

ABSTRACT

The objective of the project is to create an interactive game to help kids raise their vocabulary in English. The target age ranges are six years old kindergarten kids. Further research on online resources, research paper and literature review was done.

The project was initialize by analysing the main problem and come out with the solution, which is the objective itself. The proposed system will be developed to solve all the problem statement.

The game is aimed to be used on android platform. Full understanding to develop android games, the various types of games on how to make it more attractive is need. The methodology, Rapid Application Development (RAD) methodology has been chosen since the project will cost a lot of change and repetition of certain phases. A prototype will be developed using MIT App Inventor by the end of the semester.

ACKNOWLEDGEMENT

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My acknowledgement also goes to Computer Information Science (CIS) department for giving students the opportunity to do this individual project using our skills. Without CIS department did not offer the previous project management courses, for sure we will get difficulties.

Last but not least, i would like to extend my gratitude to all my fellow friends and family who are supporting and encouraging enough to make me complete this dissertation.

Thank you.

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CHAPTER 1

INTRODUCTION

English is becoming important nowadays. Furthermore, mathematics and science subject now are being teach at school use English as the text. To master English, a strong foundation and basic is needed. In this paper, the author is trying to develop a mobile application for the purpose to teach English. This mobile application will be develop for kids in the kindergarten as to provide stronger basic about English earlier with an interactive learning environment.

1.1 Project Background

This project is to develop an educative game (Guess Me) to raise these kids English vocabulary. This is focusing on four to six years old kids in PINTAS kindergarten who has difficulties and problem with English vocabulary. This is proven by the teachers at the kindergarten during a short interview.

Kids in the kindergarten are not so interested to learn because the method use by the teachers is less exciting. Thus, an attractive and interactive way of learning and teaching will be provide to both teachers and kids.

There are many ways to gain kids attraction towards learning. One of them is by introducing new things. An android tablet, for example, is different material from the usual. With Guess Me installed in the tablet, the kids may attract to the games when they see their friend enjoying the games. The tablet itself indirectly provides additional material/tools for learning purpose.

1.2 Problem Statement

1. Kids at PINTAS kindergarten have problem with vocabulary.
2. Traditional method used by teachers to teach the kids is less exciting.
3. Sometimes, the material is not attractive enough for kids to be willing to learn.

1.3 Objectives and Scope of Study

1.3.1 Objectives

1. To develop an educative game as a learning tool to raise kids vocabulary.
2. To provide an interesting and interactive learning environment (edutainment).
3. To provide an additional material/tools for learning.

1.3.2 Scope of Study

GUESSME will cover basic words in English vocabulary. There will be several categories such as transportations, occupations, animals, fruits and vegetables. The level of difficulties of each category will be the same as current books used for teaching the kids. At this stage, this application will be develop for a kindergarten. Later on, this application may be marketed to others kindergarten that is interested.

1.3.3 Target User

GUESSME is developed for kindergarten kids, so it will involve two parties or two type of users: Teacher and kindergarten kids. For the time being, the teacher will be the guider and supporter to help the kids.

The main target is the student. Their participation is important to make sure this mobile application is helping them to improve their English vocabulary or not.

1.4 The Relevancy of the Project

This project is believed that it can be implemented to benefits kindergarten kids. This is because the application will cover only basic words in English vocabulary that is use in preschool learning stage.

As the students enjoy this mobile application, their interest for English subject will be increase. Thus, they will find it is easy to understand English.

During the learning session, the teacher will have personal interaction with the kids. This is because, kids need attention. On the other hand, the teachers who guide the kids can identify which one needs more attention to improve English.

Android OS, which is the platform, is suitable with the current trend where kids nowadays love playing with electronic devices and technology such as touchscreen.

Benefits to kindergarten kids:

1. Fun learning environment
2. Improve vocabulary and spelling
3. More interaction with the teacher

Benefits to Teachers:

1. Extra material
2. Gain kids interest
3. Identify which kids need more attention to improve more on English.

1.5 Feasibility of Project within the Time Frame

The project is feasible within the time frame because the author has two semesters to accomplish the objective. For the first semester, the author focus on research while the second semester for the design and implementation. At the end, the author should come out with a working prototype or the application itself.

There are also other feasibility factors, which are:

Finance

The author only need to buy a tablet since he already has the development tools and the internet has been provided by university.

Market

For testing purpose, only one kindergarten is being chosen. After this application successfully developed, it can be market to other kindergarten.

Technical

With MIT App Inventor, there are no much difficulties for the technical part. The author is using the same approach with the previous project that involves the same platform to develop the application.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this section, a few papers/articles relevant to the project have been acquired for literature analysis. The paper is related to the impact of video games towards kids' performance. This is to prove the feasibility of GUESSME as a need.

2.2 Literature Reviewed

“THE EFFECTS OF PLAYING EDUCATIONAL VIDEO GAMES ON KINDERGARTEN ACHIEVEMENT”

By Feng S. Din, Josephine Calao

This research paper is about the study of kindergarten students who played educational video games learned better than peers who did not play such games.

Computer application can provide effective and efficient learning in the formal school setting (Fitch & Sims, 1992). Those who worked on computer give positive impact on social, psychological, cognitive development, and academic learning (Fitch & Sims, 1992). Children could engage for a longer period of time with video, audio and graphics (Min, 1996). Haugland (1992) revealed that children exposed to developmental software had significant gains in intelligence, structural knowledge, nonverbal skills, complex manual dexterity and long-term memory.

The total of 47 preschool age children from to classes has been involved in this study. The students were 5 – 6 years old. The materials used for this research are, Sony PlayStation (Light span) and over 40 compact discs learning related games content for kindergarten students.

For the descriptive analysis results, both groups indicated increased in their scores in spelling and reading. There are only slight improvement was found on the post test in math. Meanwhile, results from ANCOVA analyses indicated no difference was found in the math area and there are significantly more gain than the control group in spelling and reading.

CHAPTER 3

METHODOLOGY

3.1 Research Methodology

With the requirements and other factors might be constantly changing, Rapid Application Development (RAD) has proven to be appropriate. RAD is chosen because it is an alternative approach to software development. This helps create software prototypes in much shorter time than Systems Development Life Cycle (SDLC) that would be required using a more structured method. While maintaining the focus on the overall goals and objectives of the project, RAD allows analysts and developers to quickly adjust and adapt to such changes.

RAD is also a reasonable choice because this projects need to be done less than one year, which is about eight month to complete. Furthermore, due to other subject project and assignments taken into consideration, shorter time is allocated to complete this project.

