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Project : Phase 4

Group 5: Nourish Knights

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Table of Contents

Phase 1.....	5
1.0 Introduction.....	5
2.0 Problem.....	6
Problem 1: An unstable system causes a loss of achievement (Usability).....	6
Problem 2: Challenging memorization and frustration (User experience).....	7
Problem 3: Lack of Grammar Correction (User Usability).....	8
3.0 Proposed Solution.....	9
Solution 1: Backup and Restore Features.....	9
Solution 2: Apply Associative Memory Method in learning a new language.....	9
Solution 3: Provide Guidance on Grammar.....	10
4.0 Target User.....	11
1. Students.....	11
2. Kids.....	11
3. Office Workers.....	11
5.0 References.....	12
Phase 2.....	14
1.0 Task Analysis.....	14
1.1 Introduction.....	14
1.2 Derivation of HTA.....	16
Task 1: Back up.....	16
Link on User (students) doing to achieve Task 1:.....	16
Textual Presentation.....	16
Diagram presentation.....	17
Discussion on Findings from Task 1-Students.....	17
Link on User (kids) doing to achieve Task 1:.....	17
Textual Presentation.....	17
Diagram presentation.....	18
Discussion on Findings from Task 1-Kids.....	18
Link on User(office workers) doing to achieve Task 1:.....	18
Textual Presentation.....	18
Diagram presentation.....	19
Discussion on Findings from Task 1-Office workers.....	19
Overall Discussion on Findings from the HTAs for Task 1.....	19
Task 2: Learn new vocabulary.....	20
Link on User (students) doing to achieve Task 2:.....	20
Textual Presentation.....	20
Diagram presentation.....	21
Discussion on Findings from Task 2-Students.....	21
Link on User (kids) doing to achieve Task 2:.....	21
Textual Presentation.....	22
Diagram presentation.....	22
Discussion on Findings from Task 2-Kids.....	22

Link on User(office workers) doing to achieve Task 2:.....	23
Textual Presentation.....	23
Diagram presentation.....	23
Discussion on Findings from Task 2-Office Worker.....	24
Overall Discussion on Findings from the HTAs for Task 2.....	24
Task 3: Check grammar.....	25
Link on User (students) doing to achieve Task 3:.....	25
Textual Presentation.....	25
Diagram Presentation.....	26
Discussion on Findings from Task 3-Students.....	26
Link on User (kids) doing to achieve Task 3:.....	26
Textual Presentation.....	26
Diagram Presentation.....	27
Discussion on Findings from Task 3-Kids.....	27
Link on User (office workers) doing to achieve Task 3:.....	27
Textual Presentation.....	28
Diagram Presentation.....	28
Discussion on Findings from Task 3-Office Workers.....	28
Overall Discussion on Findings from Task 3.....	29
1.3 Design Requirement.....	30
2.0 User Analysis.....	30
2.1 Proposed task.....	30
2.2 Persona.....	30
1. Student.....	30
2. Kid.....	31
3. Office Worker.....	32
2.3 Scenario.....	33
1. Student.....	33
2. Kids.....	33
3. Office Worker.....	34
Phase 3.....	36
1.0 Storyboards.....	36
1.1 Task 1: Back up.....	36
1.2 Task 2: Learn new vocabulary.....	39
1.3 Task 3: Check grammar.....	41
2.0 Alternative Design.....	45
2.1 Liow Zhi Heng.....	45
2.2 Denies Wong Ke Ying.....	47
2.3 Lim Xiao Xuan.....	49
2.4 Pang Zhi Xuan.....	51
2.5 Scan of Voted Design Layouts.....	53
3.0 Wireframes.....	55
3.1 Task 1: Back up.....	55
3.2 Task 2: Learn new vocabulary.....	56

3.3 Task 3: Check grammar.....	57
3.4 Justification of design.....	58
4.0 Description and Justification of Metaphors.....	63
Phase 4.....	66
1.0 Introduction.....	66
2.0 Screenshots of Prototype.....	67
2.1 Task 1: Backup.....	67
2.2 Task 2: Learn new vocabulary.....	68
2.3 Task 3: Check grammar.....	69
3.0 Briefing Notes.....	70
4.0 Testing with Users.....	71
4.1 User 1: Chua Ern Qi (Students).....	71
4.1.1 Task 1:Backup.....	71
4.1.2 Task 2:Learn new vocabulary.....	72
4.1.3 Task 3: Check grammar.....	73
4.1.4 Photo when User 1 Testing.....	74
4.1.5 Link Video User 1.....	74
4.2 User 2: Ooi En Tong (Kids).....	75
4.2.1 Task 1: Backup.....	75
4.2.2 Task 2: Learn new vocabulary.....	76
4.2.3 Task 3: Check grammar.....	77
4.2.4 Photo when User 2 Testing.....	78
4.2.5 Link Video User 2.....	78
4.3 User 3: Mary (Office Worker).....	79
4.3.1 Task 1:Backup.....	79
4.3.2 Task 2:Learn new vocabulary.....	80
4.3.3 Task 3: Check grammar.....	81
4.3.4 Photo when User 3 Testing.....	82
4.3.5 Link Video User 3.....	82
5.0 Observations.....	83
6.0 Findings.....	85

Phase 1

1.0 Introduction

Within the busy metropolitan environments of today's society, an invisible crisis is developing. Every single day, many people in the same neighborhood suffer from inadequate access to high-quality education and numerous learning opportunities are wasted because of various barriers in our educational systems. When these opportunities to use education to help individuals through engagement are wasted, it can cause educational inequality. Hence, one major issue that contributes to educational inequality and limited learning outcomes is the inefficiency of educational resources distribution.

Promoting inclusive and equitable quality education and encouraging opportunities for lifelong learning for all are the objectives of Quality Education in Sustainable Development Goal (SDG) 4. However, there are numerous usability and user experience concerns with the current educational platforms such as Duolingo including an unstable system causing loss of achievement, challenging memorization methods, and limited grammar explanation.

To tackle the issues above, we propose an alternative approach to these problems which includes backup and restore features, associative memory method reinforcement, and providing constructive feedback. With the help of these solutions, learning will be more enjoyable, retention and recall will be improved, and Duolingo's language-learning resources will continue to advance. Hence, we are able to make sure the educational resources are used to assist people in need rather than being wasted by putting these suggestions into practice.

This is inline with the goals of SDG 4 Quality Education and promotes a more sustainable educational system by guaranteeing the additional educational resources are used wisely. Ensuring that each and every Duolingo user has a fun, successful, and interesting language learning experience is our ultimate objective. Hence, we hope to have an important contribution to this objective.

2.0 Problem

Problem 1: An unstable system causes a loss of achievement (Usability)

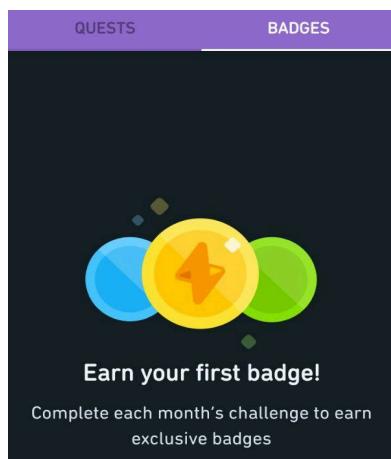
The current language learning progress of the app which is Duolingo has a very unstable system and it causes some important features to face some errors after updating the app. One of the important features is achievement.



Duolingo includes many achievement features to motivate and reward users for their language learning progress. For example, XP points which are Experience Points. A sample of XP is shown in *Figure 2.1*. It allows users to level up and track their progress.

Figure 2.1

The loss of these XP points will cause users cannot use the features that require a high level.



Next, the achievement badge is one of the achievement features. A sample of badges is shown in *Figure 2.2*. Users can earn many types of badges when they get specific achievements or they reach milestones. After getting these badges, they can redeem some special complete lessons that others do not have.

Figure 2.2

So, when they lose their achievement, it will cause users to lose motivation. Other than that, language learning is a long-term learning plan, users need to spend much time and effort to complete lessons and memorize the terms. Losing these achievements may make users feel like their effort and time have been wasted. Then, when their achievements are lost, it will make it difficult to track their past progress and continue their progress. Next, when the

problem of losing achievement keeps happening, users will think the app is unreliable. If users always worry about this problem, they will not put more effort into this system to learn the language.

Problem 2: Challenging memorization and frustration (User experience)

The current language learning progress of the app Duolingo has a challenging memorization method. The primary usability goal in language learning apps should facilitate effective and efficient learning by incorporating better mnemonic techniques. A common problem in memorizing is the lack of in-depth cultural contextual learning, where vocabulary and grammar are taught in isolation or short dialogue rather than in meaningful and extensive contexts. Duolingo often uses spaced repetition as a primary method for reinforcing vocabulary. In terms of user experience goals, the focus should be on creating an engaging and enjoyable learning journey that motivates users to continue learning the language. However, the current challenging memorization method of Duolingo causes difficulty in maintaining user interest and motivation over time. The reliance on repetitive memorization techniques fails to captivate users, leading to a lack of engagement and feelings of monotony. This uninteresting approach in remembering words contributes to an unenjoyable learning experience. Moreover, users frequently experience forgetfulness and a lack of impression with these methods. This can lead to a stagnation in their progress and subsequent tendency to abandon the learning process. **An example of learning new vocabulary which does not employ easier associative memory methods, such as connecting the vocabulary and syllabary to the learner's native language is shown in Figure 2.3**.



Figure 2.3

Problem 3: Lack of Grammar Correction (User Usability)

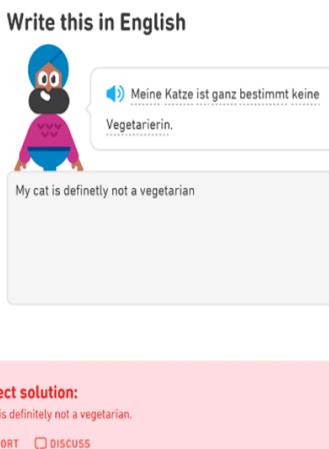


Figure 2.5

The lack of comprehensive grammar correction in Duolingo is a notable aspect that impacts the effectiveness of the platform for language learners.

Although Duolingo is excellent at creating an engaging and interactive language learning environment, it is not as good at providing in-depth justifications and fixes for grammatical errors as shown in *Figure 2.5*. Users frequently receive insufficient feedback on particular grammatical details, and the platform prefers vocabulary and sentence completion over complex grammatical constructions.

This can be a big disadvantage, especially for students who want to learn more about grammar rules and how to use them in different situations. Moreover, the absence of thorough grammar correction may hinder learners from grasping the subtleties of a language, potentially leading to the reinforcement of incorrect usage. Understanding grammatical concepts is crucial for achieving proficiency in a language, and a more robust system for grammar correction within Duolingo would undoubtedly enhance the overall learning experience. Incorporating comprehensive grammar explanations and targeted corrections could better address the diverse needs of language learners and contribute to a more well-rounded language education platform.

3.0 Proposed Solution

Solution 1: Backup and Restore Features

A backup, also known as a data backup, is a copy of computer data that is taken and kept in a different location to be used to recover the original in the case of an incident involving data loss including the data loss in Duolingo. We can categorize backups into a variety of types.

Firstly, automatic periodic backups. For example, Duolingo should automatically back up users' data every day to keep the data on the server. This is because implementing an automatic backup system that periodically stores users' data at specific intervals of time can ensure that users have a recent backup even if they forgot about it. Next, manual backups. It should allow users to back up their data manually whenever they want to ensure that they can control their data is saved. Then, versioned backups are also one of the types of backups. The host should store multiple versions of the application and user data, and enable users to go back to a specific version of the application if they realize their data application is lost. For example, users can roll back to Duolingo version 2.0 after updating to Duolingo version 3.0 and realize their achievements are lost.

Solution 2: Apply Associative Memory Method in learning a new language

Associative memory method reinforcement focuses on leveraging advanced associative memory techniques to enhance language learning within Duolingo. This innovative approach emphasizes the power of memory association to strengthen connections between new language elements and existing knowledge. This can help in improving retention and recall, developing long-term memory. These techniques include linking words to visual cues, connecting them with users' native language. For instance, consider the Chinese word for "cat," which is pronounced as "máo." Users might associate this pronunciation with the English onomatopoeic word "meow," used to describe the sound cats make. This association aids in memorizing the Chinese term "máo" by connecting it with a familiar and related concept. Integrating vocabularies within meaningful context such as real-life scenarios, stories, or cultural references can enhance a better understanding. For instance, when a learner encounters the Italian word for “apple,” which is “mela,” they might associate it with the English word “meal,” considering an apple as part of a healthy meal. This method ensures users not only memorize but also internalize and utilize their new language skills in a meaningful way. Associative memory method reinforcement can address the limitations of

traditional memorization methods. It establishes robust memory associations and mitigates forgetfulness. By using associative memory techniques, it can provide engaging learning experiences and ensures an enjoyable and motivating learning journey. It overcomes boredom by offering interesting memorizing ways, preventing user frustration and abandonment tendencies.

Solution 3: Provide Guidance on Grammar

To address the current lack of thorough grammar correction, Duolingo might greatly profit from the implementation of a strong system to offer grammar guidance. When users make mistakes in the language, Duolingo can provide them with immediate insight into the rules and specifics of the language by incorporating clear and understandable grammar explanations throughout the learning modules. This proactive instruction may enable students to understand grammar's fundamental ideas and develop a deeper comprehension of the language that goes beyond simple error correction.

Additionally, Duolingo could improve its grammar advice by customizing feedback for each user according to their unique difficulties and common errors. With this customized approach, students might focus on their areas of greatest need for development, leading to a more flexible and effective learning environment. Overall, Duolingo can improve the efficiency of the platform for language learners by emphasizing thorough grammar guidance, which will enable users to confidently navigate the complexities of language structure.

4.0 Target User

1. Students

The Duolingo updated app's main beneficiaries are students who want to learn a new language by themselves. With the use of our Duolingo updated app, a copy of the student's progress data would be automatically saved by this feature on a regular basis. For example, it might save information about the student's level right now, the lessons they've finished, their XP overall and any accomplishments. This implies that the student's progress data is securely saved and retrievable, regardless of whether the Duolingo app is updated or if unintentionally removed. When a student needs to get their data back from backup, the student can utilize the restore option to retrieve their saved progress data from the server if they update or reinstallation app which allows them to pick up where they left off. Therefore, our updated Duolingo might be able to give a better solution to improve usability among the students.

2. Kids

Our Duolingo updated app would be also beneficial to kids who want to improve their language. The associative memory method could enhance their learning experience since it is undeniable that the method can improve the child's ability to learn and remember English words and phrases. Taking the Chinese term for "cat" , which is pronounced as "máo." Kids may connect this pronunciation to the onomatopoeic English word "meow" which describes the sound that cats make. Duolingo can make sure kids have a fun and exciting learning journey by using the associative memory techniques. It is believed to help prevent feelings of abandonment by providing engaging methods for word memorization which can overcome a kid's boredom. Besides having a better user experience, this also aligns with effective and ongoing learning which is a crucial component of SDG 4 Quality Education.

3. Office Workers

One of our target users is office workers who have to learn a language because of being ordered by the supervisor to travel for work. In our updated Duolingo app, we have inserted the check grammar function which lets office workers use this function to check their sentences whether they have grammatical, pronunciation or spelling mistakes. By using our improved grammar checker features, office workers can make sure there is no error while writing the report, meeting minutes, and presentation slides. They may impress their

colleagues when they travel for work. Thus, the office worker is imperative for our prospect improvement on the Duolingo app. Our ultimate goal is hoping to enhance learning, increase retention which guarantees all Duolingo users including office workers in studying new language for business travel an interesting and pleasurable language learning experience.

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Link:<https://keying1516192527.wixsite.com/nourishknight>

Phase 2

1.0 Task Analysis

1.1 Introduction

In this phase of the project, we have decided to create a language-learning platform called 3lingo. The objective of creating this platform is to improve the feature in the current system which is Duolingo. Hence, several external applications will be used in our application to provide more useful features for our users. By using these external applications, our application will become more user-friendly and achieve the aim of the users which is to enhance their language skills.

1. Google Photos



Google Photos is a photo-sharing and storage service developed by Google. It was announced in May 2015 and spun off from Google+, the company's former social network. Google Photos lets you store, share, view, and edit photos and videos and includes an AI-powered assistant to help manage your media. It works for both Android and iOS devices and provides an automatic backup for your media.

2. Tuyangdanci (Too young)



Tuyangdanci (Too young) is an English learning app developed in China that uses visual memory techniques to help users learn English words. The app applies an associative memory method by presenting images designed to help users form mental associations between English words and their meanings. This method of learning leverages the brain's natural tendency to remember images and associations, making it easier to remember new words.

3. Sapling



Sapling is an AI-powered writing assistant designed to enhance your writing. It corrects grammar and spelling errors in real-time. It offers suggestions for tone, formality, readability, and variety, catering to users in support, sales, recruiting, and academia who require high-quality written communication. Sapling also features an AI content detector that distinguishes between human and machine-generated content, utilizing a machine learning system akin to those generating AI content.

The 3 tasks from the Duolingo application that we chose for observation include:

1. Back up

Users can back up the file that they want to save. It can make sure the files will not be lost.

2. Learn new vocabulary

Users can use the associative memory method to learn and memorize new vocabulary. It can make their learning process faster and more effective.

3. Check grammar

Users can learn more grammar. When the system finds grammar mistakes in exercises or tasks, the system will notify users to correct them.

1.2 Derivation of HTA

Task 1: Back up

Link on User (students) doing to achieve Task 1:

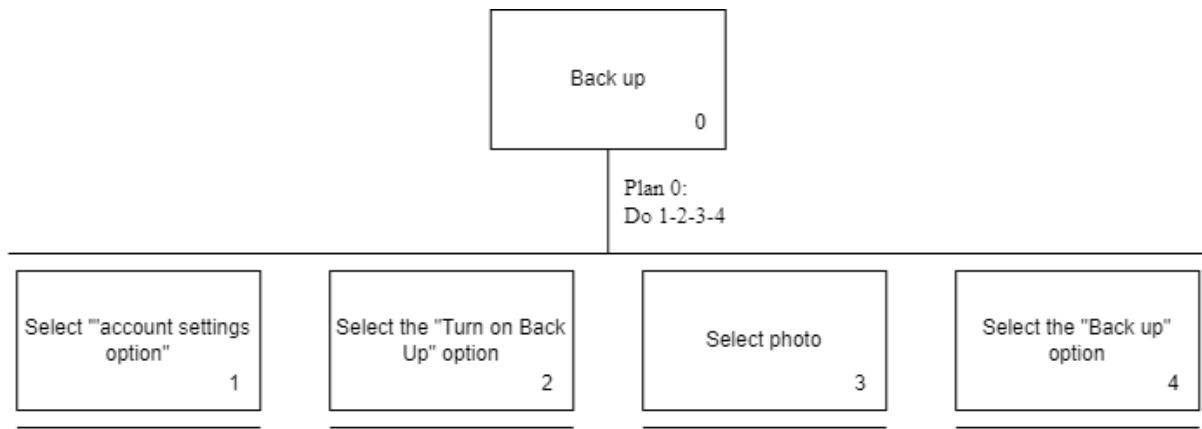
https://drive.google.com/file/d/1e_R3rSS_KoAiDpfu0rH8q8bqUaWFHU-F/view?usp=drive_link

Textual Presentation

0. Back up

1. Select the “account settings” option
2. Select the "Turn on Backup" option
3. Select photo
4. Select the “Backup” option

Diagram presentation



Discussion on Findings from Task 1-Students

In the task of backup, the students begin by selecting the “account settings” option to locate their account profile. In the account settings, the students choose the "Turn on Back up" option to enable the backup functionality. All the photos will be started to back up. The students then select the precious photos to back up again by choosing the "Back up" option to initiate the back up process. This sequence of steps ensures that the selected data in this case are photos is securely backed up, giving an additional layer of protection and safeguarding the students information.

