



University of
BRISTOL

DEPARTMENT OF COMPUTER SCIENCE

Overcoming Writer's Block with Word Count Tracking Application

A dissertation submitted to the University of Bristol in accordance with the requirements of the degree of Bachelor of Science in the Faculty of Engineering.

20th May 2020

Declaration

This dissertation is submitted to the University of Bristol in accordance with the requirements of the degree of Bachelor of Science in the Faculty of Engineering. It has not been submitted for any other degree or diploma of any examining body. Except where specifically acknowledged, it is all the work of the Author.

Acknowledgements

I would like to thank my supervisor, Doctor Simon Lock, for his guidance throughout the project. I would also like to thank my friends for testing my application during the hard times of the COVID-19 outbreak.

Foreword

Writer's block has been a common issue to all kinds of creators, especially creative writers.

My aims in this project are:

1. To study the causes, impacts and treatment for writer's block, then making a technological approach to overcome the problem.
2. To develop my app, Writing Blocks, according to this approach.
3. To find out the important aspects of developing an app, like the user interface design and what the users want and expect.
4. To perform analysis on the effectiveness of the app towards writing productivity and prove that it shows improvement.

Based on my research, I suggest that the current technology used to overcome writer's block is not sufficient and does not have ample rewarding incentive, as well as lacking in user engagement. I argue that an application to overcome writer's block should have some inclusion of creative or aesthetic elements.

A study is conducted to compare the word counts recorded by participants before and after using the application I develop, Writing Blocks. Results and analysis will then suggest that there will be an increase in word count after using the developed application. The study is also performed and evaluated to gather feedback from participants regarding the general user experience.

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INTRODUCTION AND BACKGROUND

Creative Writing

Creative writing is a type of literature, usually with more emphasis in narration and character development, and less technical, academic, or journalistic. It mainly includes stories, mostly fictional, scripts and poetry, which also extends to the more artistic areas, like songwriting and comic or cartoon storyboarding.

The main idea behind creative writing is for writers to unleash their own creativity and freedom in the form of words. It is to convey a story, expression, feeling or message to the audience who reads it. Creative writing is important to the world, as there is no restriction in thinking, it boosts our minds to more open and further ideas. Creative writing is a kind of art, helping to strengthen one's soul by giving freedom to express one's thoughts ¹.

However, it is not always the case that writers are able to constantly produce creative works. It can be due to physical health or medical reason, but this can also be caused by a writer's block.

Writer's Block

Writer's block is, as usually defined, the inability of an author or a creator to write new works. It is not a medical disability, neither disorder nor disease ². However, the impact is real to writers, whether it is short-term or long term. Writers can struggle very hard when they do not have the ability to produce work, especially for those who write for a living. Even professionals throughout the history like famous authors, cartoonists and composers had faced this problem. One notable case is of the famous writer of Moby Dick, Herman Melville, who stopped writing novels due to writer's block ³. Therefore, this is proven that writer's block is a common condition to writers and creators.

Writers would feel as if there is a wall built up between them and the ideas or goal they want to reach ², hence the name writer's block. Some people would debate if writer's block is real, where in truth, writer's block is just like a mental obstacle ², and the real issues needed to be addressed lie behind the reasons causing it.

There can be several causes to writer's block, and several ways to overcome it. Ultimately, it depends on the individual themselves, however research and surveys were conducted to find what the majority answers. In the current era of advanced technology where software applications can solve human problems, I decided to research a way to develop an application to address writer's block and to overcome it. This is one of my goals for my project.

Survey

Besides doing online research, conducting a survey is a useful, practical, and straightforward approach to gather real life people's opinions and suggestions. Opinions and suggestions are essential as they are conveying what the audience wants, and the point of developing a software is to create what the audience desires or needs.

However, it is also important to focus on a specific group of people who would be more likely to be interested in my ideas, which in this case they are called the target audience. This is a cost-effective marketing strategy to develop a software as we are focusing on a small group of people who have knowledge or are involved in the field of interest⁴.

Hence, I chose the University of Bristol's Poetry and Creative Writing Club as my target audience. They are writers who are passionate in creative writing and poetry, and naturally they would have some knowledge, opinions, or experience in writer's block. Some members from the club have been surveyed to express some opinions regarding writer's block. I used Google Forms to create the survey form as it is a convenient way to gather responses. Below were the questions asked:

1. What kind of writings do you most commonly do?
2. How often do you write?
3. Have you ever experienced writer's block/creativity slowdown/lacking ideas or motivation to write or create?
4. If there is a mobile game that encourages you to write everyday by rewarding you in-game currency for every word per minute and customized goals, how useful do you think this app will be, especially to you? (In-game currency will then allow you to unlock items and characters.)
5. What do you think are the major causes of writer's block? Do you think an application software, or a game can help overcome these problems?
6. Do you have any suggestions to overcome writer's block? If implemented in an app, what kind of features do you think will help?

According to the survey results in Figure 1.1, majority of the club members write novels.

What kind of writings do you most commonly do?

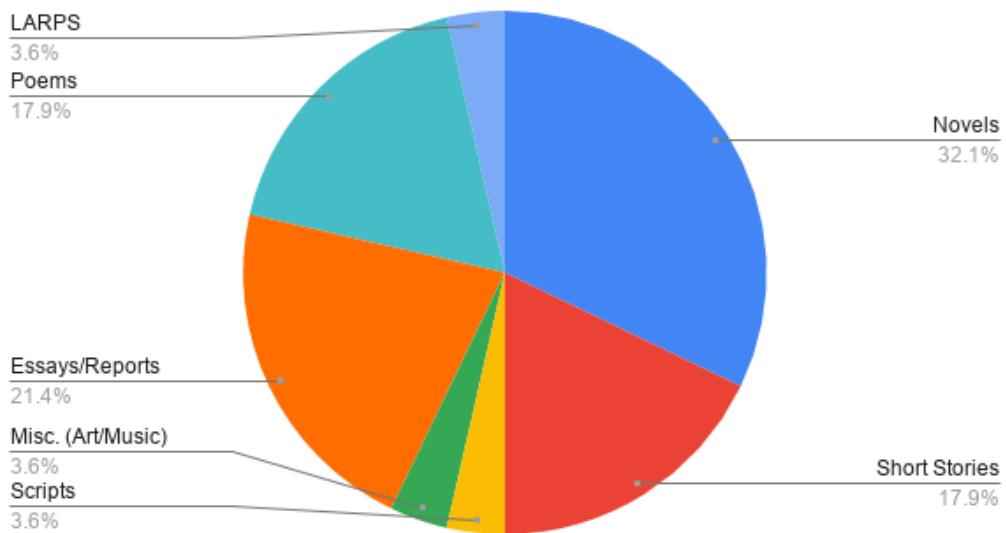


Figure 1.1

As shown in Figure 1.2, the largest percentage, which is around 46%, write more than once a week.

How often do you write?

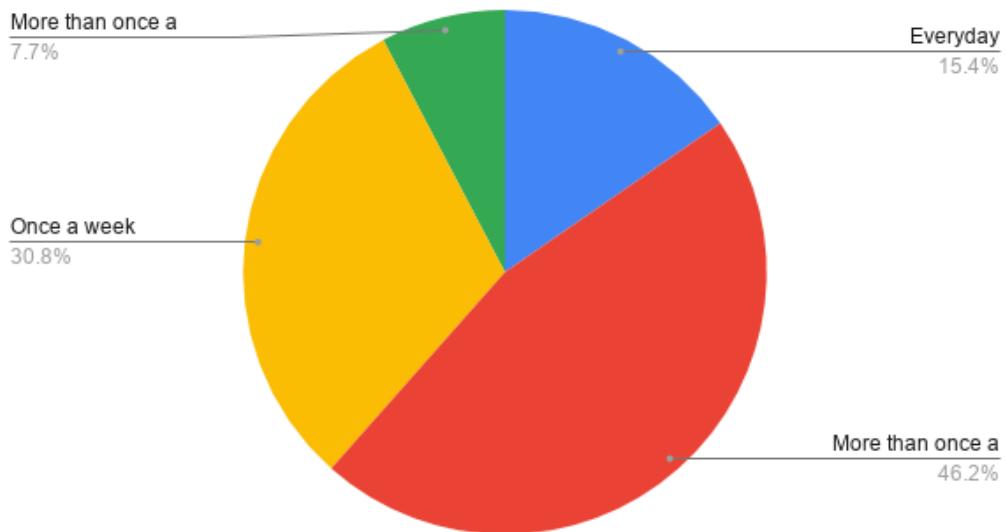


Figure 1.2

In addition, most of the club members have also experienced writer's block, with a high percentage of 80% and above, according to Figure 1.3.

Have you ever experienced writer's block/creativity slowdown/lacking ideas or motivation to write or create?

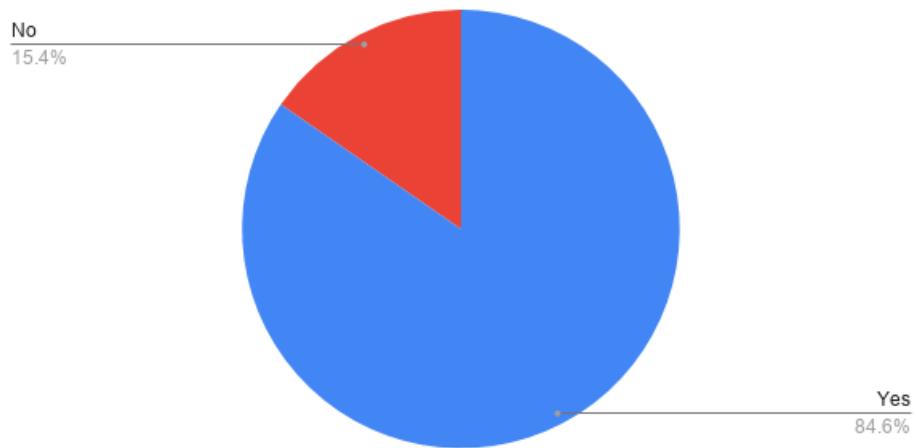


Figure 1.3

Then, around more than half of them are above average being interested in the idea of the application. Some of them gave reasons as to why they were not interested in it, which I would be using those opinions to develop the application even better. The results are shown in Figure 1.4.

If there is a mobile game that encourages you to write everyday by rewarding you in-game currency for every word per minute and customized goals, how useful do you think this app will be, especially to you? (In-game currency will then allow you to unlock items and characters.)

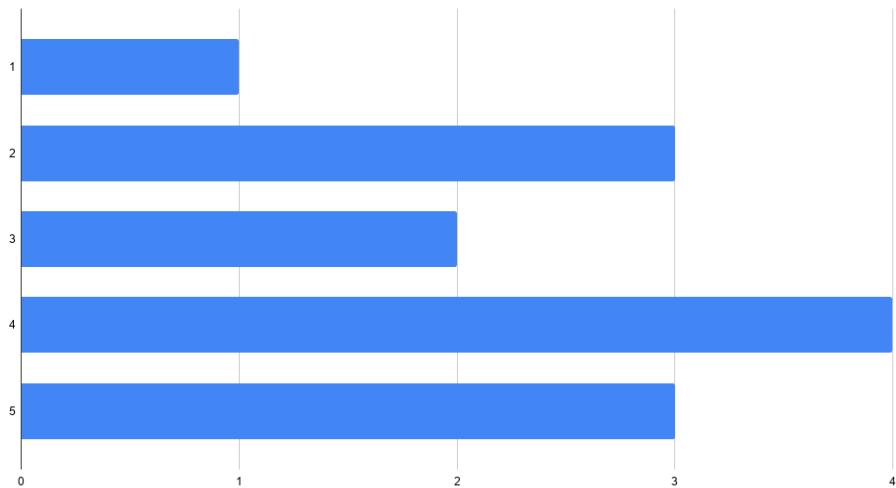


Figure 1.4

After gathering responses from the survey, I listed out the causes of writer's block and methods to overcome it, as well as whether the majority is interested in having an app that helps overcoming writer's block. Then, I sorted out the most frequent ideas and opinions, and make them my top priorities to be featured in the app.

Causes of Writer's Block

According to the survey conducted, majority of the club members answered that the cause of writer's block is due to the lack of motivation or confidence, as shown in Figure 1.5.

What do you think are the major causes of writer's block? Do you think an application or a game can help overcome these problems?

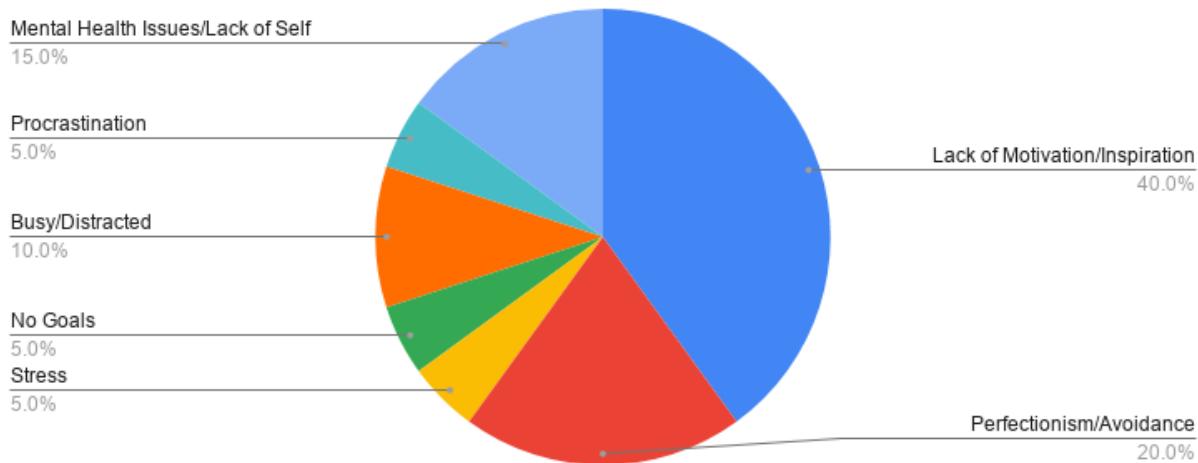


Figure 1.5

This holds true as the most common causes are due to mental health or neurological disorders⁵. Mental health issues such as depression and anxiety cast self-doubt and hopelessness onto an individual, hence making them lose the confidence, inspiration, or motivation to put out a good work.

In a more neuroscientific explanation, writer's block is caused by some kind of stress, which the human brain triggers a flight or fight response, where the limbic system takes control instead of the cerebral cortex, where then any creative input from the cerebral cortex is unconsciously hindered as the limbic system takes action in the behaviours of writer's block instead³.

Some other notable reasons given by the surveyed people are perfectionism, having a busy schedule or the lack of inspiration and ideas. Especially in the case of perfectionism, writers are pressured either by public or themselves to produce something good, and would set their

expectations too high, to the point where nothing would seem to look good in their own eyes. These writers would need to learn to be willing to publish something imperfect, then learn and practice from there ⁶.