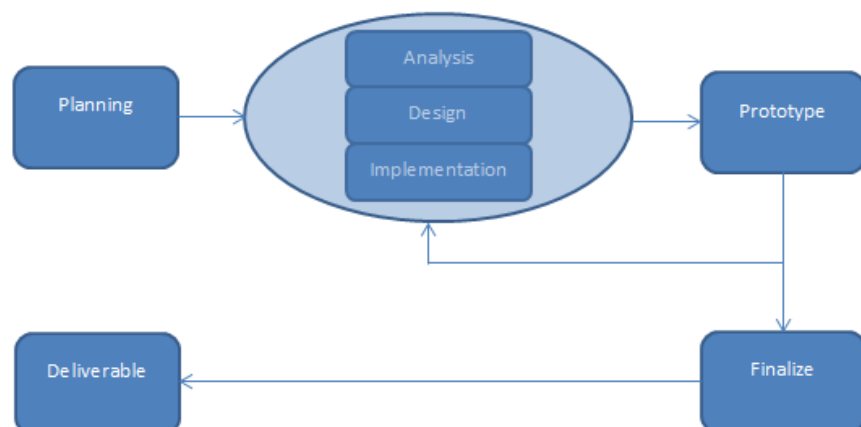


Figure 1 The phase involved in RAD

3.1.1 Planning Phase

Planning is the first development phase of this project. During this phase, the author focuses on searching the required information regarding the project title. Research papers and web-site articles are being used to understand about the scope and matters regarding this project.

The author also plan about the application that will be develop. What platform to choose, the hardware, software needed are among the question that has being asked to the author himself in order to make the application completed within the time given.

Furthermore, the author has allocated specific time for each of the following phase. The author builds a Gantt chart to make it easier for him to check whether the project is on time, ahead of schedule or behind schedule.

3.1.2 Analysis, Design and Implementation Phase

3.1.2.1 Analysis Phase

After done with the planning phase, all the information and the data should be analyse. This will be done in analysis phase. During this phase, all requirements will be checked and the author will have the view how the prototype will be working, its function and its appearance.

3.1.2.2 Design Phase

The information gathered in the analysis phase used in design phase to ensure the application met the requirement. The design of the application need to be attractive as it has to get kids attention.

The author used storyboard, a series of sketch to assist him in designing the application. There is also a flowchart of how the application will work.

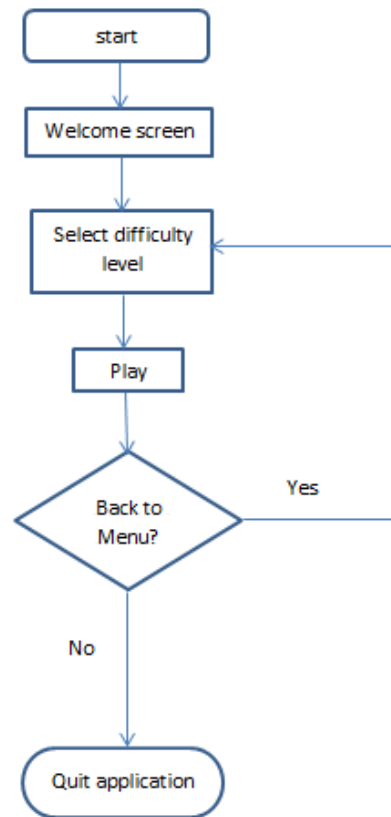


Figure 2 Proposed Application Flowchart

3.1.2.3 Implementation phase

The implementation phase will be the phase where the author tested using the emulator (a dummy android). After the application has been implemented, it tested by the author himself.

If there something wrong, the author need to go back to the analysis and design phase to solve the problem raised.

3.1.3 Project Prototype

This will be the phase where the application should run on android, which is the platform. The application is ready to be finalized since it has been tested by the author.

3.1.4 Project Finalization

Finalization of the application to run smoothly without any errors since it has been tested by the author and the users. This has been achieved after the author has faced many difficulties during the analysis and design phase.

3.1.5 Project deliverable

The functions of every single thing of the application do as what is told. The application is now ready to be used and ready to be presented to examiner.

3.2 Project Activities

At the beginning, the only activity carried out by the author is research and reading to understand about the project. After that, the author did found out about android development and take into consideration to use MIT App Inventor.

There are also other activities done in order to help the author developing the application:

Gathering Information

Beside the traditional methods use to gather information, the usage of internet provided by the university has been used. The information from the website, online articles, research paper and forums helps the author a lot.

Discussions

Some discussion has been made especially with the supervisor of the project that really gives encouragement to the development. The author also discuss with some friends that are familiar about Android development.

Interview

Interview session with the teachers to gather information explain more and give the author a better understanding about the kids. Although the interview is simple with basic question, it really matters for the development. Interviewing previous Android developers motivates and gives the idea to the author to develop the application.

3.3 Key Milestones

The Key Milestones are as depicted below:

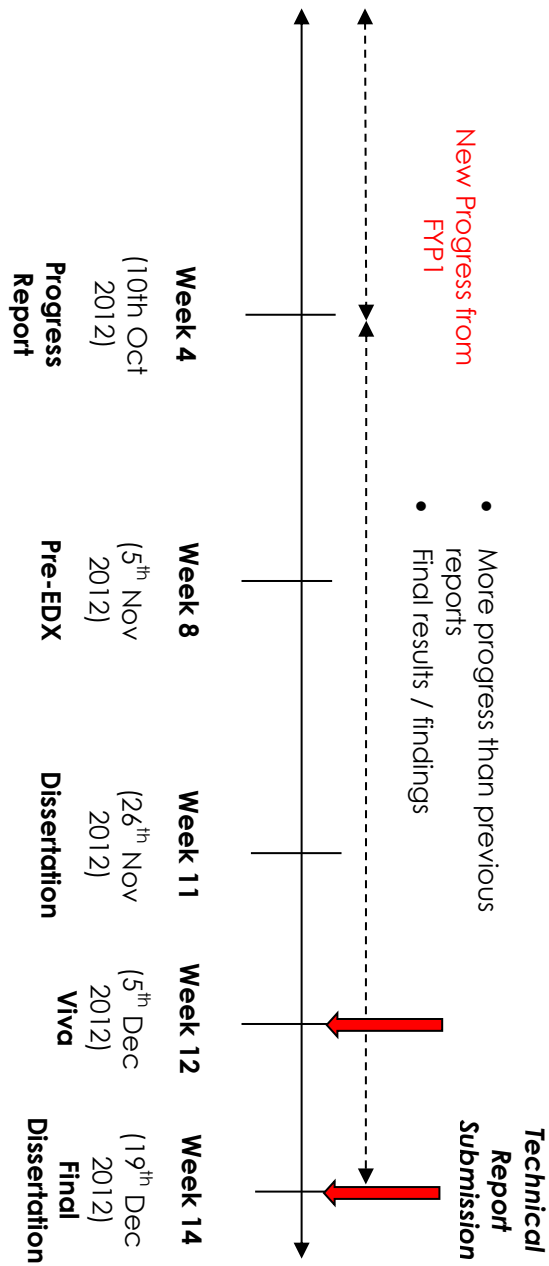


Figure 3

Source: <http://elearning.utp.edu.my>

3.3.1 Gantt Chart

Activity	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
Discussion with SV	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Identify Requirement	█			█			█							
System Analysis		█	█		█	█		█	█					
System Development		█	█		█	█		█	█					
System Component		█	█		█	█		█	█					
Testing using Emulator		█	█		█	█		█	█					
Install on Android			█			█			█					
Testing by Author			█			█			█					
Test with Users				█			█			█				
Evaluate the Application											█	█	█	

