Asthma Education Game for Children

"Bronchi Talisman"

by

Aini Azlina binti Azman

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Technology (Hons)

(Information and Communication Technology)

September 2013

Universiti Teknologi PETRONAS

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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the

Information and Communication Technology Programme

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Approved by,

_____

(MAZLINA BINTI MEHAT)

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

September 2013

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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AINI AZLINA BINTI AZMAN

ABSTRACT

Asthma is the top two of the Big Four Lung Disease in Malaysia. This disease covers about 3.25 millions of Malaysian population and the biggest group that have this disease is children below 12 years old. Bronchi Talisman is the mobile game application that is specially created for the asthmatic children. With the objective of learning the importance of asthma education and developing an interactive mobile game application, Bronchi Talisman is expected to solve the problem that has been found about asthma. The first problem is the lack of the knowledge of the parents about asthma. This followed by the lack of attractive material that is related to asthma education and the existing material is not attractive. Lastly, the existing mobile games do not educate the children about healthcare. Instead, they are just providing entertainment solely.

The scope of the project is the asthmatic children from the age of 5 to 11 years old and it should be able to run on Android devices from the version of 2.2 till version 4.1. By using the Agile Development methodology, the project is expected to be completed in January 2013. Agile methodology is used as currently it is one of the mostly used methodologies in mobile development. This methodology gives flexibility to developer to make any changes at any stages of the application development.

50 respondents were selected to answer the online survey that is related with the projects. The results show that the asthma education is essential for the children and mobile game is one of the attractive ways to educate the children about asthma. The project testing was done in week 20, the results show the positive acceptance of this game by the children. It is also shown that the project is effective in delivering the information about asthma to the target user. As a conclusion, the project succeeds in studying the importance of asthma education and developing the asthma mobile game for children.

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CHAPTER 1

INTRODUCTION

1.1Background of Study

Bronchi Talisman is a mobile game application for Android that is created for asthma education for the children of Malaysia. Bronchi is the short form of bronchiolitis which is the alternative name of asthma and talisman means charm or amulet that brings good luck. Together this name means the protection from asthma. Asthma is labelled as the most chronic disease for children in Malaysia. Based from World Health Organization (WHO) statistics data published in April 2011, the Asthma adjusted Death Rate is 5.32 per 100,000 of population that ranks Malaysia at the 79th places in the world. Besides, from the research done by Omar T.D, Mohamed I.M.I,& Anna C.A, (2011), Malaysian children have low knowledge and attitude towards asthma management. As a result the essential information for this disease does not reached successfully to them. Thus, this project is created to educate and share the information about asthma to the children as their guidance in an enjoyable way and also reducing the severity and probability of asthma in Malaysia.

1.2 Problem Statement

Asthma is one of the increasing chronic diseases in the world especially when the global environment status is endangered. According to the WHO statistic, there are 235 million of people in the world that suffered from asthma. In Malaysia itself, it is estimated that about 2 million of people suffering from asthma where it covers 12.5% of the Malaysian population and the numbers are growing. This is because of the problem identified as below:

1. Parents have lack of knowledge about asthma and asthma education material to provide to their children.

   The lack of knowledge of the parents about asthma may cause problem to the asthmatic children. Parents should have adequate knowledge about asthma in order to control and manage their asthmatic children. Based from the author experience, she had witnessed a mother of asthmatic children who give a trigger (ice cream) to her asthmatic children and start to get panic and lost control when the child has an asthma attack. Besides, they also do not have suitable and sufficient material to give to their children to learn about asthma on their own.

2. Difficulties in explaining about the disease clearly to children.

   Besides, the parents also face a problem in explaining the disease clearly to the child. A verbal explanation is not enough for the children to understand about her disease.

3. Existing material is too formal and not attractive for the children to learn.

The current materials are not attractive for children. (Please refer Appendix 5). Most of the materials are too formal and wordy. It makes the children cannot figure out about what the material is trying to convey or to remember it.

4. Abundant of games that only provide entertainment instead of education especially in medicine.

   Most of the famous game such as Candy Crush, Fruit Ninja or Zombie does not give much value to the children. It only provides entertainment and enjoyment to them but does not help them to broaden their knowledge about healthcare.

The project is significant due to its ability to help the parents and also the healthcare organization in reducing and controlling the asthma cases. This project will help in providing an entertainment as well as knowledge to the asthmatic children. Since the project is a game, the attractiveness for the children to play it is higher than just using an ordinary medical book to explain about asthma to them.

1.3 Objectives and Scope of Study

The objectives of this project are:

a) To study the importance of asthma education in children.
b) To develop a mobile game application that will increase the awareness of the people starting from their childhood about asthma management and prevention.

The scopes of this project are the asthmatic children from 5-11 years old. This application will be able to run on any Android device starting from the version 2.2 with the code name of Froyo till version 4.1 with the code name Jelly Bean.

1.4 Relevancy of the Project

This project is relevant in increasing the awareness about asthma prevention from the early stages of the citizen of Malaysia. It is significant as along with providing entertainment and enjoyment for the children the application educates them about asthma management. Moreover, the emerging of the mobile learning games trends is one of the effective ways to attract the children on learning while playing.

1.5 Feasibility of the Project within the Scope and Time Frame

The project is feasible as it does not require any extra equipment or machinery to create the games application. The author only needs a computer and an Android phone to code the program. The first semester of the project will be used for thorough documentation, research and prototyping. The following semester will focus on the application development. The project should be completed within the duration from May 2013 till January 2014. (Refer to Gantt Chart on Appendix 1&2)

CHAPTER 2

LITERATURE REVIEW

2.1. What is Asthma?

According to Malaysia Asthma Council, asthma is a disease affecting the airways that carry air to and from your lungs. People who suffer from this chronic condition are said to be asthmatic. The symptoms for this disease include wheezing, chest tightness, breathing problems and coughing. Asthmatic usually suffered these symptoms during the night and early in the morning where the temperature is lower than the day.