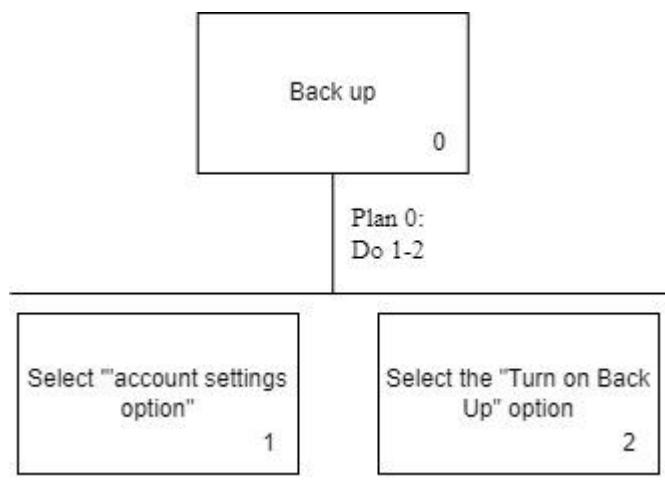
Link on User (kids) doing to achieve Task 1:

https://drive.google.com/file/d/1eZSu2udbcCQ7KPm0sD5nuzSBf8Xli3yx/view?usp=drive_link

Textual Presentation

0. Back up
 1. Select account settings
 2. Select the "Turn on Backup" option

Diagram presentation



Discussion on Findings from Task 1-Kids

In the task of backup, the kid goes to the account settings section first in order to start the data backup procedure. Find the "Turn on Backup" option and click it under the account settings. The above step let kid save all photos by enabling the backup feature. Kids that use this function guarantee a methodical and safe file backup, adding another line of defense against any data loss. The kid can maintain the security and integrity of photos by routinely accessing account settings and turning on the "Back up" option.

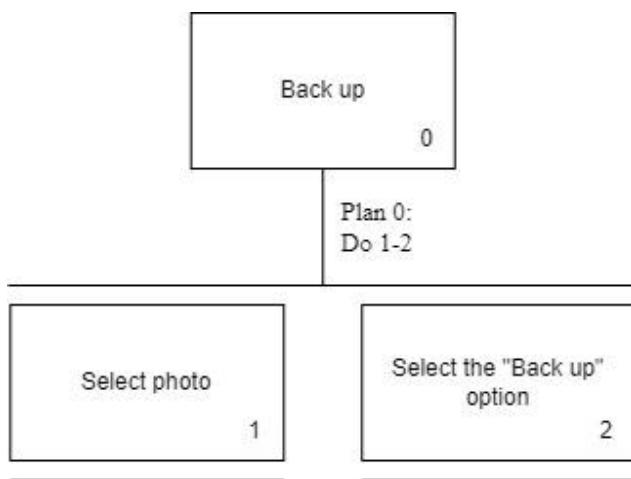
Link on User(office workers) doing to achieve Task 1:

https://drive.google.com/file/d/1eUuwv5NTJ6oD-9eBb9efM9gFbMGI8QD-/view?usp=drive_link

Textual Presentation

0. Back up
 1. Select photo
 2. Select the “Backup” option

Diagram presentation



Discussion on Findings from Task 1-Office workers

In the task of backup, the office worker will first choose the "Back up" feature. This is accessible via a specific area that is usually located in the digital workspace environment, usually under the account or system settings. Next, the office worker will select the photos where she wants to back up and to avoid backing up unnecessary photos. And she will go ahead and select the "Back up" option from the photo selection. The office worker can consistently save important photos by following these procedures which will help to create a safe and well-organized digital storage.

Overall Discussion on Findings from the HTAs for Task 1

Based on all the HTAs for Task 1 that we have done, the findings give us the chance to reveal a quite user-friendly method to back up photos and data for different kinds of users including students, kids and office workers. The main idea is to go into account settings and activate the "Turn on Back up" feature which highlights a consistent process for starting data backup. The step can increase accessibility and user engagement since it is simple to use which all users from different ages can follow the backup procedure easily.

Besides that, the findings also emphasize on the importance of choosing photos while backing up. It is because the feature is considered extremely useful when the users do not have enough storage space on their devices. The users have the ability to select pictures which makes the backup procedure more personalized and effective. In our opinion, this back

up feature for photos can be used as an additional function in our proposed system to back up processes and data to prevent loss. However, Google Photos' updated backup guidelines received criticism. It used to provide free, limitless storage for high-quality pictures, but in June 2021, this changed, raising worries about possible fees for storing more than the limited 15GB. Since users were used to unlimited storage, this policy change has made more careful data management necessary and may have an effect on users who have sizable photo collections.

Task 2: Learn new vocabulary

Link on User (students) doing to achieve Task 2:

https://drive.google.com/file/d/1eUdPqpwwYoQq2jcbQcRhSmQhjn1JHLVM/view?usp=drive_link

Textual Presentation

0. Learn new vocabulary
 1. Select vocabulary familiarity
 2. Access vocabulary study page
 3. Access visual memory method option
 - 3.1 Observe visual association image
 4. Click root option
 - 4.1 Learn the root tree
 5. Click derivation option
 - 5.1 Listen to the pronunciation of different derivation
 - 5.2 Learn the meaning of different derivation

Diagram presentation

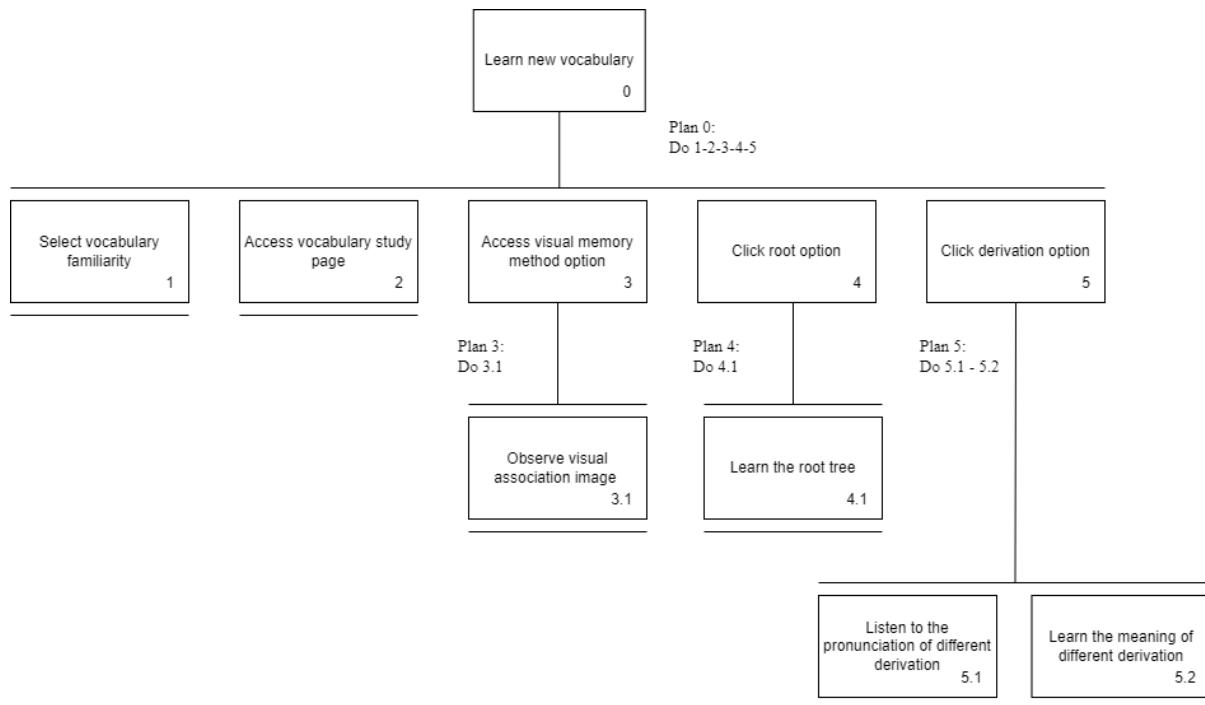


Figure 2.2.1

Discussion on Findings from Task 2-Students

In the task of learning new vocabulary, the student begins by selecting her familiarity with the vocabulary word. This leads the student to access the vocabulary study page, which serves as a comprehensive resource for studying the word. Here, she accesses the visual memory method, which involves observing an image provided that visually associates with the word, aiding in memory retention. Additionally, she clicks on the root option to learn about the root tree of the word, providing her with a deeper understanding of its origins and related words. Finally, the student clicks on the derivation option, where she can listen to the pronunciation of different derivations of the word and learn their meanings.

Link on User (kids) doing to achieve Task 2:

https://drive.google.com/file/d/1eTh_UkIGtcRIGuSB336xDJEzrpJCNkE0/view?usp=drive_link

Textual Presentation

0. Learn new vocabulary
 1. Select vocabulary familiarity
 2. Access vocabulary study page
 3. Access visual memory method option
 - 3.1 Observe visual association image

Diagram presentation

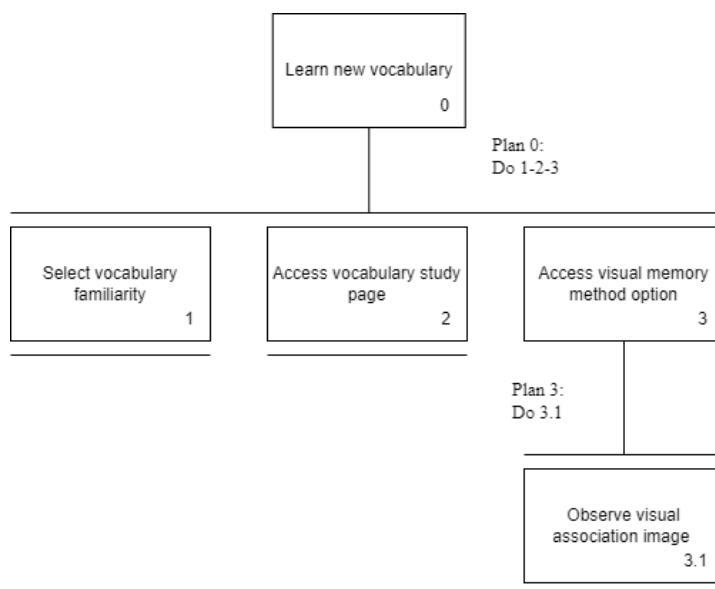


Figure 2.2.2

Discussion on Findings from Task 2-Kids

In the task of learning new vocabulary, the kid starts by identifying whether they know a particular word. This leads her to a vocabulary study page, a fun and interactive space designed to make learning new words enjoyable. Here, she accesses the visual memory method, a kid-friendly approach that involves looking at an image that helps her to remember the word. By observing this visual association image, the kid finds it looks like a story book can create a mental picture that makes the word easier to remember.

Link on User(office workers) doing to achieve Task 2:

https://drive.google.com/file/d/1eAsL3OvWIy1jIiuUi53Cknj4Lrb4LFfy/view?usp=drive_link

Textual Presentation

0. Learn new vocabulary
 1. Select vocabulary familiarity
 2. Access vocabulary study page
 3. Access visual memory method option
 - 3.1 Observe visual association image
 4. Listen to the pronunciation
 5. Click explanation option
 - 5.1 Listen to different context

Diagram presentation

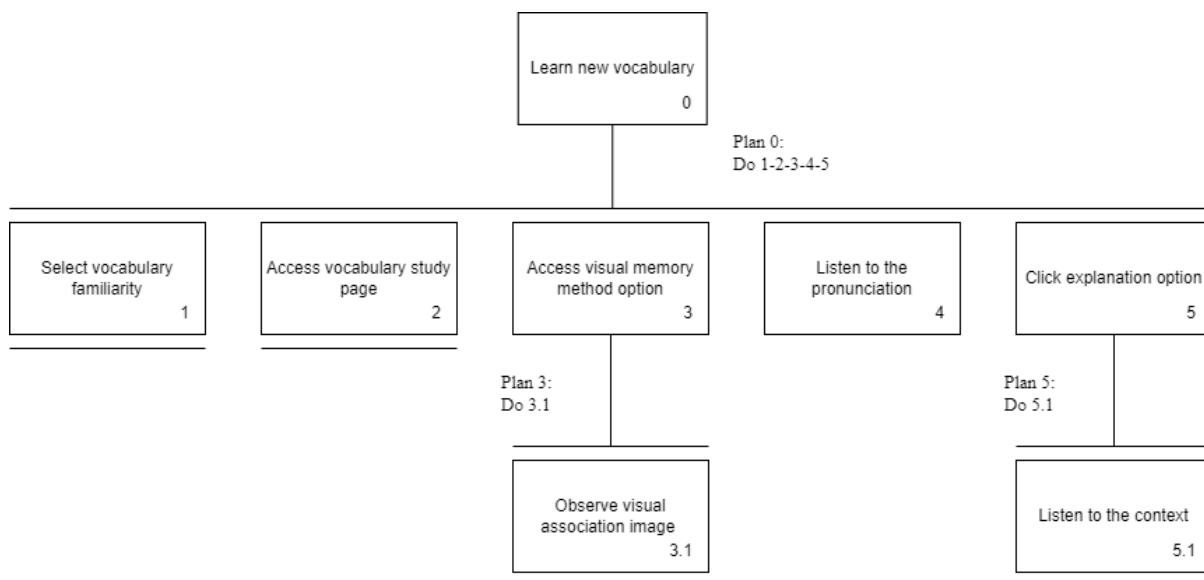


Figure 2.2.3

Discussion on Findings from Task 2-Office Worker

In the task of learning new vocabulary, the office worker starts by selecting her familiarity with the vocabulary word. This leads them to the vocabulary study page, a comprehensive resource for studying the word. Here, she has access to the visual memory method, which involves observing an image that visually associates with the word, aiding in memory retention. She also listens to the pronunciation of the word, which is crucial for correct usage in spoken communication. Furthermore, she clicks on the explanation option to gain a deeper understanding of the word. This includes listening to the word used in different contexts, which helps her to understand the various nuances of its meaning. This process not only enhances her vocabulary but also improves their overall language skills.

Overall Discussion on Findings from the HTAs for Task 2

Based on the HTAs for each user when doing task 2, it appears that the task of learning new vocabulary is approached differently by the student, kid, and office worker, yet there are common elements that benefit all users. The vocabulary study page serves as a comprehensive resource for all users, providing various methods to aid in learning and memory retention. One such method is the visual memory method, which uses images associated with the word to enhance memory retention. This method is very useful for all users, particularly effective for the kid, as it makes learning new words enjoyable and memorable, similar to reading a storybook. Another common feature is the option to learn about the root of the word. This provides the student with a deeper understanding of the word's origins and related words, enriching their vocabulary knowledge. For the student and office worker, the pronunciation feature is beneficial. The student listens to the pronunciation of different derivations of the word and learns their meanings, while the office worker ensures correct usage in spoken communication. Furthermore, the office worker listens to the word used in different contexts, helping her to understand the various nuances of its meaning and enhancing her overall language skills.

The student aims to enhance her academic performance by expanding their vocabulary. She utilizes the application to learn new words, their roots, and derivations, which aids in performing better in exams. The kid is in the early stages of language acquisition. Her aim is to build a strong foundation for their vocabulary. The application makes this process

enjoyable and interactive, encouraging her to learn more words and fostering a love for language learning at a young age. The office worker aims to improve her professional communication skills. A rich vocabulary allows her to express her ideas more effectively. This can lead to better job performance and clearer communication when working overseas.

Although many users find these strategies useful, some people might prefer a different approach to learning or gain from a wider variety of teaching strategies. For users with different learning styles, the app's usefulness and accessibility may be limited if it just uses visual memory approaches.

Task 3: Check grammar

Link on User (students) doing to achieve Task 3:

https://drive.google.com/file/d/1efFwhDXSAGggFItlV0wzHQRcpUonOzWY/view?usp=drive_link

Textual Presentation

0 Check Grammar

1. Access Sapling Platform
2. Write a Paragraph
3. Detect Grammar Error
4. Provide Corrections for Detected Mistakes
 - 4.1 Correct Grammar Error
5. Check the Complete Paragraph

Diagram Presentation

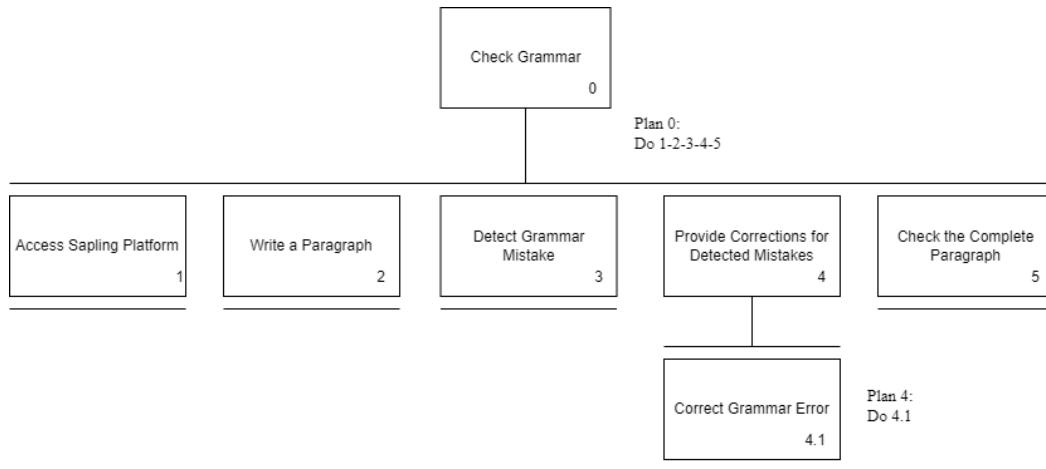


Figure 2.3.1

Discussion on Findings from Task 3-Students

As students are preparing for the upcoming IELTS exam, checking the grammar using the Sapling platform is necessary. Accessing the Sapling platform, students write a paragraph to practice and assess their language proficiency. The platform's advanced grammar-checking features detect errors in their writing, find out areas that need improvement. With helpful suggestions provided by Sapling, they can correct grammar errors to refine their language skills further. The process involves not only fixing individual mistakes but also ensuring the overall coherence and correctness of the complete paragraph. This systematic approach aids them in honing their language proficiency for the challenges of the IELTS examination.