Table 1 Gantt Chart

No.	Progress/Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Progress Report				√										
2	Pre-EDX								√						
3	Project Research	√	√	√	√	√	√	√							
4	Dissertation											√			
5	Viva												√		
6	Final Dissertation														√

Table 2 Current Status and Deliverables

3.4 Tools and Equipment used

3.4.1 Hardware

Both of the hardware is chosen because the author already owned it.

- **Samsung Galaxy SL**
 - Running on Android OS
 - Implementation
 - Testing with users
 - Deployment
 - Sufficient graphics



Figure 4 Samsung Galaxy SL

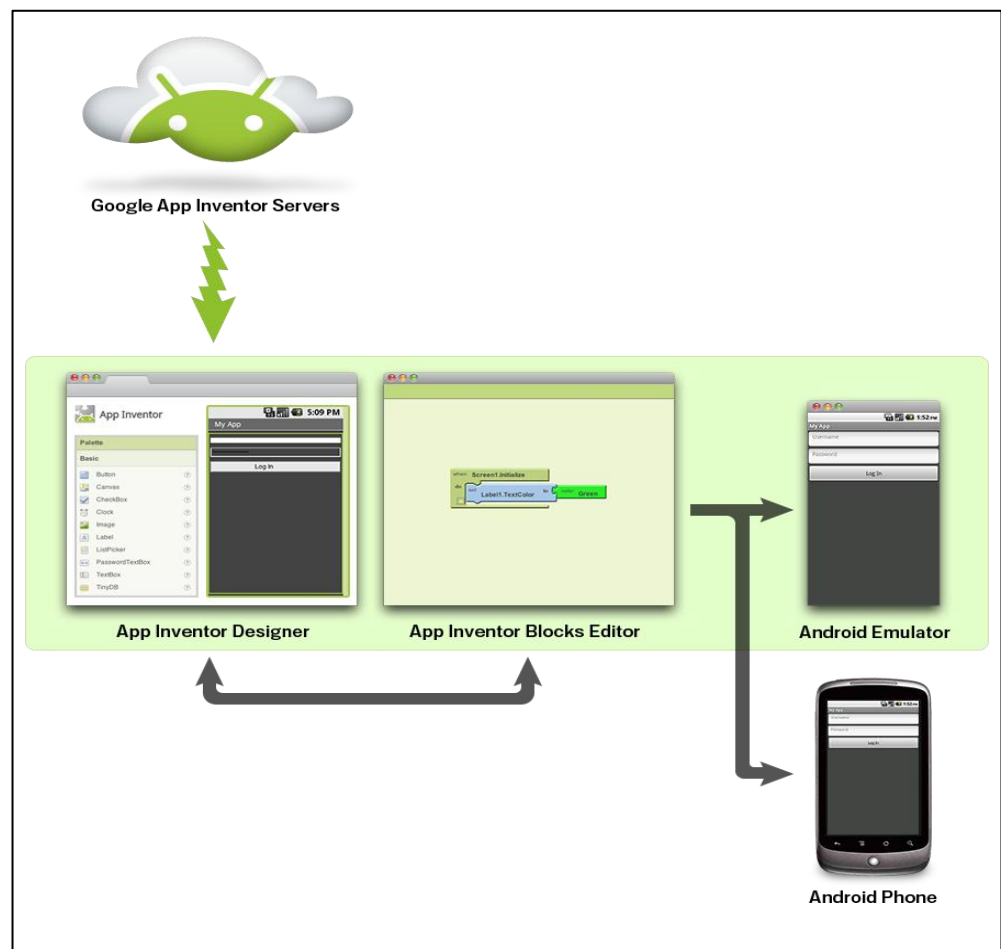
- **HP Pavilion dv4**
 - Gathering Information
 - Research purpose
 - Development of the application
 - Documentation (report)
 - Testing (dummy) prototype



Figure 5 HP Pavilion dv4

3.4.2 Software

- **Android SDK (Software Development Kit)**
 - One of the extensions needed to develop software (games) on Android
- **Microsoft Word**
 - For documentation purpose
- **MIT App Inventor**
 - Design and development process



.Figure 6 How MIT App Inventor works

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Survey

The survey has been conducted after agreed with the teacher. The author has set up the date and went to the kindergarten. The objective of having the survey was to find out the response from the user. The total of 20 participants took part for the survey.

The survey consists of four close-end questions:

1. Do you have problem when learning English?
2. Do you have difficulties to spell words in English?
3. Do you enjoy learning English?
4. If there is a mobile application to teach English, would you like to use it?

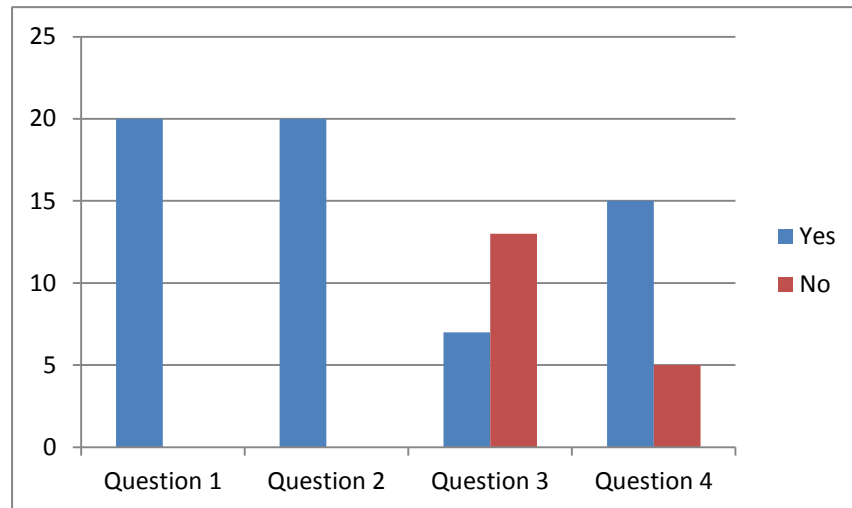


Figure 7 Survey results

From **Figure 7**, the survey shows that all participants are having problem learning and spelling in English (Question 1 and 2). These two questions aimed to find out the participants level of knowledge.

