# The English as a Second Language flashcard system

# Project Overview

## Topic

The project is to create a flashcard system for teaching basic English nouns to children whos’ primary language is not English.

A flash-card is a match between an image of an object and its name (in English), and an sound file demonstrating how the work is pronounced. The software will teach basic English nouns to children using a flashcard system. It will have mini-games to keep the children interested and engaged through the process. Users will be able to customise the app by adding their own flashcards. The customisation will empower the end-user to improve the app for use in ways that fit their ESL curriculum.

We intend on building a small, focused application that provides a simple tool to help with this specific part of language acquisition. The product will be available as a standalone website and on app stores. We also hope to make the software offline functional to enable use by remote communities who don’t have high-end technology or qualified teachers to teach English.

## Motivation

People worldwide consider English to be the most valuable language to learn as a second language (Taylor, 2020). Research has predicted that the market for learning English as a second language (ESL) will grow 7.1% and is expecting to hit the $54.8 billion mark by 2025 (Research, 2020). Our motivation is to tap into this growing market and help children learn some English in areas of the world that do not have access to native English speakers to teach them, such as Vietnam where there is currently a lack of English teachers available (News 2020 ).

Completing this project would show that our team was able to work together to produce a viable product. It would demonstrate that we could identify a need and craft a solution that fits within it. We consider success to be a high adoption rate. If successful, our project will an example of us using our skills to help the global community.

## Landscape

There are many existing applications in the market for teaching children second languages, especially English, as it is the most popular second language. A popular ESL flashcard system aimed at ESL kids is called Lingo Kids ([www.lingokids.com](http://www.lingokids.com)). We see three significant differences between our application and Lingo Kids, being:

1. ours can be customised, by adding new flashcard decks
2. We will allow people to share their customisations
3. We will also provide our application one hundred per cent free

Many of the competitors in this market seek to generate income from selling in-app advertising. In adopting this strategy, our competitors inherently geared towards more affluent urban areas that can access the items advertised.

For our motivations, market penetration (numbers uptake) is more important than profitability – our motive is to demonstrate our IT skills. We hope our strategy of not charging, or including advertising, will make the application more favourable for kids in rural, less wealthy areas. Because of this, we are open ourselves to a significant market segment that other competitors don’t value highly.

# Aims

## Project Aim

#### 1.0 Build an English as a Second Language flashcard system.

We aim to develop a basic working ESL flashcard application that can dynamically load new flashcards. We see two enhancements that follow, as detailed below

### Enhancement Aims

#### 1.1. Add mini-games functionality

The mini-games will make learning with the flashcards more engaging of children.

#### 1.2. Add flashcard customisation

The customisation will allow users to add new flashcards by combining a word with an image. The user will then be able to store their new cards in custom decks.

#### 1.3. Add customisation sharing options

Users will be able to store custom decks on the cloud. The community of users may search and download any custom decks where the owner has made them to publicly accessible. We envision forceful censorship to ensure the appropriateness of the content is maintained.

## Goals To achieve project aim 1.0

### Outline the core functionality of the application

List the core functions the application will provide.

### Draft a menu workflow

Decide how the application will flow between functions and draw up a menu structure that will enable this.

### Create a workable main menu and .exe package

This goal would be to create a working main menu prototype for our ESL flashcard software and allow it to be run on a Windows operating system from an executable file. This would also need to be tested, documented as well as having a suitable background image and background music and a clear and easy to navigate graphical user interface.

### Create a basic set of twenty flashcards image files.

This goal would require us to source royalty free public use images or create our own basic flashcard image files. The goal would be to have at least twenty of these to showcase the software. The images would have to be of appropriate sizes and matching noun English words written underneath them.

### Create a basic set of twenty audio recordings for these flashcards.

The goal here would be to have an audio recording for each flashcard image file we have. The audio recordings would have to be brief, clear and match up with the word on the image on the flashcard image. Ideally, we would want twenty recordings to match up with the amount of stock flashcards.