Link on User (kids) doing to achieve Task 3:

https://drive.google.com/file/d/1edCsslEoWG8R-l0kQGDUUrW-FUsxCmQw/view?usp=drivve_link

Textual Presentation

- 0 Check Grammar
 - 1. Access Sapling Platform
 - 2. Type a Text
 - 3. Detect Grammar Mistake

- 4. Provide Some Suggestions

 - 4.1 Correct Grammar Mistake

- 5. Check the Complete Paragraph

Diagram Prensentation

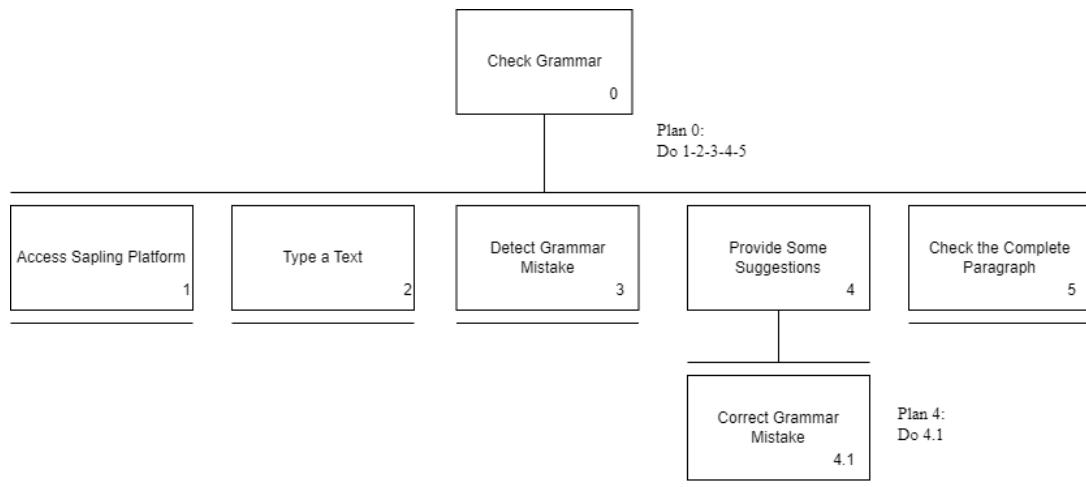


Figure 2.3.2

Discussion on Findings from Task 3-Kids

Kids can use the Sapling platform to improve their skills in the exciting field of language learning. Children use Sapling to playfully type texts, expressing their creativity and learning the language at the same time. The user-friendly interface of the platform identifies grammatical errors in their writing and gently emphasizes areas that require improvement. Like a supportive friend, Sapling offers entertaining and instructive tips to help young students fix their grammar. Our aiming linguists are guaranteed a comprehensive and enjoyable language learning experience because the process goes beyond simple corrections and instead encourages children to interact with the entire paragraph.

Link on User (office workers) doing to achieve Task 3:

https://drive.google.com/file/d/1e_S4AHR0YqHQO984dJxdfX4H6Q2cnr64/view?usp=drive_link

Textual Presentation

- 0 Check Grammar
 1. Access Sapling Platform
 2. Type a Text
 3. Detect Grammar Error
 4. Provide Suggestion
 - 4.1 Correct Grammar Error
 5. Check the Complete Paragraph

Diagram Presentation

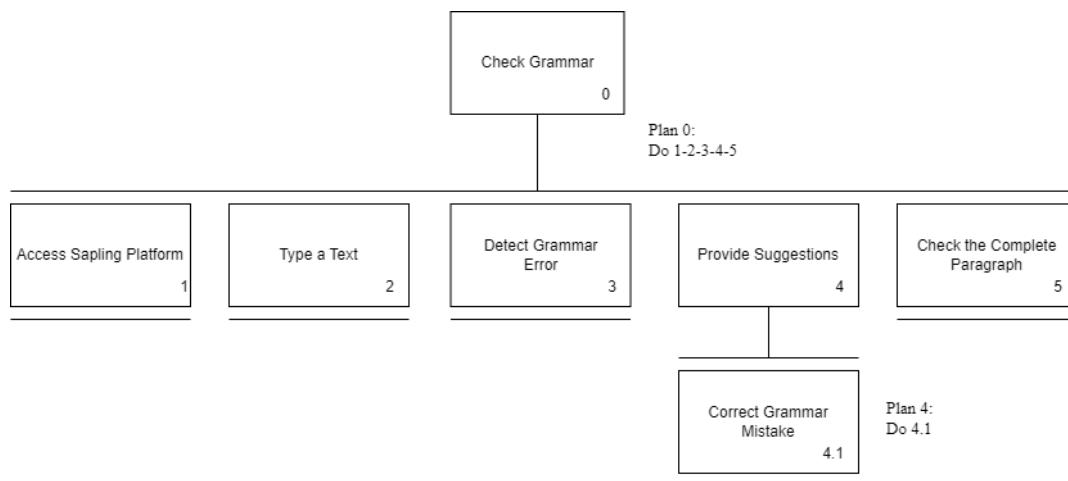


Figure 2.3.3

Discussion on Findings from Task 3-Office Workers

Office workers can use the Sapling platform to improve the accuracy and clarity of their communication in advance of a coming business trip. Professionals can ensure that their messages are grammatically correct and informative by using Sapling to type out important texts. The complex grammar-checking features of the platform quickly identify mistakes in their writing and provide useful suggestions to improve the language. Office workers then go on to correct discovered grammatical errors with a focus toward accuracy. This careful procedure goes so far as to review every sentence, ensuring that as they start their significant business company, their communication is not only free of mistakes but also displays professionalism and clarity.

Overall Discussion on Findings from Task 3

In examining the HTAs for Task 3, which involves checking grammar, it becomes evident that the approach varies for the student, kid, and office worker, while also revealing common elements that benefit all users. The grammar-checking feature is designed to be versatile and user-friendly, catering to the distinct needs of each persona. Besides that, this feature can help to solve the problem which is lack of grammar correction when users are using the platform by providing grammar correction in real-time. Therefore, it can help the user to save time.

Moreover, academic excellence is the student's main priority, and the grammar-checking tool turns into a useful tool for improving written assignments. The application helps students identify and correct grammatical errors so they can turn in polished, error-free work and ultimately improve their academic performance. The child uses a more captivating and attractive method when interacting with the grammar-checking feature. With gamification features and animated characters to promote a positive attitude toward language skill development, the tool is made to make learning fun. The tool helps the child by helping them have fun while laying the foundation for using proper grammar.

The grammar-checking feature is a crucial tool for office workers to use when communicating professionally. In a professional context, written communication must be accurate and clear. This application supports the office worker in making sure her written documents are free of grammatical errors. Therefore, this leads to enhanced professional competence and better workplace communication. However, for some users, Sapling's grammar correction is excessively sensitive. Although accuracy is essential, an excessively strict approach may annoy users and prevent them from writing clearly. Improving the Sapling user experience requires finding a balance between correctness and easily understandable correction. In conclusion, the grammar-checking function serves the various needs of office workers, children, and students. It demonstrates its adaptability and effectiveness across various user personas and contexts as a tool for academic excellence, an engaging learning aid, and an essential resource for professional communication.

1.3 Design Requirement

KEEP

- Personalized Learning Paths
- Have an easy-to-use interface and navigation
- System testing, user acceptability testing, and regression testing following updates

NEW

- Install an effective and safe backup and restore data system to completely protect user data
- Provide comprehensive resources for learning new words, including visual memory methods, root options, and derivation options
- Include an effective grammar checker which provides instant grammar feedback in the writing tasks

2.0 User Analysis

2.1 Proposed task

1. Back up
2. Learn new vocabulary
3. Check grammar

2.2 Persona

1. Student



Chua Ern Qi is a year 2 software engineering student who is deeply committed to her academic pursuits. She is preparing for a significant milestone in her academic journey: the International English Language Testing System (IELTS). This test is not just an exam for her; it's a challenge she has set for herself to prove her proficiency in English. Her current goal is

to excel in her IELTS exam. Despite her busy schedule with routine assignments and academic workload, she consistently carves out time for her English studies. However, she finds it hard to remember new vocabulary and sometimes lacks motivation. However, she finds it hard to remember new vocabulary and sometimes lacks motivation. She has also been struggling to find a good platform to check her writing grammar.

Our new system is designed to address the specific challenges Ern Qi faces in her language learning journey. The vocabulary learning feature uses an associative memory method, which can help her remember new words more effectively. The grammar checking feature, on the other hand, can provide instant feedback on her writing, enabling her to learn from her mistakes and improve over time. These features can make her preparation for the IELTS exam more manageable and less overwhelming.

2. Kid



Ooi En Tong has a happy and curious attitude. She is motivated by the excitement of learning new things. Even at an early stage, En Tong has the fundamental skills needed to use and navigate educational apps, demonstrating a natural desire to learn new things. Her objective is to improve English language skills. Her goal is to build a solid foundation for English learning and trigger her interest in learning more words. She enjoys the gamification feature in language learning apps like Duolingo. It makes the learning process fun and engaging for her. However, she sometimes struggles with retaining new vocabulary and is confused with complex grammar, which can be a challenge in her language learning journey.

Our new system is like a fun and friendly teacher for young learners like En Tong. It has a special feature that helps her remember new words in a fun way, just like reading a storybook. This method can help her remember new words more effectively,

as it creates a visual story in her mind, making the learning process more engaging and enjoyable. Understanding grammar rules is crucial for mastering a language. The grammar checking feature helps kids build a solid foundation in English grammar from an early age.

3. Office Worker



Mary is a 24-year-old, business development professional and her boss always instructs her to go to the United States for meetings. Her desire to be able to connect with them effectively is what drives her to learn English deeply. Her motivation is that she thinks she should learn and communicate in their native language to impress them which may enable her to close profitable sales. Before her trip, her goal was to become fluent in spoken English. But, her pain is that she feels that she does not have a clear learning path. She is motivated and committed to learning English, however, she needs help to follow an organized learning path. This lack of focus may stop her from developing in her learning process. Other than that, She has experienced losing her progress in Duolingo in the past, which was a disappointing experience for her. It has to be solved to satisfy her learning process.

Our new system can be useful for Mary. The vocabulary learning feature, which uses an associative memory method, can help her expand her vocabulary effectively. This can enhance her communication skills and make her conversations with her American counterparts more engaging. The grammar checking feature can provide instant feedback on her writing, enabling her to learn from her mistakes and improve over time. This can help her write professional emails and reports with more confidence and accuracy. Plus, it has a backup feature that keeps all her learning progress safe. Even if she loses her progress, the backup feature can bring it back.

2.3 Scenario

1. Student

Persona: Chua Ern Qi, a year 2 software engineering student, desires to improve English skills and do preparation for the IELTS Exam.

User goal: Learn new vocabulary effectively

Tasks:

- Challenging to remember new vocabulary
- Navigate to vocabulary learning page
- Start learning using the associative memory technique
- Check comprehension
- Recall the new vocabulary
- Check daily progress

Scenario:

Ern Qi is preparing for her IELTS exam in the midst of her busy academic schedule. She finds it challenging to remember new vocabulary, which is crucial for her exam. She's been looking for an effective method to learn and retain new words. The associative memory method applied in vocabulary study can help her to learn new vocabulary effectively.

Ern Qi begins her day by introducing herself to a new word that she will learn. She navigates to the vocabulary learning page and starts learning using the associative memory technique. This method showcases an image connected to the word, simplifying her memorization process. Subsequently, she checks her comprehension of the word via engaging activities. She discovers that she can recall the new vocabulary with ease. By checking daily progress, she realizes that she effortlessly achieves her target.

2. Kids

Persona: Ooi En Tong, 7-year-old , using Duolingo to improve her English proficiency

User Goal: Enhance her English language skills

Tasks:

- Access the grammar checking platform
- Do a short writing paragraph
- Platform detect sentences' grammar mistakes
- Platform provides some grammar correction suggestions
- Correct the grammar mistakes
- Check and complete her writing paragraph

Scenario:

A spirited 7-year-old with a passion for learning, Ooi En Tong accesses the grammar checking platform to explore the world of grammar improvement. Equipped with basic English knowledge obtained through educational applications, she does a short writing paragraph on her beloved kitten. The platform detects her sentences' grammar mistakes and provides some grammar correction suggestions. En Tong learns as she corrects the grammar mistakes thanks to funny graphics and practical advice, making the process an engaging and interactive learning exercise. She also checks and completes her writing paragraph after fixing the grammar mistakes.

In this case, Ooi En Tong's potentially boring task is turned into an exciting adventure by the grammar-checking platform. The user-friendly interface, coupled with interactive feedback, not only corrects grammar but also instills a sense of accomplishment in the young learner, fostering a positive attitude towards language development.

3. Office Worker

Persona: Mary, 24, business development professional, desire to comprehend the business culture of her clients and be able to connect with them effectively is what drives her to learn English

User goal: Improve English skills for business trips.

Tasks:

- Opens language learning app
- Turn on back up button
- Select learning progress section
- Choosing modules
- Confirm backup
- Backup process ends

Scenario:

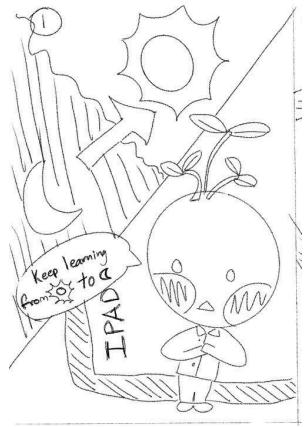
Mary, a diligent office worker with a penchant for continuous learning, is ready to depart on a business trip. She opens a language learning app on her tablet to make sure her language abilities stay sharp while she's on journeys. Realizing how important it is to keep her recent progress intact, Mary selects the backup settings and turn on back up button. This proactive evaluation guarantees that the language modules she has selected, which were carefully chosen for efficient business communication, will be safely kept for convenient access during her travels.

Mary selects the learning progress section with the backup feature activated, carefully choosing modules that are relevant to her upcoming professional interactions. These modules cover key words and phrases relevant to her international business meetings and presentations. Mary confirms backup and backup process started, watching the progress bar with patience until the system tells her the backup process ends. Mary departs on her business trip with confidence, knowing that her resources for language learning are securely stored and prepared to advance her language abilities while she attends to her job responsibilities.

Phase 3

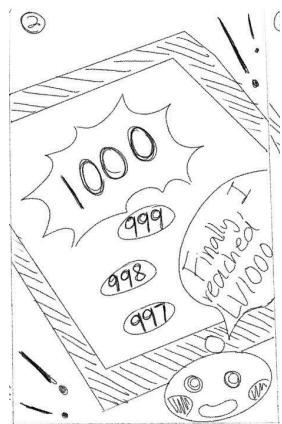
1.0 Storyboards

1.1 Task 1: Back up



Scene 1

A worker learning from morning to night.



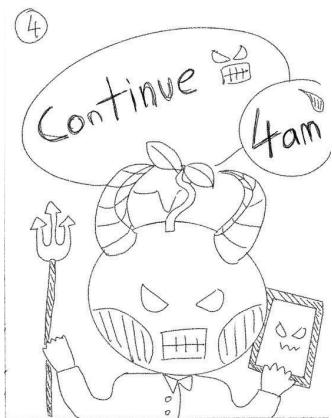
Scene 2

Finally, she reached level 1000.



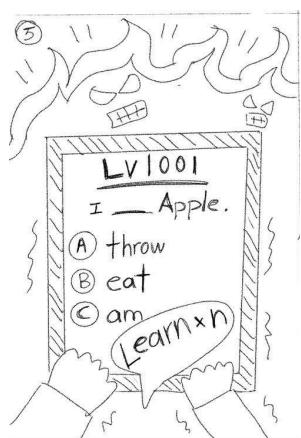
Scene 3

The application notifies the worker to back up. And then, the worker backed up.



Scene 4

She continues the learning process.



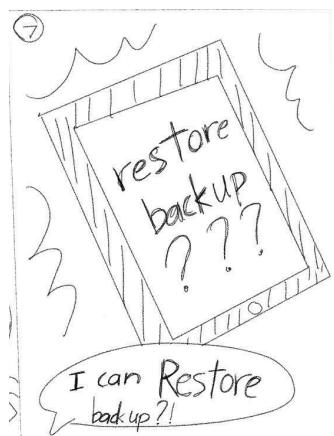
Scene 5

She starts playing level 1001.



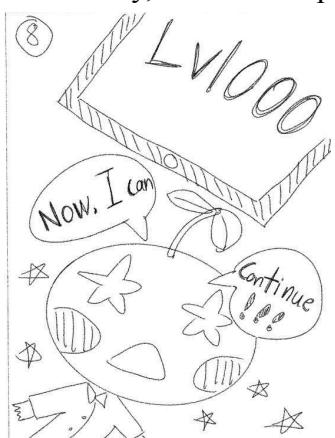
Scene 6

Suddenly, the achievement of the application goes back to level 1 without any notification and saves.



Scene 7

Fortunately, there is an option for restoring backup.

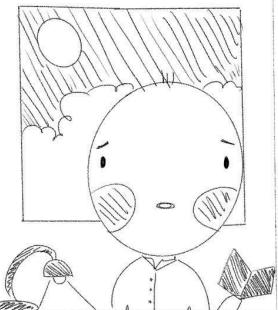


Scene 8

Her achievement is back, and he continues it.

1.2 Task 2: Learn new vocabulary

①



{

Scene 1

A student is studying.

②



Scene 2

She tries to memorize the word “Allowance”, but she cannot.

③



Scene 3

She feels angry.



Scene 4

She decided to use the application.



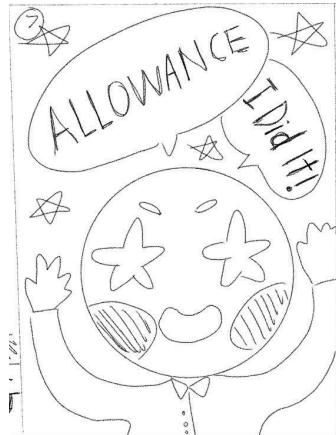
Scene 5

She is using the application and associative memory method provided by the application.



Scene 6

Application provided an associative memory method for this word.



Scene 7

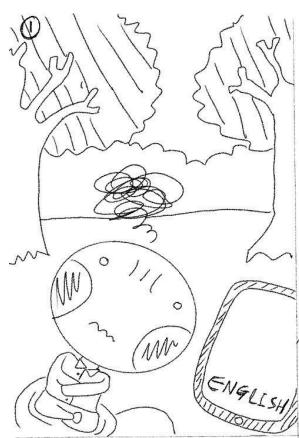
Finally, she verifies her comprehension of the word and succeeds in memorizing it.



Scene 8

She feels happy to see her achievement and tells his mum.

1.3 Task 3: Check grammar



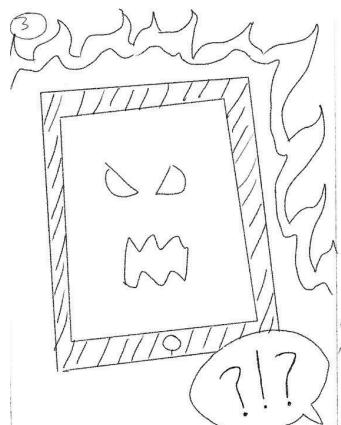
Scene 1

A kid is doing a brief composition on her beloved kitten. .