Asthma is the most chronic respiratory condition in children. Children have a high risk to get asthma starting from the day when they are born. The Centers for Disease Control and Prevention (CDC, 2011) reported that asthma had affected 7.1 million children in the world. Besides, the statistics from the Medical News Today (MNT), asthma killed about 255000 people worldwide every year.

2.1.1 What causes Asthma?

According to MNT, the children who have low birth weight, exposed to extreme tobacco smoke, and were grown in a low income environment have more risk to suffer asthma. The symptoms are usually presents when the children are around five years old. Other causes of asthma include allergies, atopy, obesity, stress, genes and airway hyperactivity.

2.1.2 Asthma is incurable

Asthma is an incurable illness. It will flare at any time if person is exposed to the triggers. However, with good treatment and asthma management plan they can live normally and actively.

2.1.3 Asthma Management Plan

As stated previously, asthma is incurable. However with good asthma management plan, this disease can be avoided or reduced to enable the asthmatics to enjoy a normal lifestyle. As defined from the Asthma Foundation West Australia(AFWA) there are 6 steps in asthma management plan:

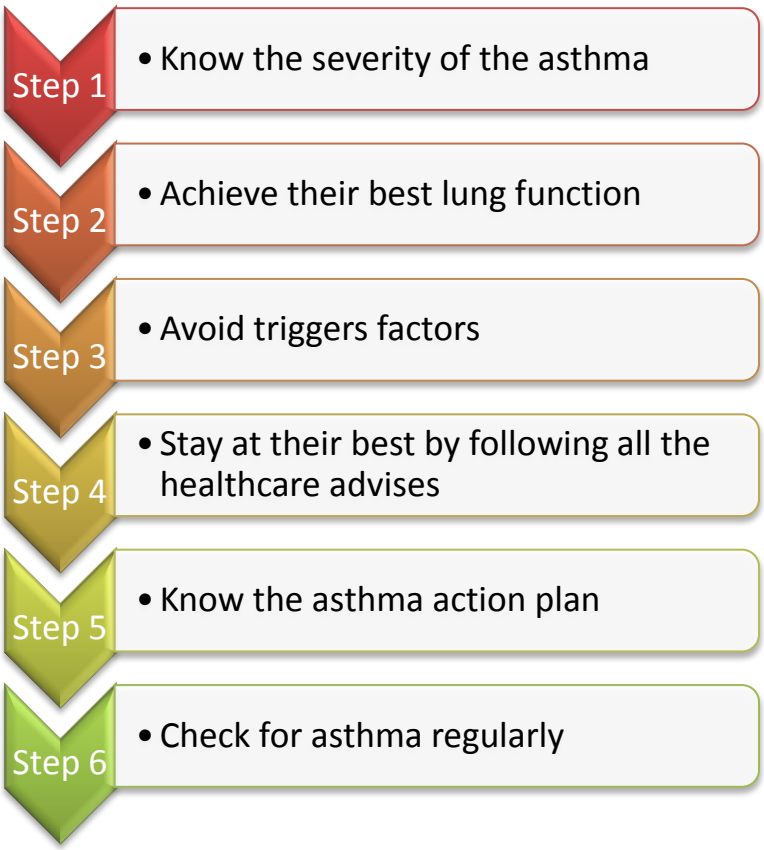

Figure 1: Asthma Management Plan

2.1.4 Asthma Action Plan

Asthma action plan is created for the asthmatics to detect the early warning of asthma attack so that they can take an appropriate action for it. The aim of the asthma management plan is to enable the asthmatics to take control of their asthma, decide on which medication that they should take and the amount of the medicines, and lastly to decide whether they should seek the emergency help. The asthma management plan has four stages which are:

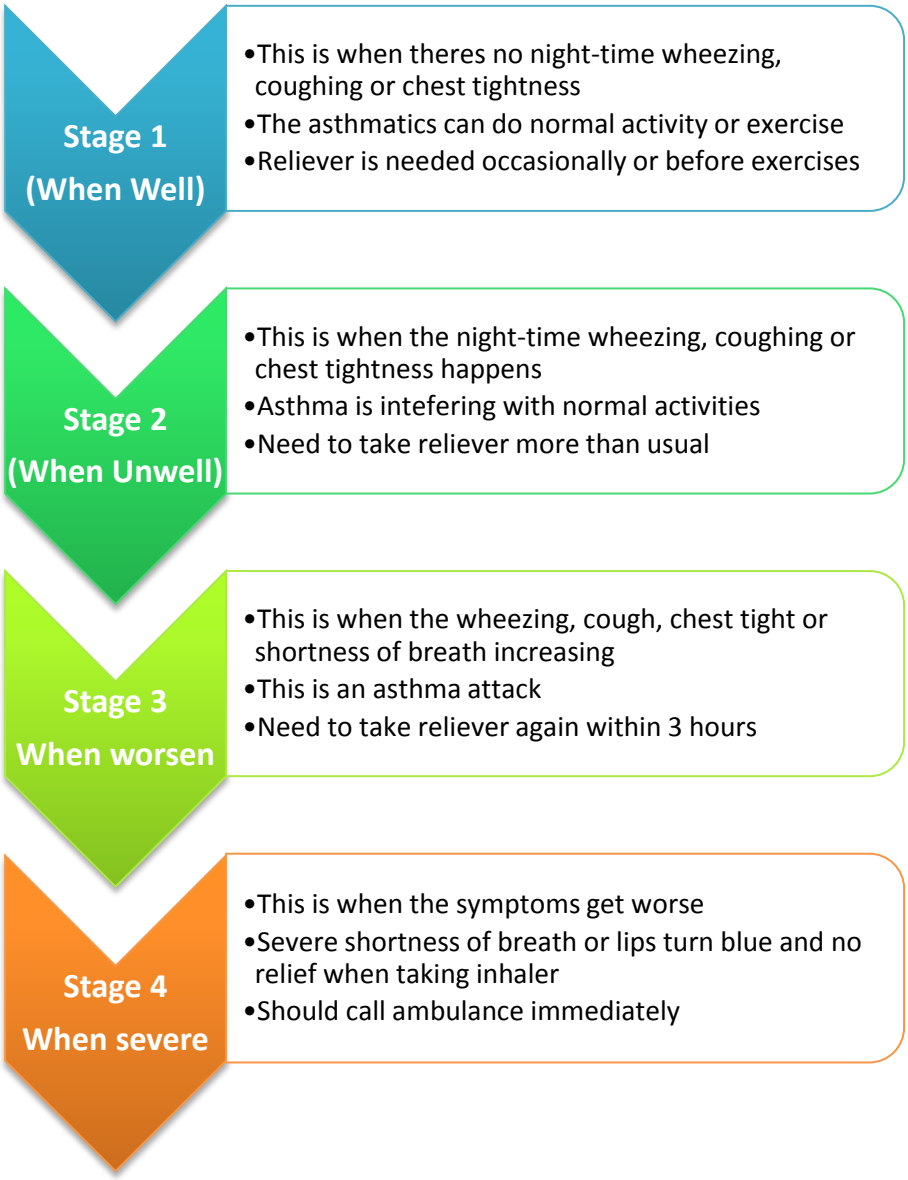

Figure 2: Asthma Action Plan

2.2 Asthma in Malaysia

2.2.1 The status of this Disease

According to WHO statistics, Asthma is in the 20th places in the rank of killer disease in Malaysia. Malaysia is ranked at the 79th places in the world for asthma cases and its severity.

Up to April 2011, Asthma death in Malaysia reached 988 or 0.97% total deaths which mean that the person who suffered from asthma has 0.97% to face death. Besides the statistics also shows that out of 100,000 people in Malaysia, about 5 of the people will die because of asthma.

According to the recent research shown in the local newspaper New Strait Times by Nadia(2013), Asthma is the top two of the lung disease in Malaysia. In addition, about 10-13% of the Malaysian population suffers from asthma and this is actually covers about 3.25 million out of 24 millions of people in Malaysia.

2.2.2 Asthma cases in Malaysia

According to the report by Nadia(2013), asthma is also on the top 2 of 10 leading causes of hospitalization and death at government hospitals in 2010. The statistics is getting worse as the air condition in Malaysia is also polluted.

May 2013 had witnessed that Malaysia was attacked by the haze hazards for two times within a month. The air quality level dropped and reaches the fatal condition due to the open burning in our neighboring country. Although warning and all precaution were given to the citizens, but according to the report from Bernama (2013), the asthma cases increased drastically and the most affected group are children. In Johor itself, this disease had increased for more than 124%. Instead of only around 50 cases on the first hazy day, the cases had increased to 119 cases on the consequence day.

2.2.3 Children's knowledge and attitude toward healthcare in Malaysia.

According to the study done by Omar T.D, Mohamed I.M.I,& Anna C.A, (2011), children in Malaysia have limited knowledge about healthcare and have some negative attitude towards it. The study which was done to children of age 11 and 12 shows that the average knowledge score was 7.725 out of maximum point score of 12. The older children however, were more

knowledgeable about healthcare than its juniors. Moreover, the result was affected by the education level of their parents and their socioeconomic status. The results were reflected in the Table 1 and Table 2.

Independent variables		Mean ± SD score of knowledge	Median	*P*-value
Gender	Male	7.62 (±2.21)	8.0	0.154
	Female	7.82 (±2.32)	8.0	
Age group	11 years old	7.36 (±2.38)	7.0	0.000*
	12 years old	8.09 (±2.08)	8.0	
Race	Malay	7.80 (±2.15)	8.0	0.009***
	Chinese	7.82 (±2.32)	8.0	
	Indian	7.04 (±2.47)**	7.0	
Father's education level[a]	Low	5.73 (±1.65)**	6.0	0.000***
	Medium	8.20 (±1.54)**	8.0	
	High	9.90 (±1.32)	10.0	
Mother's education level[a]	Low	5.92 (±1.77)**	6.0	0.000***
	Medium	8.29 (±1.59)**	8.0	
	High	10.07 (±1.20)	10.0	
Parent's job	Health professional	11.04 (±1.18)	11.0	0.000**
	Non-health professional	7.63 (±2.22)	8.0	
SES[b]	Low	6.43 (±1.78)**	6.0	0.000***
	Moderate	9.24 (±1.34)**	9.0	
	High	10.17 (±1.22)	10.0	

[a] Education level: Primary and lower secondary school = low; upper secondary school and college = medium; university = high.
[b] SES: RM1000 and below & RM1001–3000 = low; RM3001–5000 = middle; above RM5000 = high. *Mann-Whitney test, $P < 0.05$. **Bonferroni adjustment test, $P < 0.017$. ***Kruskal-Wallis test, $P < 0.05$.