### Create a dynamic flashcard loading system.

This goal would be to have a working dynamic flashcard loading system to use the images/audio in a folder and put them together into workable and selectable flashcards for our flashcard software. No matter how many cards are placed into the folder, the software would need to be able to dynamically add them. This feature would also need to be tested for bugs and usability as well as having an easy to access

### Create a working mini game (Choose the correct card).

Our goal here would be to create a single mini game that is working and tested. The first mini game to create would be the ‘choose the correct card’ game. Specs and information for this game is found later in this document.

### Create a second working mini game (Memory).

Our goal here would be to create a second mini game that is working and tested. The first mini game to create would be the ‘choose the correct card’ game. Specs and information for this game is found later in this document.

### Create a marketing presentation video for the project.

An important goal is also our marketing video, which we would need to be created to showcase our software to people who would be interested in it (I.e. schools, parents, teachers or education companies).

### Create a basic website for the project.

Our last goal would be to build a basic website where people can download the software and extra flashcard sets from, as well as view documentation or marketing material related to the product.

# Plans and Progress

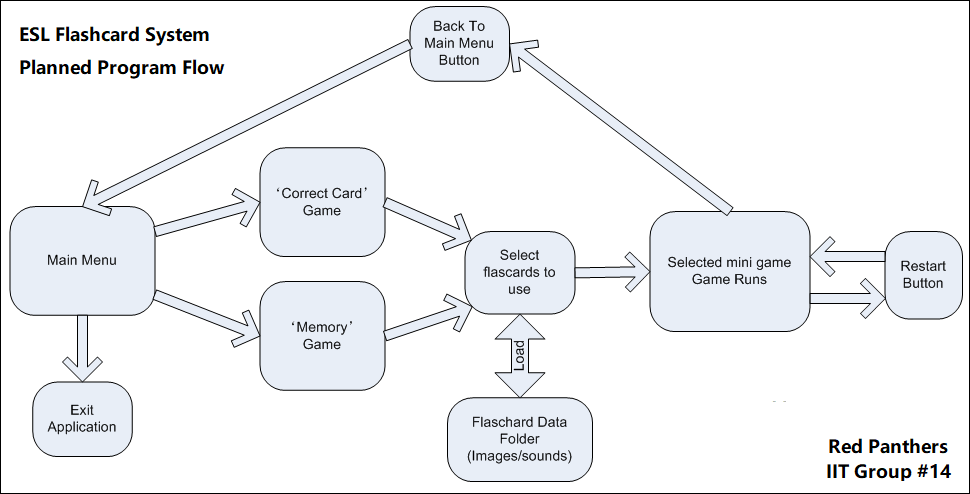
## The Plan

### Planned features and flow of the software

The ESL flashcard system will start with these features, with the possibility to expand and add more features later as needed:

* A main menu.
* A collection of stock flashcards (showing a picture and the English noun below it).
* A flashcard selection screen to choose the appropriate flashcards.
* A system which allows users to add their own flashcards and associated voice recording.
* A ‘Click the correct card’ mini game.
* A ‘Memory’ mini game.

Planned Program Flow Diagram:



### The plan for the ‘Main Menu’

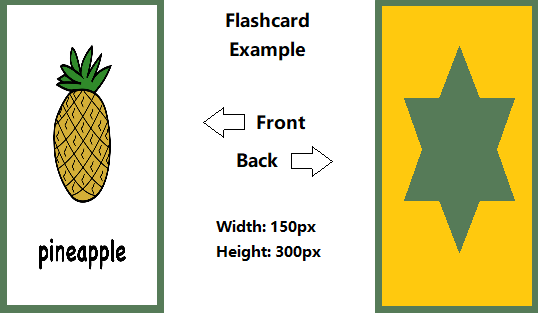
The main menu will consist of three buttons:

* ‘Correct Card Game’
* ‘Memory Game’
* ‘Exit Application’

Clicking either of the game buttons will proceed to load up the selected mini game, whereas the exit button will simply exit the application. The application will have an appropriate background image and a simple music loop.

