



A study of gamifications place in learning, can it be implemented successfully?

1. Abstract

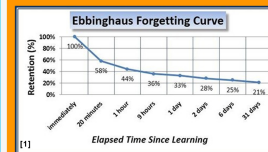
The overall question in this project is, does gamification have a place in learning? If so, can it be implemented effectively? This question has been tackled by developing a prototype app that hopes to answer in favour of that question. The chosen methodology for this project is rapid application development (RAD). This methodology fits well with the authors philosophy and objectives. RAD emphasizes rapid prototyping and getting feedback on what could be improved. The designer can then use this feedback to improve the product. When the improvements have been made, a new prototype is released. This cycle is all about constant improvement which is crucial to this project's success. A mixed method was used for research, both positivistic and phenomenological. It consisted mainly of a focus group interview, document review, and software development. All the data collected and the development of a successful prototype app point towards a positive conclusion.

2. Aims & Objectives

The aim of this project is to develop a prototype app that hopes to answer in favour of the project question. The objectives are,

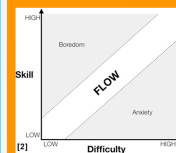
- Create a prototype with a fully functioning user interface. This will include handmade menus, buttons, lesson slides, and characters.
- Cover a minimum of one maths topic. The app will cover the contents of this chosen topic at a suitable level, in this case key stage 2.
- Have a minimum of one maths related game. To prove the concept of gamification the app will contain at least one fully functioning maths game.
- Full implementation of gamification trends such as a player profile, levels, experience, and rank. To tie in with the gamification trend the app will include these listed features.

3. Research



Educational theory was a particular focus as it proved helpful in understanding how people learn. This Ebbinghaus curve represents a human's ability to retain information over a period of 31 days. Lessons and content would have to be kept short to maximise retention.

Five apps were reviewed for this project. They provided valuable insight on what was popular on the market. Animals was a popular theme for these apps. The designs were minimalist and functional.



Flow theory was key in understanding how to make a challenging app that wasn't boring or difficult. The graph to the left illustrates that concept. The aim of any educational app that uses gamification should be to hit this flow state. Have the skill and difficulty at an even level so that maximum engagement can be reached. This was a crucial part of the apps development.

4. Design & Implementation

Originally, the theme was explorers with a lot of UI design fitting that theme. After careful consideration and valuable information from the focus group interview, the project changed course. The theme then became more about city life as the explorer's theme was heavily in favour of a more male audience. The new theme was more neutral and could appeal to a wider audience. The development consisted of designing UI assets, scripting, and testing the app on an android phone. Unity was used for the development of the app prototype. It was a natural choice as the author had experience in Unity and it was easy to use.

Many of the UI elements followed the same colour theme of orange, white, and blue. The design of the UI was meant to fit in with the city theme that was used throughout the app. Fractions were the main focus as they were the area that was brought up most in the focus group discussion. Below to the left is a screenshot of the new home screen. It features the three main areas of the map; fraction street is the starting area. A mini game was made for the app that consisted of matching fractions. Cake icons were made and shown in segments of eight to be used for the game. The main objective of the game was to match the correct slice of cake to the order. Testing feedback was positive, most of the praise was given for the apps look and theme.



FRACTIONS

- | | |
|---------------------------------|--------------------------------|
| LESSON 1: Fraction Basics | LESSON 2: Equivalent Fractions |
| LESSON 3: Improper Fractions | LESSON 4: Comparing Fractions |
| LESSON 5: Multiplying Fractions | LESSON 6: Adding Fractions |
| LESSON 7: Subtracting Fractions | LESSON 8: Dividing Fractions |

The app offers eight complete lessons for fractions. At the end of each lesson is a true or false quiz that tests the user's knowledge on the lesson they just took.

5. Conclusion

All the data collected and the development of a successful prototype app point towards a positive conclusion. The literature review concluded that gamification could see use in education and successful apps have been made with a keen response from users. The focus group interview proved that technology can and has been used in education. Also, that there is a desire to see and use more educational apps with gamification in the education sector. The feedback for the prototype app was optimistic, praise was given for the apps look and feel. It was conveyed that there was a genuine desire to see more from the app which was a helpful response. The literature review and data collected seem to conclude that education and gamification can be used together effectively. However, mainstream education has yet to fully adopt gamification into its fold. We've seen basic versions of educational games introduced and used in the past, but nothing like the apps we see today.



The character above is called the guide. He was created and scripted to help the user understand how to use the app. There are multiple portraits of him with different expressions.