Table 1: Statistics of children knowledge about healthcare in Malaysia

Independent variables		Mean (±SD) of attitude score	Median	*P*-value
Gender	Male	7.71 (±2.23)	8.0	0.378
	Female	7.85 (±2.32)	8.0	
Age group	11 years old	7.51 (±2.33)	8.0	0.002*
	12 years old	8.05 (±2.20)	8.0	
Race	Malay	7.96 (±2.14)	8.0	0.002***
	Chinese	7.79 (±2.38)	8.0	
	Indian	7.04 (±2.35)**	7.0	
Father's education level[a]	Low	5.83 (±1.82)**	5.0	0.000***
	Medium	8.33(±1.56)**	8.0	
	High	9.81 (±1.32)	10.0	
Mother's education level[a]	Low	6.02 (±1.95)**	6.0	0.000***
	Medium	8.42(±1.64)**	8.0	
	High	9.93 (±1.07)	10.0	
Parent's job	Health professional	11.00 (±0.95)	11.0	0.000*
	Non-health professional	7.69 (±2.24)	8.0	
SES[b]	Low	6.58 (±1.94)**	7.0	0.000***
	Middle	9.18 (±1.56)**	9.0	
	High	10.07 (±1.01)	10.0	

[a] Education level: Primary and lower secondary school = low; upper secondary school and college = medium; university = high.
[b] SES: RM1000 and below & RM1001–3000 = low, RM3001–5000 = middle, above of RM5000 = high.*Mann-Whitney test, $P < 0.05$. **Bonferroni adjustment test, $P < 0.017$. ***Kruskal-Wallis test, $P < 0.05$.

Table 2: Statistics of children attitude towards healthcare in Malaysia

2.3 The benefits of Mobile Game-based learning for Children

- **Enhance the thinking abilities and decision making**

  As quoted by Joseph Berg, "In older persons, puzzle games have been linked to slowing down the aging of the process". This shows that games does gives benefits to human kind. By doing some reasoning for the solution needed for games, this will help the children to use their thinking abilities and sharpen their intellect. Moreover, a game does help the children to develop their cognitive abilities as well as effective learning issue. Kebritichi and Hirumi(2008) added that game-based learning is much more effective for learning process as they uses

action instead of explanation. This helps the children to understand more in an interactive way.

- **Portable for the concept of any time/ every where**

  Based from David F, Santiago G, Carmen J., Ingnacio S., & Noemi R (2012), mobile Game-based learning provide more versatile educational methods for the user. Additionally, the extended use of portable gaming platforms allows the user to access the game at anytime and anywhere. This is truly relevant as the user can take this opportunity to fill up their idle time for learning.

- **Providing a real world examples virtually**

  According to Derryberry A. (2007), games can be used to achieve goals in education industry by building the similar environment of the real world virtually. This will help to enhance and develop the sense of meaning for playing the games as the actions taken will determine the results just like in real world. As reported by Ardito C.(2010), a games which has a narrative flow is essential in providing the meaning of game. With this, the delivery of the message or information flows smoothly and efficiently.

2.4 The Benefits of Android Mobile Applications

- **Ease of Developing on the platform**

  According to Cedric(2012), anyone can develop Android applications. Most of the app created is applicable to most of their OS such as Froyo and Jelly Bean. Moreover there are lots of tutorial exist on the net on how to create an Android Mobile Apps.

- **Open source**

  As quoted by Cedric (2012) in his article, Android is the only mobile development platform that provide freedom to its developers. There is no requirement to get a license to develop the applications. This will give the abilitiy to the user to use their creativity to create the mobile app. Moreover, there were abundant of open source compiler/ builder that provide the free service in developing the application.

- **Easy to test Application on Multiple Device**

  Android is not rigid to one type/ brand of phones only. The usage of Android is very broad where there are tremendous of brands use it as the OS. Such brands are Samsung, HTC, Alcatel and Sony. Hence, the market of Android is wide and the application can be tested just based from the OS, not on the type of phone.

2.5 Existing Mobile Applications for Asthmatics

2.5.1 Kid Beating Asthma

Kids Beating Asthma was created by Pediatric Services at Hospital Universitario San Carlos (HCSC) de Madrid (Spain).It was designed to help asthmatic children under 12 years old as well as teenagers to learn about their condition. The application was made to teach children on what is asthma and how to live with it in an interactive and fun way

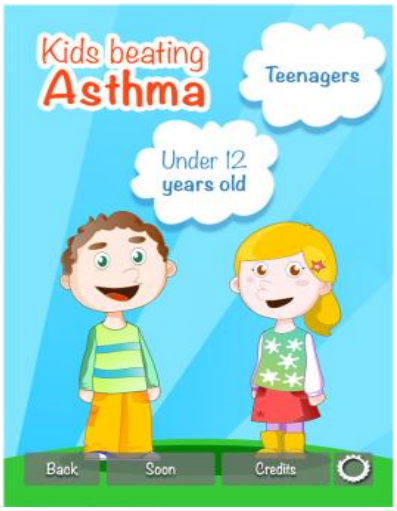

Figure 3: Kid Beating Asthma Mobile Application

2.5.2 Huff and Puff

Huff and Puff video based tale about asthma that was created based from the Three Pigs Tale. This video tells about a wolf that wants to burn the three pigs' house but was suffering from asthma. Each episode will give the explanation about asthma by the three pigs that is knowledgeable about medicine. This game also provides quiz to the children to answer after each episode. Created by Health Nuts Media, this games is sold for 7.99$ USD.

Figure 4: Huff and Puff Mobile Application

2.5.3 Assist Me With Inhalers

Assist Me With Inhalers is a patient centered app that instructs patients on how to use their inhaler and it will even set a reminder for them to take scheduled treatments. Assist Me was developed by Use Inhalers. This is an organization dedicated to providing audio-visual instruction for use of inhalers for patients online and through their smartphone applications.