From all the participants, only 7 out of 20 enjoy learning English. This shows that majority of the student did not enjoy learning English.

The data also shows that 15 out of 20, seventy five per cent of the total participant would like to learn English using mobile application.

4.2 Application Flow Chart

Due to the requirement needs, a new flowchart has been constructed:

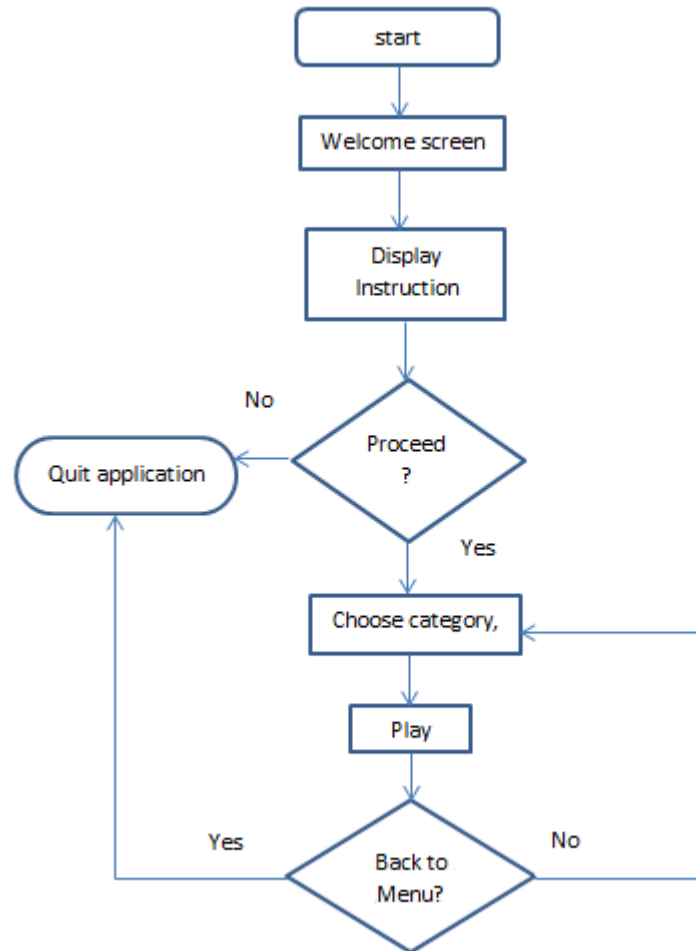


Figure 8 Finalize Flowchart

The new flowchart shows the differences from the proposed flowchart. The finalize flowchart display instruction after the welcome screen rather than asking users to select the difficulty level. The “select difficulty level” option is omitted because all the participants tend to choose the easy level compared to medium and hard.

4.3 Snapshot of modification and prototype

The interfaces that have been developed are shown in this section. All the codes to overcome the problem arise also depicted.

4.3.1 First Design

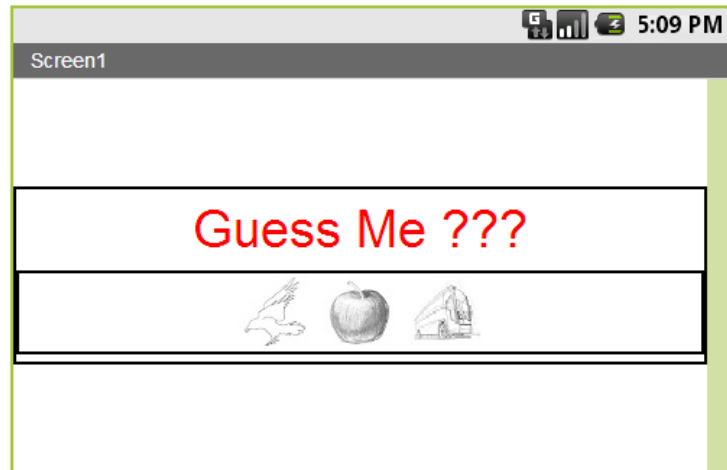


Figure 9 Opening screen



Figure 9.1 Welcoming screen



Figure 9.2 Level of difficulties (option)

The modification need to be done because the user tends to answer the easy part only. The modifications also need to be done because the subject is mixed while running. Furthermore, it took a long time to complete each round (until the question finish) if the teacher want to access the kids personally.

To make the application enjoyable and attractive, cheerful and charming sound need to be inserted. The sound will be playing while the user trying to answer the question given.

4.3.2 Second Design



Figure 10 Opening splash screen



Figure 10.1 Timer splash screen 1



Figure 10.2 Timer splash screen 2



Figure 10.3 Menu Screen

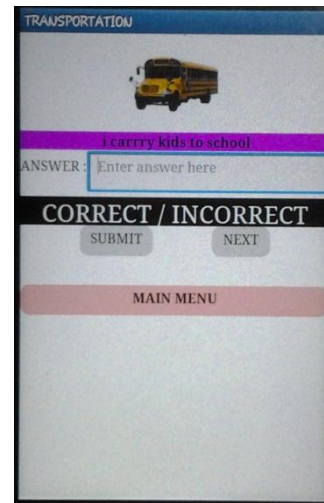
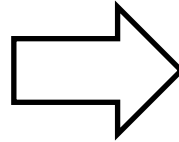


Figure 10.4 Initial Question

At first, when Menu Screen appears, the button cannot be pressed. The application suddenly crashed. The author needs to re-construct the blocks for a few days before the application can run.

Modification of the function need to be done because, kids can easily pressing next button without answering the questions. There is also no indicator to see whether the answer is correct or not.

The main menu button at the bottom of the Initial Question interface did not working and this become the problem because sometimes kids wrongly press the button at Menu Screen.

