LEADER'S LEGACY: AN RPG GAME TO BRING OUT THE LEADERSHIP OF ITS PLAYERS

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ABSTRACT

There has not been a sustainable amount of leaders matching up to the demand for such skill by 2030. Leader's Legacy has been created to help alleviate the issue by presenting educational questions on leadership principles within an interactive game [1]. Our solution is built with a combination of quiz-style questions and scenarios that are tied to player progression for the combat system [2]. We also integrated a cloud-based backend via Firebase to allow users to access their information from anywhere for greater accessibility.

KEYWORDS

Leadership, Unity, Firebase, Education

1. INTRODUCTION

There has been a growing demand for new talents and leaders, likewise there also has been a shortage of people willing to show that side. According to a study conducted by Korn Ferry, they found that "by 2030, there will be a global human talent shortage of more than 85 million people…that talent shortage could result in about $8.5 trillion in unrealized annual revenues" [3]. Given the potential magnitude of this issue, it is important to create new interactive tools to promote leadership principles among students to help train talents in the coming years and generations. In addition, a lack of human talent and leadership would ultimately lead to a collapsed society, which benefits nobody.

1. Along with the development of new different video games, the educational types for children prove to be effective in teaching them different things. This way, building a foundation for leadership within these games for the next generation would be easier and don't require an in-person class. Leader's Legacy attempts to fit into that category of games.

2. It is told that leadership can be taught to a student, but is best taught when the overall experience is enjoyable. Leader's Legacy seeks to be a wonderful experience for the player and teach the user what being a leader is really like. Nonetheless, limitations include that there is no real person interaction.

3. Research shows that students learn better in a non-classroom environment due to the rapidly changing world, moving more towards virtual things. Using online games, students can get an early start to learning about leadership and potentially become one. Limitations include the type of questions that can be utilized to educate the student.

The solution we propose comes in the form of an interactive game that is built with the goal of reinforcing important principles in its users to succeed. Games as a medium are a very attractive and engaging activity among the student demographic. In fact, a study by Steve Jones found that about "Seventy percent (70%) of college students reported playing video, computer or online games at least once in a while [6]. Some 65% of college students reported being regular or occasional game players. All of those surveyed reported having played a video, computer or online game at one time or another." The ability of games to draw in students in particular can address the issue by designing a game that is both fun and educational and reinforces acts of leadership to allow the player to succeed. This solution improves upon other methods by getting more people to care about such concepts who would otherwise not care to do so.

In our 2 experiments, we were trying to collect different data trying to prove that Leader's Legacy does teach users leadership content and whether the game was relevant to its purpose. Each experiment was setup via Google Forms where we created the 2 surveys for the experiments [7]. One survey was essentially just a small quiz with content questions from Leader's Legacy to test whether users are retaining the information received. The second survey includes questions to test relevancy to different age groups. The quiz supports the fact that people do better on the quiz once they have played the game while the survey shows the pros and cons of our design, and how we can improve in the future.

2. CHALLENGES

In order to build the project, a few challenges have been identified as follows.

2.1. Game assets

One of the biggest hurdles that needed to be overcome is the issue of game assets. How the game is visually represented has a major impact on how receptive students can be toward the game, so it is important to make sure that assets are able to be properly created or otherwise acquired. There are a variety of ways that this problem can be addressed, with the two main ways depending on if there is an artist internally whose ability and style match the vision of the project. In the event that no such person is present, the best approach is to find available game assets shared by others or through commissioned work.

2.2. Backend service

Another obstacle was learning about a Backend service, which was a new thing to me that was essential to making a game with players. When implementing this service, I had to think about what the server needed to keep track of that was important and specific to each player. This created a logical puzzle that I had to solve. To make sure it was working, I used a dummy character and tested numerous things on that prototype [8].

2.3. Figure out the best way to wriet C# code

The final obstacle was figuring out the best ways to use and write C# code to make the things I want to happen actually function. Thankfully this can be remedied by reading the documentation for whatever particular thing we might need to implement. Given prior programming knowledge, the main goal of this exercise is to find the equivalent functions and tools in C# to implement those ideas.