Other reasons given were either more of the impacts of writer's block, or related to the previous ones mentioned, such as reluctance, procrastination, boredom, having no goals or stress. Procrastination is more of an impact of writer's block, as it is due to the inability to create works that writers will procrastinate, whether intentionally or not.

Methods to Overcome Writer's Block

According to the survey conducted, one of the most common methods the writing club members suggested is to track their word count. Tracking word count is a way of setting individual goals, but easier to manage in numbers. Peter Drucker, a management consultant, said, "You can't manage what you can't measure", it means that quantifying one's progress is easier and more efficient to manage. It is also easier to show improvement in productivity as a kind of concrete data, in this case, numbers ⁷.

Another useful method is to have daily writing prompts. It can be generated randomly to kick start some impromptu creativity. This method is useful as it encourages writers to not be afraid of making mistakes. Most importantly, it gets writers to write something than nothing, no matter how good or bad the quality is. This idea is also used in freewriting, where one writes anything that comes to mind in a short amount of time ⁸. This is a very useful way to overcome writer's block for those who have it due to perfectionism or pressure.

Some other notable suggestions the members provided are reading inspirational quotes, getting rewarded for having progress in writing, and not being disturbed by external environment. The suggestion of rewarding for progresses is useful, as it is a sign of encouragement for writers to keep going, they benefit something for overcoming an obstacle and improving themselves ⁹.

Other minor methods suggested are to write out one's own thoughts, learn some writing tips, getting inspired by images and checking out NaNoWriMo for ideas. NaNoWriMo, its full name as the National Novel Writing Month, is a month's project for writers to create content, namely a 50000-word manuscript or novel. This project takes place every November, and it is one of the most popular events for writers. NaNoWriMo also encourages writers to track their progress and it gathers a community of passionate writers to interact and share ideas ¹⁰.

A pie chart is created in Figure 1.6 to show a summary of suggestion by the surveyed people.

Do you have any suggestions to overcome writer's block? If implemented in an app, what kind of features do you think will help?

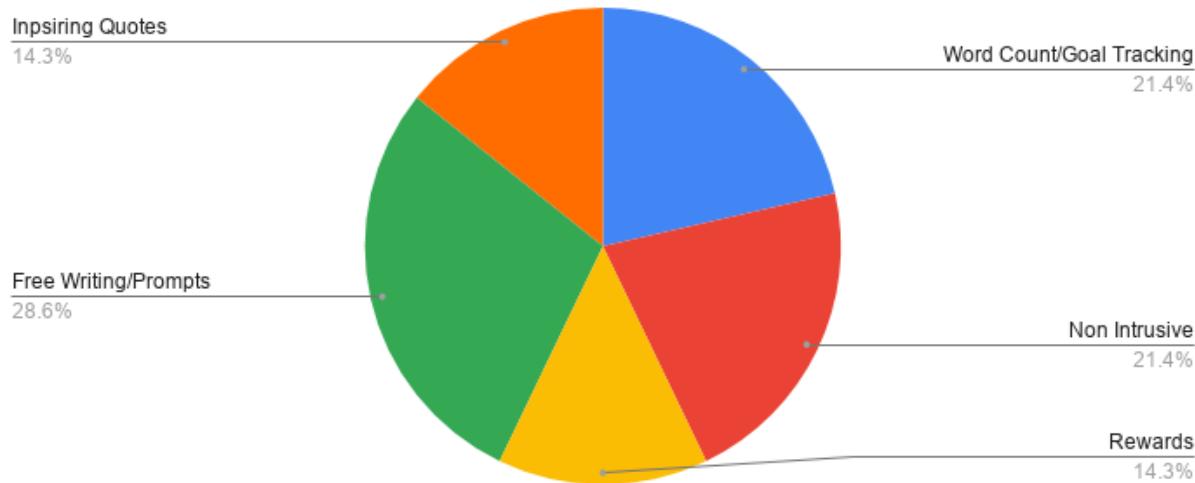


Figure 1.6

Existing Solutions in Technology

As gradually more people rely on technology to solve problems, some online tools exist on the web to help with writers to boost their creativity, such as impromptu writing, random title generators and writer community websites. There is also a game to write as much as one can in a limited amount of time, or else they “lose lives” ¹¹.

There is another application called FocusWriter, developed by Catherine Ellis, that allows writers to set a goal, which in this case to track word count, as well as including a spell checker and auto-save function for the works the users are writing ¹².

However, there are not many existing technologies to provide aid on overcoming writer's block, besides the few ones mentioned above, and most of these online tools do not have a rewarding system. According to a theory, the human brain connects rewards with visual stimuli ¹³. These existing technologies without ample visual stimuli then lack stronger incentive and user engagement. A game would be most ideal to this solution, however focusing on typing in a limited time like the exemplary existing game mentioned above might not be effective for all writers, as each writer has their own way to be motivated in writing. Hence, my approach would be to make a casual, multi-functional mini collection game with the aid of visual aesthetic.

My Project Proposal

My application, Writing Blocks, is a simple collection game app to track a writer's word count and reward them in-game coins based on the amount of words. Writers can also customize their own daily goal, and they will be rewarded extra coins if they achieve their goal. However, to not overstress the writers, the game will encourage smaller goals to be made, as the extra coins rewarded will not increase even if the writer decides to increase their daily goal.

Then, with the in-game currency, writers can exchange in-game characters. To make the rewards worth the effort, the exchangeable characters will also focus on being visually attractive or interesting.

Some writers would also prefer taking a break from technology, searching for ideas and inspirations. Some of the surveyed members were not interested in the application, because they thought having it would be intrusive and distracting. Hence, this simple application is meant to be only used approximately 5 minutes every day. All the user needs to do is to just record their word count and if they have enough money, they can buy a character. It will be designed to be non-intrusive so that writers do not get overly distracted by just playing the game and not actually making any progress in writing. As an extra feature, the game will also provide a random prompt generator for writers who need a drive of creativity and inspiration.

The interesting catch behind this prompt generator is that its content depends on the characters bought. Each character is designed based on a literature genre, such as horror or romance. Then, with each character unlocked and collected, the genres of the prompts in the generator expands according to the character genres. For example, if a horror character is bought, horror prompts will be unlocked in the generator. This means when all characters are collected, all the prompts available will be unlocked too.

I planned to design 10 characters based on 10 genres: Horror, Romance, Action, Western, Comedy, Music, Dystopia, Mystery, Fantasy and Sci-Fi. In addition to collecting characters, users can also set their collected favourite character as their main screen mascot.

Interfaces

As a mini collection game application, it is important to have a user-friendly Graphic User Interface (GUI). GUI mainly includes icons, buttons, menus, visual effects and sometimes sounds. A user-friendly interface is essential to enhancing user experience (UX), as with simple graphical representations it is easier for user to recognize and understand what do to and how to use the application ¹⁴.

To make the application interface-friendly and simple to use, there will be a total of 4 layouts planned in this application: the welcome screen, main screen, character shop screen and character collections screen. It is very important to not over complicate the interface design,

hence main features such as the word count tracker and prompt generator are featured in the main screen with just one or two buttons needed to click away.

Platform

Unity will be used to develop the application. This is because Unity is a simple-to-use game engine, not only used to create games, whether in 3-Dimensional or 2-Dimensional, but also to create other state-of-the-art featured technology like Virtual and Augmented Reality. Unity, although its main purpose is to serve as a game engine, also provides professional industries the ability to create films, simulations, constructions and many more. Ever since Unity launched and for fourteen years, the global gaming market had drastically increased by over a hundred billion, expanding not only computer gaming but also the mobile gaming market¹⁵. It is also available to download for free as a personal edition, with most of the essential features included.

It also allows the application to be exported easily into mobiles, including iOS and Android. For easier testing purposes, I build the application into my own phone's system, which is Android. To build the application into the phone, the only few steps to do is to install Android Studio, configure some settings, and then set the build paths in Unity to the SDK and JDK folders of Android Studio. Then, by connecting the phone to PC, Unity builds and runs the application directly into the phone.

To write scripts, C# is my main programming language. Implementing the interfaces with Unity's built in features saves a lot of time, so most of the programming comes from setting up the logic of storing user information like character collections and money management.

Project Management

As I am working as a solo developer, I decided to risk less by not implementing databases or any sort of online systems. As the application only focuses on individual improvement, it is strived to be simple, easy to use and not time consuming, hence online features are not necessary. However, I will be backing up my files online, such as Google Drive or Github.

IMPLEMENTATION

Time Management

The estimated time I worked on this app was around 60 to 70 hours. After coming up with the proposal of this project, I started on my app development in November 2019, and worked for approximately 5 hours for every two weeks.

Development process

Development engine

I decided to use Unity 3D as my app development engine but using the 2D UI instead of 3D. Unity uses C# as the main programming language. It is very easy to use and to utilize the code and assets in Unity. The reason I chose Unity as my immediate choice was also partially because I had some experience using it to develop a VR app for a building tour last year.

Other software specifically for mobile app development such as AppSheet or Appy Pie could work. However, I chose Unity as it is versatile, allowing me to not only create mobile apps but also having the choice to expand building other types of applications, such as desktop / PC applications. This was proven useful later during evaluation. I do not own any Apple products, so I was not in any convenient state to build iPhone or Macbook applications. Therefore, as an alternative, I also created a PC version of Writing Blocks, even though it was not originally part of the plan to do so.

Unlike other software, Unity makes things very simple and easy to understand when it comes to creating user interface (UI). Since a good user interface is one of the most important aspects in app development, Unity saves a lot of time as I could just customize the sizes, fonts, colours and many more in the inspector panels given in the development engine. It also breaks down elements into Game Objects and sorts layouts through a simple hierarchy.

How Unity's objects and scripts work together is that when a script and game object are created, the script can be directly dragged into the inspector of the object, the object is then simply tied to the script. Then, to link the public variables in the script with other objects, I can just drag and drop them into the inspector again. This means that I do not need to manually code the instances of the objects in the script. Figure 2.1 shows how game objects and values are used as public variables of a script.

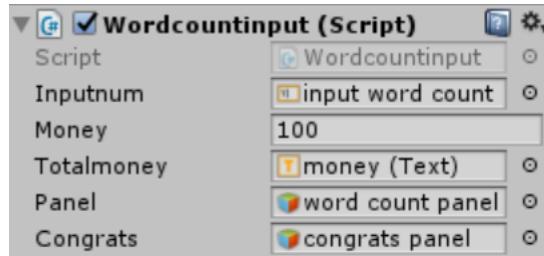


Figure 2.1

Overall, I am comfortable using Unity as it is complex in its features, yet easy to understand and use.

Application Development Process

Planning and Setting Up

First, I needed to create a new Unity project, then organize and plan what files and folders I needed. Figure 2.2 below shows that I have my assets categorized in folders. The font folder is where I keep the fonts I use, and the scenes folder keeps what is equivalent to the total layouts of the application. The prefab folder contains a scene loader object, which I will have easier access to as this object is used in every scene. There is also a folder to keep my scripts and lastly, a textures folder to store all kinds of sprites and images, like the game characters.

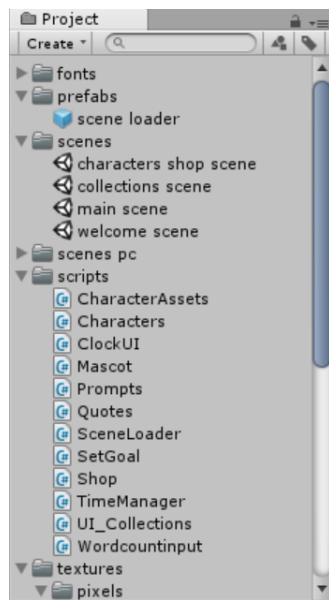


Figure 2.2

Implementing Word Count Converter

Although I had some experience with using Unity, it is still my first-time programming in C#. Not having any experience in the language, I quickly followed a simple online tutorial by Jimmy Vegas on how to display input to text in Unity with a C# script to get an idea on the syntax¹⁶.

Then, I implemented a function in the script where the number input will be added to the number text. This will be how the word count converts into in-game money. After testing a few times, I then construct a simple interface where when the user clicks the Word Count Record button, an input panel will appear. Once the user inputs the number, they can press the Enter key on their keyboard, the displayed money will then increase. Initially, there was a Confirm button on the input panel. However, when the user taps away from the screen without pressing the confirm button, the input number will still be read and added to the displayed text. I could not figure out why this was the case. Therefore, I adapted and changed it to the case where users should press Enter on the keyboard to confirm the amount instead. These implementations can be found in the **WordcountInput.cs** script.

Figures 2.3 and 2.4 below show how the string input turns into a number and adds its value to the top left corner displayed text.

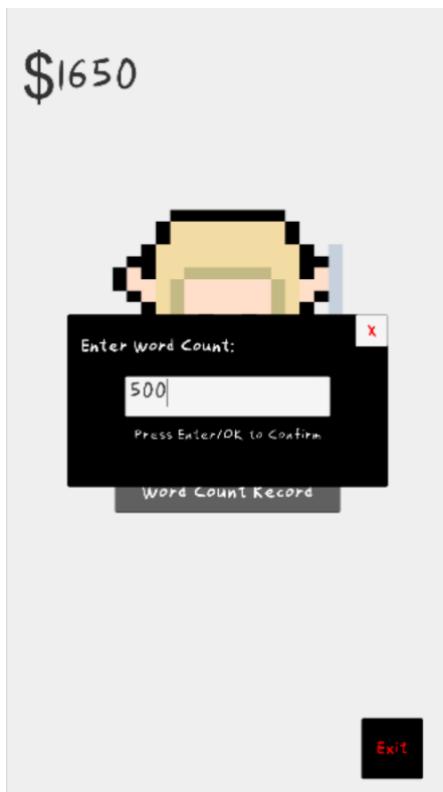


Figure 2.3

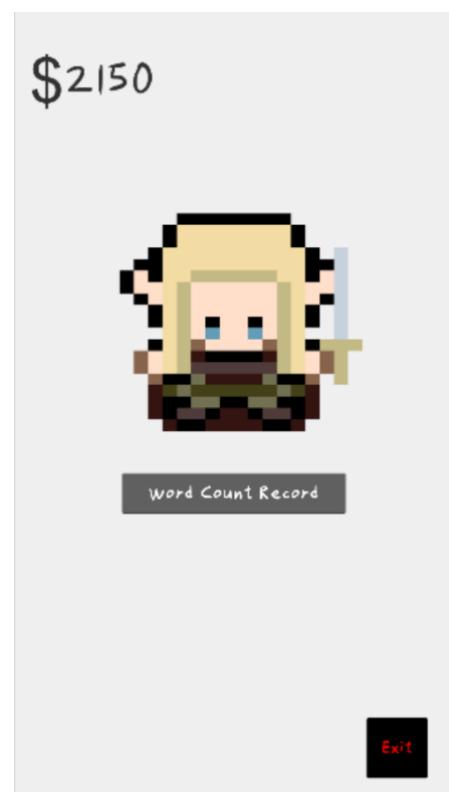


Figure 2.4

Creating a Writing Prompt Generator

Creating the generator was simple. All that was needed were a script to randomize some string texts, a button to generate the random text and a panel to display the generated text. The written script for this is in **Prompts.cs**. Figures 2.5 and 2.6 show the text being randomly generated upon button press.

