring to web game, Instagram and Board game]."* (PT2).

FL Improvement: The majority of participants thought that the transmedia enhanced their understanding of finance and clarified previously unclear concepts; one participant said *"Yes, I think it's improved [the financial knowledge], because it's like I said before, I'm a bit of a literacy buff and I think these types of games make... It's good to raise awareness."* (PT2). They also observed that they would have more trouble remembering information if they were not exposed to it repeatedly over time. One participant felt that the Carlota level was beneficial because they had to read the PPRs multiple times, repeating the exposure. *"Maybe the part at the end of Carlota's level, the part where we really had to analyze what the difference was between the three types of PPRs."* (PT1),.

Engagement: The web game's interactivity and variety of tasks were deemed intriguing by the participants, who also remarked that the score kept them interested. For instance, *"The score increased*

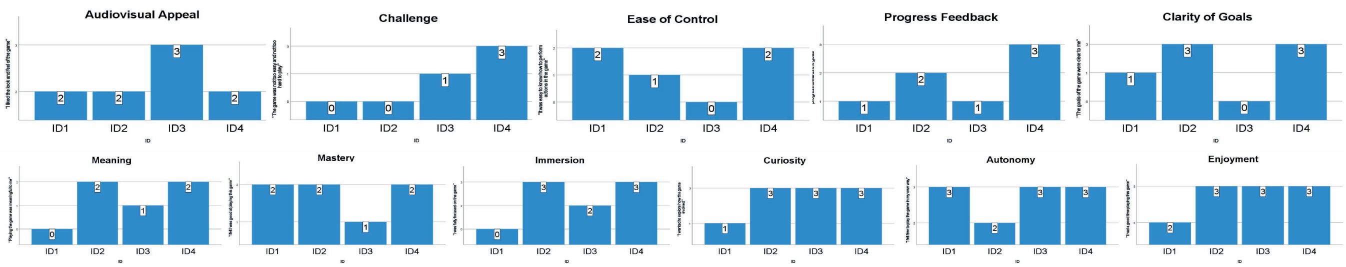

Figure 2: Mini PXI constructs for each of the participants (ID1-ID4). Top: audiovisual appeal, challenge, ease of control, progress feedback, and clarity of goals. Bottom: meaning, mastery, immersion, curiosity, autonomy, and enjoyment

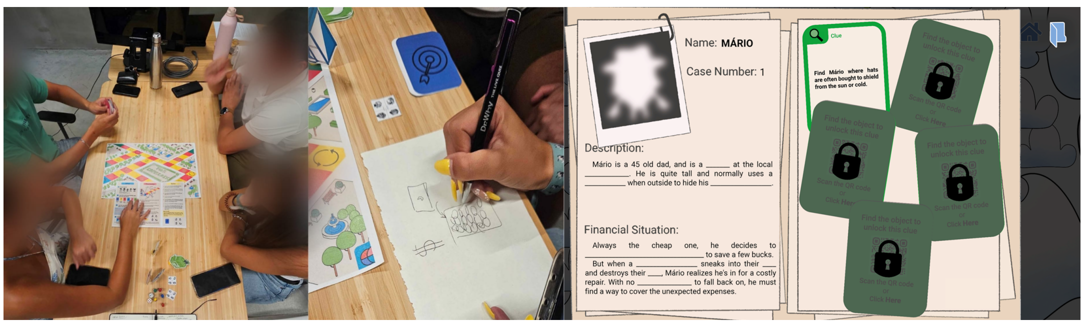

Figure 3: The first two images, left to right, show participants interacting with the transmedia's board game component; the third image shows the interface of the web game. On the left, it shows the four participants and the board, and in the middle, it shows one of the participants doing the drawing challenge of the game.

my engagement simply because I had the goal of being ahead of other people." (PT1). However, some participants found the difficult nature of some financial concepts to be disengaging. For instance, this participant felt more focused once they began identifying the characters, *"What kept me more focused was starting to get the clues right"* (PT2).

Story Immersion and Notable Story Elements: One participant expressed appreciation for the web game's storytelling components and the characters' stories, which made financial ideas more approachable and understandable while also enabling participants to relate to the material on a personal level, *"It had an impact for the simple fact that each story represented a different person and that person had their own needs."* (PT1). Because learners could observe the effects of bad financial choices on the lives of the characters, this method gave the lessons greater significance, for example, *"That's why the story, the story of the characters, is impactful so that you understand the knowledge."* (PT4).

Instagram Usability: Participants found that using the Instagram component was simple and well reasoned because young adults are accustomed to using the platform, drawing a parallel because, for instance, FL is something young adults also use daily, for example, *"Yes, as it has two options, mobile and computer, it is easy to use if you are playing on the computer and automatically opening Instagram is easy."* (PT1). Because they had to solve the clues on their own, just like a real detective, it gave the game a modern and realistic sense. They also thought that the transitions between the media were smooth and that it might be expanded to include additional media, a participant said *"Instagram is cool. Hey, you could also expand it to other social networks, right? TikTok?"* (PT4).