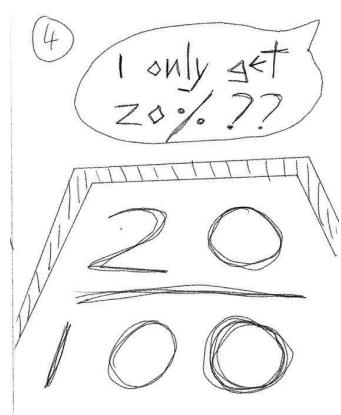
Scene 2

She submits it after it is done.



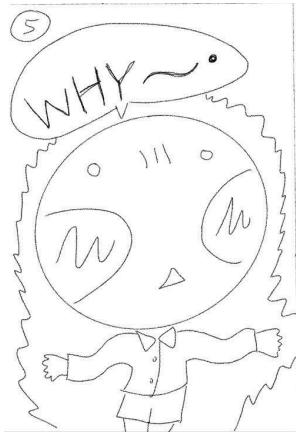
Scene 3

She feels angry.



Scene 4

She only gets 20/100 in her essay.



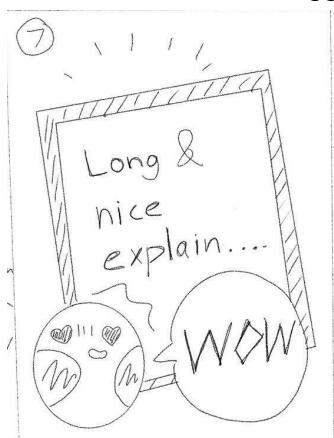
Scene 5

She feels very confused about her result.



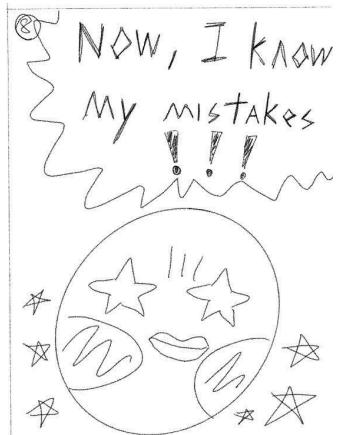
Scene 6

She decided to use the application to check grammar.



Scene 7

The application provides an explanation that is long and detailed.



Scene 8

She feels happy because she knows her mistake.

2.0 Alternative Design

2.1 Liow Zhi Heng



Screen 1

This is the main page for this application. Users can select levels directly. Beside the level button, it shows a collection of new words in this level. The bottom of this page shows according to the home page button, grammar check, user profile, notification, and also achievement. The top of this page shows the user profile name, points, the life that the user earns, and the language the user is learning.

Screen 2

This is the page of the user profile. It shows some functions like, add friends, achievement, statistics, and also back up. The right top of this page shows the setting. Users can change settings here.

Screen 3

This is the page of the back up. Users can choose to back up all, choose the level to back up, and turn on or off the back up and the last one deletes back up.

Screen 3

This is the page for grammar checking. Users can copy a sentence and paste it into the chatbox. The system will show the user the mistakes

Screen 5

This is the page of the new words. Users can use this page to check today's new words here. The bottom of the page shows a dustbin. Users can choose to delete the word that they don't need. Users can also see the next word. Users can also select the collection to see all the new words. The system will show the new words and give interesting explanations.

Screen 6

This is the page of the collection. It is categorized by level. Users can decide the level and check the new words of this level.

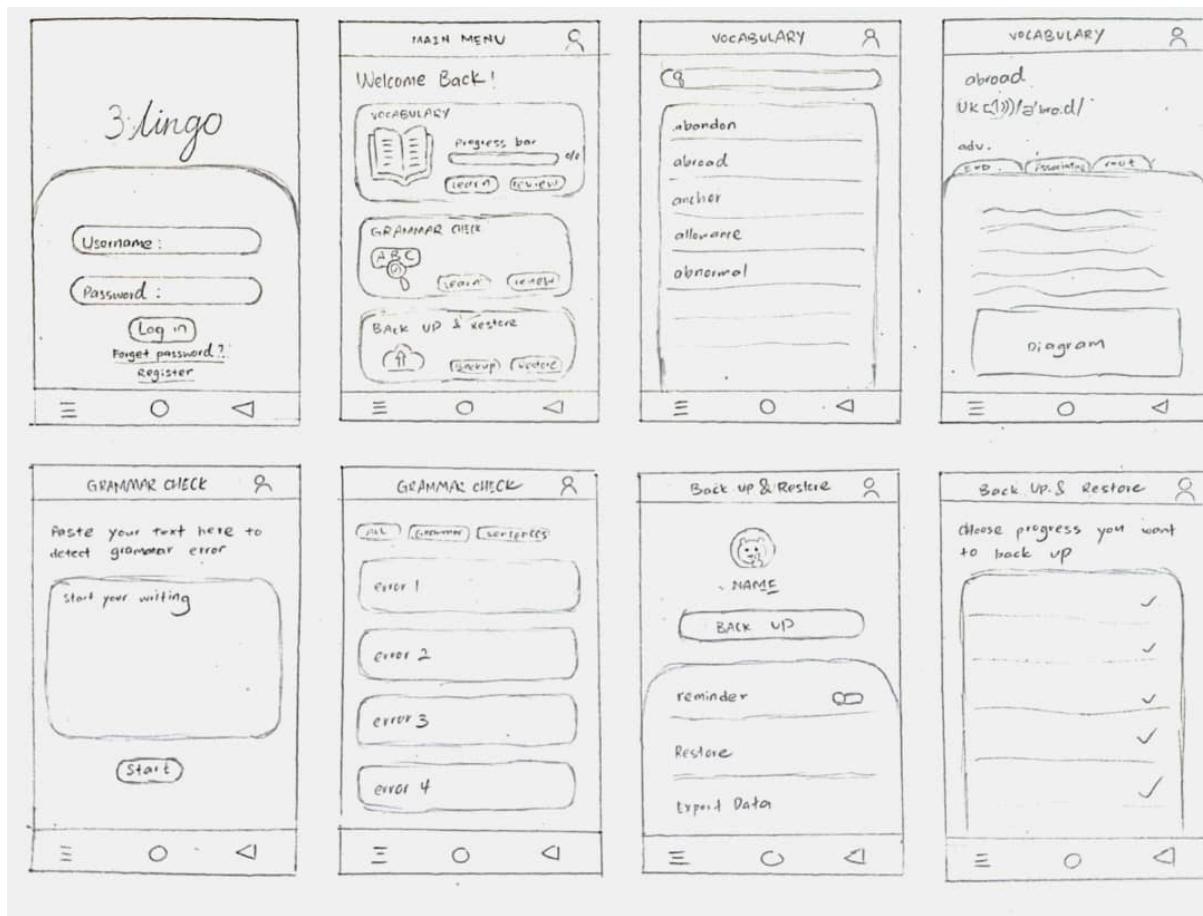
Screen 7

After users select the level, it shows all the new words one by one.

Screen 8

It shows the progress when users are playing. Users can select directly the new words in this level by pressing the button “new word”.

2.2 Denies Wong Ke Ying



Screen 1

The User Login Page, which is the default start-up page of the 3Lingo. It allows existing users to log in directly using their username and password, ensuring that their personalized settings and progress are saved and accessible. For new users, the page provides an option to register a new account, enabling them to join the platform and start their learning journey. Additionally, the page includes a feature for password recovery, which is essential for users who have forgotten their password.

Screen 2

The main menu of the application is designed to be user-friendly and functional, with three distinct sections catering to different aspects of language learning. Vocabulary section is dedicated to vocabulary learning and includes two options - 'Learn' and 'Review'. The 'Learn' button allows users to learn new words, while the 'Review' button enables them to revisit and practice the words they have already learned. The Grammar Check section provides users with resources and tools to check and improve their grammar. Backup and Restore Section allows users to back up their progress and data.

Screen 3

The Vocabulary Page is designed to facilitate effective vocabulary learning. It displays a list of words from which users can select the ones they wish to learn. This feature provides users

with the flexibility to focus on words that they find challenging or interesting. Additionally, the page includes a search feature, allowing users to easily find specific words they want to learn. This combination of features makes the vocabulary learning process more personalized and efficient.

Screen 4

Once a user selects a word from the Vocabulary Page, they are directed to the Vocabulary Learning Page. This page is rich in features designed to aid in vocabulary acquisition. It provides the pronunciation of the word, enhancing the user's linguistic skills. The page also offers an explanation of the word, its usage in context, and its root, providing a comprehensive understanding of the word. A unique feature of this page is the use of visual associative memory method, where an illustration related to the word is provided to aid memorization.

Screen 5

The Grammar Check Page is a valuable tool for users to improve their language skills. Users can either type in or paste their sentences or paragraphs into a designated area. After inputting their text, they simply need to click the 'Start' button to initiate the grammar check.

Screen 6

Upon clicking the 'Start' button on the Grammar Check Page, users are directed to a results page. This page highlights any grammatical errors found in the user's text. Along with identifying these errors, the system also provides suggestions for correction. This feature is designed to help users understand their mistakes and learn how to avoid them in the future, thereby improving their language proficiency.

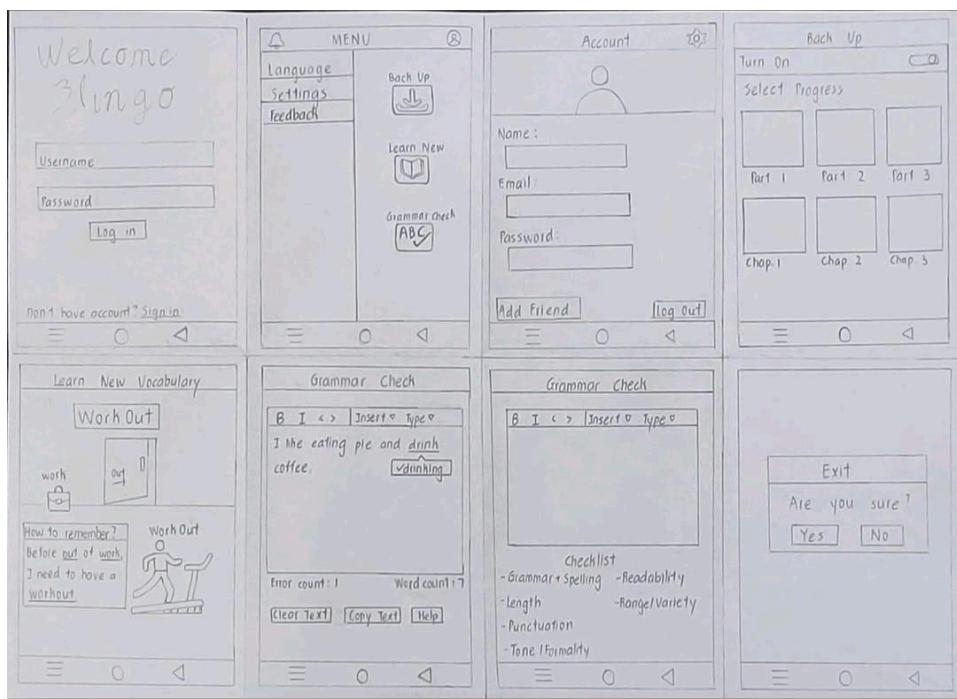
Screen 7

The BackUp and Restore Page is designed to safeguard the user's progress and data. It features a 'Back Up' button that allows users to save their current data, and a 'Restore' button to retrieve previously saved data. The 'Export Data' option enables users to download their data for external use or storage. Additionally, the page includes a reminder option that can be toggled on or off. When turned on, the system will send reminders to the user to back up their data, ensuring that their progress is regularly saved.

Screen 8

After clicking the 'Backup' button on the Backup and Restore Page, users are presented with options to select the specific progress they wish to back up. This feature allows users to have control over what data they want to save.

2.3 Lim Xiao Xuan



Screen 1

This page shows the welcome screen and login process for the user. If there is a new user, a sign in process is needed by the new user. When the welcome screen is its first interface, it can welcome users and provide a visually appealing overview of the learning process. However, the login page serves as a safe entry point where users can enter their login information to gain individualized access. It usually emphasizes security by having fields for a password and username. When combined, these components offer a friendly and safe entry point that makes it easy for users to begin their language learning journey.

Screen 2

This page shows the main menu of the 3lingo learning language platforms. There are 3 main features in the platform which are back up progress, learning new vocabulary and checking grammar. Besides that, this page also provides a profile button, notification button, language button, setting button and feedback button to the user.

Screen 3

This page is used to show the profile account of the user. Users can insert their name, email and reset password in this page. In addition, users also can insert any picture they like as their profile picture. Therefore, their friends can find the users easily. Moreover, add a friend button also available in this page. This button can allow users to add friends so they won't feel lonely while studying. Users can also log out their account on this page by clicking the logout button.

Screen 4

In this page, one of the main feature which is back up feature will be display. Before using this feature, users are required to click the turn on button and it will start to function. Next, users will select the progress that they want to back up. After complete back up, users can receive a notification. Hence, when a user wants to change his phone, the data will not be lost.

Screen 5

This page shows the second main feature which is learning a new vocabulary. When the user learns a new vocabulary such as workout, they can select vocabulary familiarity. If the user is familiar with the new vocabulary, the page will show an interesting method to increase the user's memory about the new vocabulary. Other than that, this page also used to associate the new words with memorable pictures.

Screen 6

This page is used for checking grammar if users make any grammar errors in the paragraph. Users need to write a sentence or paragraph in the white space that is provided. This feature will detect grammar errors and suggest the correct grammar for users when they are writing the sentence or paragraph. Moreover, the error count and word count will also show at the end of the white space. Clear text button, copy text button and help button also available on the page to make it convenient for users.

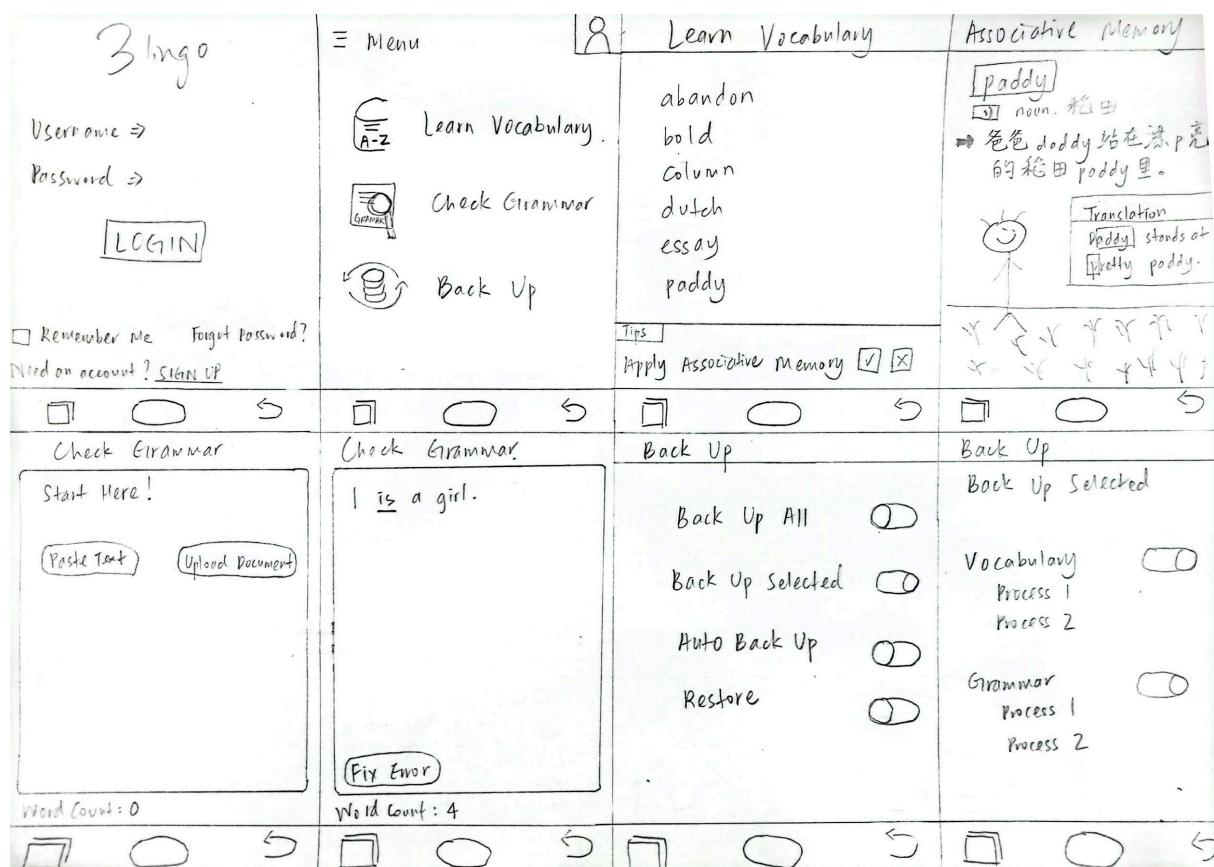
Screen 7

This page also shows the function for grammar check. There is a checklist in this page and it shows that grammar and spelling, length of sentence, punctuation, tone or formality, readability as well as range or variety are provided in the grammar check feature.

Screen 8

This page shows the exit process from the platform. If the user wants to exit, it will show a window to make sure the user really wants to exit the platform or not by asking the question.

2.4 Pang Zhi Xuan



Screen 1

This is the login interface of our 3lingo application. It has input fields including username and password. Users have to input their username and password before using the function of the application. Besides, there is also a “Remember Me” checkbox and a “Forgot Password” link for users to choose. Users shall select “Remember Me” if they don't want to retype their information again when they attempt to use the application. Users can also sign up if they are using the application for the first time.

Screen 2

This user interface has a main menu that includes “Learn Vocabulary,” “Check Grammar” and “Back Up”. The “Learn Vocabulary” gives users a list of words, definitions and examples. “Check Grammar” can help check for grammatical, punctuation and also spelling errors. “Back Up” lets users save their work to the cloud so that their process will not be lost.

Screen 3

This page will be shown if the users click on the “Learn Vocabulary” option in the main menu. This page lists out words for users to learn. Users can click on every vocabulary to know their definitions and also the examples of how to use it. Moreover, there is a tip for users where they can choose a more effective way which is to use associative memory to learn new words.

Screen 4

In this user interface, they can choose any word and they will be redirected to the page to learn new vocabulary using the associative memory method. For example, to memorize “paddy”, our application gives the example of “Daddy stands at pretty paddy.” This may help users to memorize the “paddy” word faster and will not forget in a short period.

Screen 5

This page will be shown if the users click on the “Check Grammar” option in the main menu. The user can choose either to type the words on their own, copy from other passages and paste it directly or upload files to check the grammar. There is also a word count available there if users want to count the word.

Screen 6

This is an example of a user's type in the application. If there is an error, the system will show the fix errors icon for users. Once they click on it, the correct version will be displayed and they can know what is the correct grammar to use in this sentence. If there is no error, the system will show a zero error icon.