The prompts used in this app were all derived online as examples, as coming up with original prompts will be very time consuming in this case.

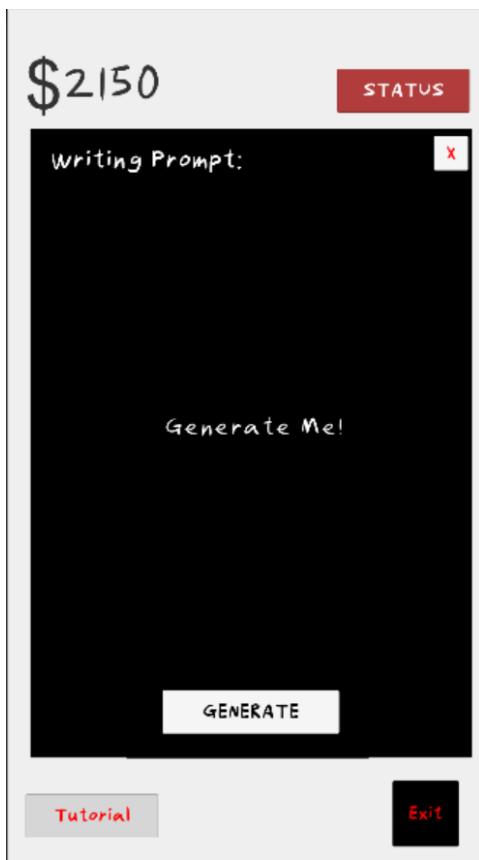


Figure 2.5

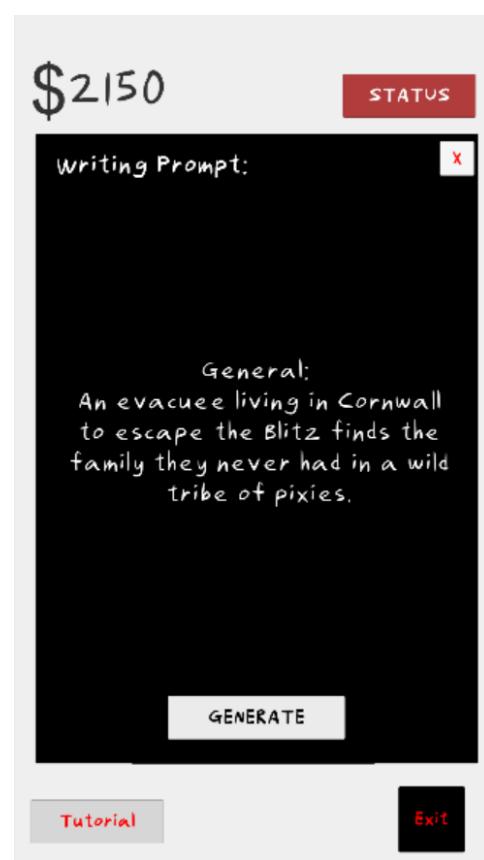


Figure 2.6

Building and Running on Android

After implementing the very first two simple features, I then proceeded to build and test run the application on my phone, which is an Android phone. Adjusting the build settings was a little challenging and time consuming at first. Firstly, according to a tutorial online by Faiid, I had to install Android Studio so that it builds directly into my phone¹⁷. It did not work for the first few attempts, so I tried installing Gradle. It did not work for me, but eventually I found my solution by just adding the SDK and JDK paths in the project external tools preferences.

After that, I turned on the debug setting on my phone and directly built the app into it via a cable.

Figure 2.7 shows the SDK and JDK paths I had added to build and run the app.

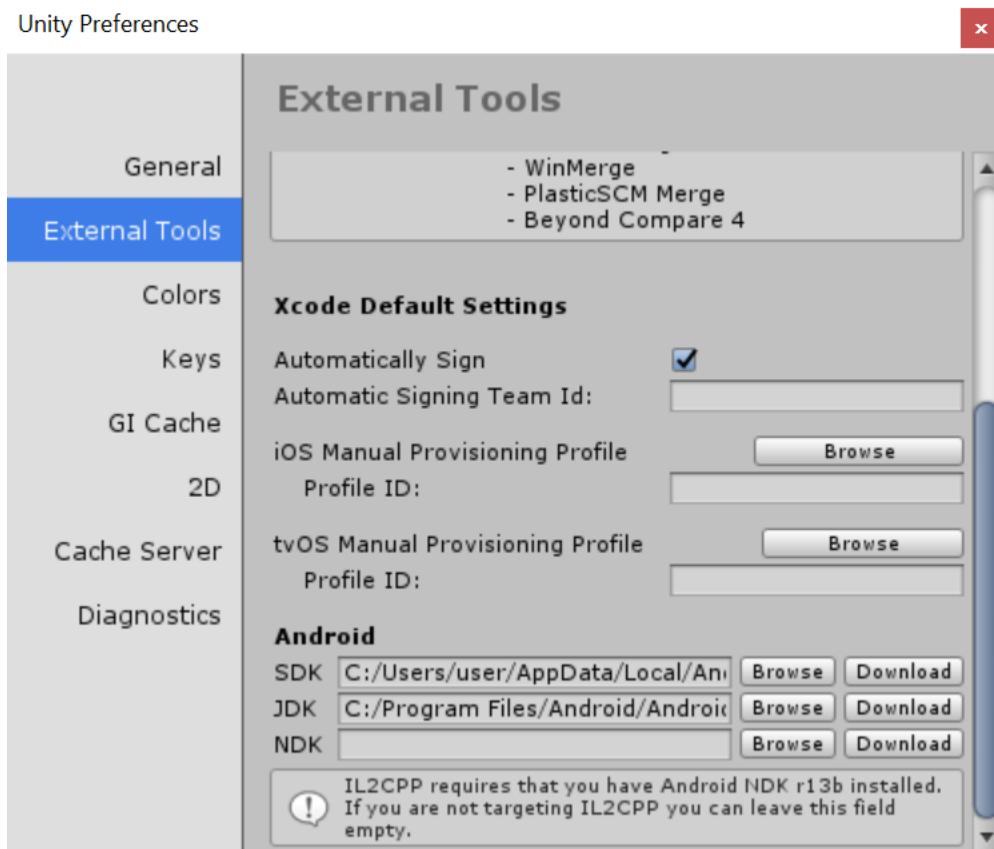


Figure 2.7

Creating the Main Scene Interface

The main scene of the app is where the main features will be, such as the word count recorder, the writing prompts generator, buttons to the character shop and collections and so on. This will be the second scene the users see upon first using the app. Figure 2.8 below shows how the buttons, text and the character mascot are placed. I am using a colour scheme of monochromatic colours and red, as these colours are contrasting, easy to distinguish and to look at. Too many complex colours will strain the user's eyes.

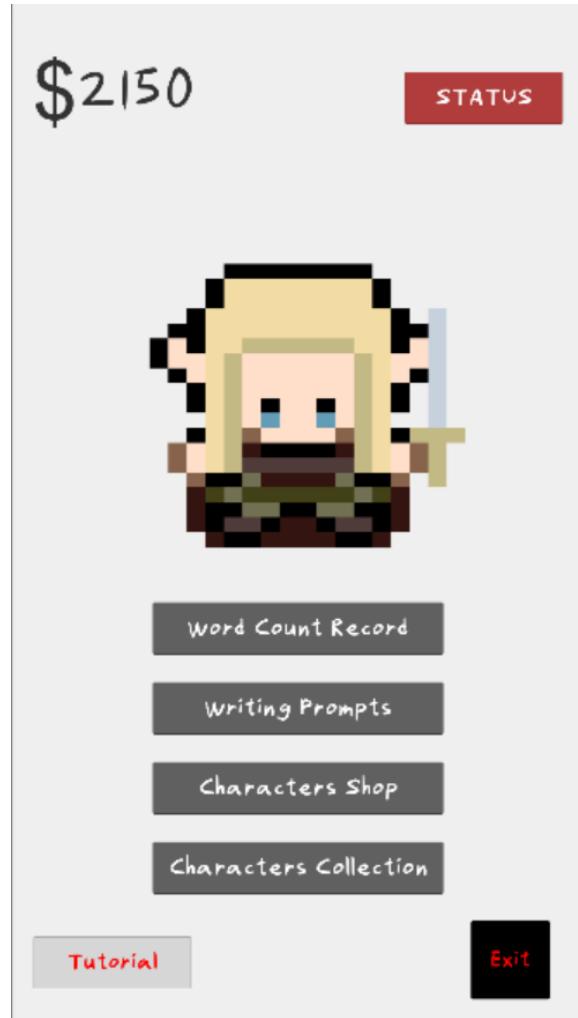


Figure 2.8

Creating the Welcome Scene

The welcome scene is just a simple interface to welcome the user when the user first opens the app. The character mascot will stand in the middle and the user only needs to click “Tap here to Enter” to proceed to the main scene. To enter the main scene, a simple scene loader is used (see **SceneLoader.cs**). The welcome scene interface design should be as simple as the purpose it serves. Figure 2.9 shows the interface design of this scene.



WRITING BLOCKS

Tap Here To Enter

Figure 2.9

Creating a Character Shop

Next, I implemented the character shop, where users can use the money, which they have converted from recording their word count, to buy characters. This was one of the parts which took me the longest to code, as I not only was not familiar with programming in Unity C#, but also because there was a lot more things to consider in this scene. Code Monkey on Youtube made amazing tutorials on creating a Unity 2D game, so I closely followed his tutorial to set up a shop¹⁸.

The idea behind the interface of this scene is when the characters are displayed in the shop panel, the sprites are cloned from the script, instead of manually creating game objects for each character sprite. Figure 2.10 shows that before running the app in Unity, there is only one character's sprite. This character sprite is in a transformation container. Then, when the app runs, the container duplicates from left to right and up to down, from there I used a game object

containing different character sprites and link it to the Shop script. The prices and names of each character differs too. These are all stored in the **Characters.cs** script, and the character sprites are defined in **CharacterAssets.cs**. By creating a game object linked to this script, the **Shop.cs** script can then link its Characters variable to this game object as well.



Figure 2.10

Additionally, when a character is bought, a large “SOLD” text will cover over the character, this means users can only buy once of the same character. When the user does not have enough money to buy a character, a large “NOT ENOUGH MONEY” text will cover the character as well, indicating that the user cannot buy the character until they write more and earn enough money. With the big text covering the character sprite, it is a great and easy way to not need to display any error messages when the user tries to click onto the character sprite to buy the character. Figure 2.11 shows how the characters and texts are displayed when the app is running.

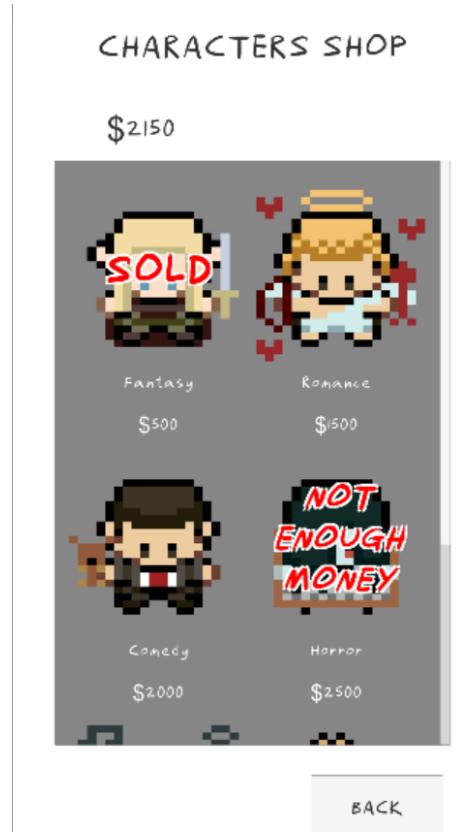


Figure 2.11

When buying a character, the user can click onto the character sprite. This will bring the user to another panel where the user confirms to buy the said character. This is necessary as if users accidentally click onto a character sprite, they can go back and choose their character again and not spend their money on a character they do not desire to buy. It is important as once a character is sold, there will be no refunds. When the user confirms to buy a character, a confirmation panel will then appear. Of course, the money decreases as well, according to the price of the said character. The money the user has will always be displayed on the top left corner. By clicking the “BACK” button, users can then continue to shop for more characters.

Figure 2.12 and 2.13 show the process of buying a Romance character.

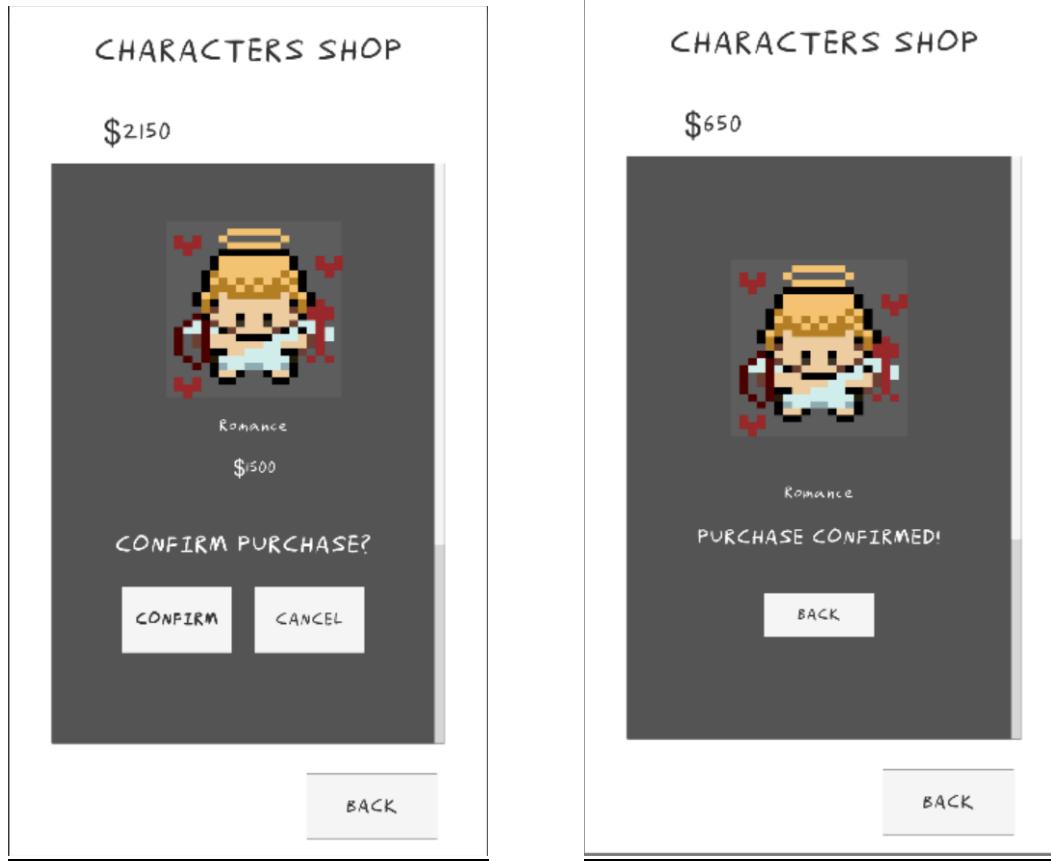


Figure 2.12

Figure 2.13

When a character is bought and the user returns to the character shop's main panel, a Boolean flag for the bought character in the script will be set to true, indicating that the character is sold. With the Boolean flag set to true, the "SOLD" text will then cover over the character sprite. Figure 2.14 shows how the Romance character is now sold.