Here are the final code snippet modification that has been done by the author in the blocks editor:

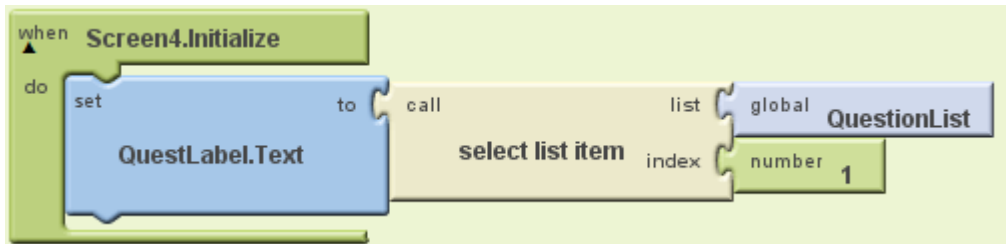


Figure 10.5 Code 1

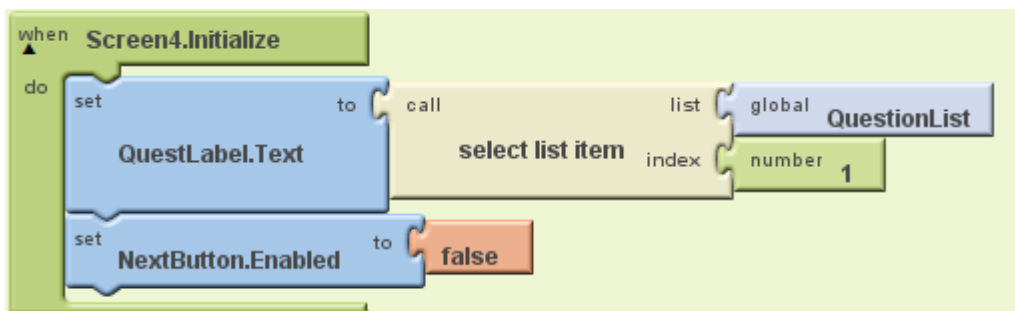


Figure 10.6 Code 2

After the modification done, when the first question appears, the next button cannot be press. The author re-download the application to Android device because switching to another screen is cannot be done using the emulator. After running the application on the android, the author found that the following question also have the same problem which the next button can be press without answering the question.

Here are the modifications done:

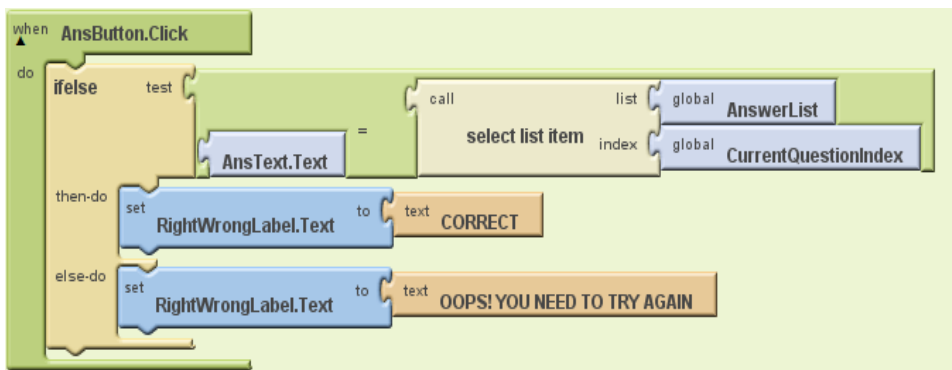


Figure 10.7 Code 3

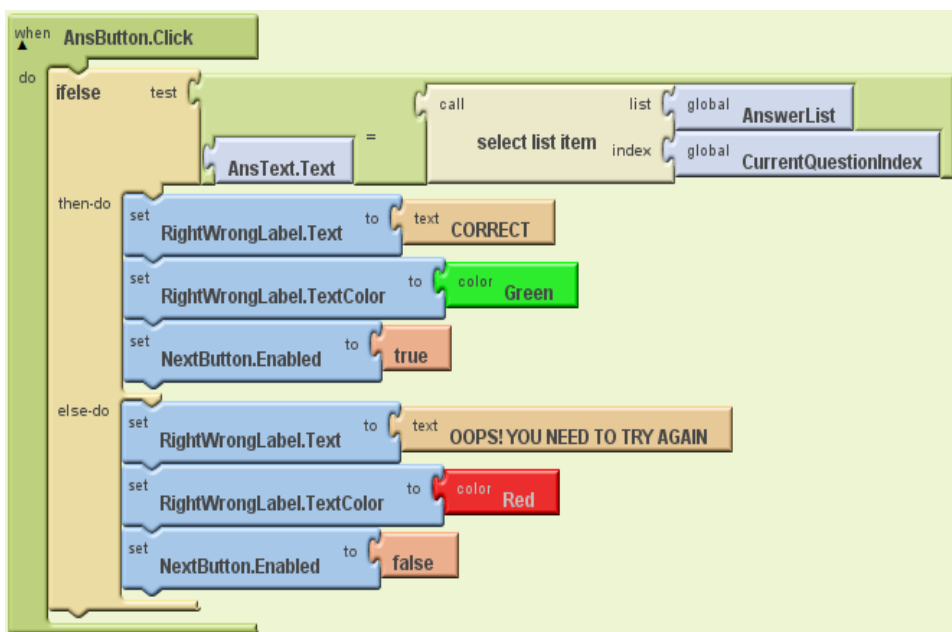


Figure 10.8 Code 4

From the two figures above, the NextButton.Enabled is added to overcome the problem. The author also modifies the colour of answer indicator to green if the answer is correct while red if the answer is incorrect.

After the block is re-arranged, the author needs to download it and install the application back in Android device. Before the author again, downloads the application, he found that when the back button is press, it automatically shut down the application.

Here how the modification done:

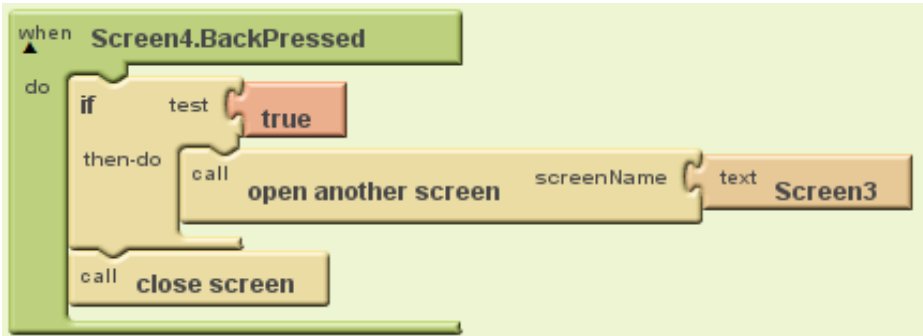


Figure 10.9 Code 5

Before this, the author did not include the option when Screen4.BackPressed inside the block editor. After he realizes it become a problem and an error, the block as Figure 10.9 is build. The Figure shows that when Back navigator on Android device is press while the application is running, it will open another screen called Screen 3 which is the Main Menu screen.

