Using Design Thinking to Develop an Educational Game

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This work presents a brief overview of the design and development of an educational game on financial literacy (FL). The game aims to offer middle school students the opportunity to engage in fundamental FL actions of spending, saving, and account-keeping, while also introducing the concept of risk. The work touches upon how we used design thinking (DT) as a framework to develop the educational game and shares some preliminary insights from student trials.

Keywords: Educational Games, Design Thinking, Game-based Learning, Financial Literacy

Introduction

Amongst the many ways to enhance teaching learning, educational games have started to gain recognition amongst researchers across the globe. Subject-specific educational games, including those in mathematics, have demonstrated potential in enhancing the learning of concepts and skills for both students and teachers (Husain, 2011). The current study describes the design and development of an educational game based on financial literacy (FL), using a design thinking (DT) framework.

Theoretical Framework

Scholars have argued that educational games can not only be intrinsically motivating, but also can be based on deep learning principles. Typically associated with game-based learning, educational games can play a crucial role in cultivating interpersonal skills, sharpening analytical and evaluative thinking, fostering imaginative thinking, improving problem-solving techniques, encourage risk taking, engage in social skills (McFarlane, et al., 2002). Building on the insights derived from game-based learning research, we embarked on the development of an educational game focused on FL for middle school students, utilising a design thinking framework. As a systematic problem-solving approach, design thinking (DT) offers numerous affordances in education, assisting both students and teachers in various ways (Goldman & Zielezinski, 2016). We used a DT framework (Plattner, dschool Stanford), as our approach to design and develop an educational game, which comprised of iterative phases of Empathising, Defining, Ideating, Prototyping and Testing.

Case Study of FunDHAN

This project began with curiosity about financial literacy (FL) stemming from personal experiences. The initial research phase involved two tracks: examining FL in school curricula and understanding the needs of students, parents, and teachers. We analysed FL content in Maharashtra's textbooks for classes 6-10 in mathematics and social studies and conducted surveys

and interviews. Insights from this research helped define educational objectives and challenges related to FL. In the ideation phase, we brainstormed various concepts for teaching FL to children, which included an interactive installation, role-playing activities, table-top games etc. We also explored existing games around FL so as to gain a holistic perspective of the topic. After assessing these ideas based on constraints like cost, scalability, school logistics, etc., we developed FunDHAN, an educational card game. The next stage was prototyping which required us to make a sample of our chosen idea. In the game, players accumulate health points, desire points, and savings by completing missions using need cards, which involve a mix of health and desire scores at a cost, along with risk elements like dice rolls. We refined the game through prototyping and user feedback, testing it with students in informal settings to evaluate its effectiveness. This iterative process ensured that the game was both educational and engaging, ultimately aiming to improve FL among children.

Observations and Way Forward

Feedback from the initial deployment indicated that most students found the game easy to understand, and the cards funny, attractive and colourful. Majority believed that this game could help them to improve their idea of money. Students reported learning various skills from playing the game, including improved calculation abilities, the importance of saving money, and careful decision-making. They also reported having gained insights into managing money wisely, balancing desires and needs, and knowing when to take risks. While our initial trials have shown positive results, we aim to further optimise the visual design, game mechanics, and content to better align with educational goals and user needs. We also plan to include a teacher handout with the game that can offer prompts for discussions on the mathematics and social aspects involved in the game.

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