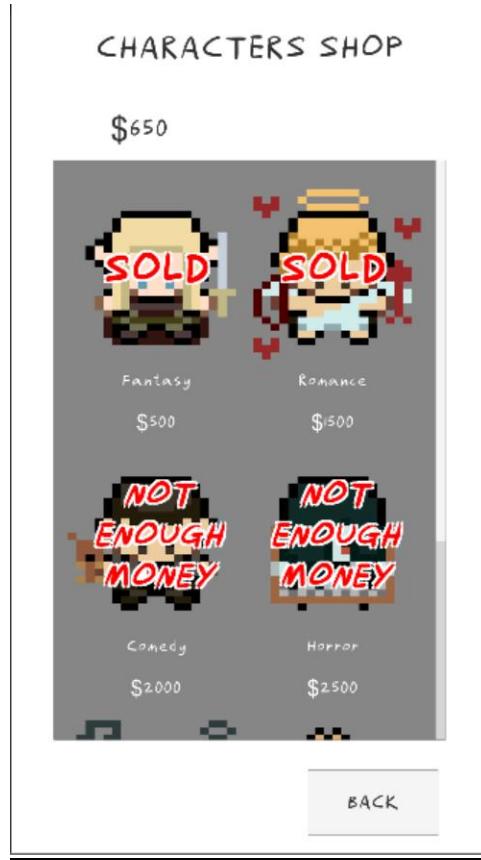


Figure 2.14

Creating Pixel Characters

There is a total of 10 characters. These character designs are based on story genres and widely known fictional characters who are linked to each of these genres. These are the 10 characters used in Writing Blocks and the inspired fictional characters tied to their genre names:

1. Fantasy – Legolas from Lord of the Rings
2. Romance – Cupid
3. Comedy – Mr. Bean
4. Horror – Sadako, a kind of Japanese ghost
5. Music – Beethoven
6. Mystery – Sherlock Holmes
7. Action – Bruce Lee, a famous Hong Kong actor
8. Dystopia – Katniss Everdeen, protagonist of The Hunger Games
9. Western – A cowboy
10. Sci-Fi – Darth Vader from Star Wars

All these characters were drawn by me using an art program called SAI Paint Tool. Although I do have the artistic ability to draw realistic or cartoon characters, I chose to create the characters

in a pixelated art style, as it is a useful style to save time without looking any less attractive. However, the style was inspired by the retro games of Pokemon. Pokemon (Pocket Monsters) is a popular video game originated from Japan and is well-known worldwide.

It is important that users can recognize these characters despite its simplified pixel style. For example, the Fantasy character has a sword, the Music character has musical notes and so on.

Figure 2.15 shows a pixel sprite from Pokemon, and Figure 2.16 shows my process of making these characters.

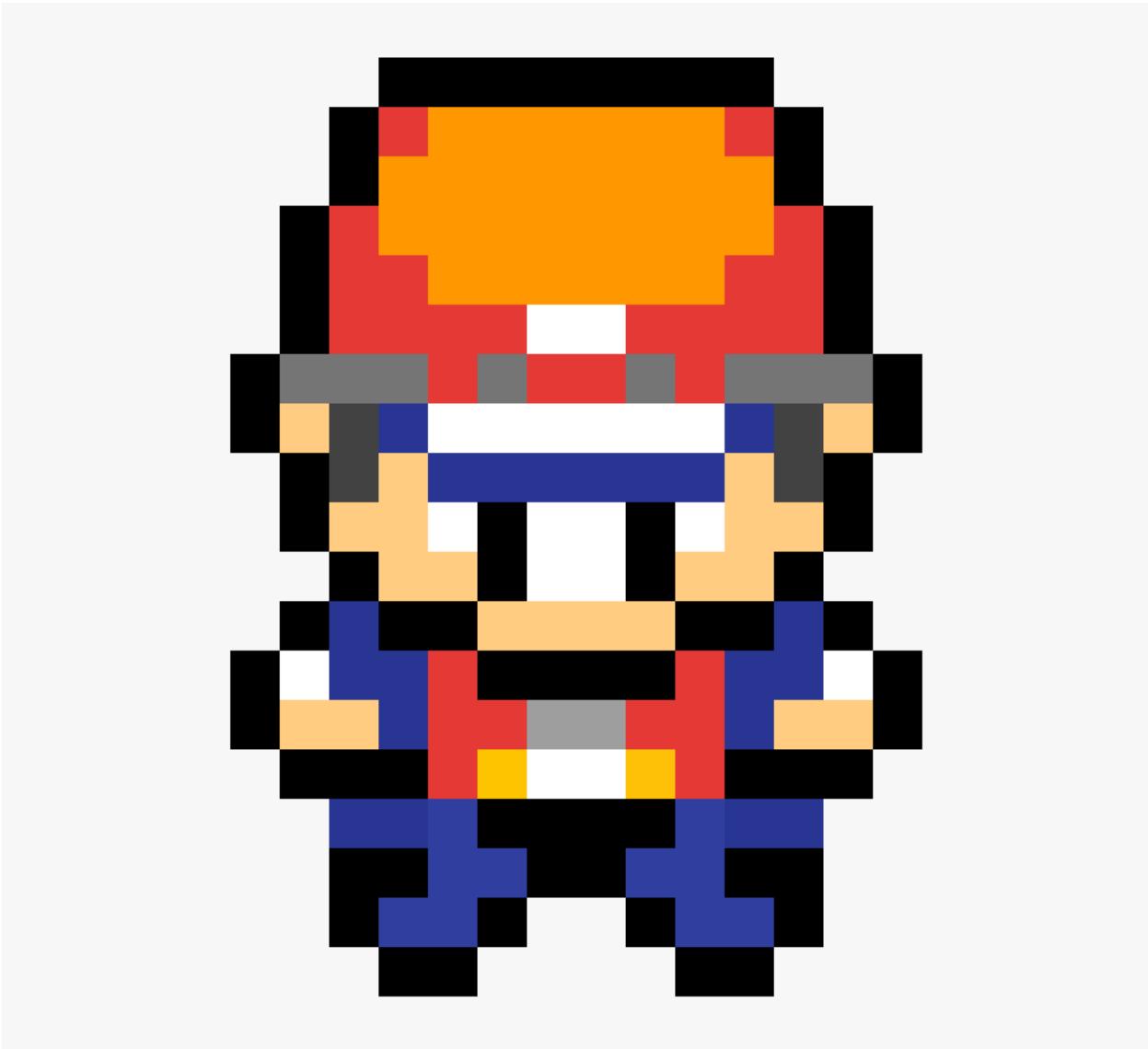


Figure 2.15

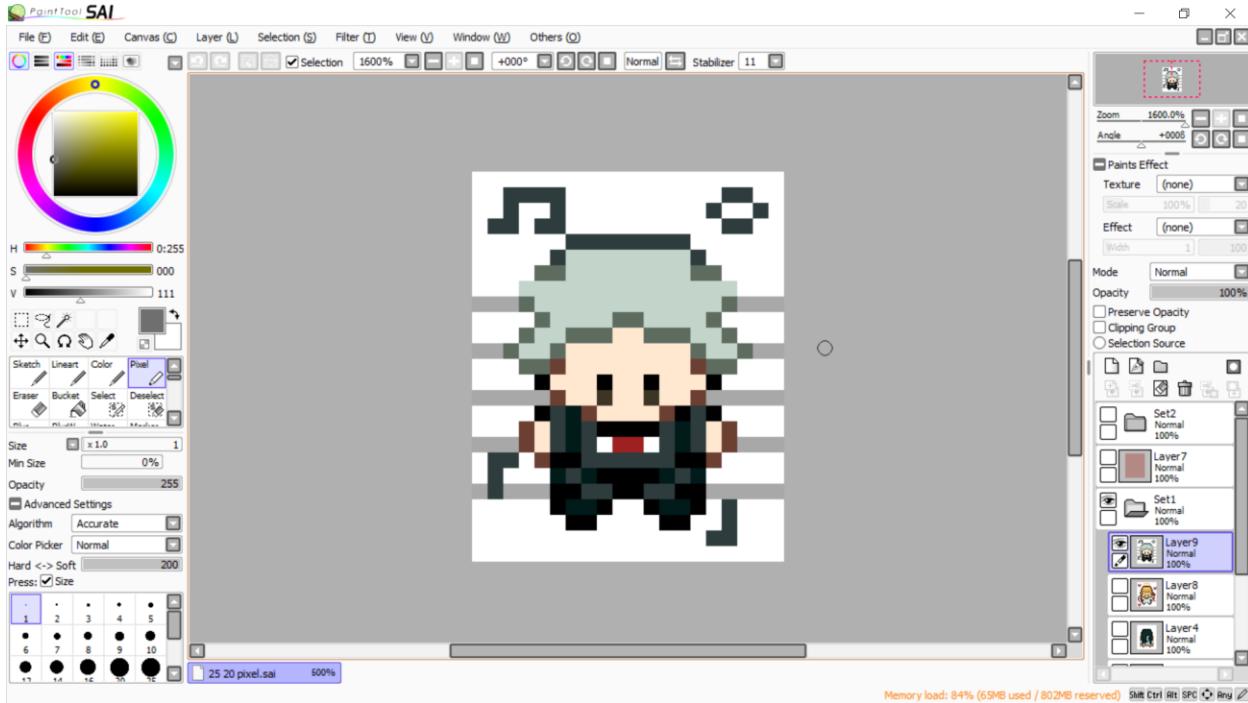


Figure 2.16

Creating a Character Collections Scene

Implementing the character collections scene is like the shop scene, as I would need to clone character containers from the code as well. There are some differences, of course. For example, no money is needed to be displayed or calculated, and when no characters have been bought yet, the collections panel stays empty. When users enter this scene, the **UI_Collections.cs** script will check if there are any characters bought. It then displays whichever characters that have been bought previously. Figure 2.17 shows a few characters collected.

CHARACTER COLLECTIONS



Figure 2.17

Saving and Deleting Data

Data management is simple to implement in Unity with PlayerPrefs. PlayerPrefs only requires three types of actions: Get Data, Set Data and Delete Data.

Of course, the most important data that needs to be saved are the money and the character collections. If those are refreshed every time the user reopens the game, there will be no point to the earning and rewarding system.

Then, users can choose to reset data in the welcome scene. Although it seems unlikely that users would want to reset everything and clear all their hard-earned money as well as the characters, this was a very useful and time-saving method for me to debug the app, as I started implementing PlayerPrefs to save data. I would need to reset the data repeatedly to check and debug any problems with the app.

Figures 2.18 and 2.19 show how data can be cleared.



Figure 2.18



Figure 2.19

There is a bug where all data can only be cleared when the confirm button is clicked twice without changing scenes. I could not successfully debug it; therefore, I took an approach where the users would need to click the button twice as the requirement to delete all the data. In a way, this is also a good way to prevent users from accidentally deleting their data. Needing to click the button twice serves a second chance for the users to keep their old data.

Implementing Mascots

The idea is to have users choose their favourite character to be displayed in the main and welcome scene. In the collections scene, when the user taps on a character sprite, a panel will appear to ask if the user would like to set the selected character as the mascot. By confirming it, the character will then appear in the main and welcome scene. Entering the main and welcome scenes, again, Boolean flags will check if a specific character mascot is set and will display the mascot according to the Boolean flags. These are all implemented in **Mascot.cs**. Figures 2.20, 2.21 and 2.22 below show the process of setting the mascot.

CHARACTER COLLECTIONS



CHARACTER COLLECTIONS



Figure 2.20

Figure 2.21



Figure 2.22

Status (Timer, Total Word Count, Daily Goal)

Users can check their status, such as the total words they have written and their daily word count goal in the status panel. The status button is shown on the top right screen in red to indicate its importance. In the status panel, the current time, daily goal, and total word count will be shown. Users can also set and change their daily goal in this panel. Like the word count record input, users will have to press the Enter key on their keyboard to confirm the amount of their daily goal. Figure 2.23 shows the layout of the status panel, and figures 2.24 and 2.25 show how to set the daily goal. These are implemented in **SetGoal.cs**.



Figure 2.23



Figure 2.24

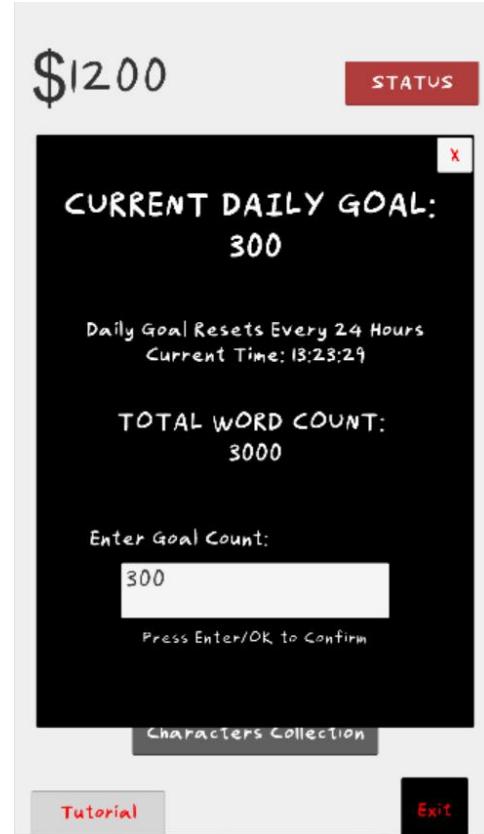


Figure 2.25

When users record their word count and the daily goal is achieved, users will get an extra \$50. After achieving their daily goal, users will not get anymore extra money for the next 24 hours. This is implemented using a timer, which I had to also follow a tutorial on how to track time (see **ClockUI.cs** and **TimeManager.cs**)¹⁹. Figures 2.26 and 2.27 show how the daily goal reward is given.