3. SOLUTION

Leader's Legacy must be a solid and compelling Unity application that is able to maintain engagement with users to better accomplish its educational goals [9]. To achieve this, the core components that makeup Leader's Legacy are a cloud-based solution for storing user data, an intuitive means of quizzing users on concepts, and general game mechanics that will keep them coming back. We set up each of these components through a combination of Unity and Firebase to allow users to create an account, learn about their purpose in the game, have objectives tied to the quizzes to make their character stronger, and also be able to connect with other players to show off their own [15].
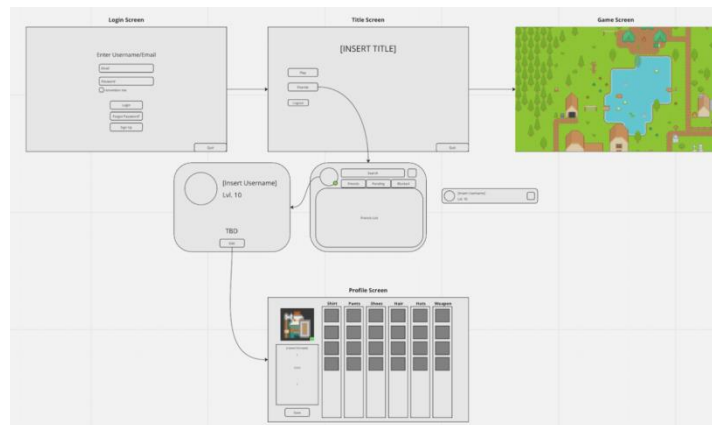
Figure 1. Overview of the solution

The first core component of the game is the integration with Firebase to hold account information for our users. Firebase is a "backend-as-a-service" that scales with user demand while also providing the infrastructure necessary to support user authentication and database storage [10]. By handling player data in this way, users will be able to access their data from any computer and keep their progress safe in the cloud.
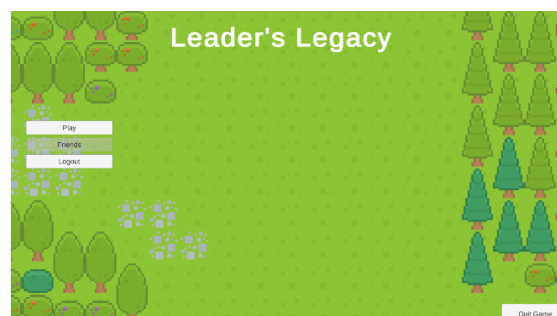
Figure 2. Screenshot of the main page

Figure 3. Screenshot of sign up page

Figure 4. Screenshot of code 1

This snippet of code covers the registration function of the application. This function is invoked when the user first registers from the game, which is required to be able to play. Given an email, password, and username, we create a firebase registration task and wait until said task is completed. If the task succeeds, then we set the display name of the user. It should be noted that the display name itself does not have to be unique as every new user is identified by an internal uid, which allows the player to pick whatever name they would like. After this task is completed, we then create a new user data entry for the player on Firestore with the initial values that would come with such an entry. Firebase actually supports two types of databases, but Firestore is the one chosen as it is more cost effective for data storage but exchange for more expensive reads or writes, which is appropriate for the purposes of user data which will not be updated often enough to be an issue.

The second core component of Leader's Legacy includes the quiz functions, where the player is quizzed on different leadership questions. If the user is successful in doing the quiz, the prize would be added to their purse, which is recorded on the top left of their screen. These quizzes can

be activated by talking to different characters spread around the map so that the user can learn how and what is needed to become a leader.
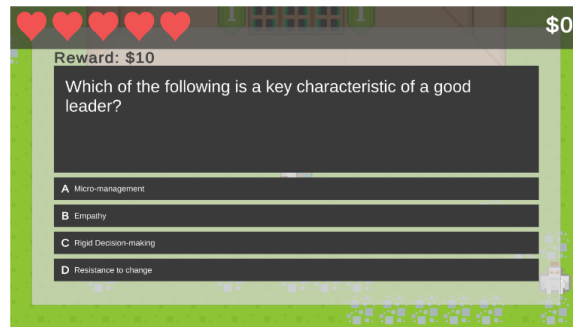

Figure 5. Screenshot of game 1

Figure 6. Screenshot of code 2

The above image is the component in which it allows the system to keep track of if the user got the question correct. We have a couple of "if" statements set up to create hypotheses on what would happen if the user picked the right choice or not.

The third component that is important to Leader's Legacy is the combat system [11]. There is a simple combat system set up to keep the player engaged and wanting to play more. Adding an engaging combat system with a clear path of progression is a great way of ensuring that there is an incentive to continue learning about the game and how to get around each of the components and educational content.

Please click on the image below for a short clip of the combat system.

Figure 7. Screenshot of game 2

Figure 8. Screenshot of code 3

The main purpose of this code snippet is to check if a player is allowed to throw out an attack upon trying to do so with a left-click. Note that the player is not allowed to throw out an attack if they are still on cooldown or in the middle of dialogue. Once permitted, we will set up all the necessary cooldowns for the attack afterward and check where the player clicked relative to the player character. Depending on the angle, the character will throw out a slash in that direction which will cause damage to enemies upon contact. We do this through a combination of the slash's "origin" property combined with the tags system so that the game knows when to run a combat interaction and who happens to be involved.