### The plan for the ‘Flashcards’

A basic set of twenty flashcards will be created to the following specifications:



All flashcards will also have an accompanying audio file that reads the word on the flashcard in a .wav format.

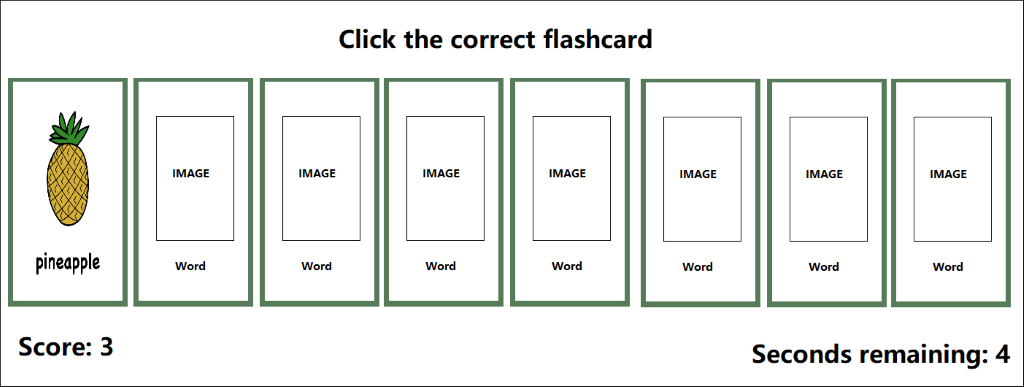
### The plan for the ‘Flashcard Selection’ system

All flashcard image files, and audio files will be placed in a single folder in the applications root directory in an images folder, underneath a flashcards folder: (flashcards/images). Each flashcard image will be named based on the card in the .PNG image format, say for example ‘pineapple.png’. A corresponding audio file in the .WAV format will also be placed in an audio folder in that same flashcards directory (flashcards/audio) and will be named to match the image name (I.e. pineapple.wav).

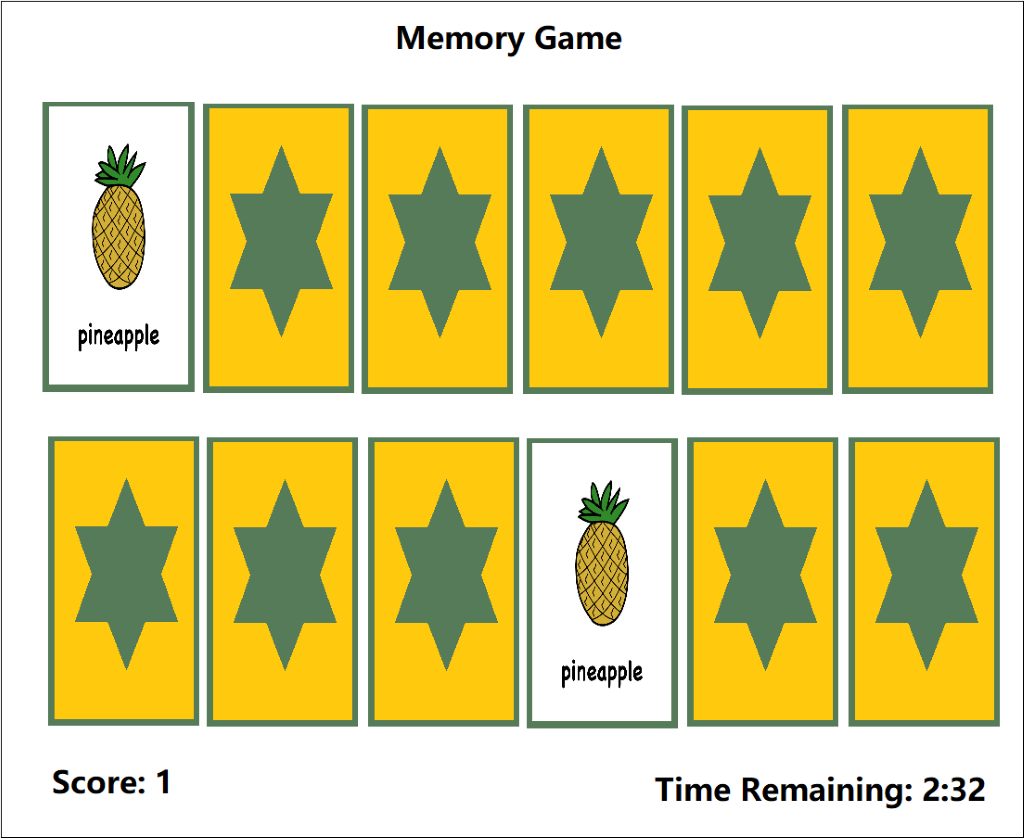
The application will then dynamically load the image and audio files to create the flashcards in the applications flashcard selection page. The user will then have to select six flashcards. As the user clicks flashcards, they will turn green. Once the user has chosen six flashcards, they will continue to the mini game they had previously selected.