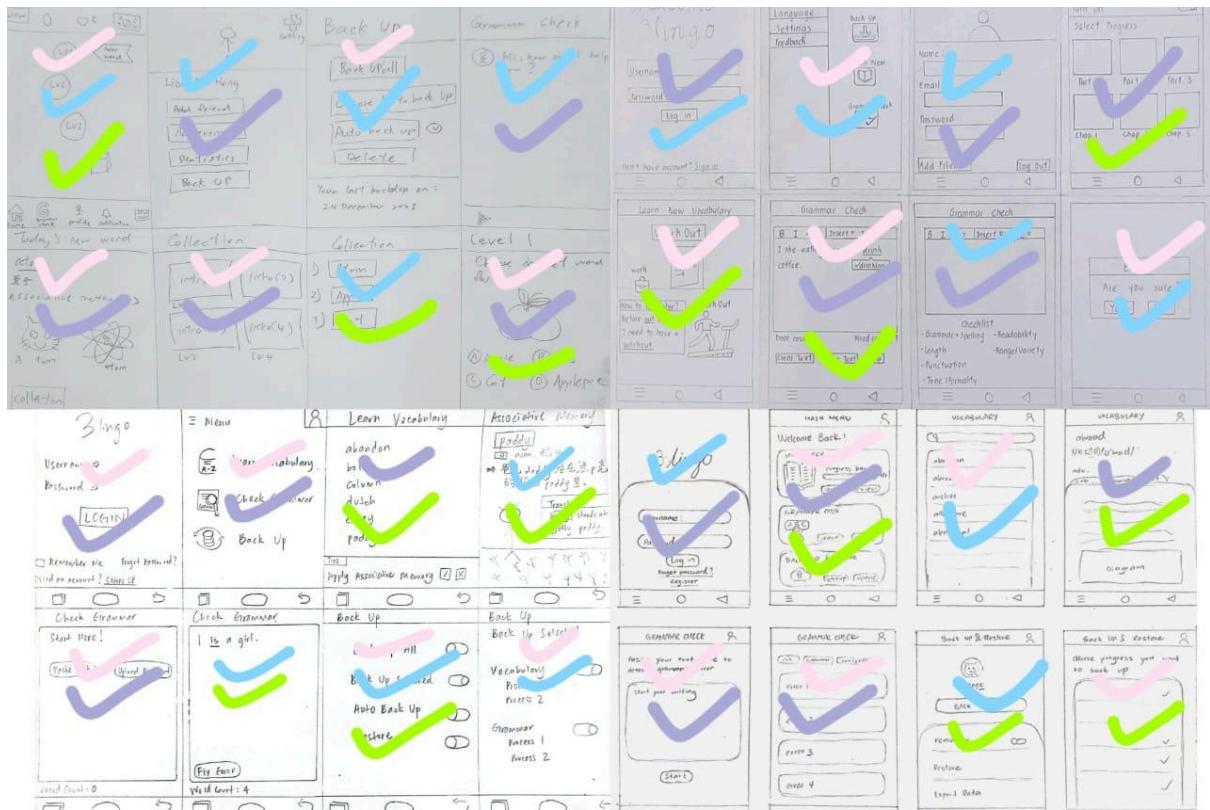
Screen 7

This page will be shown if the users click on the “Back Up” option in the main menu. There are four features for users to select including back up all, back up selected, auto back up as well as restore. Back up all means if the application will backup all data, selected means users can select only what they wish to back up, auto back up means they can auto back up all the data and users can use restore function if they accidentally delete something.

Screen 8

This is the example of users choosing the “Back Up Selected” features. There are two options in this feature, they can choose to back up process or data in vocabulary section only or back up process or data in grammar section or both. Hence, the users can select data that will be back up to save their storage.

2.5 Scan of Voted Design Layouts



1. Liow Zhi Heng-vote for everyone

Reason: I want the good things of everyone's design to be combined together and become a better ui. I think Pang Zhi Xuan's login interface has a clean, intuitive design that makes for an easy user experience. Similarly, the select features interface designed by Lim Xiao Xuan is exceptionally user-friendly due to its straightforward navigation and user-focused design. Innovative visual memory strategies are also incorporated into Denies Wong Ke Ying's design, which gives the learning process an enjoyable dimension.

2. Denies Wong Ke Ying - vote for everyone

Reason: I believe that each design has its unique strengths. By combining them, we can create an interface that is more effective and user-friendly. In my opinion, the interface that design by Liow Zhi Heng which is to select the level of familiarity with the language is necessary for the design of 3lingo language platform. Moreover, the login interface that was designed by Lim Xiao Xuan is very clear and suitable to use for users of every age group. In addition, the selection of the vocabulary interfaces designed by Pang Zhi Xuan is very useful because users can select the vocabulary that they are not familiar with.

3. Lim Xiao Xuan - vote for everyone

Reason: Everyone's design has characteristics that attract users. For example, the login interface design by Denies Wong Ke Ying is a visually clean and

easy-to-navigate interface. The simplicity and clarity of Liow Zhi Heng's design about the select features interfaces for users to use and Pang Zhi Xuan's design employs visual memory techniques. By combining the most notable elements from different designs, we can create a platform that is focused on the user. In addition, I also suggest Denies Wong Ke Ying's design as the basic of the 3lingo platform design.

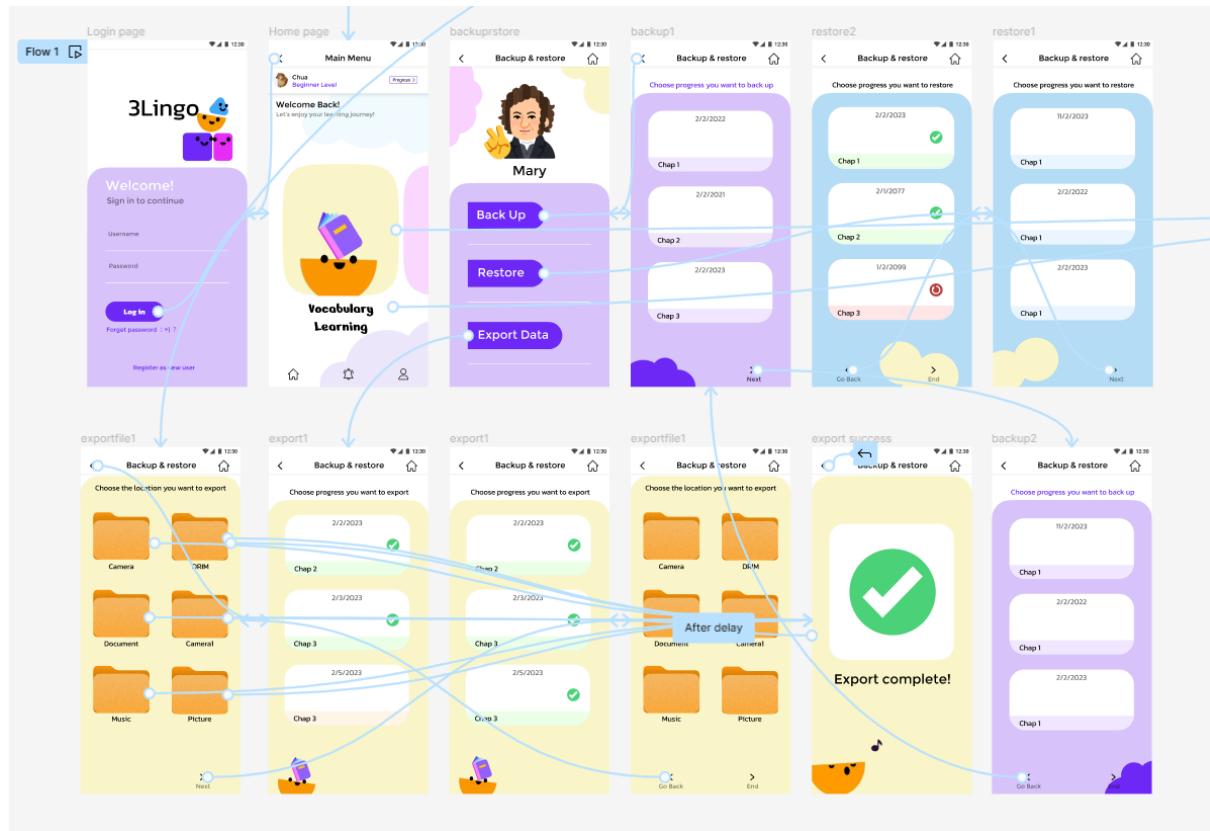
4. Pang Zhi Xuan - vote for everyone

Reason: I think that creativity of everyone shall be combined to give the best user interface and usability to our users. The selection of familiar language level interfaces designed by Liow Zhi Heng is useful to get information about our users. Other than that, the interfaces of select features designed by Denies Wong Ke Ying implement intuitive icons or animated characters that convey the functionality and make it both visually appealing and simple to use. Besides that, the grammar checking interfaces designed by Lim Xiao Xuan make sure the grammar checker is easily readable and utilizes a tidy, user-friendly layout.

Result: After discussion, we all decided to use Denies Wong Ke Ying's design as a basic of 3lingo platform design. In addition, we also combine other member's designs as reference to the final design of this learning language platform.

3.0 Wireframes

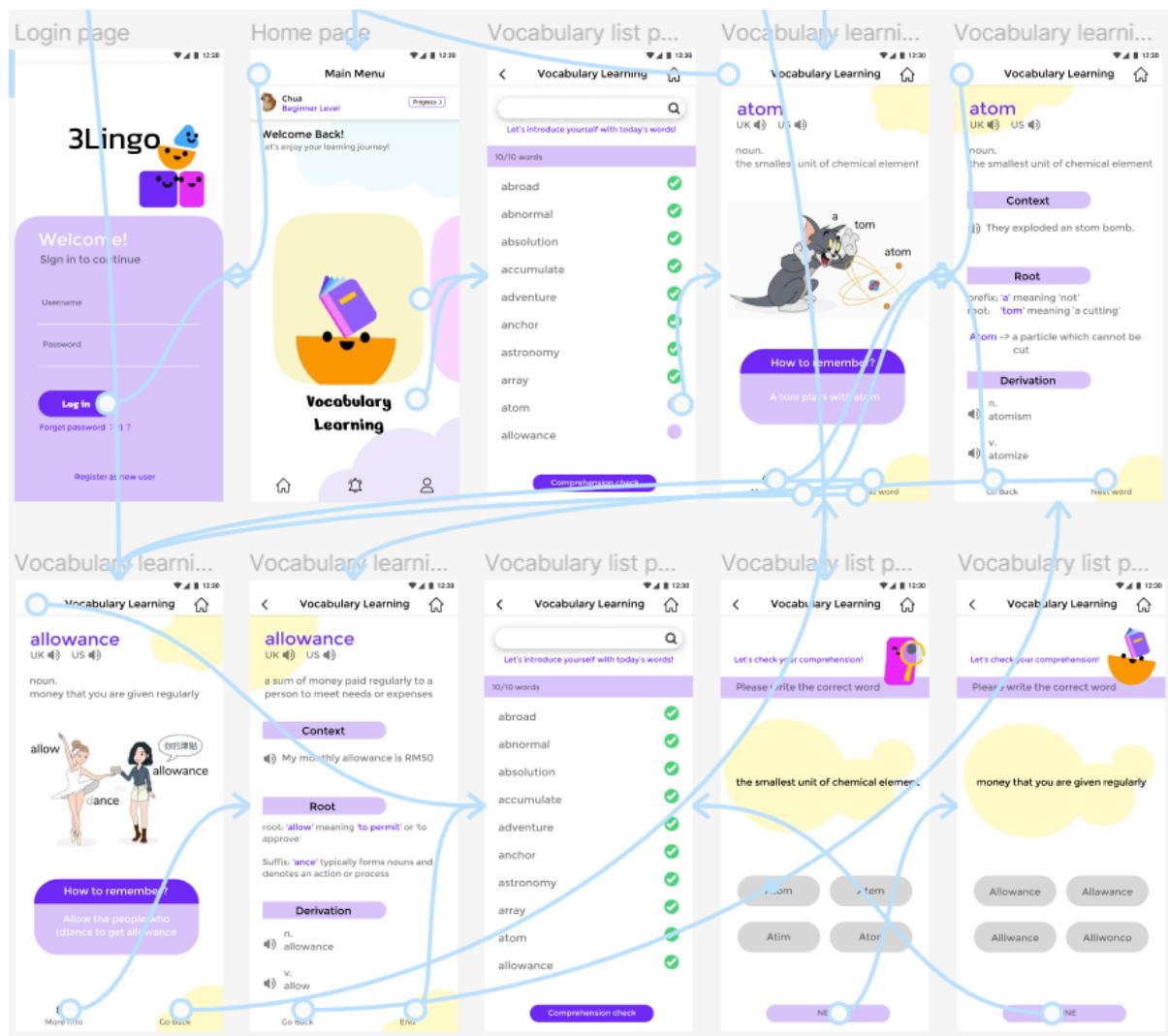
3.1 Task 1: Back up



Discussion of Wireframe Task 1

In the design requirement of phase 2, backup features have been mentioned to backup and restore the users' data to avoid data loss. After users login to the 3lingo platform, "Backup and Restore" button is available in the main menu to bring users to access backup and restore pages. In addition, backup and restore features have been divided into back up, restore and export data and it is convenient for users to access the features they need. The backup and restore process ensures that user data, including completed lessons and vocabulary learned are stored securely in the cloud. When the progress is completed to backup, users can click the "End" button to go back to the backup pages to choose again the features they want.

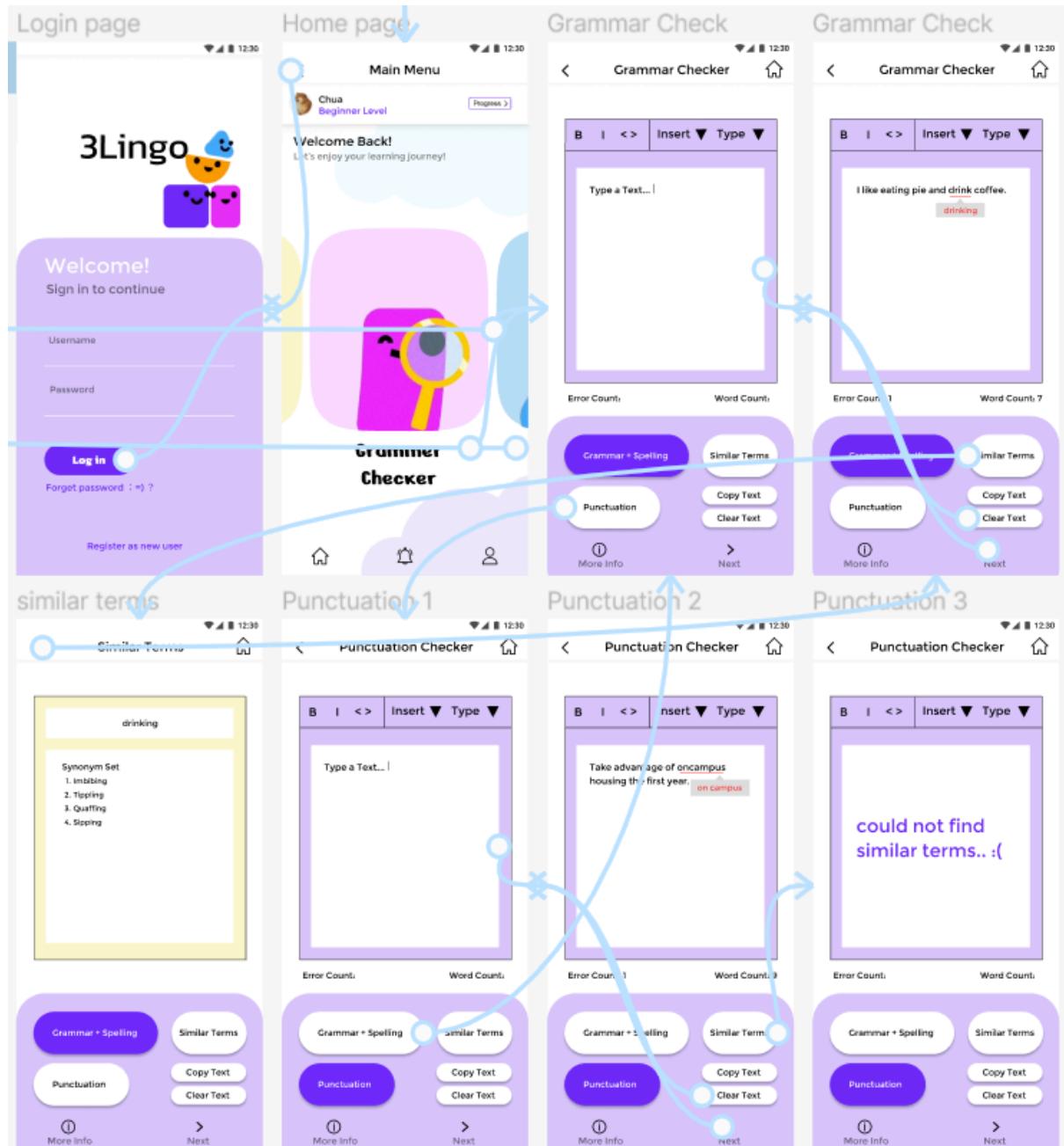
3.2 Task 2: Learn new vocabulary



Discussion of Wireframe Task 2

The features of learning new vocabulary in the 3lingo platform can resolve the problem of challenging memorization and frustration. Users can login to the platform and click the “Vocabulary Learning” button to learn a new vocabulary with an interesting and fun method. This feature is available with a dynamic module featuring visual aids, gamification elements, and interactive activities. Engaging visuals and imagery are incorporated, associating new words with memorable pictures to enhance memory retention. Moreover, the volume button is used to play the audio pronunciation about the new vocabulary and it can guide the users to pronounce the vocabulary correctly. Users can also explore the context, root, and derivation of words by clicking the “more info” icon. Once the user has mastered all the intended vocabulary, they can assess their understanding through interactive gaming activities.

3.3 Task 3: Check grammar



Description of Wireframe Task 3

In the wireframe for task 3 which is grammar checker, this feature solves the lack of grammar correction problem. Firstly, users are required to login to the 3lingo platform and they will access the main menu to select the feature that users need. By clicking the “Grammar Checker” button, the platform utilizes a grammar-checking algorithm, offering real-time

corrections and suggestions as users engage in language activities, write paragraphs, or complete exercises. Hence, grammar error problems will be reduced and users will get a more accurate grammar in the paragraph. Moreover, the checklist that shows in the grammar checker also provides other useful features to check the grammar such as punctuation, tone or formality, readability and similar terms of sentences.

3.4 Justification of design

Our system has applied both Gestalt principles and Shneiderman's Golden Rules. In Gestalt principles, we have used proximity and similarity. Firstly, for the "proximity", we have put all the functions in the main menu so that the users can navigate our application more efficiently(Figure 4.1). This design created a visual connection between related items by placing them in close proximity to each other.