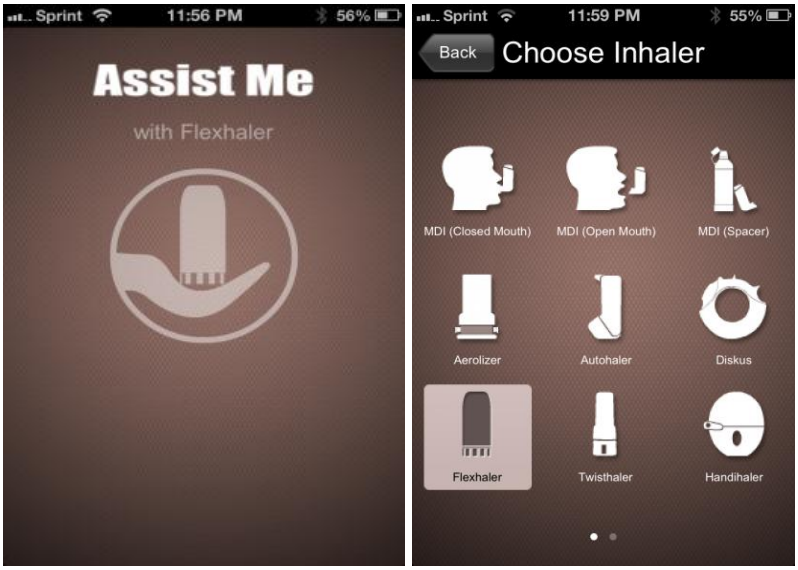

Figure 5: Assist Me with Inhalers Mobile Application

2.5.4 Asthma Sense

AsthmaSense was created by iSonea Inc., who specialize in management of asthma through technological innovations. They have so far created the WeezoMeter and have started the development of an application to help manage asthma.

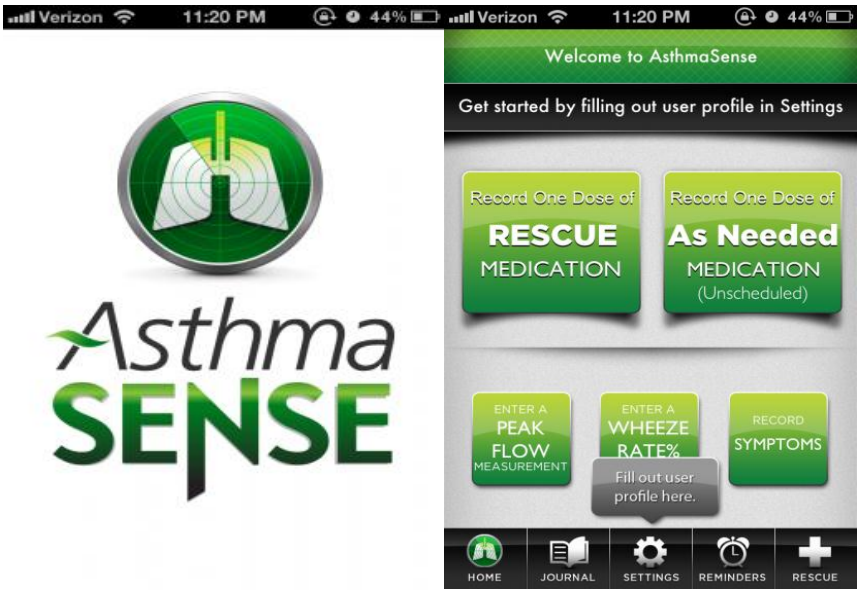

Figure 6: Asthma Sense Mobile Application

2.5.5 Comparison of the asthma mobile applications

Name	Type	Price	Age	Advantages	Disadvantages
Kids Beating Asthma	Game	Free	Under 12 years old and teenagers	▪ Great idea to teach children about asthma ▪ Media and illustrations made are attractive for children	▪ The application is not complete. There is no teenager section and there are only 2 of the 5 information modules added. ▪ The

					information may be too hard for under 12 years old to understand ▪ Some of the games are not related with asthma at all ▪ The application features are unattractive for teenagers
Huff and Puff	Video	7.99 USD-22.00 USD	4-12 years old	▪ Great idea to teach children about asthma ▪ Media and illustrations made are attractive for children ▪ The tale story of the three pigs is well known	▪ The application is expensive for Malaysian. ▪ The game may not all be useful in learning about

				and accepted worldwide	asthma ▪ The Graphical User Interface (GUI) is only good if viewed on a large screen display
Assist Me with Inhalers	Guide	Free	Adult	▪ Information includes most popular inhalers ▪ Very easy to follow the instruction ▪ Have features that will remind patients to take their scheduled puff.	▪ Doesn't have the Emergency Response (ER) guides ▪ The computer generated voice narration is not enjoyable and creepy.
Asthma Sense	Guide	Free	Adult	▪ Have password protection ▪ Supports multiple users	▪ The data cannot be exported to other

				on same device ▪ Have features to remind user about their medication use ▪ Able to record the utilization of prescribed-as-needed (PRN) or Rescue medications ▪ Have graphs and journals features to show the overall progress of patients' asthma history.	devices ▪ Some features (such as graphs) are not understand able by the users. ▪ Difficulties in entering the information of the medical history

Table 3 : Comparison of existing asthma mobile apps

CHAPTER 3

METHODOLOGY

3.1 Project Methodology

The project is planned to follow the agile methodology as it is the most practical methodology in mobile development. This is because mobile development requires constant change in technology, high usability requirements and faced strict boundaries such as memory, screen size and input devices. Agile methodology suits the demand for the mobile development as it provides simplicity, low overhead, business adaptability, and rapid delivery, maintain a strict focus on delivering the application value and identify and address the technical risk as early as possible.

The agile methodology comprises of four important elements that are:

- Incremental

  Working software over comprehensive documentation
- Cooperation

  Customer collaboration over negotiation
- Straightforward

  Individuals and interaction over process and tools

- Adaptive

  Responding to change over following a plan

Figure 7 shows the methodology that will be used in the project. The description for each phase of the methodology will be described in the next point.