### The plan for the mini game ‘Click the correct card’

A row of six flashcards will be displayed face up. The application pronounces one of the cards and the user then has 10 seconds to click on the matching flashcard. The user gets one point for a correct answer, or one point deducted for a wrong answer. The round will end when the application has finished reading all the flashcards. The game will not repeat the same flashcard twice.



### The plan for the mini game ‘Memory’

A grid of flashcards is displayed, which is each of the six flashcards loaded twice, then distributed randomly on the screen. The flashcards are face down. The user will then click flashcards in pairs, looking for matches. As the card turns over, the audio plays. The user gets a point every time they correctly reveal a matching pair. A timer is set to give the user a time to beat the round. The round ends when the user has matched all the pairs, or the timer runs out. A final score is given based on the time remaining as well as how many pairs were successfully matched.

### The plan for the marketing presentation video

We will create a basic video advertisement for our flashcard system. This will showcase all the features of our program as well as show a small sample video of a non-native child using this application.

### The plan for the website

We will create a basic website to show the products features as well as allow the user to download the application onto their system. This website will show system requirements as well as documentation on how to use our software.

## Progress

### Person1 – Project manager

### Person2 – Programmer

### Person3 – Artist/Assests acquisition

### Person4 – Tester

### Person5 – Marketing

### Person6 – Website Designer

# Roles

Six roles are required for this group, with them being a project manager, a programmer, an artist, a tester/QA, marketer/documentation and a website developer. We have decided to assign static roles to the group in order to maximise our work potential as well as keep good organisation and allow the groups skills to be utilised in the best possible way.

## Project manager/Team leader – Person1

The project manager/team leader for this project will be responsible for all timing and planning made by our group as well as the general organisation and following up of people's duties and workloads.

## Programmer – Person2

The programmers in this project will be responsible for creating the flashcard system using unity, including all games, GUI, menus and features of the actual program itself.

## Artist/Assests acquisition - Person3

This position will be for the acquisition/creation of all artwork designed for the flashcard system, I.e. graphics for buttons, main menus backgrounds, flashcards as well as basic sounds and music.

## Tester – Person4 **//CAN BE CHANGED TO GAME DESIGNER/CONSULTANT OR QA?**

The tester will be responsible for using the flashcard system as a user would and reporting on any errors and problems that they have faced during this period to either the programmers or recommend changes to the applications design to make it more user friendly.

## Marketing/Documentation - Person5

Person5 will be responsible for all marketing and presentation materials, including a basic presentation video and any other related marketing information.

## Website Developer- Person6

We will have a website developer create a basic website that will host our presentation video, a link to download the software, a list of features and a basic manual of how to use it.