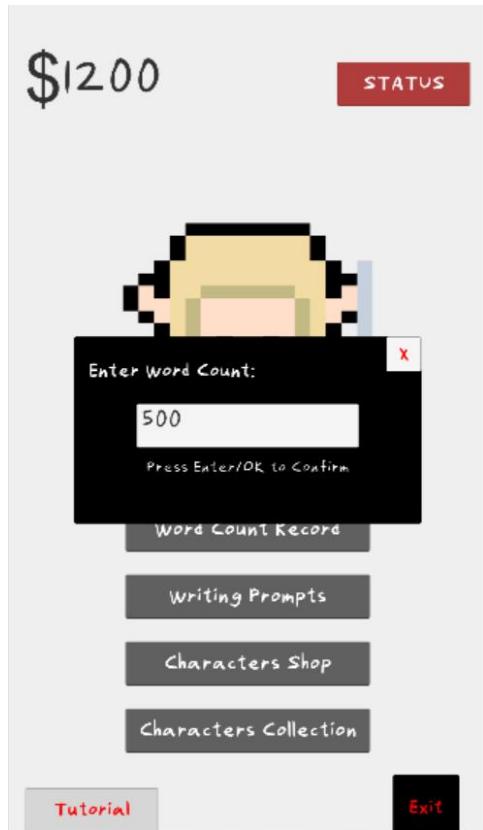


Figure 2.26

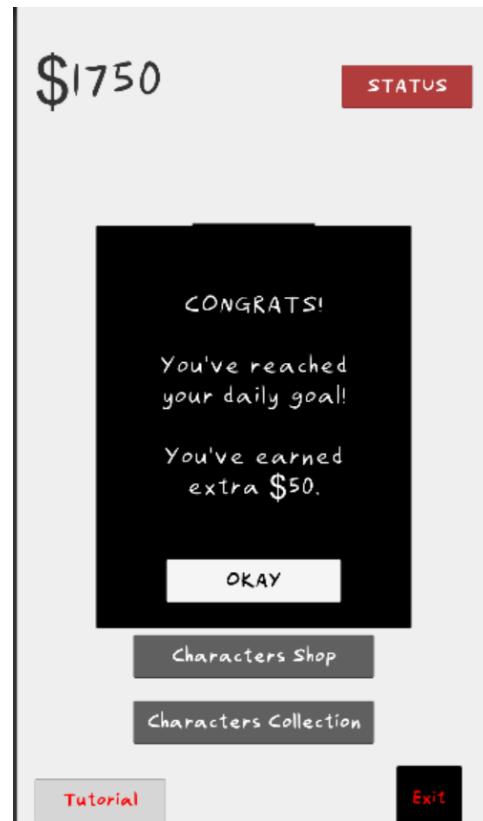


Figure 2.27

Additional Features (Enhancing Prompt Generator, Inspirational Quotes)

I then implemented a few more simple features to make the app a little more interesting. First, I enhanced the writing prompt generator, where when a character is bought, more writing prompts will be unlocked. The unlocked prompts are based on which characters are bought. For example, buying the Romance character will unlock romance genre writing prompts. This will make users who are more interested in the writing prompts to be more motivated to collect more characters, so that they will have varying genres of prompts to write about. So far, there are 65 basic prompts without buying any characters. If all characters are bought, there will be a total of 230 prompts unlocked.

Then, I also added a pixelated speech bubble for the mascots to “talk” when the users tap on them. The speech bubble will contain a randomized inspirational quote about writing and will appear for 5 seconds before disappearing automatically. When the user taps on the mascot again, the speech bubble appears again but with a different randomized quote. I had added this feature as according to the survey, some writers would like to be motivated by inspiring quotes. Generating the quotes is the same concept as generating the writing prompts (see **Quotes.cs**).

Figure 2.28 shows how the speech bubble pops out when the mascot is tapped.



Figure 2.28

Adjusting and Enhancing Interface (Fonts and Colours)

During my development process, I had asked a few people to test the prototype of the app. Some people gave the feedback where the font was quite hard to read. The font I originally used was Fineliner, a font I simply downloaded when I was following a tutorial to set up my Unity project¹⁷. It turns out the cursive writing was hard for users to distinguish the letters. Hence, I changed the font to C6010-Regular, which is my own handwriting converted into a font.

I had also changed some of the panels' colour to black instead of gray to create a more distinguishable and contrasted look.

Figures 2.29 and 2.30 show an example of the before and after appearances of a panel.

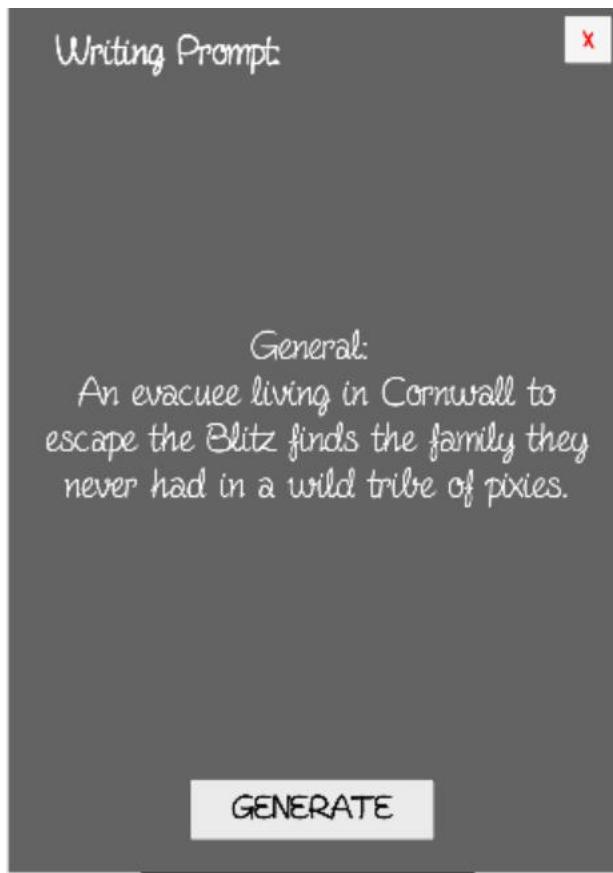


Figure 2.29

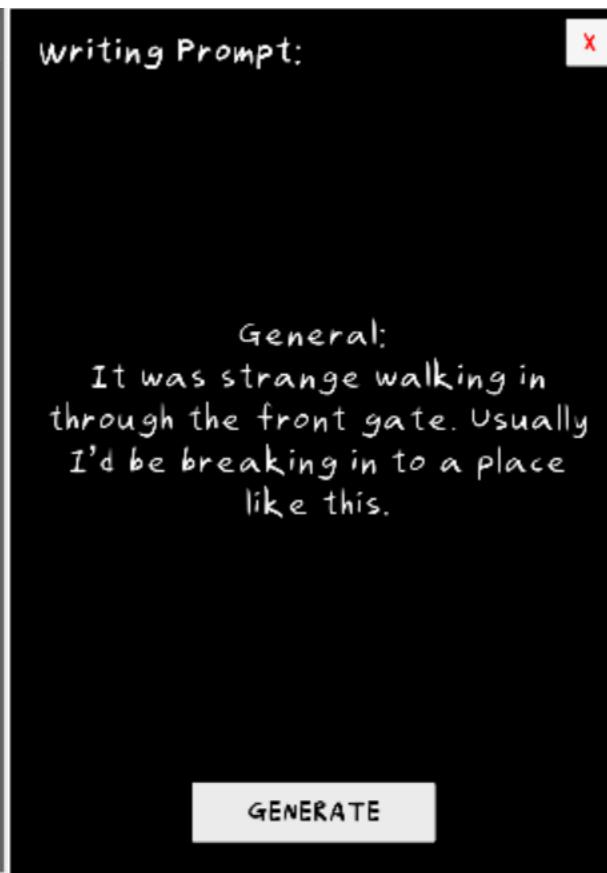


Figure 2.30

Changes and Updates in Development of the App

During the process of developing the app, I had gone through a few changes for it:

- Adding inspirational quotes
 - I did not include inspirational quotes as part of my proposal because I did not figure out where I could ideally place them back then. It was during the development process that I figured I could make the mascots “speak” the quotes.
- Adding a tutorial panel
 - Towards the end of the development process, a few users gave the feedback where they did not know about the underlying and unexplained features such as the daily goal reward, the mascot setting and so on. Realizing that I did not give the users a tutorial or guide in advance, I quickly created a tutorial panel in the app, with its button at the bottom left corner of the main scene. The tutorial of the app is only explained in text in a long scroll view. I could not give the test users a live demonstration or tutorial due to the COVID-19 outbreak and country lockdown. Figure 2.31 shows the tutorial panel upon tapping the tutorial button.

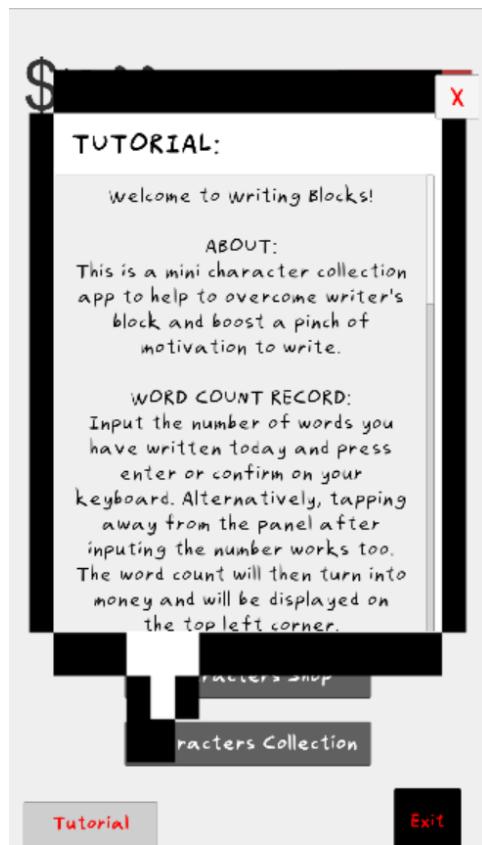


Figure 2.31

- Adding a PC version
 - Due to the lockdown, I had to let participants test out the app by downloading the app themselves instead of doing a live demonstration. Therefore, there were cases where users were unable to use the app because their phones are not Android phones. Writing Blocks was only built for Android phones. Hence, I created a PC version by the last minute, just for users who at least have a Windows desktop to test the app. The PC version functions exactly the same as the mobile version, but in a different resolution and layout arrangements. Figure 2.32 shows the interface of the main screen of the PC version.

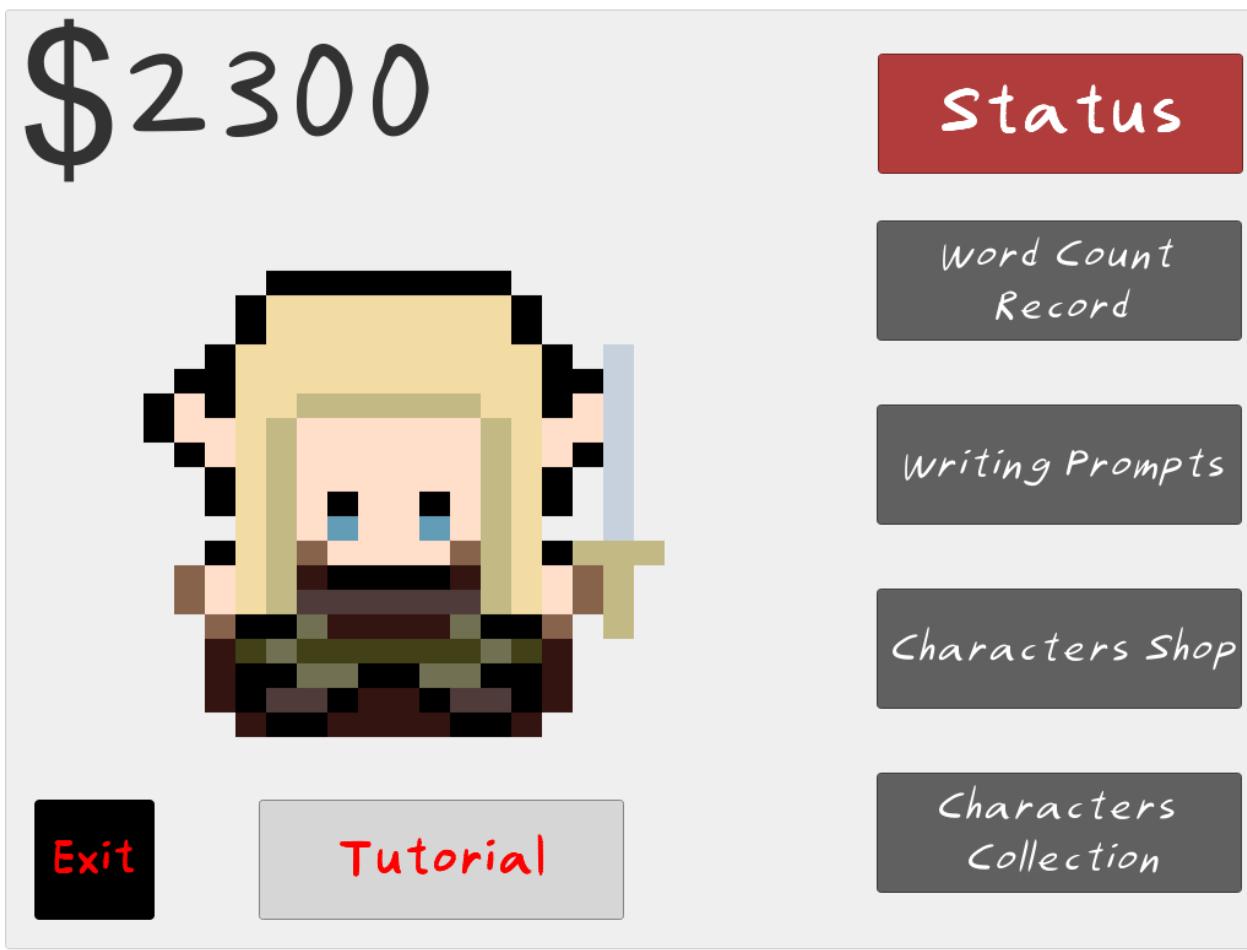


Figure 2.32

Workload Management

I had prepared a backup of my projects and assets on a Google Drive and on Github. As for organizing my work for this project, I made a short list of things I would like to do in sequence, from surveying to a step by step list of implementation, and then I tried to follow the list by working on the project for an average of 2 hours per week.

User Interface Design

Besides writing clean and “dry” codes, and making the algorithms behind the app system work, the user interface design is also vital in app development. No matter how well written and developed is the app, it would still be impractical if users do not have easy access to the app features.

Here, I will reference the “10 Rules to a Good User Interface Design”, written by B.J. Keeton²⁰, and explain how these rules were applied in the app. Although the article specified for every web design project, the same will still apply in any kinds of application development or design in general.