4.4 Flow of application

4.4.1 Starting Page

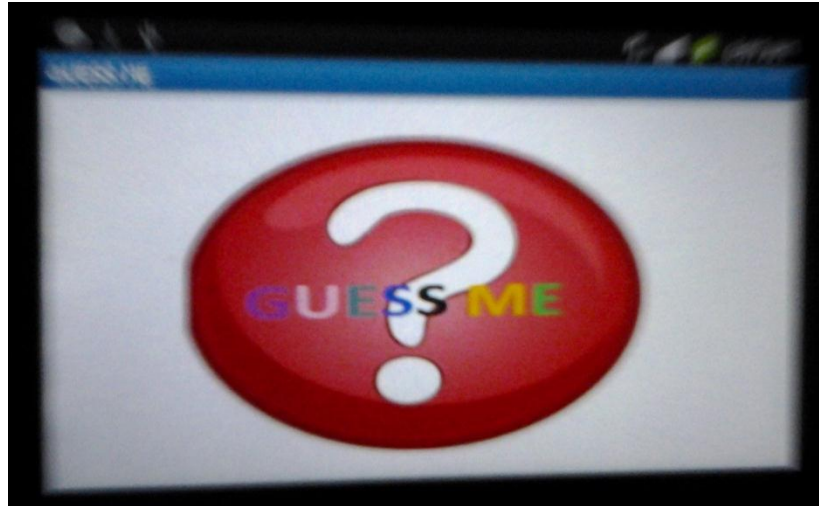


Figure 11 GUESSME



Figure 11.1 ENJOY LEARNING!

4.4.2 Instruction Page

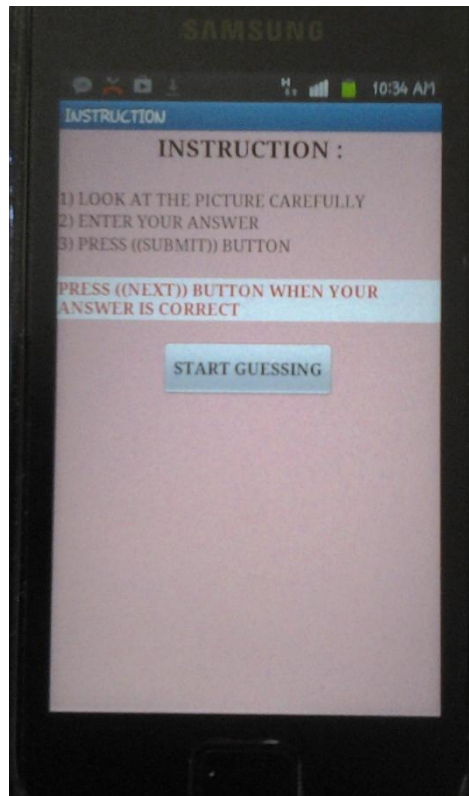


Figure 11.2 Instruction for users

Before the final version, the author suddenly makes decision to put instruction page before the activity is started. This is made to help the user understand why they cannot continue guessing if their answer is wrong. The user also will know where to insert their answer, and when to push submit and next button.

4.4.3 Main Menu Page

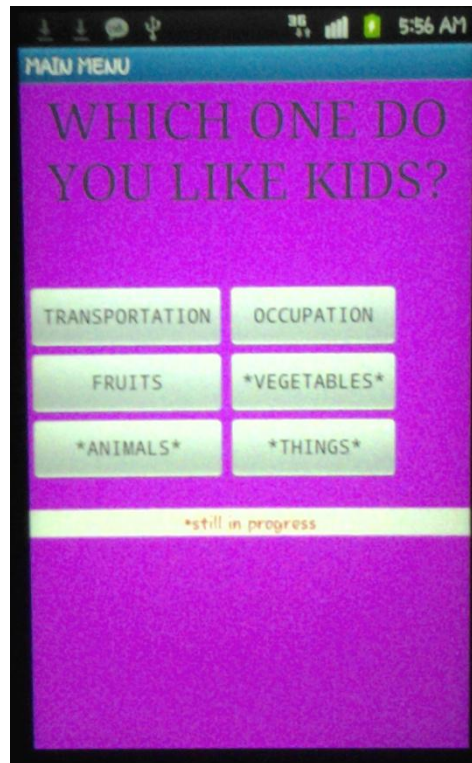


Figure 11.3 Main Menu

At this point, user can select which one they want to guess. There are three options available which are transportation, occupation and fruits. When one of this option buttons is pressed, the activity page appears and guessing activity will start.

4.4.4 Activity 1

Activity 1 happens when Transportation is chosen at the Main Menu.

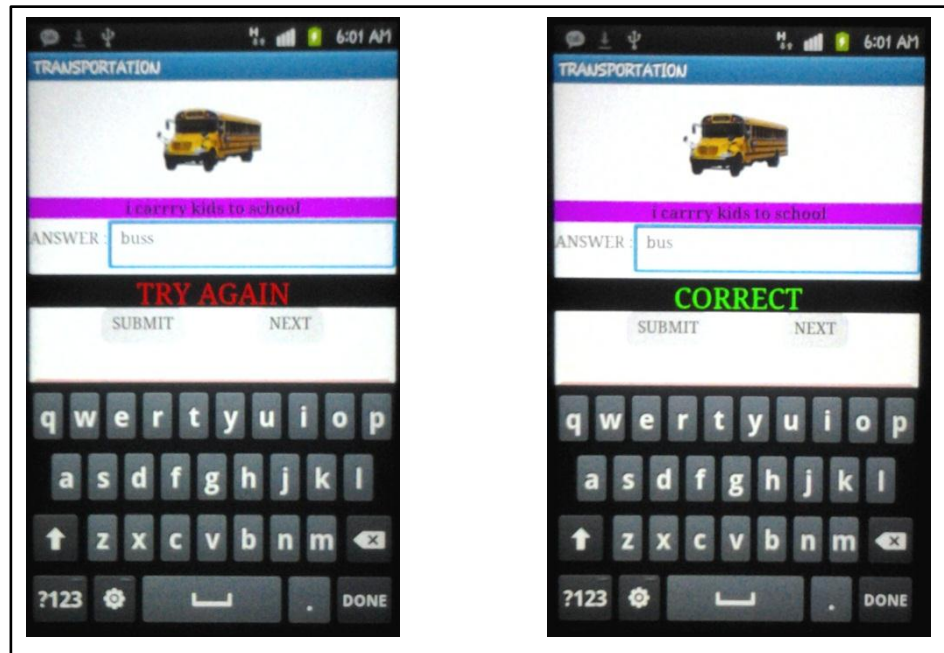


Figure 12 Activity 1

When users are in Transportation activity, the question will ask the user about name of the vehicle. For example, the figure above show a bus and the hint given is 'I carry kids to school'. When user enters a wrong answer, he or she need to try again until 'CORRECT' is shown. After that, the user will press next button and the same step of guessing the picture occurs.