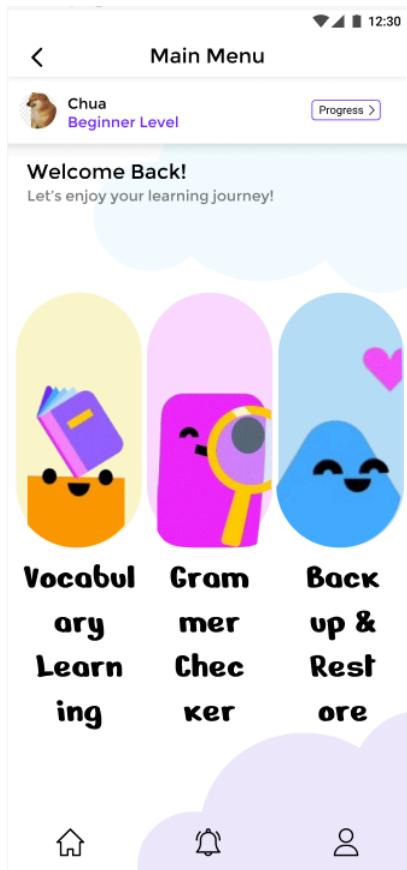


Figure 4.1

In the context of "similarity", our functions or information that are similar in nature are represented using similar styles, colors, or shapes. For instance, all buttons in our app have the same color and style(Figure 4.2). It aids users in fast and simply recognizing and

comprehending the connections between the interfaces. For the bell icon, it is easier for users to know that there is a notification to alert them.

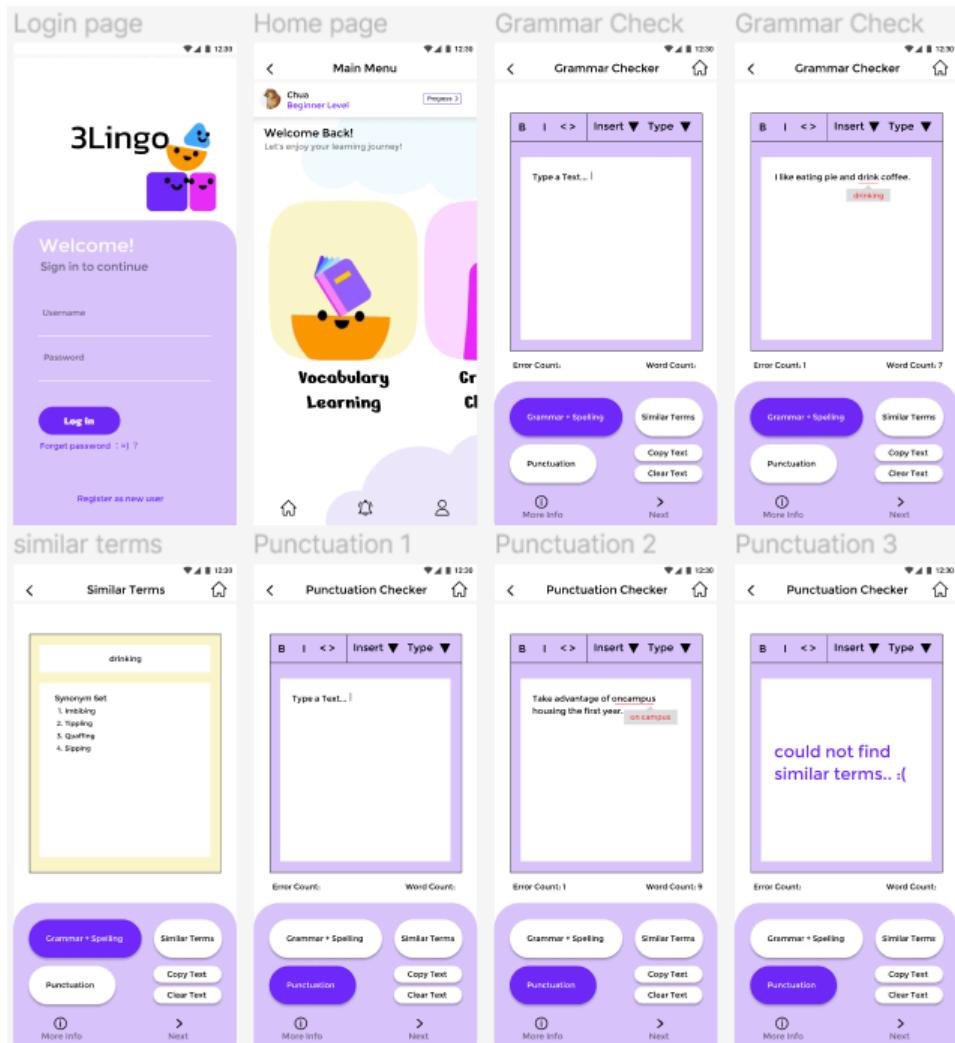


Figure 4.2

Moreover, we have also applied the Shneiderman's 8 Golden Principles. In principle of "Permit Easy Reversal of Actions", if a user is in the middle of our app's multiple steps, they may simply undo their actions by clicking the go back feature in every right upper page of our app (Figure 4.3). Users are given authority over the application by this design decision which also makes it straightforward for them to log out or access other features with a single click.

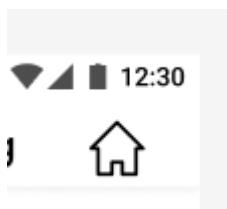


Figure 4.3

Next, our system adheres to the “Support Internal Locus of Control” principle which allows users to take the initiative to do the action and complete control instead of feeling like they are reacting to the system and they are free from limitations set by the developer.

Furthermore, our application makes use of recognizable icons and colors to adhere to the principles of "Strive for Consistency" and "Reduce Short-term Memory Load". In this case, our application uses the home, bell and profile icons which let users identify which icon corresponds to which function in the main menu page(Figure 4.4). Following this, we “Enable Frequent Users to Use Shortcuts” within our application. By just clicking the "home" button, users may quickly return to the app's homepage and continue with their current task.



Figure 4.4

Additionally, our application also “Offer Simple Error Handling” which means that if the users make an error, our system gives them chances to easily recover. For example, if users forget their password, they can try to recover it by simply clicking the forgot password in the bottom part of our login page(Figure 4.5). This will redirect them to change their password so that they can login to use our app.

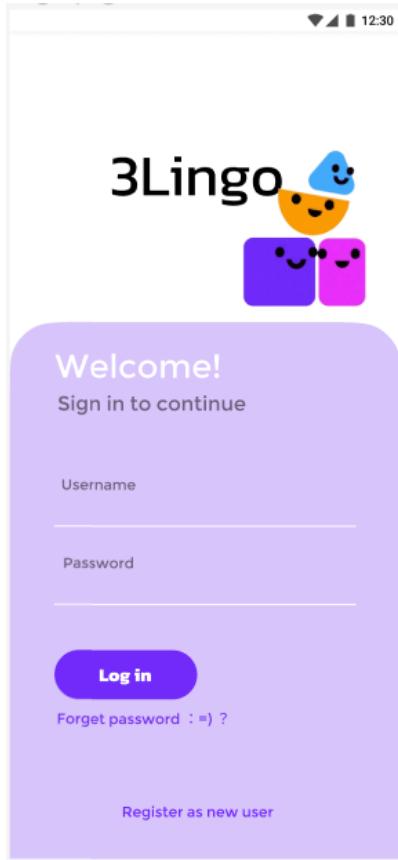


Figure 4.5

Lastly, our application “Offer Informative Feedback” which means that feedback is sent by the system following each activity. For example, if users click on the back up or restore function, the system will redirect them to the back up page(Figure 4.6).

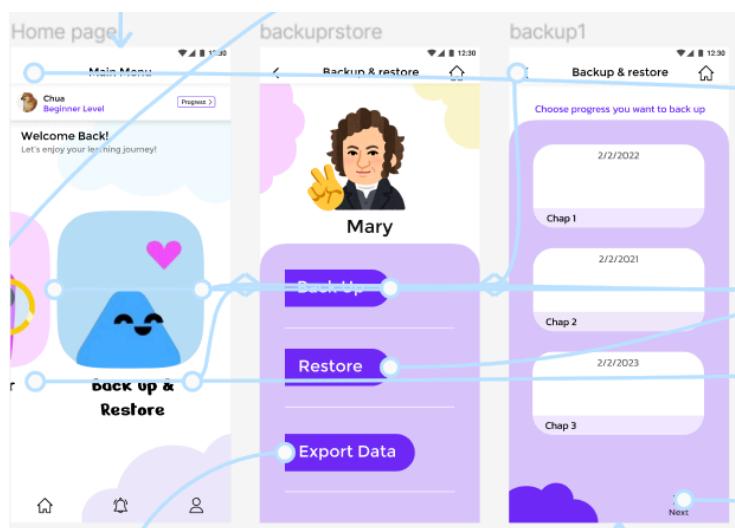


Figure 4.6

The “Design Dialog to Yield Closure” that is used in our system is the action sequences are arranged in groups according to their beginning, middle, and end. For example, learning vocabulary begins with choosing a word, followed by memorizing it using associative memory and finishes with exercises(Figure 4.7).

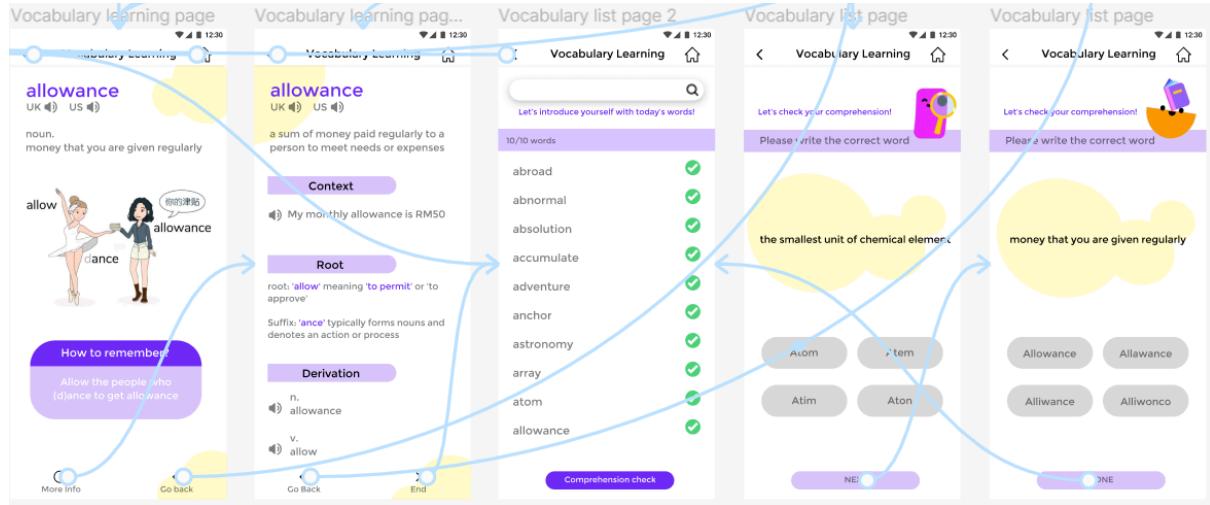


Figure 4.7

4.0 Description and Justification of Metaphors



Home

Function: To redirect users back to the application's homepage



Notification

Function: To give users update on their progress



User Profile

Function: To take users to profile page



Vocabulary Learning

Function: To access learning new vocabulary pages.



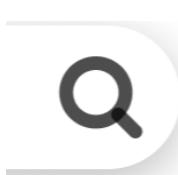
Grammar Checker

Function: To access checking grammar error pages.



Backup and Restore

Function: To make users access backup and restore pages and avoid data loss.



Search

Function: To let user to search the word



Volume

To play the audio pronunciation



Information

Function: To let user to get more information about the word

More Info



Successful

Function1: To mark the word as learned

Function 2: To let users know backup progress success.



Not Successful

Function: To let users know backup progress not success.



Back

Function: To take users to the previous page.



Next

Function: To take users to the next page.



Clear Text

Function: Convenient for users to delete all sentences at once.



Copy Text

Function: Convenient for users to copy the text.



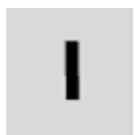
Help

Function: Provide guidelines about how to use the features.



Bold

Function: Make the selected text bold.



Italic

Function: Italicize the selected text.



Theme Font

Function: Change the theme font of selected text.



Correction Grammar

Function: Provide correct grammar when detecting grammar errors.

Phase 4

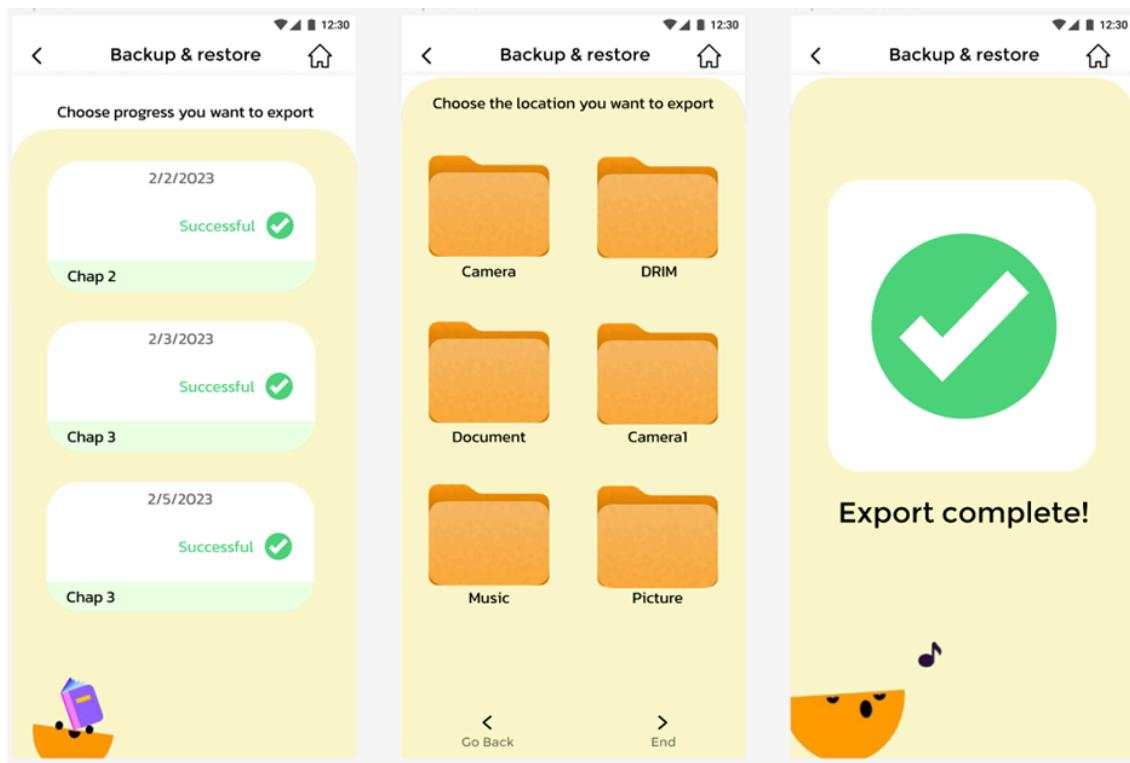
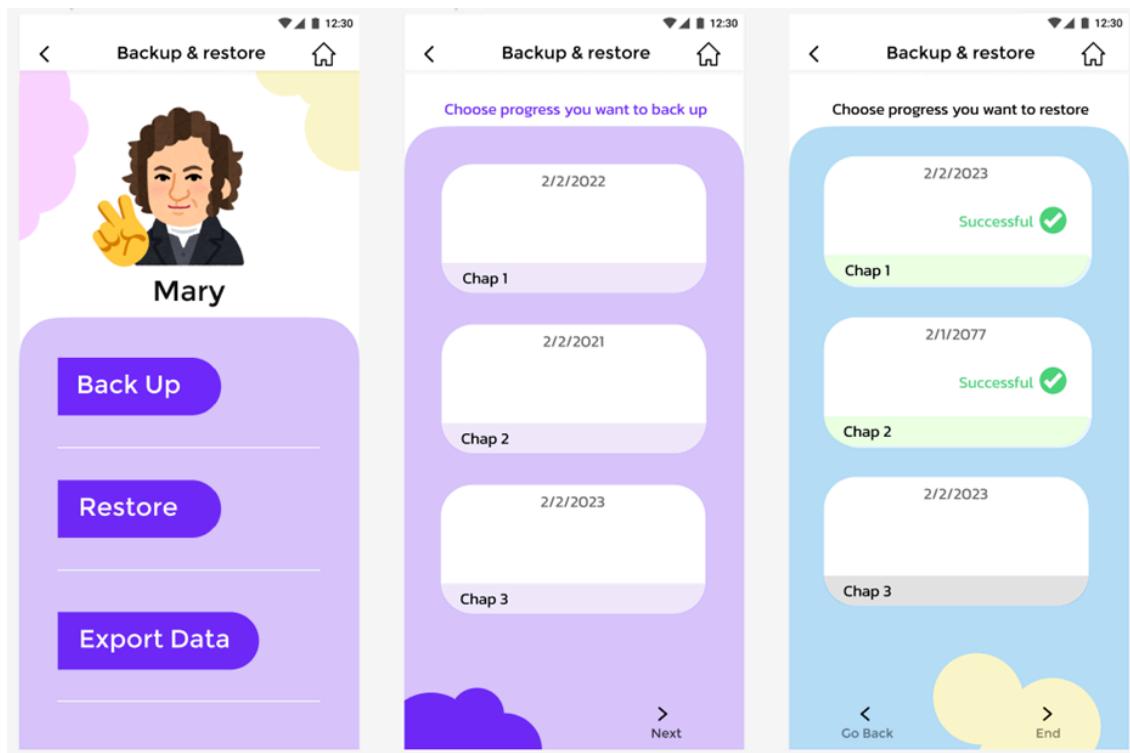
1.0 Introduction

This report is focused on the usability assessment that our team, Team Nourish Knights, conducted on our innovative language learning platform, 3Lingo. The evolved language-learning platform 3Lingo develops on the foundation that was established by its predecessor, Duolingo. The creation of a prototype has been helpful in learning the specifics of check grammar, learning a new vocabulary and backup system. Similar to the difficulties encountered when turning a sketch into a prototype, the process entails keeping up with technological advancements, learning about analytics, and designing algorithm interfaces. This project has produced a wealth of knowledge that advances language learning experiences in an ongoing way. The testing took place at UTM campus under the guidance of our group members and involved three participants, each from a different target user group. The participants used their phones to test the 3Lingo prototype on Figma by doing three tasks which are check grammar, learning a new vocabulary and backup.

The 3Lingo platform works to use every bit of learned knowledge to benefit language learners around the world in the rapidly changing world of technology. Improving language learning experiences for students, teachers, and language enthusiasts is the aim. The 3Lingo app is made to help users become more fluent language learners while also making everyday language-related tasks easier. As we move toward the last phase of the 3Lingo language learning platform development, our goal is to produce an application that appeals to users and increases the accessibility and fun of language learning. By using tools such as Figma for usability testing, we can improve and modify the user experience in response to insightful input from those we want to attract.

2.0 Screenshots of Prototype

2.1 Task 1: Backup



2.2 Task 2: Learn new vocabulary

The image displays four screenshots of a mobile application for vocabulary learning, showing the interface for learning words like 'atom' and 'allowance'.