1. Necessities are Readily Accessible

- The main features of the app, such as the word count record and the buttons leading to the shop and collection pages are shown in the middle of the main scene for users to access straightforwardly, and not hidden elsewhere.

2. Consistency

- The app only uses one type of font, as using too many fonts may confuse the users. By standard, the body text should only stick to one type of font, and another font for the headers and so on. However, I decided to just use one font for everything.

3. Clarity

- Users should know what each feature does. For example, when a character is bought, a big “SOLD” text will cover over the character sprite. Also, in the prompt generator, the panel starts off by telling the users to “Generate Me”, so the users would know that they should click the GENERATE button to generate a random writing prompt.
- However, I failed to present a good way to show how the daily word count goal works. I had then created a tutorial panel to further clarify all the features of the app.

4. Feedback

- The app should respond whenever it performs an action, to let the users know what has happened. For example, in the character shop scene, when the user buys a character, a panel will show up with a message saying that the character has been bought. Another example is when the user inputs their word count and reaches their daily goal, a message will appear indicating that the goal is reached.

5. Use Recognition, Not Recall

- Buttons should be designed in a way that the user can recognize their uses. For example, the Exit button in the main scene is the smallest button, and the Close buttons are designed as a small red X at the top right corner of each panel, indicating that it is a close panel button.

6. How People Interact with the Device

- This is especially important for mobile apps. Writing Blocks was designed in a portrait (vertical) resolution of 1080x1920. This is because usually, mobile phone users will hold their phones vertically, and very less likely horizontally. It is also common for smartphone users to swipe their screens or slide their finger on it. Therefore, the character shop, collections and tutorial panel have a scroll view for

the users to slide their finger to scroll, instead of using up and down viewing buttons.

- It is also important to note that users interact with their phones mostly with their thumbs, and judging by the position their thumbs are placed, it is always on the bottom half of the screen. This is also why in the main scene, the buttons are below the mascot, and not the other way around.

7. Conventional Design Standards

- As mentioned above, the close panel buttons are designed as a small red X on the top right of the panel. This is because this design has been widely known as the “close window” button, and it would not be wise to go against the norm.

8. Elemental Hierarchy

- This depends on the importance of every single element. For example, in the main scene, the mascot is shown in the middle and takes up half the space of the scene. This is because as a mascot, its purpose is to stand out aesthetically and strikingly. In Writing Blocks, the money will also always display on the top left corner. Also, the Status button is red and placed at the top right of the scene, indicating that it is information equally important as the money displayed, and it serves a slightly different purpose from the other buttons.

9. Simplicity

- As mentioned before, a cluttered or complex interface can confuse the users. In Writing Blocks, the interface elements are mostly aligned and spaced out so that they do not look cluttered. Also, as mentioned previously, Writing Blocks follows the simple colour scheme of only red and monochrome colours. This is to prevent users from getting confused as to which colours indicate elements that stand out more, in this case, red is the only colour that will stand out from the monochrome colours such as white, grey, and black.

10. Users have Freedom and are In Control

- Users should not feel restricted when using an app. Although Writing Blocks does not allow refunding bought characters, users still have the choice to confirm their purchase, in the case of accidentally tapping onto a character sprite.

APP DEVELOPMENT STUDY

Description

Participants are asked to download Writing Blocks themselves, either the APK file or the PC application to test out the application. Then, they are asked to fill in an evaluation form to give a review on how is the user experience and the effectiveness in writing productivity, as well as giving feedback on what has been done well and what needs to be further improved.

Initially, a live demonstration was going to be given to test the effectiveness of using the app with or without a live tutorial. However due to the COVID-19 outbreak and country lockdown, this became impossible.

As this study requires some form of human participation in testing the app on their own devices as well as giving out feedback and reviews, I had to fill in an ethics application online. This project has been ethically approved by the Research and Enterprise Development's Ethics Online Tool.

Effectiveness (Hypothesis)

Participants who used the app will have an improvement in writing productivity compared to before using the app. To be precise, the word count after using the app will increase.

Experimental Design

Experiment Procedure

1. Participants are given a consent form to sign. This is because this research needs human participation to test the app, and hence the app needs to be ethically consented before using.
2. After that, participants are given the link to the Google Drive containing the APK file and PC version of the app, and the link to fill in the evaluation form.
3. Participants should ideally have previous writing experience and record their word count before testing the app.
4. Participants then download the files into either their phone or Desktop to test out the app, and record their newest word count as they use the app.
5. Finally, participants fill out the evaluation form to give feedback on the app.

Variables

Independent variables:

- Status before using Writing Blocks
- Status after using Writing Blocks

Dependent variables:

- Word Count Record

Participants

Participants were originally planned to be the members from University of Bristol's Poetry and Creative Writing Society. A live demonstration was planned to be performed during one of the writing sessions. Unfortunately, due to the lockdown, the demonstration could not happen, and I could not get enough attention on social media groups.

Hence, participants are of random acquaintances and friends, where a couple of them do write more diligently and hence have previous word count records before using Writing Blocks.

Improvement Percentage

An improvement percentage is calculated to determine how much a participant has improved in writing productivity. The formula is as below:

$$\text{Improvement Percentage, } I\% = \frac{\text{Average Word Count Difference}}{\text{Average Word Count Before Using the App}} * 100\%$$

Results

A total of 8 participants had tested and evaluated the app. However, only 3 had given their word count data.

Productivity Results

Table 3.1 and Figure 3.1 show the results of three participants' word count records and the average word counts.

Word count	Word count before using the app	Word count after using the app	Word count difference
Participant 1	1500	2100	600
Participant 2	500	1000	500
Participant 3	500	950	450
Average	833	1350	517

Table 3.1

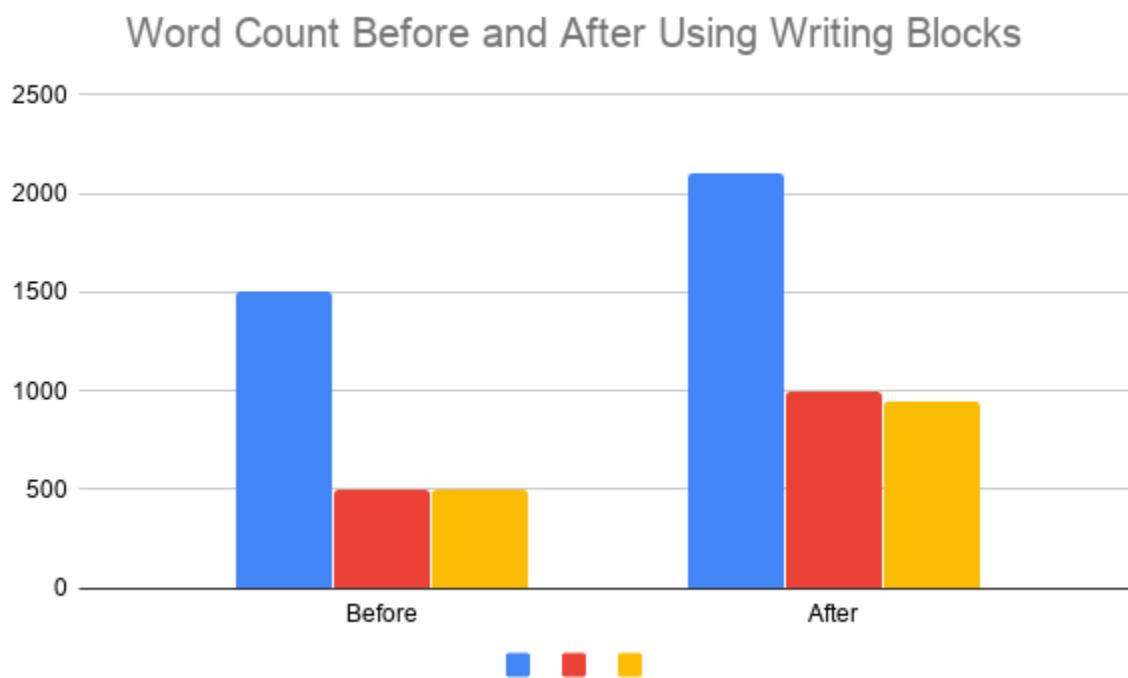


Figure 3.1

The improvement percentage is then calculated using the formula mentioned above,

$$I = 517/833 * 100\%$$

$$I = 62\%$$

Statistical Significance

Calculating only the improvement percentage is insufficient, as I would need to further analyze the data to find out if the difference between the word count before and after using the app is

significant, and also to find out if I had enough participants in this study to perform accurate analysis.

I used a program called SPSS to record and run analysis tests on my data.

ShapiroWilk Test

After gathering the data, I wanted to find out its statistical significance. To test this, I had to first determine if the data was normally distributed, as the test to calculate statistical significance will depend on this. I used the ShapiroWilk test to run on the word count data, for both statuses of before and after using Writing Blocks. The null hypothesis states that the data is normally distributed.

According to Table 3.2 below, the red text shows that only the word counts after using the application has a significance level higher than 5%, which in this case is 7.3%, and there is 0 p-value for the word count data before using Writing Blocks. This means that the word count data after using the app is normally distributed, whereas the ones before using it is significantly deviated from being normally distributed. Therefore, the null hypothesis could be accepted.

Tests of Normality							
Word Count	Status (Before/After)	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
	Before	.385	3	.	.750	3	.000
	After	.372	3	.	.783	3	.073

a. Lilliefors Significance Correction

Table 3.2

One-way ANOVA (Analysis of Variance)

Next, I used a one-way ANOVA, which is an Analysis of Variance test to check the significant difference in the condition of before and after using Writing Blocks. According to Table 3.3 below, the results state that there is a p-value of more than 0.05, which is 0.361, shown in red text. This means that there is no significant result.

Not only that, the table shows that the observed power to the test is only 12.7%, shown in blue text. This observed power defines the probability of detection of a significant difference. Since the probability is very low, it proves that the number of participants who evaluated the app and provided their word count record is simply insufficient.

Tests of Between-Subjects Effects

Dependent Variable: Word Count

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	400416.667 ^a	1	400416.667	1.060	.361	.209	1.060	.127
Intercept	7150416.667	1	7150416.667	18.921	.012	.825	18.921	.894
Status	400416.667	1	400416.667	1.060	.361	.209	1.060	.127
Error	1511666.667	4	377916.667					
Total	9062500.000	6						
Corrected Total	1912083.333	5						

a. R Squared = .209 (Adjusted R Squared = .012)

b. Computed using alpha = .05

Table 3.3

Questionnaire Results

Figure 3.2 below shows that participants have an above average user experience when using the app, from a rating of 1 (bad) to 5 (great).

As shown below, the user experience has an average rating of 3.9 over 5.

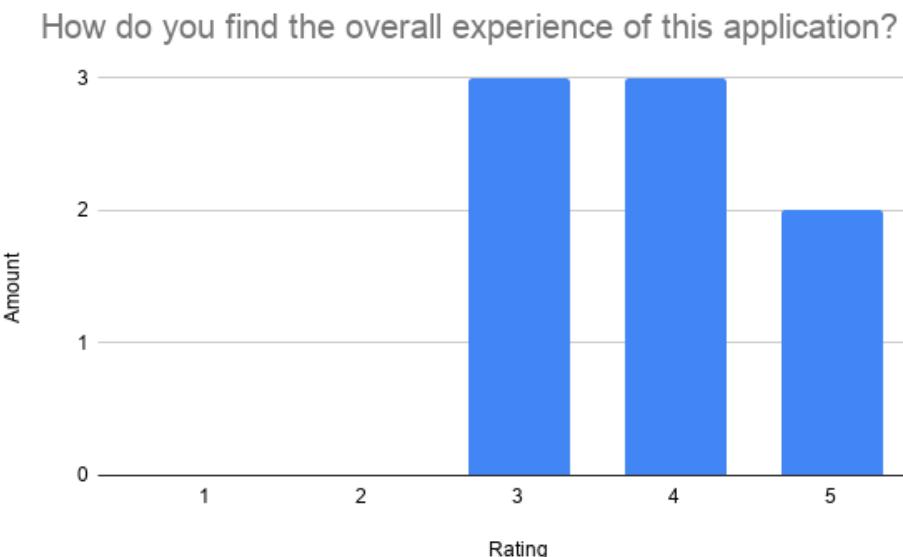


Figure 3.2

Figure 3.3 below shows that most participants think the app has average or above potential to overcome writer's block, from a rating of 1 (useless) to 5 (useful).

As shown, it has an average rating of 3.35 over 5.

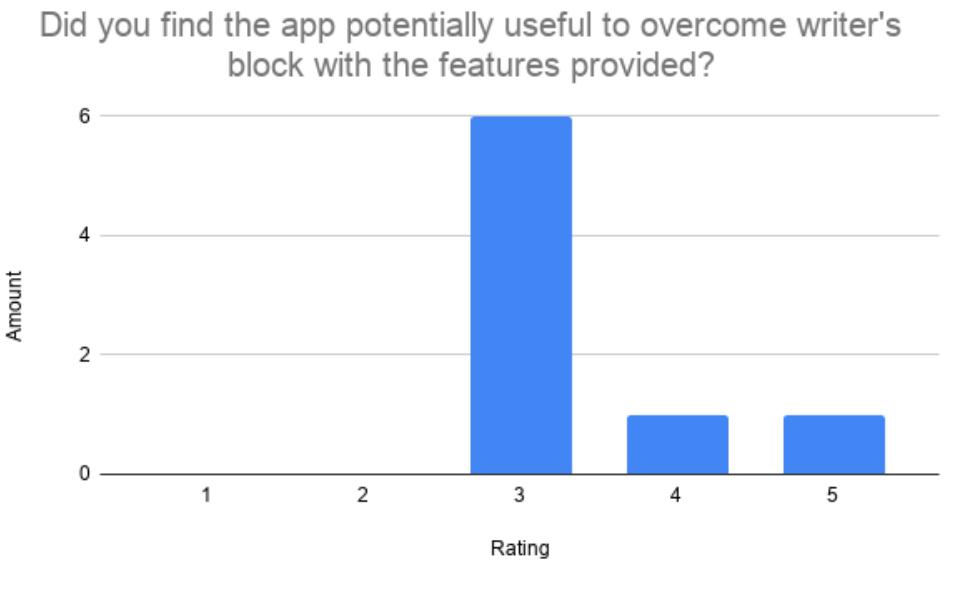


Figure 3.3

Participants also answered a few long answer questions as below:

QUESTION: What are the strong points of this app (if any)?

- **RESPONSES:** Most of the participants were pleased by the aesthetic and the character art. They also thought that the rewarding system to earn buy characters is interesting and motivational.

QUESTION: Are there any other features you would like to see in this application (besides adding in more characters)?

- **RESPONSES:** Each response had given a very different suggestion. Some suggested having more rewards, like character backstories, wallpapers, and more daily reward money. Others suggested having additional features like notetaking, a desktop version (which I implemented it in the end), and graphs to track word count productivity and progress.