# Scope and Limits

The general scope of this project does seem to be possible to do in the allotted time, as the project itself is reasonable for six people to create. We have however placed some limits on creating this application to deal with scope creep and help us meet and manage our time and work commitments on this project.

One of these limits has been the amount of mini games we will produce, as it stands now, we only plan to add two. Ideally if time and scope constraints weren’t an issue, we would want to add many more mini games to the application.

Another limit on our project is the number of flashcards we will create and supply with the application. A set of twenty is a rather modest number, however creating more than twenty would be ideal. An ESL flashcard application such as this should have at least 200 or so cards in a stock version. A way to get around this limitation in scope is to allow users to create and add their own flashcards if required, but ideally more should be bundled with the stock application.

# Tools and Technologies

Our project will require a small collection of different hardware and software to achieve our goals. Listed below is the hardware and software that we will require along with our groups experience with these tools and technologies.

## Software required:

* Unity3D (v2019.2.17f1) - License is free for non-commercial use and educational use. This will be used to create the actual application using the Unity3D framework.
* Microsoft Visual Studio (v15.9.17)– License is free for non-commercial use and educational use. This will be used for the programming aspects of the application development in conjunction with Unity3D.
* Gimp (v2.10.8) – License is free for non-commercial use and educational use. This will be used for flashcard image creation.
* GitHub – This will be used to help us collaborate our work and host our website under a GitHub page.
* Trello – This will be used to help us organise our workload.
* Slack – This will be used for all text correspondence between the team
* Discord – This will be used for our weekly voice meetings.
* **INCOMPLETE: WHATEVER VIDEO EDITING SOFTWARE WE USE TO CREATE THE PRESENTATION VIDEO?**
* **INCOMPLETE: WHATEVER SOFTWARE WE USE TO CREATE THE WEBSITE AS WELL AS HOSTING ETC (PROBALY GITHUB?)**

## Hardware required:

* A computer capable of running Unity3D and Microsoft Visual Studio.
* A microphone for recording sound for the flashcards.
* An internet connection to allow online collaboration between the group.

## Group experience:

Jason Walstab – I have experience at a hobbyist level for Unity3D and Gimp and experience at a professional level for Microsoft Visual Studio (primarily in .NET and C#).

**INCOMPLETE: The rest? No idea you guys fill this is in if you want, maybe we should have someone have experience in video editing software?**

# Testing

Our group plans to do testing each week during development using QA(Quality Assurance) sessions. Each week a new feature will be added to the application, basic testing will initially done by the programmer and then followed up at the end of the week with a QA session with a dedicated project member whose job is to test the program and write up and errors, issues or problems they have come across, which the programmer will then be able to follow up. If a serious problem is encountered by the dedicated QA tester, the programmer will schedule in another testing session before moving on to add the next applications feature.