Collaboration and Teamwork: Through cooperation and teamwork, participants in the board game's transmedia reported that learning and overcoming obstacles was more efficient and pleasurable. They also mentioned that it was simpler to arrive at the right answer and avoid getting stuck when they communicated, shared knowledge, and combined their team's skills. Additionally, they observed that because they could rely on one another's skills to comprehend difficult subjects, these interactions made the learning process more sociable and engaging. The participants stated, *"It was easy to collaborate with others. It's better to collaborate than to play individually"*(PT1), *"I thought what made it difficult was the challenges. Because to collaborate with people, it wasn't..."* (PT3).

Language Barrier: Given that these participants were native Portuguese speakers, the language barrier affected their comprehension of some financial terminology, a participant said *"I think the biggest challenge was my English"* (PT4). They believed that using the game in their mother tongue would enhance both learning and comprehension, in particular, a participant said *"I felt good. Maybe if it was in Portuguese I would feel better, I would feel secure [in their ability to read and play]"* (PT2).

Visuals: The game's visual aesthetic and design were commended by players. It was seen as appealing and easy to use, which made it simpler to comprehend the game, follow the plot, and maintain interest while playing. Some participants stated, *"What caught* *my attention, maybe the design, it's appealing, it's cool."* (PT4), *"I think the design [the user interface and user experience] was intuitive"* (PT3).

5 Discussion

The research sought to determine whether the FL of young adults can be enhanced by TS. From earlier pilot studies [12], there was excitement towards both board games and web games, but participants did not have financial knowledge. The results obtained in this study build upon Lusardi et al. [19], as they have showcased some results indicating that new educational tools, such as an informational brochure, a visual interactive tool, a written narrative, and a video narrative can improve FL. Our findings extend this body of work by quantifying improvements in FL scores, thereby addressing a gap in the existing literature. Additionally, in the context of edutainment, and in relation to TS Loertscher et al. [16], who reported that transmedia can aid in engagement and creativity, aligns with our findings. Unlike the earlier studies [26], which only explored the possibilities of TS conceptually, this study adds evidence of the impact storytelling has on learning performance. Participants highlighted how much they enjoyed the storytelling features and characters, how these made the financial concepts easier to grasp, much in the same way as Rodrigues et al. have mentioned in their paper [25], which states that teachers can increase the motivation and participation of students by using different forms of media to tell a captivating story. Nevertheless, where Graaf et al. [9] focus on narrative persuasion for attitude change or emotion-driven engagement, our results may demonstrate a wider scope of using character-driven narratives in which awareness of FL topics is created and FL improved. The significant difference in post-test scores confirmed the effectiveness of the interactive, multi-platform approach; participants were given financial topic questionnaires before and after, and a lot more correct answers were provided. The differences were expected since they were exposed to the content, yet the difference was greater than expected initially. For example, the low score that the students obtained during the pre-test median was 7 but during the post-test, the median score was 9. This implies that financial concepts were successfully reinforced through TS and were made easier to grasp, the research supports the previous claim [24] that TS with psychoeducational interventions could aid in remembering information better. Preference for long-term participation was a desire by participants, which implies that FL is best done as a perpetual activity. Despite positive outcomes, areas for improvement included adding more financial content to the web game and simplifying challenge card concepts in the board game. Overall, the transmedia approach proved effective in increasing FL knowledge and engagement.

6 Limitations and Future Work

The research had some limitations that, in turn, had an impact on the results. For instance, one of the limitations was the low number of participants involved in the study, only four. This low number was due to the duration of the test, which made it hard to recruit and ensure the availability of subjects all at the same time for the team-based game. Another limitation was the format of the test, participants were tasked to complete all the components of the transmedia in one day, which made it easier to elicit feedback from participants in a controlled setting, which is not how most transmedia content would have been consumed in real life. In the future, one possibility is researching the effects of TS on FL in longitudinal studies. Participants reported greater confidence in their FL, but how long this confidence lasts and whether their financial behavior adapts to this knowledge remains unknown. Additionally, letting people interact with the elements for a longer duration would help provide an important understanding of the effect of TS. This research also used only three media, although these media were suitable, TS is usually much more effective with a more extensive range of platforms. Subsequently, enriching the content with additional levels, different media, more characters, and more finance-related situations like investment options or tax cases could increase the range of financial topics addressed and make learning more effective. Other possibilities include creating a multilingual version of the game to overcome language barriers perceived by some participants.

7 Conclusion

This work explored the potential of TS as a novel approach to financial education. This research was motivated by the limitations of traditional teaching methods in capturing the attention of young adults for FL. TS takes the learners through the narrative and enables them to grasp the financial ideas more integrated and meaningfully. Moreover, it enhances learning through different media channels such as Instagram, where there is mainly imagery content for visual learners, as well as interactive elements in web gaming activities for active learners. Furthermore, transmedia storytelling takes advantage of the power of repetition to enhance the learning of the target audience. With financial literacy topics spread across numerous channels, there is an opportunity for reinforcement as it seeks to help the user retain the ideas presented. The pilot study from the TS experience, "Where's the Finance?", incorporating a web-based puzzle game, a social media platform with clues, and a collaborative board game, highlights the transformative potential of TS to create innovative financial learning experiences.

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