QUESTION: What can you suggest to further improve or develop the application?

- **RESPONSES:** The first few participants stated that the UI needed improvement, mainly the controls, and font was hard to read. I had changed the font and colours later, as well as adding a tutorial panel so that they would understand how the controls and features worked. Others suggested the app to be either more interactive or have more additional features like mentioned in the previous question.

Study Conclusion

As calculated above, participants will have an average writing improvement of 62%, which means writers would write 162% of their usual amount. It is considered an above average improvement.

However, this is not an accurate enough data as there were only three participants involved. In data science, it is fundamental that the more data we have to a certain extent, the more accurate the information is. The insufficient number of participants has been proven by the ANOVA test, showing a low probability of 12.7% regarding the detection of significant difference in data.

If the study were to be conducted again, I would have done a few things a lot differently:

1. Firstly, I should have gone through a prototype test and get a few feedbacks before letting participants officially evaluate the app. This is because I changed the font and colours halfway through the evaluation process.
2. I should have also considered a desktop version since the beginning, as well as finding a way to build the app for different operating systems.
3. Lastly, I did not have participants attempt to do a free writing session in advance before using Writing Blocks, which I should have, so that I have more concrete data to calculate and perform analysis on.

Concisely, I would need to plan further and in advance when it comes to experiments and its study, and not just about focusing on constructing the app.

MITIGATION TABLE

Due to the COVID-19 outbreak and country lockdown, departments had been closed, and outdoor activities had been canceled. This had led to a few difficulties for me to conduct my research project. Hence, the mitigation table below is shown to explain the issues I faced, its impacts and the actions I took.

Event/Issue	Potential/actual Impact on project	Action(s) taken to mitigate impact on project outcomes	Remaining impact
No live demonstration of the project could be performed to writer participants due to lockdown and cancellation of society activities.	Key data which is the word count record from writers could not be obtained directly from the group of participants.	Gathered as many participants and data as possible.	Insufficient metrical data to perform analysis on the effectiveness of the app.

THESIS CONCLUSION

My main goals for this thesis, mentioned in the foreword, were:

1. To study the causes, impacts and treatment for writer's block, then making a technological approach to overcome the problem.
2. To develop my app, Writing Blocks, according to this approach.
3. To find out the important aspects of developing an app, like the user interface design and what the users want and expect.
4. To perform analysis on the effectiveness of the app towards writing productivity and prove that it shows improvement.

The first goal was where I did research in the first section of the thesis, which is the introduction and background of writer's block. There are many causes to writer's block, and the impacts are mostly psychological, preventing writers from being productive. It is not a mental illness and hence quite a tricky topic to decipher, and there are many ways to overcome it, depending on the individuals themselves, but the most common solutions are managing one's goal or writing freely. I then gave examples of a few technologies used to overcome it and researched on the importance of having goals, motivation, and rewards. Then, I proposed my idea of creating an app to reward writing productivity. In general, I have achieved this goal by not only researching by reading alone, but also through surveying, which is a useful human resource to understand more on a topic.

The second goal was to create Writing Blocks from scratch, using the approach explained in the background chapter. The process of developing my own app was explained in the Implementation chapter. I first explained why I used Unity to develop my app. Changes were made throughout the development process, such as the additional feature of the inspirational quotes, as well as the PC version of the app. Then, I went through the 10 rules to a good interface design and explained how they were applied in my app. All the resources can be found on my Google Drive, Github, and the submitted zip file. I have achieved most parts of this goal, with a few minor changes but overall, the main features of the app were successfully implemented as planned. If I had more time, of course, I would add more characters and prompts, as well as to plan more precisely and thoughtfully on where to build the application to.

The third goal was to understand what the audience desires for a good and well-developed app. This goal was achieved by processing through the feedbacks from participants via the evaluation form. I had asked a few participants to test out the app and fill in an evaluation form. The data

was then collected and analyzed in the chapter of App Development Study. The evaluation showed that the review of the app was mostly average and above, the same for its potential usefulness to overcome writer's block. Participants were also required to give in detailed feedback, such as what is good about the app and suggestions to improve it. All in all, participants were delighted by the art and the rewarding concept, but also mostly interested in a better user interface and more features.

The fourth goal was to gather data of how many words the participants can write before and after using Writing Blocks, then comparing the improvement. This experiment was also performed in the third section of the thesis, which is the App Development Study. I first hypothesize that the app will show an above average improvement in writing productivity. I then performed some calculations on how much the participants' writing improved before and after using Writing Blocks. The results show that the improvement increases by more than half, however as the data is minuscule it is not accurate enough to hold onto the hypothesis. To prove that, I also ran a few tests on my data in SPSS, namely the ShapiroWilk test and the ANOVA test. It showed that there was not a significant difference in the data, and the number of participants is not enough. Therefore, the desired goal to solidly prove that the app is effective in terms of writing productivity improvement was not entirely achieved.

The worktime I had spent on this project was about 60~70 hours of app development, 40~50 hours of study, analysis, and surveying, and about 70~80 hours of writing the thesis. Therefore, it was a total worktime of around 170~200 hours. This project has made me learned how important it is to plan an app development, work management and to study more on a topic to solve problems for the audience with technology. I look forward to using these skills I learned to further improve Writing Blocks and develop any other applications in the future.

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APPENDIX

APPENDIX A – FULL ETHICS APPLICATION FORM



Faculty of Engineering Research Ethics Committee

Upon completion this application form should be uploaded as an attachment, together with documents referred to in the application, to your online ethics submission. This form should be completed in conjunction with the guidance form.

Questions 1-12 Contact Information and Study Details	
1.	Title of the research: Overcoming Writer's Block With Mobile App
2.	Applicant details: Student Name or Principal Investigator: Janie Tey Job or Course Title (UG or PG): UG Computer Science BSc Contact number: 07724823475 Email: Jt17196@bristol.ac.uk
3.	Details of Supervisor (if applicant is a postgraduate or undergraduate student) Name: Simon Lock Title: Dr Contact number: +44 (0) 117 954 5145 Email: simon.lock@bristol.ac.uk
4.	Other investigator(s) involved, with job title: n/a
5.	Source of funding: n/a
6.	Start Date and Project Duration: Start Date: November 2019 Duration: 6 months
7.	Where will the study take place? Online

8.	Background and aims of the study:
	<p>1. Background: Writer's block is, as usually defined, the inability of an author or a creator to write new works. The cause of writer's block varies from creative slowdown, to lack of motivation or inspiration, to perfectionism, stress, or health issues. One of the ways writers tend to fight back writer's block is to write as much as they can every day without stressing themselves too much, whether the quality is the best or not. Therefore, word count is significantly important to writers. "Writing Blocks" is a simple mobile collection game to track a writer's word count every day and reward them in-game coins based on the amount of words. Writers can also customize their own daily goal, and they will be rewarded extra coins if they achieve their goal. However, to not overstress the writers, the game will encourage smaller goals to be made, as the extra coins rewarded will not increase even if the daily goal increases. Then, with the in-game currency, writers can exchange game items and characters. To make the rewards worth the effort, the exchangeable items and characters will also focus on being visually attractive or interesting. Some writers would also usually prefer taking a break from technology, searching for ideas and inspirations. Hence, this simple application is meant to be only used approximately 5 minutes every day. It will be designed to be non-intrusive so that writers do not get overly distracted by just playing the game and not actually making any progress in writing. As an extra feature, the game will also provide a random prompt generator for writers who need a drive of creativity and inspiration. The application will be developed in Unity using C# as the main programming language.</p> <p>2. Aims:</p> <ul style="list-style-type: none">- To research what are the potential causes of writer's block- To research what are the most recommended ways to overcome writer's block- To research what are the implications of using technology such as a mobile app to overcome writer's block

9.	Outline the design of the study and list the procedures to which the participants will be subjected, the anticipated testing time and any treatments administered:
	<ol style="list-style-type: none"> 1) A quick survey was conducted to propose the idea of the mobile app and collect ideas on what causes writer's block and how to overcome it. 2) Online research was also done to investigate for more scientific reasonings. 3) Mobile app was developed. 4) A demo / prototype version is then given out to participants in the form of either an APK file or a PC program. Participants then will need to download the application to run and test it. 5) Participants will then need to fill in an evaluation form to review the application. 6) There was initially going to be a public demonstration session, but due to the COVID-19 outbreak, demonstrating in person became impossible and hence would need to be conducted online.
10.	Does your study involve the collection or use of any human tissue or exudate? If yes, what is the material to be collected?.
	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	If yes, please explain:
10a.	If you have answered 'yes' to Q10, has confirmation been obtained from your Departmental Human

Tissue Act Advisor that collection and storage of this material will be undertaken under an appropriate licence?		
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
11. Will the research involve working with animals?		
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, please identify how you will address any animal welfare issues and whether you have undertaken ethical review elsewhere (e.g. zoo or national park authorities). Please also see the relevant guidance.	
12. Has this study been subjected to peer review?		
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Questions 13-22 Recruitment and Informed Consent	
13.	Who will be recruited to participate in this study?
	<ul style="list-style-type: none"> - Initially, people from the Creative Writing Society would be recruited. - But due to the COVID-19 outbreak, I will be recruiting anyone who is willing to give the application a try.
14.	Are there any potential participants who will be excluded? If so, what are the exclusion criteria?
	n/a
15.	How many participants will be recruited?
	<ul style="list-style-type: none"> - Ideally 5 to 10.
16.	How will the participants be recruited?
	<ul style="list-style-type: none"> - Via online, by downloading and testing the app themselves and filling in the evaluation form online.
17.	How will informed consent be obtained from all participants or their parents/guardians prior to individuals entering the research study?
	<ul style="list-style-type: none"> - A short form will be filled out.
18.	How long will potential participants have to decide whether to give consent?
	<ul style="list-style-type: none"> - As soon as within a day or two
19.	Will participants be kept informed of new information that becomes available during the study which may influence their continued participation?
	<ul style="list-style-type: none"> - Not necessary

20.	Will the study involve actively deceiving, or withholding information from, the participants?
	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	If YES, explain why it is necessary to use deception and state how you will ensure that the participants are provided with sufficient information at the earliest stage, and how you intend to ameliorate possible distress caused by the deception, including a plan for subject debriefing.
21.	Will participants be made aware that they can withdraw from the study at any time without having to give a reason for doing so?
	Yes
22.	Describe potential risks (physical, psychological, legal, social) arising from these procedures:
	N/A
22b.	Is there likely to be any risk to the investigator during this study?
	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	If yes, please explain how this will be minimised
22c.	Is there likely to be any risk eg. legal, adverse publicity, to the UoB?
	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	If yes, please explain

	Questions 23-32 Outcomes and Data Protection
23.	How will participants be informed about the outcome of the study?
	<ul style="list-style-type: none"> - Data from the feedback of participants shall stay anonymous
24.	How will the results of the study be disseminated and reported?
	<ul style="list-style-type: none"> - Through the final year thesis
25.	Is any payment other than reimbursement of expenses to be made to participants?
	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If YES, outline the reason for this and the amounts involved.
26.	Will personal data, beyond that recorded on the consent form, be used in the research?
	No
27.	Will the participants be audio-taped or video-taped?
	No
28.	What arrangements have been put in place to ensure confidentiality and security of data gathered in the study? Will the data be stored in hard copy or electronically, and where will it be held?
	<ul style="list-style-type: none"> - Data will be stored electronically in a sheet. Participants will evaluate the form anonymously and the data from the evaluation form will only be used in the thesis.
29.	Has this proposal been seen by or submitted to another ethics committee?
	No

30.	Do any of the investigators have any actual or potential conflict of interest in this study?
	No
31.	Is there any other relevant information you would like to make known to the committee?
	N/A
32.	How will the data be made available at the end of the project? You must declare your level of access, see Data Access appendix
	Controlled – any access requests for my data should be referred to committee for review on a case-by-case basis
33.	Have you read and understood the guidelines for completing this form (see last page)?
	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

	<p>Appendices</p>
	<p>Informed Consent</p>
	<p>Obtaining informed consent from parents does not obviate the need to obtain informed consent or assent from children participating in research. Assent means that the child shows some form of agreement to participate in the research without necessarily comprehending the nature of the research sufficiently to give full informed consent. Investigators working with infants should take special effort to explain the research to the parents and be especially sensitive to any indication of discomfort or avoidance in the infant.</p> <p>It is good practice to ask participants on the consent form to confirm their consent to keep and make use of the data they have contributed. This allows someone, who for example becomes unhappy about their participation in the research, to prevent their data being used.</p> <p>The researcher should keep signed copies of consent forms securely and separately from the research data.</p> <p>For a questionnaire study, the researchers should consider if the questionnaires can be returned anonymously, in which case a consent form may not be necessary since consent is implied by the subject choosing to participate in the study. Under these circumstances, an information sheet is still required.</p>
	<p>Data Access</p> <p>Research funders and publishers increasingly require researchers to find a way to provide access to their research data, even if that data initially includes personal information.</p> <p>The University of Bristol requires you to assign an expected access level to your research data, your selection will be checked and signed off by the Ethics Committee. If you intend to create multiple datasets with different anticipated access levels you should select the most restrictive access level you expect to use. The four access levels are:</p> <ul style="list-style-type: none"> • Open – my data can be made openly available through a data repository • Registration required – my data should only be available to bona fide researchers, on request • Controlled – any access requests for my data should be referred to committee for review on a case-by-case basis • Closed – my data should not available for sharing <p>If, during the course of your research, you believe that your nominated access level will no longer be appropriate you should inform your Faculty Ethics Officer.</p> <p>You must also ensure that you get the appropriate level of consent from participants at the start of the project to allow for onward use. If you need more information about this please see the guidance on sensitive data http://data.bris.ac.uk/research/storage-and-security/sensitive-data/ or contact data-bris@bristol.ac.uk</p> <p>Guidance on access levels</p> <p>Open – this level can be assigned where consent has been given by participants to make their anonymised data publicly available through a repository, in addition the risk assessment of re-identification of this anonymised data has been classed as low. These data sets can be made openly available through data repositories, including the Bristol Research Data Repository.</p> <p>Registration required – this level can be assigned where consent has been given by participants to make their anonymised data available to bona fide researchers on request, within the terms of participant consent and the risk assessment of re-identification of the anonymised data is low. If the data is deposited with the University of Bristol Research Data Repository requests will be facilitated by the Research Data Service.</p> <p>Controlled – this covers cases where historical consent for sharing is very limited and/or the risk assessment of re-identification is classed as medium to high. If the data is deposited with the University of Bristol Research Data Repository the Research Data Service will forward on requests to a Data Access Committee who will work with you as the PI to decide if/what data is appropriate to be made available.</p> <p>Closed – this covers data that is not available for sharing (except by regulators) because of ethical, IPR, prior exclusive agreements or other constraints. This should only be assigned if you have got prior agreement from the funder that they are willing to allow the data to be completely closed.</p>

APPENDIX B – PARTICIPATION INFORMATION SHEET

Faculty of Engineering



Participant Information Sheet

Project title:
Overcoming Writer's Block with Mobile App

Invitation paragraph

I would like to invite you to take part in my final year project research. Participation is voluntary but much appreciated. I would like you to understand why the research is being conducted and what it would involve for you. Please ask me any questions regarding the project.