4.4.5 Activity 2

Activity 1 happens when Occupation is chosen at the Main Menu.

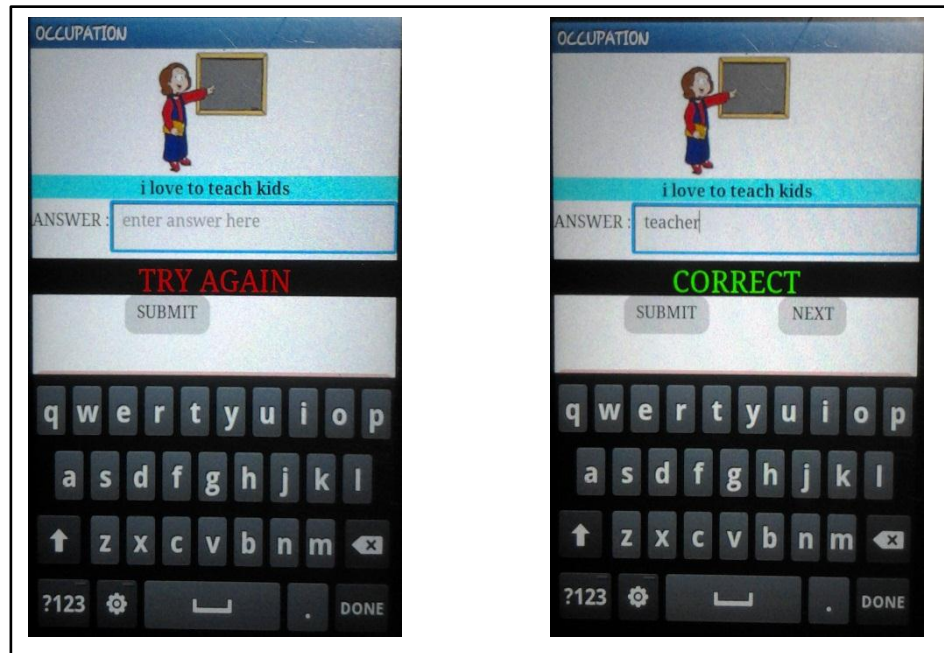


Figure 13 Activity 2

When users are in Occupation activity, the question will ask the user about job of the person shows. For example, the figure above show a teacher and the hint given is 'I love to teach kids'. When user enters a wrong answer, he or she need to try again until 'CORRECT' is shown. After that, the user will press next button and the same step of guessing the picture occurs.

4.4.6 Activity 3

Activity 3 happens when Fruits is chosen at the Main Menu.

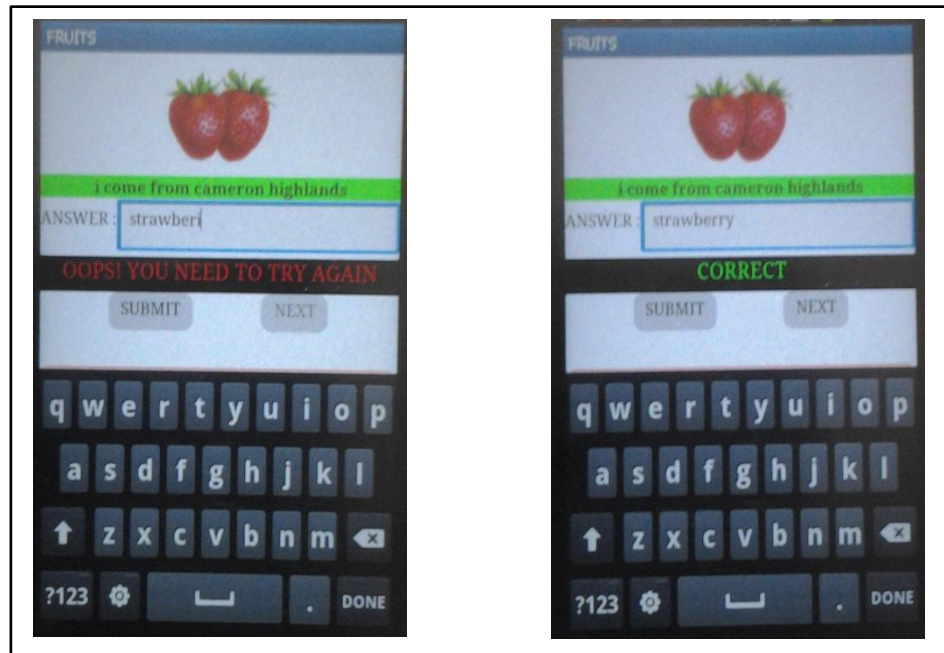


Figure 14 Activity 3

When users are in Fruits activity, the question will ask the user about the name of the fruits. For example, the figure above show a strawberry and the hint given is 'I came from Cameron Highlands'. When user enters a wrong answer, he or she need to try again until 'CORRECT' is shown. After that, the user will press next button and the same step of guessing the picture occurs.

4.5 Post-Survey

The post survey is conducted for 6 participants who are the lecturers, parents and kindergarten teachers. All participants have been told the purpose of the survey and the objective of the project. The questions are closed-end question where the answer will only be yes and no.

Here are list of question for the survey:

1. Is it interactive and suitable for kids?
2. Will kids improve their vocabulary using this application?
3. Will kids improve their spelling and know how to pronounce basics English using this application?

The results:

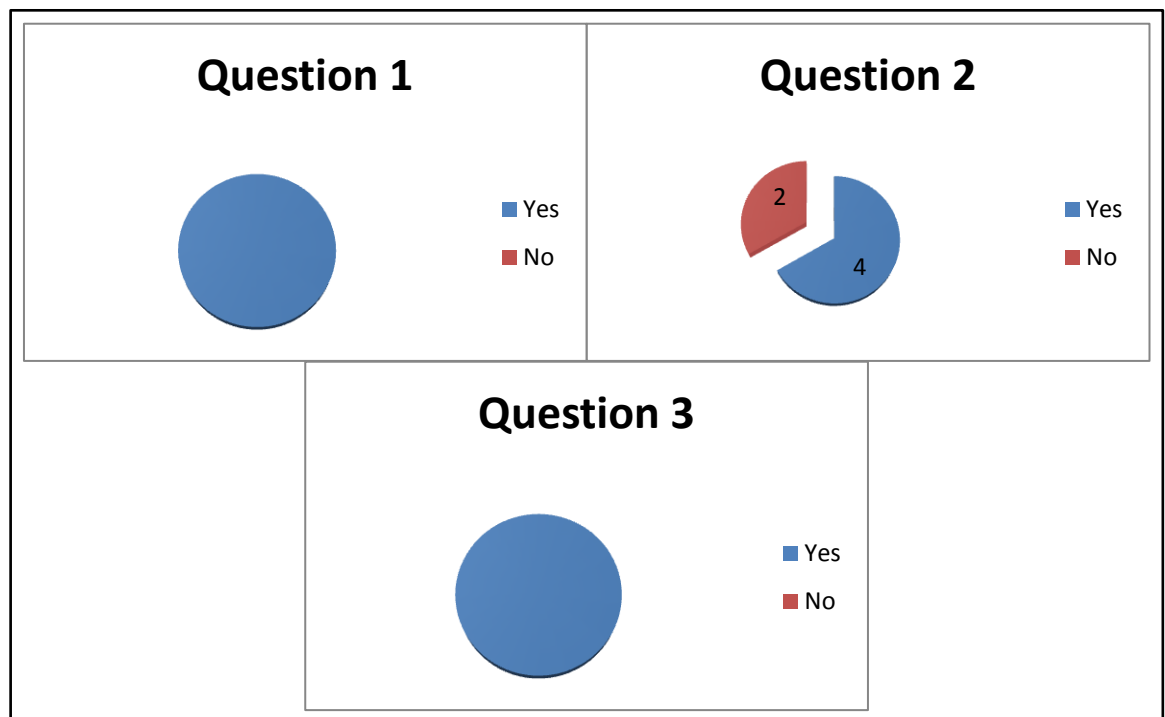


Figure 15 Post Survey Results

1. All six participants agree the application is suitable for kids.
2. Two participants disagree the application can help kids improve their vocabulary.
3. All participants agree that kids will improve their spelling using this application.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSIONS

5.1 RECOMMENDATIONS

5.1.1 Recommendations by examiner

During the previous (poster) presentation, the author received a few suggestions from the examiner. Due to the positive suggestions, the decision to change some of the functionality of the application has made. The list of figure (before and after) of the application and the code blocks are as presented:

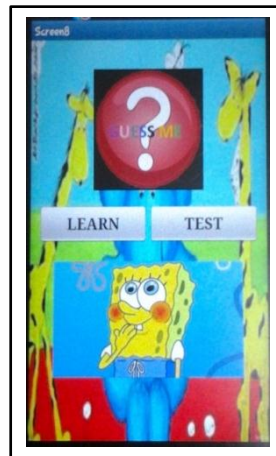


Figure 16 Change made to main menu

After reconsidered, the application has a new button, learn and test. This screen will appear first after the splash screen. This is to provide the kids to an attractive learning environment. This is also to make the kids prepared before they are being tested by the teacher.



Figure 17 Learning environment

When the kids enter the learning screen, they will choose any type of material that they want to learn. Figure 17 is an example of transportation learning screen. As the figure depicted, the screen has images and buttons. When the kids press the button, a correct pronunciation of the text on the button will be heard. For example, when the kids press 'lorry' button, the voice will be automatically produced.



Figure 18 Improved choice option

Figure 18 shows the difference before and after the changed is made. At the top of the figure, the background is plain. New colourful background replaced the previous background to make it more attractive for kids.

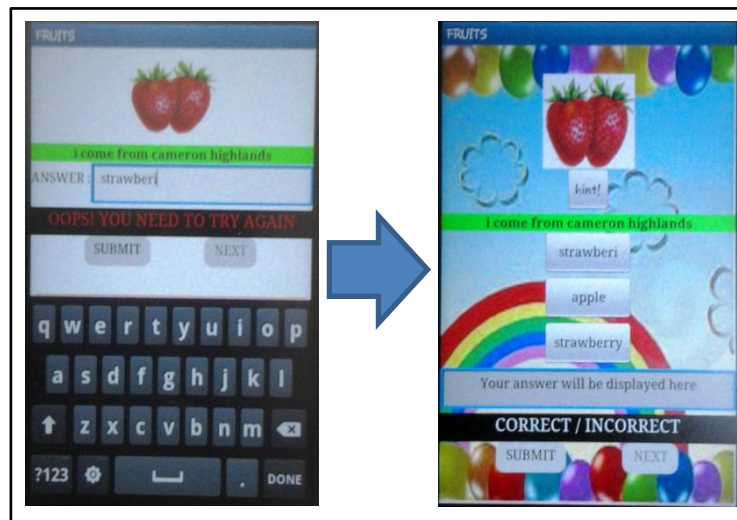


Figure 19 Changed in answering the question

The author also changed the way to answer the question from manually inserting the answer letter by letter, to a list of choices. The list of choices is actually a set of button. When the kids press any button, their answer will be prompted below the list of choice.

A change also made by applying correct and try again audio. This is happened when the kids submit their answer. If the answer is wrong, try again voice will be heard and if the answer is true, correct voice will be heard.

Previously, there is no hint button. This will be hard for the kids to answer the question given. In order to help them, a hint button below the image is inserted. When the kids press the hint button, they can hear the correct pronunciation of the image thus, it will be easier for them to guess.

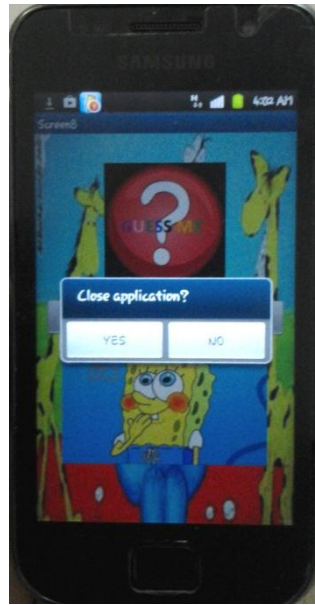


Figure 20 Notifier

The notifier will be popped out when the user back-pressed the Android devices on the first screen. Before this, the application did not have notifier. When there is no notifier, the user sometimes back-pressed the application many times and suddenly the application automatically shut down. With notifier included, it can prevent the problem happening again.

5.2 CONCLUSSIONS

GUESSME as the results shown in post survey is suitable for kids. Due to the limitation of MIT App Inventor, the application cannot exceed 5Mb size. This is an obstacle or disadvantage for the author to make it more interactive such as including music and moving graphics.

The objective of the project is achieves since the application is completely done within the time frame. Furthermore, an interactive mobile application has been develop so it can be the additional material to teach kindergarten kids.

With GUESSME, kids find it is enjoyable to learn English. The application can help the kids to pronounce the words in a correct way. This shows that the problem statement has been addressed.

The application itself is easy to use, user-friendly which is good for user that is rarely or did not know how to use touchscreen devices.

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