A Gamified Approach To Teaching Algorithms & Data Structures

Assessing the impact of extrinsic gamification methods in educational software

Project Overview

Project Aims:

1. Assess the impact on user engagement of implementing **Achievements** into an educational e-learning environment.
2. Assess the impact on user engagement of implementing a **Levelling Structure** into an educational e-learning environment.
3. Assess the **impact on learning and knowledge** retention of an extrinsic gamified approach.

Objectives:

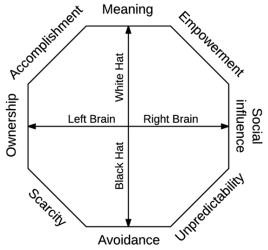
- Design and develop a prototype mobile learning application.
- Implement extrinsic gamification elements focused on Achievements and Levelling.
- Implement automated data collection methods.
- Organise software trial to gather data for analysis and elicit feedback from users.
- Assess and report on the extent to which the implementation of gamification features has an impact on user engagement and learning.

Further work

- **Larger scale funded software trials** based on the framework laid out in this study!
- **Complimentary research** into gamification techniques focused on targeting intrinsic right brain motivational drives.
- Research focused on the motivational impact of white hat vs black hat motivational drives

Introduction

The Octalysis framework proposes a guide to the development and analysis of gamified designs. It identifies 8 core motivational drives which can be targeted by specific gamification elements, these can be further grouped into four subcategories based on how they aim to influence the users actions: left brain (extrinsic), right brain (intrinsic), black hat & white hat.



This Project Aims to evaluate how gamification elements which target extrinsic core drives can impact the user's motivation to engage with educational software, and to what extent it can have an effect on learning

Conclusions

- **Transparent achievement systems influence how users interact with an application. This influence can include but is not limited to increasing engagement with the software.**
- **Level Structure has a positive impact on user engagement, encouraging users to engage with more content overall and to use the application more frequently.**

Methodology

- Research into current trends in e-learning
- User-centred gamified design
- **Building a sense of ownership** through time invested in collecting achievements.
- **Creating a sense of accomplishment** by reaching higher ranks.
- **Implementing scarcity** with locked content
- Generating **real user data** for statistical analysis
- **Eliciting feedback** from real users
- **A/B testing** to introduce an un-gamified baseline to which gamified results can be compared
- Working with stakeholders to **elicit requirements**
- Rapid prototyping and **development with Android Studio**