What is the purpose of the project?

This project is for my Computer Science BSc final year thesis. The aim for this project is to find out how technology such as a mobile application can aid people, in this case, to overcome writer's block. In detail, it is to find out the causes of writer's block based on participant suggestions and online research, as well as ways to overcome it and boost motivation for writers.

Why have I been invited to participate?

Participants were originally going to be recruited from the University of Bristol's Poetry and Creative Writing Club. Unfortunately, due to the COVID-19 pandemic outbreak, direct demonstration would be hard. Therefore, any participants who are my acquaintances would get to participate, whether they are writers or not, since the idea behind the mobile app isn't just about writing, but also a rewarding mini collection game.

Do I have to take part?

It is up to you to decide whether you wish to participate in the project. I will describe the study and go through this information sheet with you before you participate and answer any questions you might have. If you agree to take part, I will then ask you to sign a consent form. You are free to withdraw at any time, without giving a reason. Data gathered will be anonymised, and as my thesis is needed to be submitted before the end of May, the cut-off date for withdrawal will be ideally the 1st of May.

What will happen to me if I take part and what will I have to do?

Participants will be linked a google drive and an evaluation form. The google drive consists of the APK file and the PC version of the word tracking application. Participants are asked to download either the APK file to their mobile phones, or the PC version to their Desktop. Participants can then take their time to try out the application, preferably for a few minutes in a day. Then, participants can fill out the evaluation form to review the app. The data used in this case will only be the review ratings, the comparison in word counts, and opinions regarding the app.

What are the possible disadvantages and risks involved in taking part in the project?
There will be no risks.

What are the possible benefits of taking part?

Participants may keep the app for personal uses if wish to do so, as the app is a mini character collection game, participants are free to use the app until they collect all the characters and continue to record their word count to their liking.

Will my participation in this project be kept confidential?

You should tell the participant the measures that you will take to keep their participation and any data that you gather through their participation confidential, during and after the study. Here, the participant should be told:

- Data will be collected from the evaluation forms.
- Data will be stored electronically in an Excel sheet.
- All data will be anonymised, and only the project supervisor shall gain access to it.
All information which is collected about you during the course of the research will be kept strictly confidential, and there will be no personal information to identify you through the evaluation forms. Data will be stored securely on my University of Bristol file store. Data will be tightly secured after I have graduated.

What will happen to the results of the research project?

Results of the research will only be used and explained in my thesis and will not be published anywhere else. Results will not be made available to anyone else besides the project supervisor.

No participants will be identified as a named individual in any report or publication.

Who is organising and funding the research?

Department of Computer Science, Computer Science BSc

Who has reviewed the study?

Dr Simon Lock of the Computer Science Department and the Faculty Research Ethics Committee.

Further information and contact details

Contact details:

Email: jt17196@bristol.ac.uk

Tel: 07724823475

If participants have any concerns related to your participation in this study, please direct them to the Faculty of Engineering Research Ethics Committee, via the Research Governance Team, research-governance@bristol.ac.uk

APPENDIX C – WRITER’S BLOCK SURVEY

4/27/2020

Writer's Block Survey

Writer's Block Survey

Hello! I'm Janie (new member of the PCW (also not really a writer)) and I would like to create an application for my final year project. My project will be focused on improving one's productivity or reducing procrastination, therefore as a start I would like to do a survey about writing productivity.

1. What kind of writings do you most commonly do?

Check all that apply.

- Novels
- Short Stories
- Poems
- Essays/Reports
- DnD Plannings/Storyboarding
- Misc. (Art / Music)

Other:

2. How often do you write?

Mark only one oval.

- Everyday
- More than once a week
- Once a week
- More than once a month
- Less than once a month

3. Have you ever experienced writer's block/creativity slowdown/lacking ideas or motivation to write or create?

Mark only one oval.

Yes

No

4. If there is a mobile game that encourages you to write everyday by rewarding you in-game currency for every word per minute and customized goals, how useful do you think this app will be, especially to you? (In-game currency will then allow you to unlock items and characters.)

eg. Your goal today is to write 100 words. At the end of the day, you have written 500 words, thus you are rewarded 500 coins and extra 50 coins for completing your goal. Whether your goal is 500 words or 1000 words, the reward is the same amount so that you don't get stressed for not achieving your goal.

Mark only one oval.

1 2 3 4 5

Really Unnecessary Very Good Idea

5. What do you think are the major causes of writer's block? Do you think an application or a game can help overcome these problems?

6. Do you have any suggestions to overcome writer's block? If implemented in an app, what kind of features do you think will help?

This content is neither created nor endorsed by Google.

Google Forms

APPENDIX D – CONSENT FORM

Department of Computer Science
Tel: 07724823475
Janie Tey
e-mail; jt17196@bristol.ac.uk



CONSENT FORM Overcoming Writer's Block with Mobile App

This document is being submitted to participants, it should outline what it is you are asking them to do, include some of the following headings with relevant information for participants included underneath:

Brief Project Outline:

- *Writer's block is, as usually defined, the inability of an author or a creator to write new works. The cause of writer's block varies from creative slowdown, to lack of motivation or inspiration, to perfectionism, stress, or health issues. One of the ways writers tend to fight back writer's block is to write as much as they can every day without stressing themselves too much, whether the quality is the best or not. Therefore, word count is significantly important to writers.*
- *"Writing Blocks" is a simple mobile collection game to track a writer's word count every day and reward them in-game coins based on the amount of words. Writers can also customize their own daily goal, and they will be rewarded extra coins if they achieve their goal. Then, with the in-game currency, writers can exchange game characters. Characters will also focus on being visually attractive or interesting.*

Do I have to take part?

- *No, participation is voluntary*

Can I withdraw at any time?

- *Yes, you can withdraw at any time without giving a reason. However if you wish to withdraw at a later date please note that once the data has been anonymised your data cannot be withdrawn*

What do I have to do?

- *Download either the APK file or the PC version of the application and test it out. Then, fill in the evaluation form to review the application.*

How will the findings be used?

- *Data such as review rating and word count improvement will be analysed and taken into consideration as research material.*

Will my taking part in the study be kept confidential?

- *Yes, all data will stay anonymous and only used in my thesis.*

What are the possible disadvantages and risks of taking part?

- *N/A*

What will happen to the data collected?

- *Data will be stored electronically in an Excel Sheet. Only people who review the thesis, such as the project supervisor, can access to the data. Data is also archived privately and anonymously.*

Please answer the following questions to the best of your knowledge

YES	NO
-----	----

HAVE YOU:

- been given information explaining about the study?
- had an opportunity to ask questions and discuss this study?
- received satisfactory answers to all questions you asked?
- received enough information about the study for you to make a decision about your participation?

DO YOU UNDERSTAND:

That you are free to withdraw from the study and free to withdraw your data prior to final consent

- at any time/ up until the point of anonymisation on 1.5.2020?
- without having to give a reason for withdrawing?

I hereby fully and freely consent to my participation in this study

Participant's signature: _____ Date: _____

Name in BLOCK Letters: _____

If you have any concerns related to your participation in this study, please direct them to the Faculty of Engineering Research Ethics Committee, via the Research Governance Team; research-governance@bristol.ac.

APPENDIX E – WRITING BLOCKS EVALUATION FORM

4/27/2020

Writing Blocks Demo App Evaluation Form

Writing Blocks Demo App Evaluation Form

Thank you for trying out Writer Blocks, the mobile app I developed to improve writer's productivity and overcome writer's block. Please fill in this evaluation form as feedback is very important for this final year project of mine, thank you!

* Required

1. How do you find the overall experience of this application? *

Mark only one oval.



2. Did you find the app potentially useful to overcome writer's block with the features provided? *

Mark only one oval.



3. How many words did you write before using this app? (if applicable, it can be during your most recent writing session or average per day or week)

4. How many words did you write after using this app? (if applicable, it can be during your most recent writing session or average per day or week)

5. What are the strong points of this app (if any)? *

6. Are there any other features you would like to see in this application (besides adding in more characters)? *

7. What can you suggest to further improve or develop the application? *

8. Any other suggestions/thoughts?

APPENDIX F – SURVEY FORM WRITTEN RESPONSES

QUESTION: What do you think are the major causes of writer's block? Do you think an application or a game can help overcome these problems?

I think perfectionism is a major cause. People need to learn how to just *write* without worrying if the words are perfect.
In my experience I have found that there are two conditions that tend to cause me to get writer's block. Firstly and most importantly, if I am stressed or troubled for some reason, I find it much harder to be creative, as my mind feels saturated with the thing that is bothering me. Secondly, I find that having goals and quotas can help, as it gets you into the habit of writing regularly, even if you feel you can't do your best work. The muse won't visit all the time, but sometimes what you can come up with on a 'bad day' can pleasantly surprise you. It is with this second one I feel a game or app could be helpful.
Lack of motivation / drive; underlying mental health issues. I believe writers block or lack of motivation can be overcome with habit. True writers block is where there is another underlying problem and this should be faced through therapy or other means.
I think the major cause is an unwillingness to push through and get something down, even if it's rubbish. I don't think an app would help me with that.
Being busy or distracted from thinking about writing
Getting stuck thinking about a problem a particular way; procrastinating; vaguely waiting for inspiration rather than properly seeking out a solution. An app may be useful, but I'm not sure exactly how to make one that would help these issues.
Boredom, lack of stimulation
Lack of inspiration, motivation, or self-confidence in your writing. Getting caught up in fixing tiny details of actually writing.
For me writers block comes from doubting myself and overthinking what I have already written to the point that I get sick of it and don't want to write anymore. I am not a gamer so I probably wouldn't use a gaming app. I just wait until I get a moment of inspiration to return to my writing.
Not having the time or motivation perhaps and I think making daily goals of only a short amount of words and having an app that will force you to stick to it would be a very helpful idea
Trying to write something that sounded like a good idea and thus when it doesn't work thinking you can't write anything. I'm not entirely sure how an app could help with this however.
Lack of motivation

Loss of motivation in the long and difficult ‘middle section’ of project, where it’s no longer exciting and the end is still a long way off. A game might help with this loss of excitement and interest.

QUESTION: Do you have any suggestions to overcome writer's block? If implemented in an app, what kind of features do you think will help?

A way to track word count and progress would be cool?

Call me a hopeless romantic if you like, but I find that I am better at being creative in an environment away from human interaction and electronics. If I have writer's block, I find that going on walks in the countryside (not too intensive, so preferably a route I know) gives my mind a chance to daydream and thus helps my creative juices to flow. From this perspective I would be tempted to say an app would be less helpful, as I would find a phone, particularly an internet connected phone, distracting. For this reason, I would suggest making the app as non-intrusive as possible. Social media apps bomb your phone with constant updates and demand you are regularly spending time with them. Don't do that.

An old favourite is doing BICHOK - Butt In Chair, Hands On Keyboard. No moving til words are made. Just do it, and get used to doing it.

For motivation though, the rewards are good. Being able to cheer other users could be helpful, and being able to see how others are doing (could be helpful/harmful depending on user?) - maybe look into features on the NaNoWriMo website for ideas? Could have forums maybe where people can brainstorm, but that again could be helpful or harmful. There's also a game online where you have to type to fight a monster and if you stop for too long it will kill you. Can be useful for people who can't stop editing?

Writing something, anything, because you can always go back and change it later. Er... I don't know how that could be incorporated into an app.

Some kind of daily writing prompts might help

I find doing something mindless, like going for a walk, helps to keep the rest of me occupied so my brain can work. Not sure how you'd put that in an app, though. Also, writing out my thoughts while I ponder a problem helps.

Perhaps a slideshow kind of thing with images? Something to get the brain going
Writing prompts

Encouraging messages, reward systems, tips about removing distractions like social media.

I think you want something that will not distract too much from the main goal of writing, but maybe offers a chance to switch your brain off every now and then, such as regular rest periods, but at the same time, if you are in the flow of writing you generally don't want to be interrupted.

An ability to set yourself rewards given for completing a certain amount of work (so like I can agree to treat myself to a shopping trip or something if I finish a chapter)

I think in an app that simply tries to get people to think about different styles of writing and topics, to open up . Personally I can't write with that kind of system of words or first on an app.

Inspirational quotes, first sentences from popular books.

A focus on writing little and often

APPENDIX G – EVALUATION FORM WRITTEN RESPONSES

QUESTION: What are the strong points of this app (if any)?

The art is super cute. <3
I like the incentive of earning money from word count to buy characters and that it can generate prompts
I like the coin system, it's rewarding and motivational
The graphics for the characters are aesthetically pleasing, the genres of writing prompts depending on the characters you unlock is a good way to kick start the writing process
the writing prompt
The mascots are super cute. <3
Unlocking interesting characters by earning money which is converted by words
Motivation for users to write more words so that they can buy new characters that they like

QUESTION: Are there any other features you would like to see in this application (besides adding in more characters)?

Graphs about your daily word count?
Maybe a timer and a desktop version. I feel with a desktop version, you can add in copy/paste the actual writing and have it count the words to authenticate it
Other types of rewards would be nice too, like wallpapers?
I would like to see a note-taking library feature in the app.
Also a blank mascot character to start with, As I did not know that is where the other characters will appear when I select them. (And because when I first tapped on the screen, a blank speech bubble appeared and I had no clue what it was for, I assumed it was a bug)
1. Each character has a story could be better, like character's background 2. There can be a very expensive character that if people buy it , they can modify the character on their own and write the story on their own. A kind of a creative part that writer can demonstrate their own personality and it will be interesting to show others their collection.
Perhaps graphs displaying your word count over time etc? And a way to create goals and deadlines that you can work towards?
Earn double money if target amount of words are achieved
NA

QUESTION: What can you suggest to further improve or develop the application?

Perhaps more of an incentive to collect the characters? Can you fight with them? Date them idk
Mostly it's just UI stuff. The font is hard to read and when I tap to enter words/goals, the keyboard doesn't pop up automatically and I was a bit confused on where to enter them.
You could try out other fonts and see which font would work better?
The word count record doesn't work after keying in the first time, I have to exit to the homepage and go back in in order to key in the word count again.
It would also be good to indicate from the start (pop up window or the initial blank character can say so in their speech bubble) that you get different genre of prompts when different characters are unlocked. It was very unclear until I unlocked the characters and looked at the prompts again
I think it would be better if character can appear on the top of character collection
Mentioned above.
add more phrase while the mascot is clicked
Maybe the app could be more interactive and have like a game for users to get creative ideas and flow