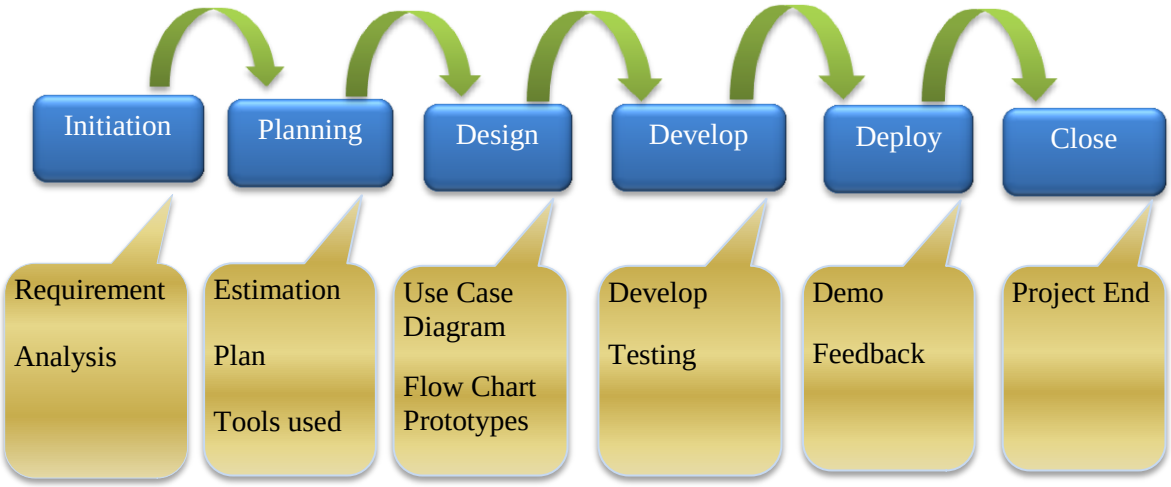

Figure 7: Agile Methodology

3.2 Project Initiation

Project initiation is the first phase of the methodology. In project initiation the requirements of the projects were discussed and were documented. The analysis of the project is done in the project initiation phase. In analysing the project some of the questions addressed are:

- Who are the learners and what are their characteristics?

  The learners of the project are the asthmatic children from age of 5-11 years old.

- What types of learning constraints exist?

  The children could not read properly or understand the message portrayed. The other constraint will be whether the children are able to understand the instruction given or not.

- What is the timeline for project completion?

  The timeline for this project are from May 2013 till January 2014.

After the analyzation process, the requirements founded were divided into three categories.

Categories	Requirements
Mobile Application	• The application should be supported by the various type of Android • The are no bugs or error exist in the game developed
Design	• The image should suit the children of age 5-11 • The animation should be interactive and understandable • The target user should be able to solve the game • The game should have 10 stages where each stages will contain information about asthma
Additional	• The games application can be played by other target groups • Adding additional features such as mobile quiz,asthma management monitor for children

Table 4: Project Requirements

3.3 Project Planning

Project planning is the second phase for the project described in the methodology. In this phase, the estimated time for the project, the tool used and the software language was defined.

3.3.1 Time Estimation

The project was estimated to be completed early in January 2014.

3.3.2 Cost Estimation

Transportation cost = RM 96 (To Persatuan Asma Kanak-Kanak and Tan Clinics Ipoh for user acceptance testing)

Equipment cost = RM 250 (Purchasing an Android pad to be used during the development and testing phases)

Google Play Accounts = 25 USD (RM75, to upload the Beta and full version application for the distribution)

Documentation = RM 55 (Printing, binding, hard cover)

3.3.3 Tools used

1. Eclipse

Eclipse is being used as the main software for the mobile development. This is because Eclipse provides a better environment and plug in for mobile development compared to other mobile development software. The project will use Eclipse Indigo version 3.7 with Mobile Plugin for Android.

3.3.4 Software Language

1. Java

The project will be developed mainly using Java. Java was designed to enable the applications of the developers' runs flexibly regarding any platform they used. This is called as the WORA abbreviations which mean "write once, run

anywhere". This means the compilation of the applications will only occur once and the applications runnable on any platform such as mobile platform.

3.4 Project Design

The third phase of the project is to design the proper design for the mobile games. The project will use Storyboard to show the flow of the games, Photoshop to create the multimedia image and Popup application to create the simple prototype of the game. There will be 12 stages planned for this game. This game will use the concept of adventure where there is a story behind for each stage. Example for current games that use the similar concept and widely accepted is Candy Crush.

The asthma management plan will be taught at stage 1-6. The game will be on learning basis where at first the will be introduced to asthma, and know the trigger factors. On stage 6-12 it will focuses on the asthma action plan. In this stage the user will start to face the "real world".

They will be given 3 lives for each game. The lives symbolise the stages of their asthma. When the lives are full they are well and can do the task given, if they lose a life they will go to the next stage of asthma action plan which is "when unwell". In this stage they need to take the inhaler and if they fail to do so within the time, they will lose another life and go to the "when worsen" stage and need to catch the stronger inhaler. The "when severe" stage means the player cannot continue the game anymore and need to go to the hospital.