Screenshot 1: Vocabulary Learning - atom

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	●
anchor	✓
array	✓
astronomy	✓
atom	●

How to remember?
A tom plays with atom

① word definition > Next word

Screenshot 2: Vocabulary Learning - allowance

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	✓
anchor	✓
array	✓
astronomy	✓
atom	✓

How to remember?
Allow the people who (d)ance to get allowance

① word definition > Go back

Screenshot 3: Vocabulary Learning - atom

Let's introduce yourself with today's words!

10/10 words

atom
UK (audio) US (audio)

noun.
the smallest unit of chemical element

Context
(audio) They exploded an atom bomb.

Root
prefix: 'a' meaning 'not'
root: 'tom' meaning 'a cutting'

Derivation
n. atomism
(audio) atomize
v. atomize

< Go Back > Next word

Screenshot 4: Vocabulary Learning - allowance

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	✓
anchor	✓
array	✓
astronomy	✓
atom	✓

Context
(audio) My monthly allowance is RM50

Root
root: 'allow' meaning 'to permit' or 'to approve'
Suffix: 'ance' typically forms nouns and denotes an action or process

Derivation
n. allowance
(audio) allow
v. allow

< Go Back > End

Screenshot 1: Vocabulary Learning

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
anchor	✓
astronomy	✓
array	✓
atom	✓
allowance	✓

Comprehension check

Screenshot 2: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

the smallest unit of chemical element

Atom Atem Atim Aton

NEXT

Screenshot 3: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

money that you are given regularly

Allowance Allawance Alliowance Alliwonco

DONE

2.3 Task 3: Check grammar

Screenshot 1: Grammar Checker

Fix all

I like eating pie and drink coffee.

drinking

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling Similar Terms
Punctuation Copy Text Clear Text
More Info Next

Screenshot 2: Grammar Checker

Fix all

I like eating pie and drinking coffee.

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling Similar Terms
Punctuation Copy Text Clear Text
More Info Next

Screenshot 3: Similar Terms

drinking

Synonym Set

1. Imbibing
2. Tippling
3. Quaffing
4. Sipping

More Info Next

3.0 Briefing Notes

Good day to you! Thanks for joining us, we are university students studying Human Computer Interaction course and are conducting usability testing for our app called 3lingo. 3lingo is an updated version of Duolingo which helps people learn most of the languages.

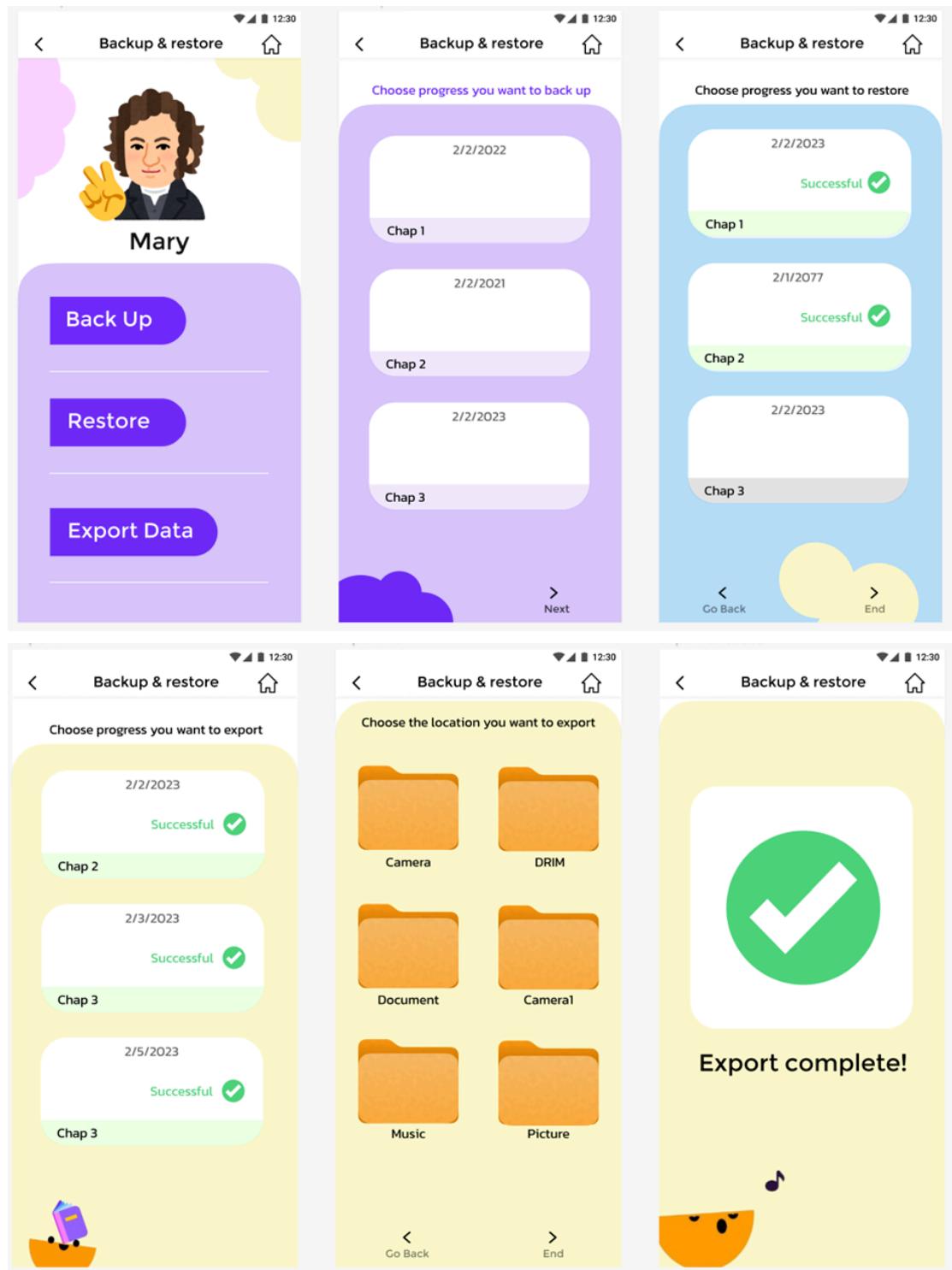
Hence, I would like you to complete three tasks which are backup, learning vocabulary and grammar checker that was proposed by us using the prototype designed in the Figma app. You are allowed to say out loud your opinions about the interface and system during testing. Feel free to say “STOP” if you are unable to complete the task, we will see if we can continue with other tasks.

Before starting, I would like to have your verbal consent. Could you please reply “YES” if you are clear? If not, please reply “NO”. Thank You.

4.0 Testing with Users

4.1 User 1: Chua Ern Qi (Students)

4.1.1 Task 1: Backup



4.1.2 Task 2: Learn new vocabulary

Vocabulary Learning

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	●
anchor	✓
array	✓
astronomy	✓
atom	●

Comprehension check

Vocabulary Learning

atom
UK ⓘ US ⓘ

noun.
the smallest unit of chemical element

How to remember?
A tom plays with atom

① word definition > Next word

Vocabulary Learning

allowance
UK ⓘ US ⓘ

noun.
money that you are given regularly

How to remember?
Allow the people who (d)ance to get allowance

① word definition ⏪ Go back > End

Vocabulary Learning

allowance
UK ⓘ US ⓘ

a sum of money paid regularly to a person to meet needs or expenses

Context
 ⓘ My monthly allowance is RM50

Root
root: 'allow' meaning 'to permit' or 'to approve'
Suffix: 'ance' typically forms nouns and denotes an action or process

Derivation
n. allowance
v. allow

Go Back > Next word

Vocabulary Learning

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	✓
anchor	✓
array	✓
astronomy	✓
atom	✓

Comprehension check

Screenshot 1: Vocabulary Learning

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
anchor	✓
astronomy	✓
array	✓
atom	✓
allowance	✓

Comprehension check

Screenshot 2: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

the smallest unit of chemical element

Atom Atem Atim Aton

NEXT

Screenshot 3: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

money that you are given regularly

Allowance Allawance Alliowance Alliwonco

DONE

4.1.3 Task 3: Check grammar

Screenshot 1: Grammar Checker

Fix all

I like eating pie and drink coffee.

drinking

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling Similar Terms
Punctuation Copy Text Clear Text
More Info Next

Screenshot 2: Grammar Checker

Fix all

I like eating pie and drinking coffee.

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling Similar Terms
Punctuation Copy Text Clear Text
More Info Next

Screenshot 3: Similar Terms

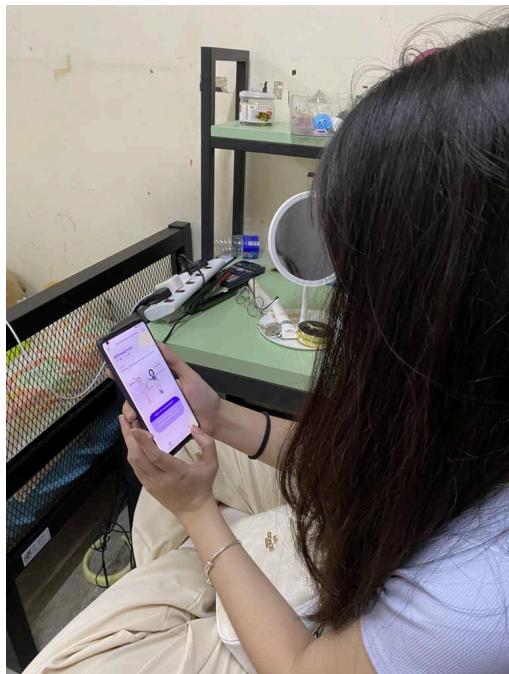
drinking

Synonym Set

1. Imbibing
2. Tippling
3. Quaffing
4. Sipping

More Info Next

4.1.4 Photo when User 1 Testing



4.1.5 Link Video User 1

Task 1:

https://drive.google.com/file/d/1havb8RrqVZQc2ovESH1o8cqf9OniOCXq/view?usp=drive_link

Task 2:

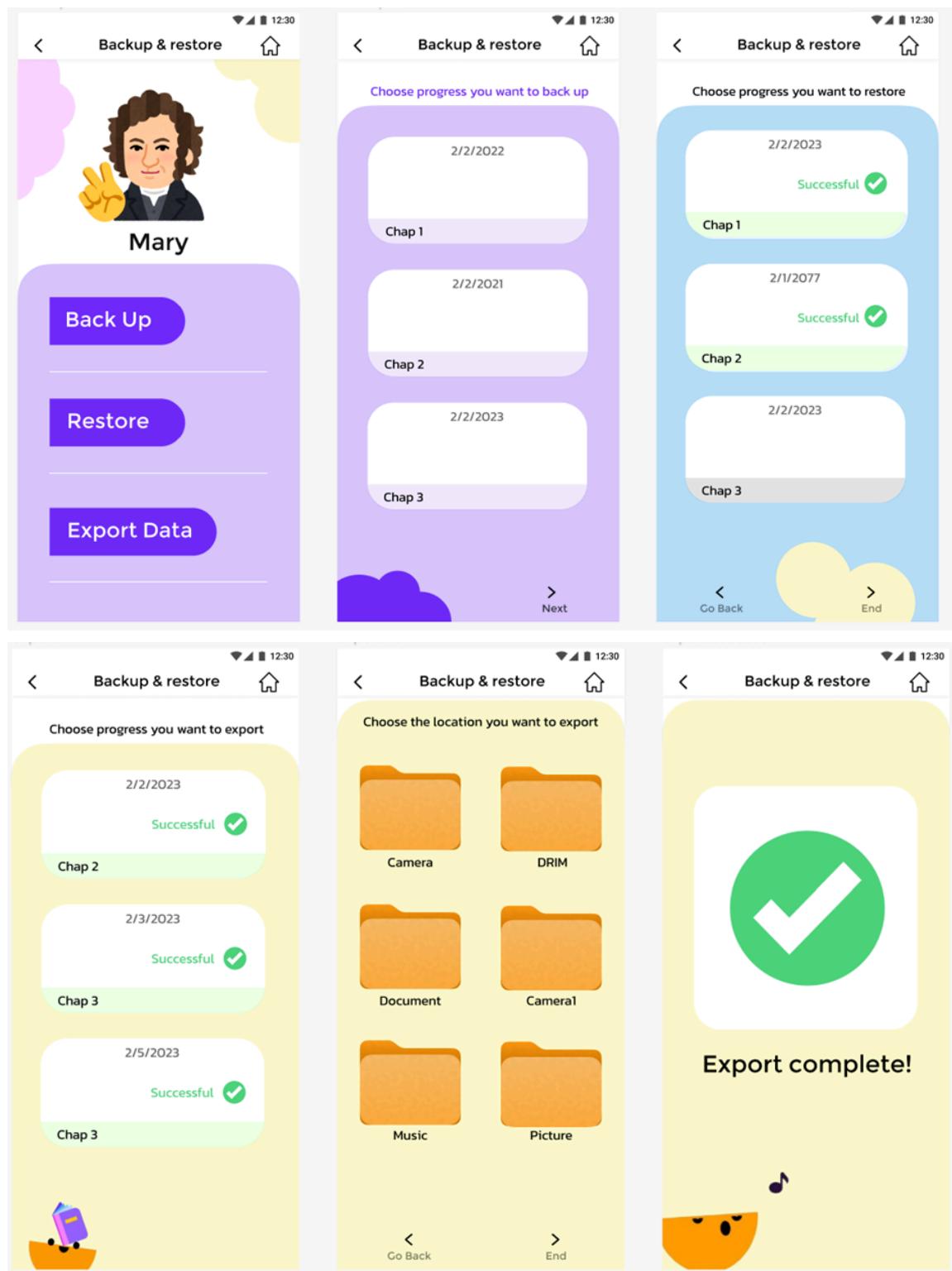
https://drive.google.com/file/d/1iz_SrEgOQ8twqHfpiaJXeNpkMUGkrBVB/view?usp=drive_link

Task 3:

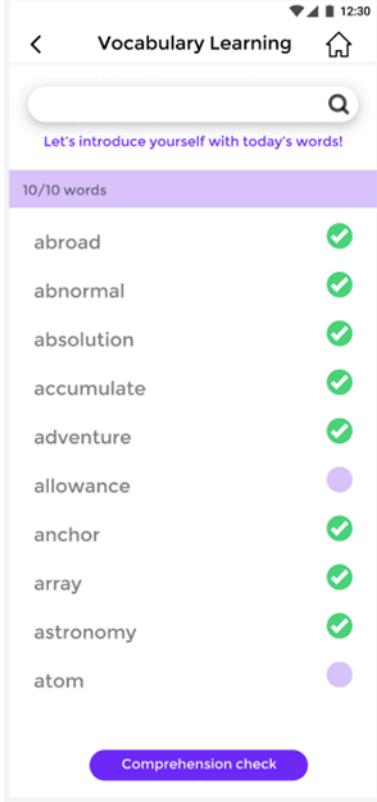
https://drive.google.com/file/d/1irqqd-5izAB3evdsDy8-oFWr_mAdl_1x/view?usp=drive_link

4.2 User 2: Ooi En Tong (Kids)

4.2.1 Task 1: Backup



4.2.2 Task 2: Learn new vocabulary

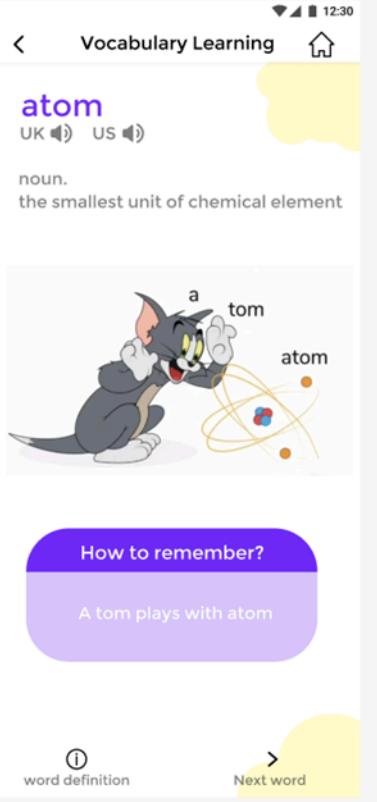


Let's introduce yourself with today's words!

10/10 words

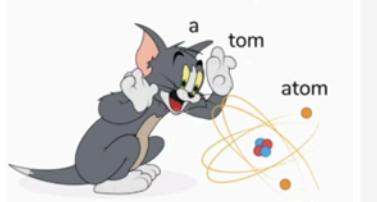
abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	●
anchor	✓
array	✓
astronomy	✓
atom	●

Comprehension check



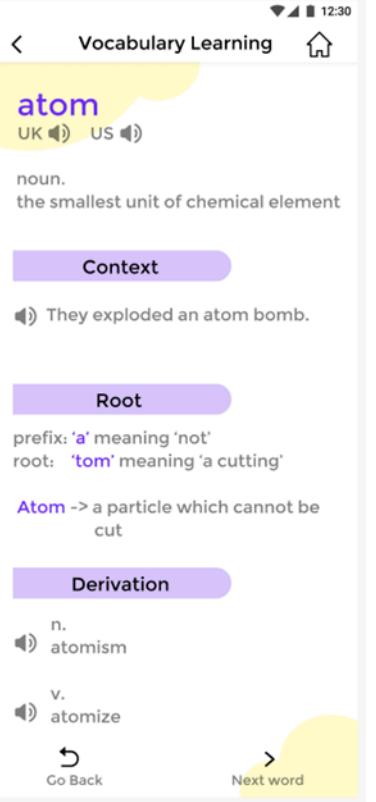
atom
UK ⓘ US ⓘ

noun.
the smallest unit of chemical element



How to remember?
A tom plays with atom

① word definition > Next word



Context
They exploded an atom bomb.