4. EXPERIMENT

4.1. Experiment 1

Given the main object of Leader's legacy is to teach leadership principles, it is important to check how well the audience manages to retain the information the game seeks to present. Elements players either excel or struggle at will shine a light on what parts of the experience may need to be adjusted.

To check how well people remember the principles the game tries to teach, there will be a quiz distributed to random participants within two groups. The control group consists of people who did not play the game while the experimental group has people who played the game.
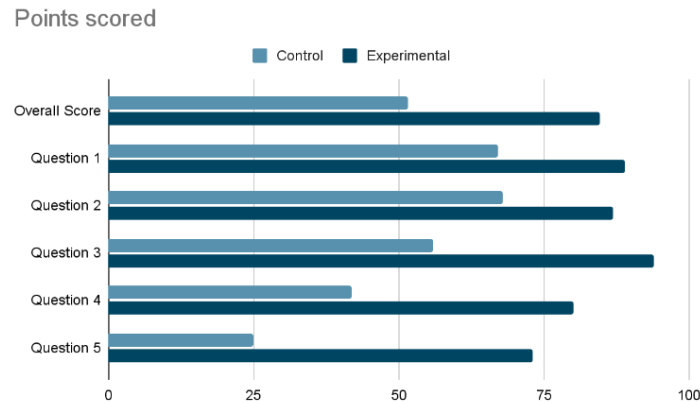
Figure 9. Figure of experiment 1

Considering the notable difference in performance between groups, this supports the fact that users are indeed learning and retaining the information presented inside the game.

There are also some notable details regarding how each of the groups performed on specific questions, with a noticeable performance gap in question with more descriptive answer choices as opposed to one word answer choices. This is likely due in part to the more descriptive choices giving more context and a scene for the reader to think about as opposed to one-word choices which can be more conceptual and ambiguious.

One potential point to consider is that the questions used in the assessment are the same as those presented within the game. While the data provides important information on the retention of said information, there is nonetheless a chance that the experimental had a higher than expected advantage on account of them already seeing these problems before. One adjustment to be considered for future tests is to have questions that do not show up in that game at all, but still touch on the same or similar topics.

4.2. Experiment 2

A large factor that will play into the effectiveness of Leader's Legacy is how engaging of a game it actually is. We will need to better gauge both the strengths and weaknesses that contribute to the overall package and experience.

To help us understand player sentiment, we will conduct a survey among players that asks a series of questions designed to probe for places to improve and others to emphasize. The survey is broken down into the following segments:
  - Demographics: the age range of the players
  - Gameplay Feedback: what things players found fun or would want improved
  - Education Feedback: enjoyability of the educational activities
  - Suggestions: open-ended section for people
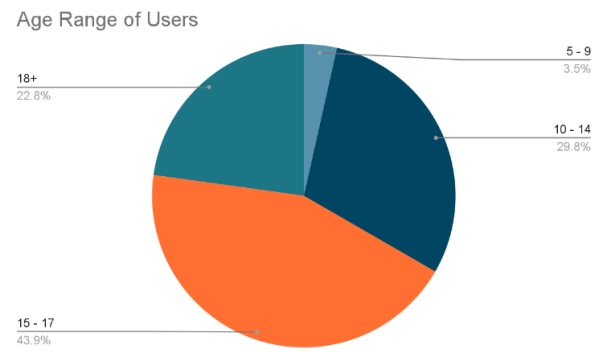
Age Range of Users

Figure 10. Age range of users

Average Gameplay Scores
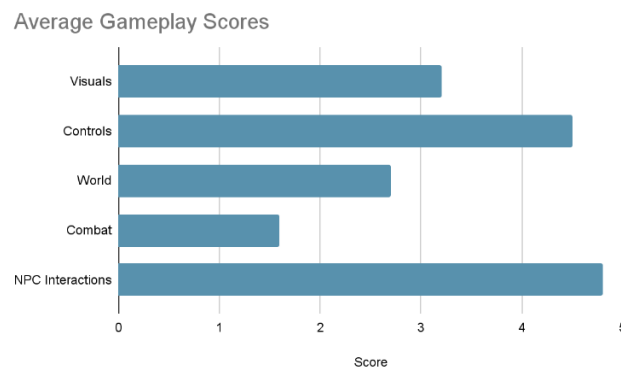
Figure 11. Average gameplay score

Activity Relevancy Score
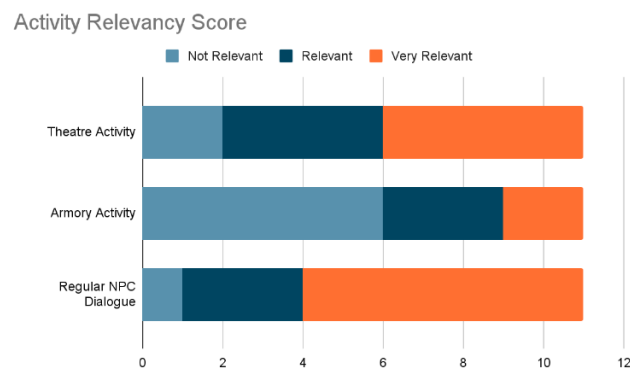
Figure 12. Activity relevancy score

