



# Initial Plan

## Spelling Practice / Spelling Test

CM3203 – Individual Project

Credits: 40

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## Project Description

The aim of this project is to create an automated/ semi-automated assessment tool to support children to undertake spelling tests. This can either be a part of synchronous or asynchronous learning materials. This will be tailored towards students with dyslexia as they will be able to change the font colour, style and background colour of the website. Additionally, it will allow the teacher to show more or less feedback depending on the severity of the case.

For the backend of the website I wish to go a little out of my comfort zone and use Java and PHP for the main bodies of code. PHP is used extensively in dynamic websites and is able to pass variables between JavaScript and PHP more easily than Flask (Python). Although I have never used PHP before I have used Java and JavaScript so I am confident that I can learn PHP quickly using online resources. PHP also has the ability to use a framework. I am undecided on whether I will use a framework as for what I want it may be better to create the whole website from scratch.

I will have a selection of colour schemes available for users to individually select. These schemes will be in line with suggested colour schemes for people with dyslexia. I will also add in colour blind options and completely custom colour schemes in order to make the website more inclusive. There will also be options for changing the font size and the type of font as larger and more spaced out letters can make it easier for someone with dyslexia to read the words. There is a lot of research done on different fonts that make reading easier for dyslexic students so I will include a selection of at least 5 different font types.

The website will have three types of accounts. One is an Admin account for administrators to use which will have maximum privileges while being careful not to break GDPR guidelines around potentially sensitive data.

The regular accounts will be teacher accounts, these will allow a teacher to create sub accounts for their students as well as set up spelling tests and group students into individual classes to mimic their classrooms at school. The teacher account will also allow for teachers to see the history of student spelling test results and edit details of students accounts. A teacher will also be able to set a default colour and font scheme to be used by the class however students will still be able to edit the selected schemes if they wish to. A teacher will also be able to select how much information a student can see about their history and the statistics gathered about their completed spelling tests.

A student account has the least amount of privileges. A student account with no extra information being displayed will only be able to see the current spelling test created by the teacher. They will also be able to edit the colour and font schemes if the currently selected one is not the best for the student. A student account will have the ability to see any of their statistics on tests but only if the teacher has allowed the student to.

Account passwords will be hashed before being stored in a database to make the website more secure.

For the database to be used I am currently undecided on whether to use MySQL or MongoDB. MySQL will work with PHP without the need to install anything extra and I have used a MySQL database before with Flask websites. With PHP you can install some MongoDB drivers that will allow you to use PHP with a Mongo database. As a MongoDB is a large-scale database it will make expanding it later on easier and data can be stored in a JSON format which will make embedding student accounts and classes into a teacher account easier for myself.

The UK government has guidelines for what the national curriculum expects students of different ages to be able to spell and by what age/year they should have learned to spell them by. Ideally, I would be able to get an API that would allow me to pull the words from an external source but so far I have only found PDF lists of spellings and expectations published by the UK government. As an alternative to this I can use the word lists of example words from the government and supplement the word lists with a dictionary API to allow for a teacher to include words not used as example words in the guidelines.

As this website is a spelling test site the words to be spelled must not be displayed on the page of the spelling test. To allow a student to be able to spell I will use a text to speech client library to read out the spelling test words to students as they fill in the test. There will be options to listen to the words again if it was misheard the first time. Most likely I will use Google's client library for text-to-speech.

There are some additional features I would like to add. One would be a challenge mode where students will be given words that are above their expected age mixed in with words that they should know at their age to give more of a challenge to student who is finding the current spelling too easy. Another feature would be a tailored spelling practice where the idea is that by tracking the words that students get wrong and get right I can give find word similar to their common spelling mistakes and suggest words that they find hard to spell more often while keeping inline with the spelling guidelines from the UK government.

There are lots of different statistics I would be able to collect and display in various forms. Statistics can be individual or for a whole class to get an overarching idea of how different students and classes perform in tests compared to each other. These statistics could be displayed graphically or just in simple text. Whole class statistics will not be allowed to be viewed by a student however if the teacher chooses to the student can see their own statistics.

An idea for an extra feature, if there is time, would be to have timed spelling tests. The teacher would be able to set up the test and assign a max length of time for it or just have the words read out automatically over a set period of time with even gaps in between words. Another additional idea would be to track the time taken to complete the test to potentially work out the typing speed of the students.

## Project Aims and Objectives

- Make it an online website.
- Allow for the creation of accounts (Teacher and Student) .
- Allow for teachers to edit accounts of their own students.
- Allow for the style of the website to be changed by students and teachers.
- Test students from a list of words they are supposed to know taken from government guidelines.
- Allow for custom tests to be made.
- Store data about students' scores individually to allow for the teachers to see an overarching view of students results across spelling tests.
- Have practice mode where students will be given words similar to words they frequently spell incorrectly.
- Have a challenge mode where spellings from higher levels/ age groups are mixed within the normal test.

## Ethics

Data collected about spelling results of minors (students), as the information cannot be used to identify the minor it will not break GDPR guidelines but I will have to be careful about usernames stored for students if they resemble their names and can be used to identify them. All personal data of students and teachers must be kept secure including login details and names. Passwords used will be hashed before being stored in a database.

## Work Plan

I plan to meet with my supervisor every 3 weeks to make sure that I am on the right track to completing my project according to my Gantt chart below to make sure I have it completed in time.

Work to be done	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Initial Planning												
Supervisor meeting												
Create a basic PHP website												
Create spelling tests												
Create database and account system												
Options to change font and colour schemes												
Class/Student account creation for teacher accounts												
Supervisor meeting												
Custom and automatic spelling test creation												
Practice mode												
Challenge mode												
Supervisor meeting												
Statistic collection												
Beautifying the website												
Supervisor meeting												
Additional features if time is left and write-up												

In my plan I aim to have the main bulk of coding done by the end of week 6 with the rest being extra features that are not just the basic spelling test and functionalities that are needed. I plan to do the bulk of my write-up during easter and in the last few weeks when all the key features are implemented. Any additional features such as turning the statistics into graphs and charts will be left for once I have the main features that we must have completed.

When I start with coding I am going to create a Kanban board, most likely on Microsoft Teams, to help track my progress and the smaller tasks/ errors that appear to make sure I do not forget about them. I will also add my supervisor to it so that they are able to see how I am progressing as I work.

Supervisor meetings are highlighted in orange above. I have spread these out fairly evenly across the plan to allow me to get guidance periodically. If I am stuck I will request additional meetings to make sure I do not fall behind my plan.