A testing log will be written up to ensure that all issues found by QA will be followed up by the programmer.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Monday** | **Tue** | **Wed** | **Thu** | **Fri** | **Sat** | **Sun** |
| **1** | Project Planning: Overview | Project Planning:  Ideas | Project Planning:  Roles | Project Planning:  Execution | Project Planning:  Planning | Project Planning:  Tools | Project Planning:  Review |
| **2** | Discord Meeting (8PM) | S: Main Menu | S: Demo Video Draft |  | E: Main Menu | S: Flashcard images set (+20 cards) | S: QA Session #1 |
| **3** | Discord Meeting (8PM) | S: QA Session #1 | E: Flashcard images set (+20 cards) | S: Flashcard Audio (2) | E: Demo Video Draft | E: Flashcard Audio (2) | S: Demo Video Final |
| **4** | Discord Meeting (8PM) | S: Flashcard Selection System | S: Basic Website Creation |  |  | E: Flashcard Selection System | S: QA Session #2 |
| **5** | Discord Meeting (8PM) | E: QA Session #2 | S: Mini Game #1 |  |  | E: Mini Game #1 | S: QA Session #3 |
| **6** | Discord Meeting (8PM) | E: QA Session #3 | E: Basic Website Creation | E: Demo Video Final | S: Finalise Project Report |  | E: Finalise Project Report |
| **MODULE IS OVER AT THIS POINT AND OUR WORK IS DONE; THE BELOW TIMEFRAME IS PROJECT PLANNING THAT WE DON’T ACTUALLY HAVE TO DO...not finished this bit below yet, will fill in with bs later.** | | | | | | | |
| **7** | Discord Meeting (8PM) | S: Mini Game #2 |  |  |  | E: Mini Game #2 | S: QA Session #4 |
| **8** | Discord Meeting (8PM) | E: QA Session #4 | S: Flashcard images set (+80) |  |  |  |  |
| **9** | Discord Meeting (8PM) |  |  |  | E: Flashcard images set (+80) |  |  |
| **10** | Discord Meeting (8PM) |  |  |  |  |  |  |
| **11** | Discord Meeting (8PM) |  |  |  |  |  |  |
| **12** | Discord Meeting (8PM) |  |  |  |  |  |  |
| **13** | Discord Meeting (8PM) |  |  |  |  |  |  |
| **14** | Discord Meeting (8PM) |  |  |  |  |  |  |
| **15** | Discord Meeting (8PM) |  |  |  |  |  |  |
| **Task Assignment** | | | | | | | |
|  | Everyone | Team Leader | Programmer | Artist/Assets | Tester | Marketing | Website Designer |

## Week 1

## Week 2

## Week 3

## Week 4

## Week 5

## Week 6

## Week 7

## Week 8

## Week 9

## Week 10

## Week 11

## Week 12

## Week 13

## Week 14

## Week 15

# Risks

## Scope too large

There is a risk for this project of the scope being too large for us to manage. While we will diligently try to pursue this task of creating an ESL flashcard system, it is possible the scope of this project is too large for our group and we will not be able to finish or meet time constraints for our project. We should try to minimise this risk by sticking to and meeting deadlines as well as following a well organised structure that will come from good project planning and not procrastinating on tasks we individually need to complete.

## Programming issues

Another risk is that it may be possible that are programming skills for the collective group will not be enough to technically complete our project, or at least not include all the features we have originally set out to include. One such task is a dynamic flashcard loading system, which will be a new challenge for our programmer to create. If the program cannot run for example due to technical problems, the project will be dead in the water.

## Application Quality

There is always the risk that even with following our plan and meeting the technical and logistical challenges that we face; the end product may not be of high enough quality or standard that we are happy with it or a standard that is not high enough for people to use as a proper application.

## Market Saturation

The market for ESL learning tools is already quite large, and our application may fall into the abyss of the mass of products and applications already produced in this area. Our application may not be able to breach this giant mass of competing applications and in the end would not be a very good project.

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## Reaching the end users

In dealing with the market, we must also face the fact it may be hard for our application to reach the intended users. Our intended users will primarily be non-native English speakers, and finding a way to advertise or reach these people in remote areas may be beyond our grasp.

## Too difficult to use

We need to make sure our application is well documented and friendly to use, otherwise we will face having an application that is not useful to the end user due to issues with ease of use. It is important to minimise this risk by using rigorous testing and QA sessions to ensure that the program is indeed user friendly.

## System requirements too high

Our application is primarily for people in areas that lack modern expensive technology. Our application will need to be able to be run on lower end systems to ensure that we can reach our target audience (rural schools, parents in impoverished areas, etc) who do not have access to the latest phones, tablets and computers.

# Group processes and communications

## **//not done yet, will finish later**

## References

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News 2020, "Vietnam lacks teachers to achieve language targets", *Thepienews.com*, 2020. [Online]. Available: <https://thepienews.com/news/vietnam-teachers-language-targets/>. [Accessed: 08- Jan- 2020].

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