Root
prefix: 'a' meaning 'not'
root: 'tom' meaning 'a cutting'

Derivation
n.
atomism
v.
atomize

< Go Back > Next word



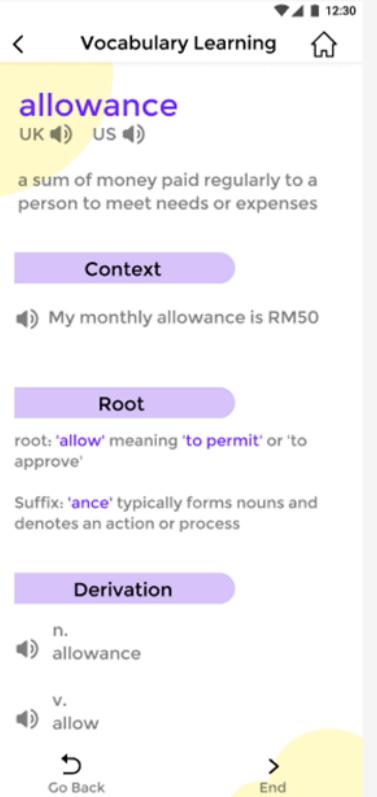
allowance
UK ⓘ US ⓘ

noun.
money that you are given regularly



How to remember?
Allow the people who (d)ance to get allowance

① word definition < Go back > End

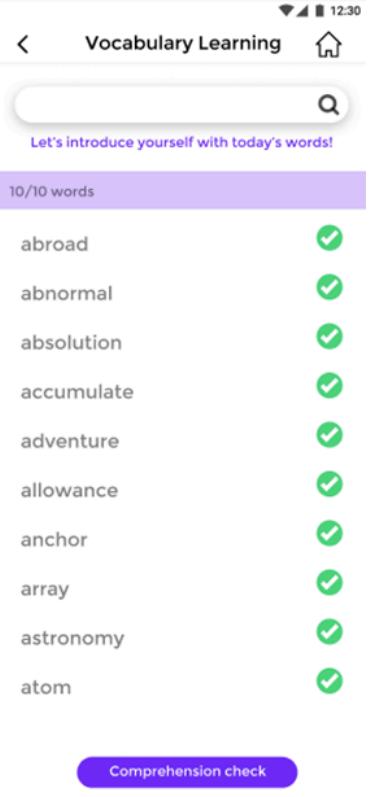


Context
My monthly allowance is RM50

Root
root: 'allow' meaning 'to permit' or 'to approve'
Suffix: 'ance' typically forms nouns and denotes an action or process

Derivation
n.
allowance
v.
allow

< Go Back > End



Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	✓
anchor	✓
array	✓
astronomy	✓
atom	✓

Comprehension check

Screenshot 1: Vocabulary Learning

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
anchor	✓
astronomy	✓
array	✓
atom	✓
allowance	✓

Comprehension check

Screenshot 2: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

the smallest unit of chemical element

Atom Atem Atim Aton

NEXT

Screenshot 3: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

money that you are given regularly

Allowance Allawance Alliowance Alliwonco

DONE

4.2.3 Task 3: Check grammar

Screenshot 1: Grammar Checker

Fix all

I like eating pie and drink coffee.

drinking

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling
Similar Terms
Punctuation
Copy Text
Clear Text
More Info > Next

Screenshot 2: Grammar Checker

Fix all

I like eating pie and drinking coffee.

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling
Similar Terms
Punctuation
Copy Text
Clear Text
More Info > Next

Screenshot 3: Similar Terms

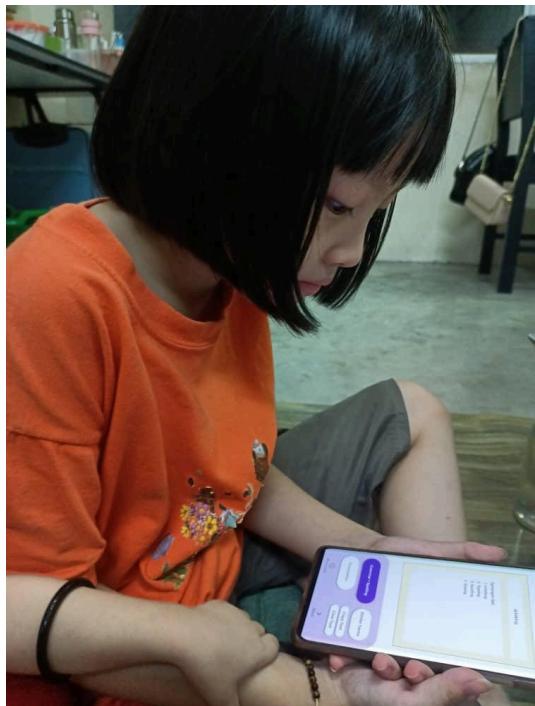
drinking

Synonym Set

1. Imbibing
2. Tippling
3. Quaffing
4. Sipping

Grammar + Spelling
Similar Terms
Punctuation
Copy Text
Clear Text
More Info > Next

4.2.4 Photo when User 2 Testing



4.2.5 Link Video User 2

Task 1:

https://drive.google.com/file/d/1iLZk-oLlmx5HeQLY_doHk2yd_KLSQn05/view?usp=drive_link

Task 2:

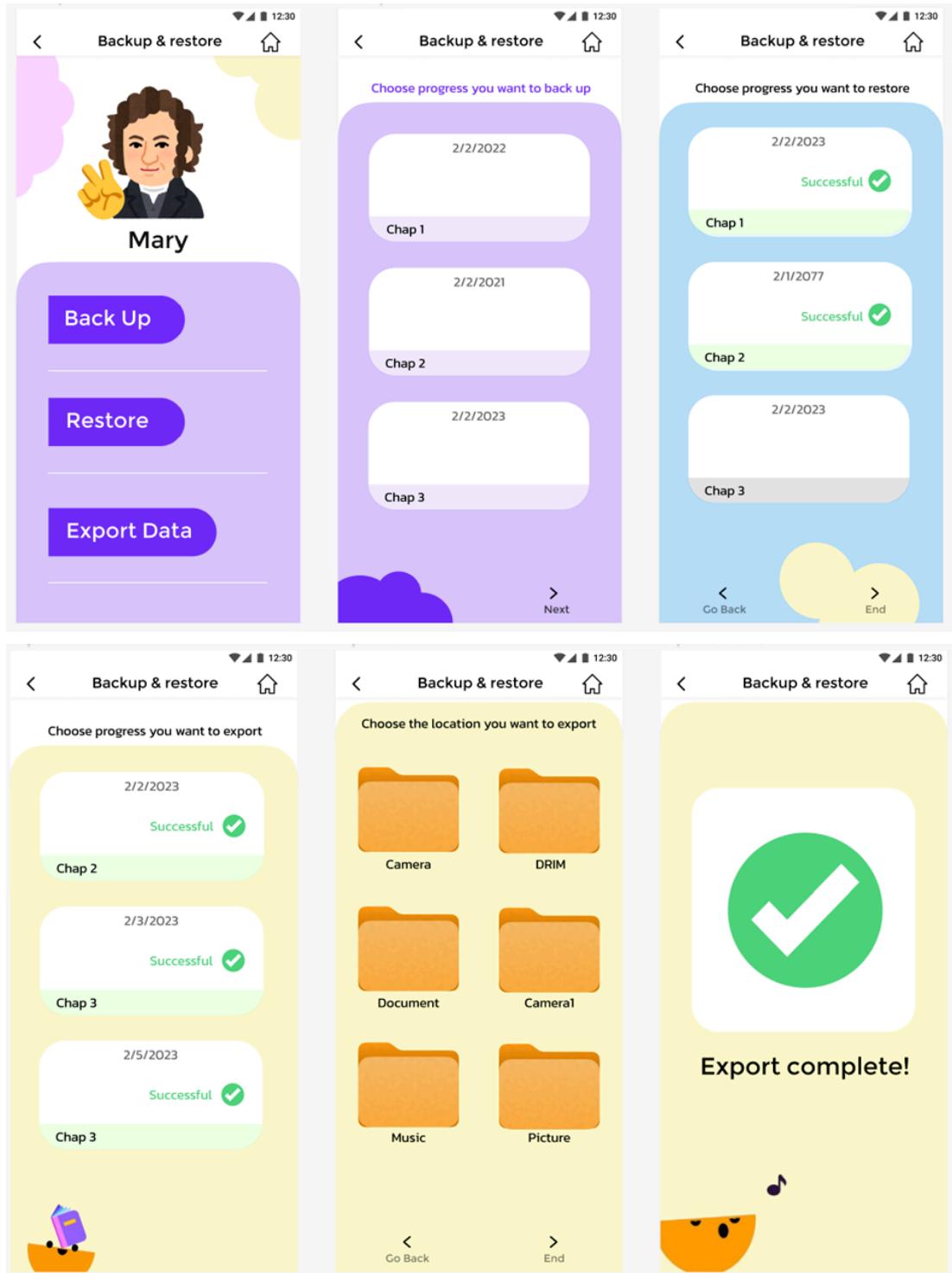
https://drive.google.com/file/d/1j2D_M5vGDBfUnwAhbLjOwrTVDfr7dScc/view?usp=drive_link

Task 3:

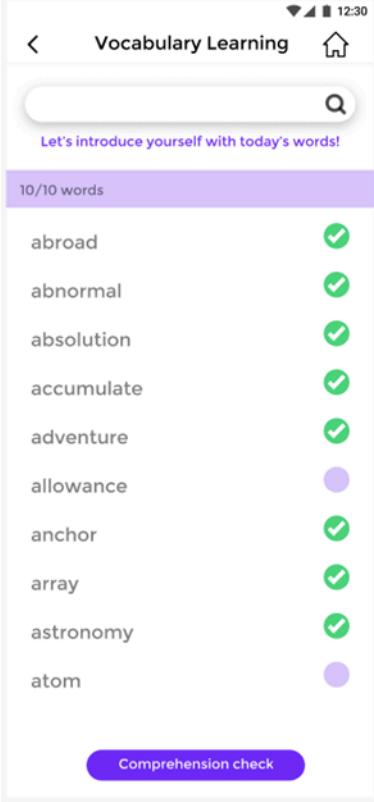
https://drive.google.com/file/d/1j0ydeQZbL5BV2dR0DIm58SZYiK1MErlN/view?usp=drive_link

4.3 User 3: Mary (Office Worker)

4.3.1 Task 1: Backup



4.3.2 Task 2: Learn new vocabulary

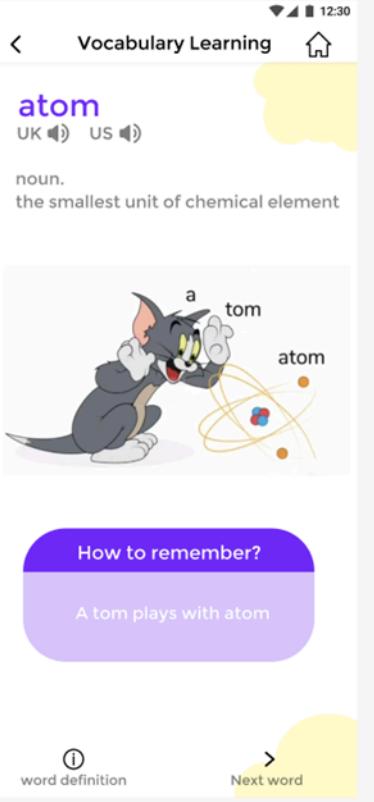


Let's introduce yourself with today's words!

10/10 words

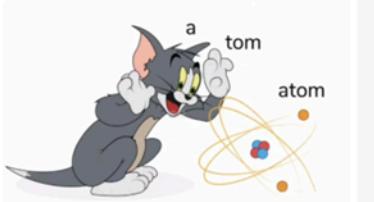
abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	●
anchor	✓
array	✓
astronomy	✓
atom	●

Comprehension check



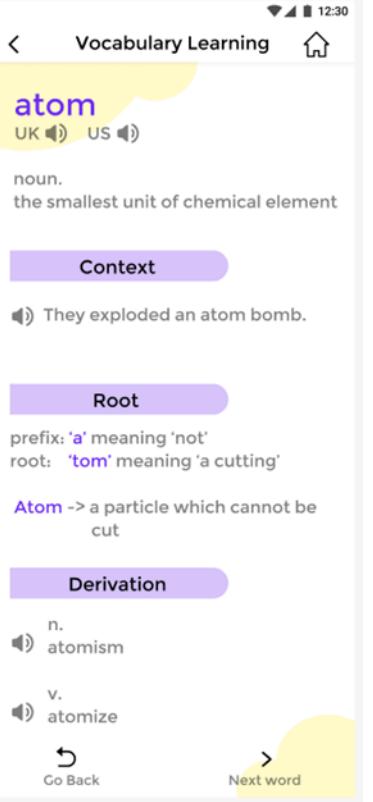
atom
UK ⓘ US ⓘ

noun.
the smallest unit of chemical element



How to remember?
A tom plays with atom

① word definition > Next word



Context
They exploded an atom bomb.

Root
prefix: 'a' meaning 'not'
root: 'tom' meaning 'a cutting'

Derivation
n.
atomism
v.
atomize

< Go Back > Next word



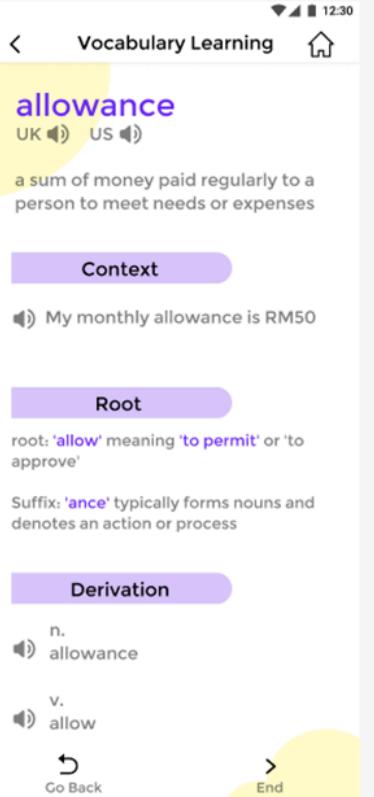
allowance
UK ⓘ US ⓘ

noun.
money that you are given regularly



How to remember?
Allow the people who (d)ance to get allowance

① word definition < Go back > End

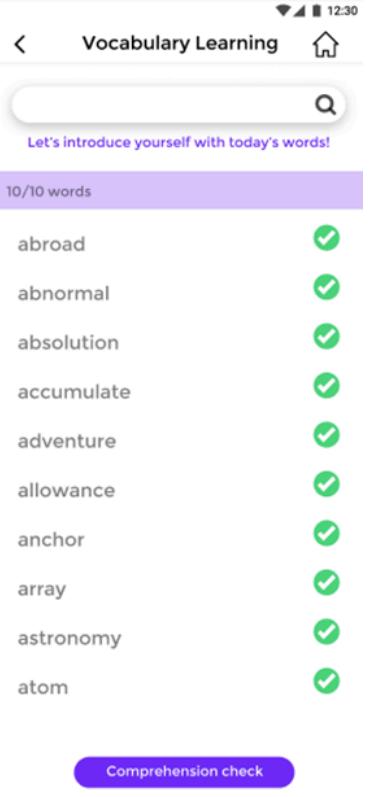


Context
My monthly allowance is RM50

Root
root: 'allow' meaning 'to permit' or 'to approve'
Suffix: 'ance' typically forms nouns and denotes an action or process

Derivation
n.
allowance
v.
allow

< Go Back > End



Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
allowance	✓
anchor	✓
array	✓
astronomy	✓
atom	✓

Comprehension check

Screenshot 1: Vocabulary Learning

Let's introduce yourself with today's words!

10/10 words

abroad	✓
abnormal	✓
absolution	✓
accumulate	✓
adventure	✓
anchor	✓
astronomy	✓
array	✓
atom	✓
allowance	✓

Comprehension check

Screenshot 2: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

the smallest unit of chemical element

Atom Atem Atim Aton

NEXT

Screenshot 3: Vocabulary Learning

Let's check your comprehension!

Please write the correct word

money that you are given regularly

Allowance Allawance Alliowance Alliwonco

DONE

4.3.3 Task 3: Check grammar

Screenshot 1: Grammar Checker

Fix all

I like eating pie and drink coffee.

drinking

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling
Similar Terms
Punctuation
Copy Text
Clear Text
More Info > Next

Screenshot 2: Grammar Checker

Fix all

I like eating pie and drinking coffee.

Word limit : 7/1000

Error Count: 1 Word Count: 7

Grammar + Spelling
Similar Terms
Punctuation
Copy Text
Clear Text
More Info > Next

Screenshot 3: Similar Terms

drinking

Synonym Set

1. Imbibing
2. Tippling
3. Quaffing
4. Sipping

Grammar + Spelling
Similar Terms
Punctuation
Copy Text
Clear Text
More Info > Next

4.3.4 Photo when User 3 Testing



4.3.5 Link Video User 3

Task 1:

https://drive.google.com/file/d/1hYQGnaB0ZjyOWU_2rGb7E71ojJNxI5JY/view?usp=drive_link

Task 2:

https://drive.google.com/file/d/1j9xwPvjwna4Z6Lo7j_2WUhup4xWA20H6/view?usp=drive_link

Task 3:

https://drive.google.com/file/d/1j0pZPYD0mgfCm98N1gMXid4ir3-uIX6_/view?usp=drive_link

5.0 Observations

During the user testing process of the first user, Chua Ern Qi who is a year 2 software engineering student studying in UTM , she thinks that the 3lingo platform is a valuable academic resource that easily integrates into her life and the grammar checker features help her to reduce the grammar error and save her time to check the error. Backing up the progress is the most ideal feature for this platform because she feels quite effective as well as she can continue learning languages across different devices easily. However, a number of observations were made that defined the usability of the platform. Among the things that stand out are the terms that have no antonyms in the check grammar feature. For the learning vocabulary feature, Ern Qi stated that she needed to be able to retake the comprehensive check's questions. Therefore, the function of this features can more completely help Ern Qi to enhances her language skills.

Furthermore, the second user, a child who is called Ooi En Tong, brought to our attention certain shortcomings in the vocabulary learning feature. The user pointed out that the small font size to be especially notable in the backup and restore features will affect user experience because she cannot see the instruction clearly. In addition, the button of clear text and button of copy text is too close and it will make the user feel inconvenience thereby reducing user satisfaction. Apart from that, the inability to construct sentences prevented her from using recently learned words in context. This observation points to a chance to improve vocabulary learning by implementing a feature that lets users construct and practice sentences with recently learned vocabulary. Despite this, En Tong is satisfied with our platform because it is easy to use and colorful. It can also store data to avoid loss and interesting pictures can help memory of new vocabulary.

Finally, our third user who is an office worker called Mary feels comfortable when using the backup features because it provides a sense of security and knowing the progress is saved. Then, the user-friendly design of the learning vocabulary features is suitable for everyone and real-time grammar checking is helpful to enhance professionalism and clarity in her work tasks. Nevertheless, she noted that there was no deletion feature, which would make it difficult for users to efficiently manage their data. By giving users more control over their data and reducing the possibility of accidental data restoration, the deletion feature would improve user experience. Other than that, Mary also suggests having a function to retake the

comprehensive check question after she does it wrongly when the first time. Besides that, she also points out that the distance between clear text buttons and copy text buttons should be increased to avoid mistakes. All of these observations help to shape future improvements to the functionality and usability of the platform.

6.0 Findings

The results of our users from different categories after testing our system pointed out a number of important findings that suggest areas where the platform needs to be improved. The users identified some challenges related to small font size in the user interface instructions. This result points out how crucial it is to maximize text readability in order to guarantee comprehension and interaction from users. It was also observed that there was no deletion function, highlighting the importance of adding one in order to give users greater control over how they manage their data and reduce the possibility of accidental data restoration. In combination, these results provide practical suggestions to improve the platform's usability and user satisfaction.

One important discovery is that users would prefer a greater number of vocabulary improvement resources, especially in the check grammar function where antonyms for synonymous terms are lacking. Including recommendations for antonyms would solve this need and make language learning more comprehensive. Users have also pointed out that the copy text and clear text buttons are too close together, which increases the possibility of accidental clicks. This is another important finding related to the button layout of the user interface. One possible way to improve user experience was to rearrange the layout so that the buttons were farther apart.

Other than that, users who were learning vocabulary stated that they needed the ability to create sentences using the words they had just learned. According to this research, there may be a chance to improve the vocabulary learning feature by including a tool that enables users to practice and create sentences with recently learned vocabulary. Furthermore, users stressed the value of having the option to retake questions in the comprehensive check, suggesting that this feature would help create a more efficient and customized learning experience.