3.4.1 Use Case Diagram

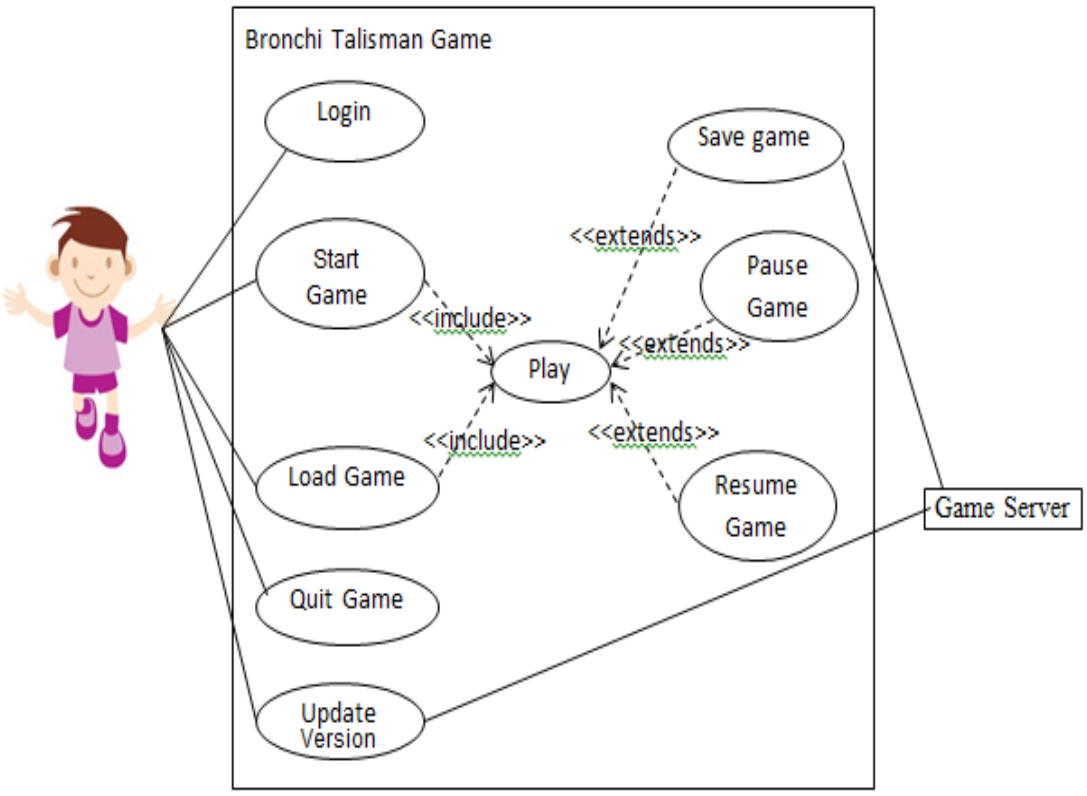

Figure 8: Use Case Diagram

3.4.2 Flow Chart

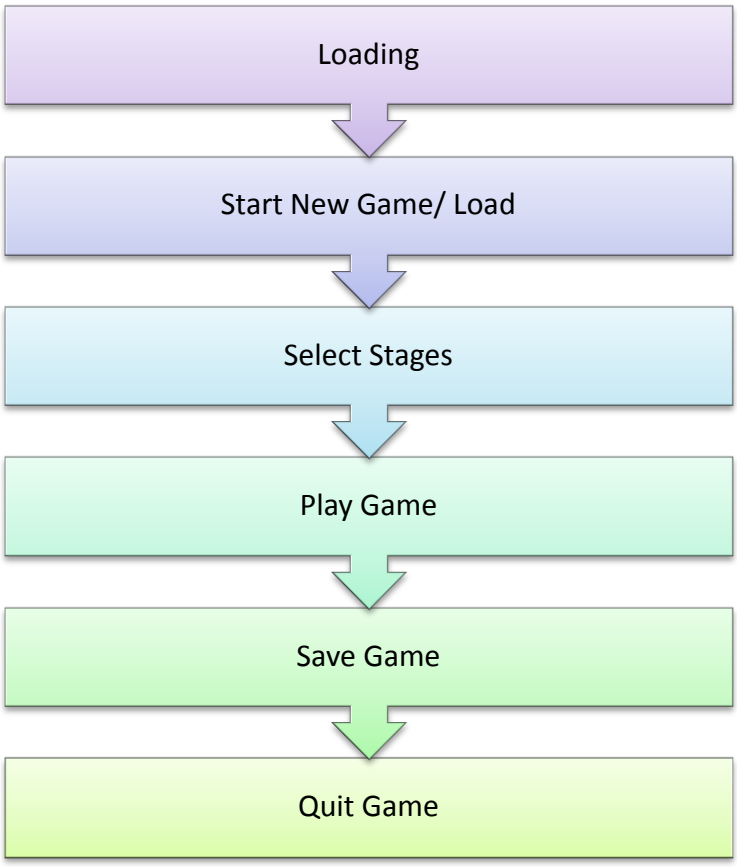

Figure 9: Bronchi Talisman Flowchart

3.5 Project Development

The third phase of the projects is to start developing the system. This phase is divided into smaller parts which starts with develops, testing and bug fixing.

3.5.1 Develop

Based from the requirements defined in the first phase, the author starts to develop the system by creating the GUI of the game first. After the interface is

completed, the author proceeds in coding the game according to the design prepared

Logo

The logo of the application is created using Photoshop. The logo was designed according to the android application guides that suggested that the logo should be simple and understandable. In the logo created, the author puts one of the characters from the game which Ace. Ace is holding a talisman of a dragon that symbolise health, wealth and prosperity. The alphabet B.T stands for Bronchi Talisman.