One of the first elements we measured during our surveys of the users, is the age demographic that they fall under. From the survey, we learn that the majority of the users are teenagers or adults. This supports the argument that the idea of educational games would work and teach people. However, one notable point to consider here is that the main focus was on breaking down the distribution of ages among children. Should the game develop in a direction that attracts older users, that will serve as another research opportunity.

As far the gameplay experience of Leader's Legacy is concerned, the two extremes we would want to highlight are the NPC and combat systems [12]. The NPC system is by far the high scoring element which reflects the extra effort that was placed into making sure the interaction

system introduced the necessary educational content. On the other hand, combat was the lowest scoring segment, which exposes the need for us to develop more variety in terms of both enemies and the tools and mechanics available to the player to perform those combat interactions. Some examples that were suggested by users include the addition of enemies with different movement patterns or means of attack and the ability for players to both throw weapons and cast spells. These are all considerations that should be made to help improve the impact of what Leader's Legacy is trying to offer.

Another important aspect of the project we polled users for was how relevant a particular key activity is in terms of teaching leadership principles. The regular NPC dialogue sequences were deemed to be the most relevant. This can be attributed to both the number of NPCs present and the range of topics that they all covered. The runner-up was the theater activity, which focussed on more conversational parts of being a leader by interacting with a general audience. The main reason why it was likely considered less relevant than the NPCs is that the points the game is trying to teach is not explicitly stated, but rather implied based on how the audience reacts, however it still is not far behind since conversational skills are a very important topic to touch on when trying to be a leader. This leaves us with the armory activity, which is largely considered to be not that relevant given that it is mostly a shop for equipment. While it is true that the items bought from the armory are only obtainable by engaging with the educational parts of the game, adding more of an educational angle in the armory itself can help improve the overall educational experience.

5. RELATED WORK

The solution of using games as a way to educate is more effective than the normal person would think. It is not strange to see children around with electronic devices often in the present day, so why not try to get their education there too? This would be beneficial to the kids since it has been found that young students are more likely to be inattentive, and through the use of educational games, it could very well be a solution. "Research shows that students' attitudes toward learning, class attendance and mood were more positive when compared to primarily using traditional methods of teaching and learning" [5]. Even though this is positive, this way of learning would be limited to simpler concepts.

The nature of this particular is more broad and generalized in that it tackles the general question on whether or not leadership is something that can be taught to a student. The most prominent theme found when discussing the topic is that experience is the best means of learning leadership, particularly when learning from mistakes. Leader's Legacy seeks to help in this respect by adding experiences and challenges for the player to overcome which will require the player to understand necessary leadership principles to do so. In terms of limitations, the "participants were limited to those working as faculty, staff, and administrators in K-12, college, and university organizational settings" and leans heavily on the perspectives of administrators which may not sufficiently take into account differing views from subordinates [4].

"Empirical evidence suggests that it is also important that the development of leadership start early in life and should be implemented in schools" [2]. Due to the rapidly changing world and technology, most kids would start learning things on electronic devices now. This argues that education can be taught using various tools on different devices. Leader's Legacy attempts to help educate these kids into starting a early leadership career by teaching them about how to act like a leader. Through this process, it would make it easy for children to learn about leadership at a young age and they can develop themselves as time passes.

6. CONCLUSIONS

Unfortunately with the time that we had, true multiplayer activities were out of scope for what we would want to implement. The ideal addition would be to have an interview type activity where people can connect with one another to practice their skills. This would be implemented either through a peer-to-peer solution where users directly connect to one another or via a server should the need for moderation arise.

One of the main visual limitations for Leader's Legacy at this time is the dependence on public domain artwork from places like Kenney.nl rather than custom in-house artwork [14]. If there was more time, then we would go about implementing a higher quality set of assets through either hired artists or our own creations.

One functional limitation for Leader's Legacy includes the variety of questions that can be provided. Currently, only multiple choice questions can be implemented as free-response type questions would cause issues in things like word-for-word type answers. The most viable way this could be implemented given more time, would be through integration with a generative AI like ChatGPT to be able to better parse and score the responses of users provided the cost of using such a tool is reasonable [13].

To solve the limitations inside Leader's Legacy, many can be fixed with time. Focusing on improvements targeting the social and visual aspects will noticeably improve the user experience and variety of things to do to help maintain retention with users.

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