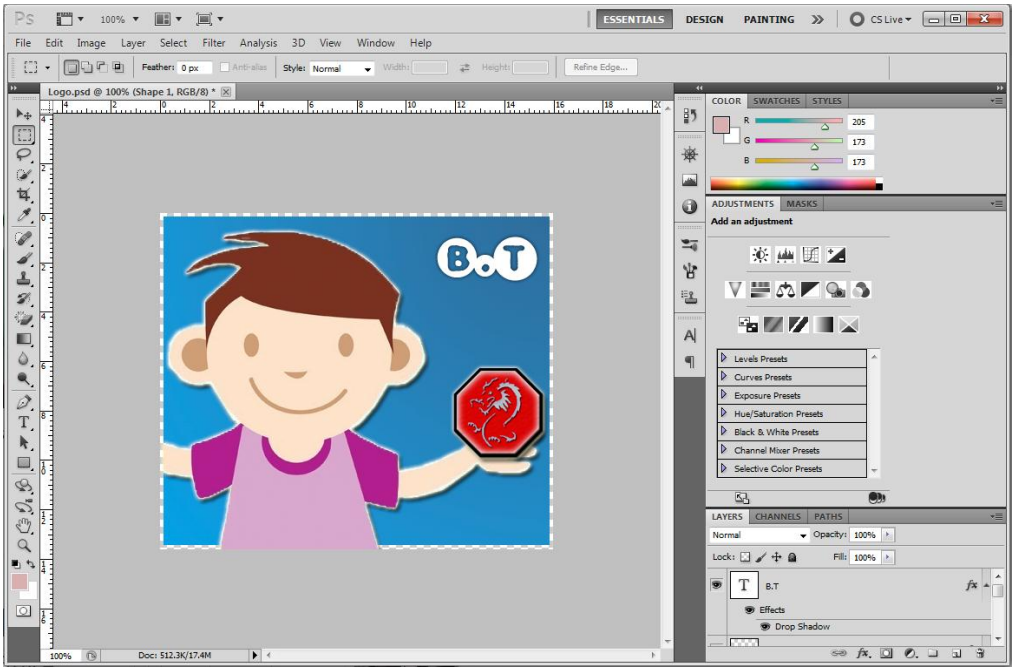

Figure 10: BT Logo

AndEngine

As stated before, the author is using Eclipse for Android to develop the application. However, Eclipse only is not enough for a game development as it is still considered as new to Android. Hence, the author used an extension known as AndEngine to ease the development of the game. AndEngine is an

extension that is designed specifically for Android game development. There are various extension created that is useful for this project. As we can see in the diagram below, the extension is imported in Eclipse and it can support the Android from version 2.1 till 4.3. For this project, the author is also using another extension known as PhysicsBox2D. PhysicBox2D is useful for the animation of the projects.

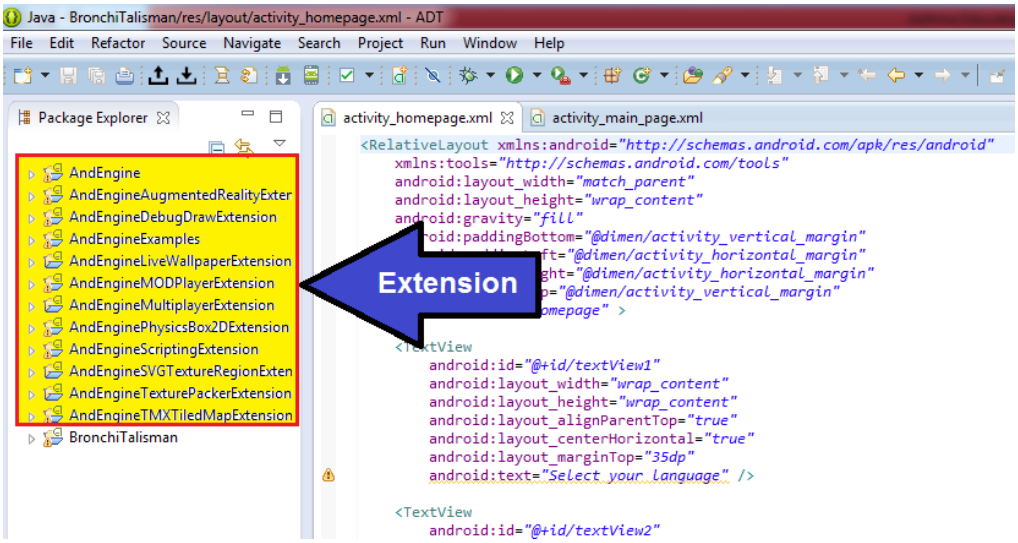

Figure 11: List of AndEngine extension imported

To add the two extension to be used in the project, the author right click on the project, select properties - > Android, and in the "library" window, select those two project and add it.

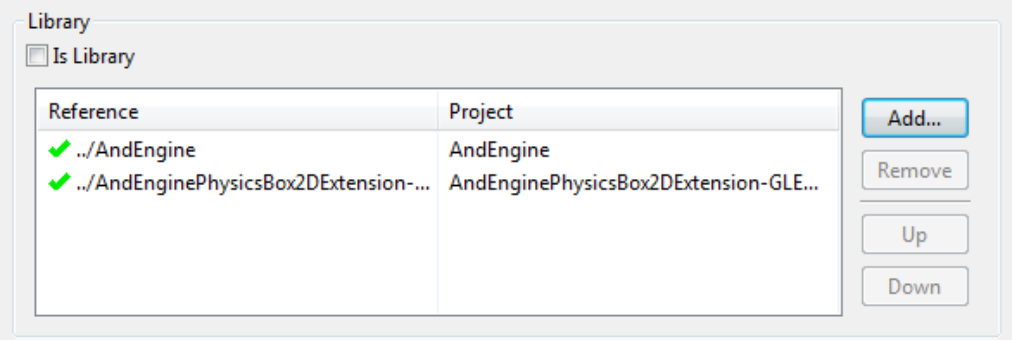

Figure 12: Adding extension to be used as project library

To start developing the game, the author opens the previously created class, and extending the class by using BaseGameActivity class. This action will force the author to add the unimplemented methods from the extended superclass.

```
import java.io.IOException;

import org.andengine.engine.options.EngineOptions;
import org.andengine.entity.scene.Scene;
import org.andengine.ui.activity.BaseGameActivity;

public class GameActivity extends BaseGameActivity
{
    public EngineOptions onCreateEngineOptions()
    {
        return null;
    }

    public void onCreateResources(OnCreateResourcesCallback pOnCreateResourcesCallback) throws IOExcepti
    {

    }

    public void onCreateScene(OnCreateSceneCallback pOnCreateSceneCallback) throws IOException
    {

    }

    public void onPopulateScene(Scene pScene, OnPopulateSceneCallback pOnPopulateSceneCallback) throws I
    {

    }
}
```

Figure 13: Game Activity Class

Next, the author will start to create the engine as the game is planned to work on various Android devices. The author used the LimitedFPSEngine class which is the subclass for AndEngine. This is by overriding onCreateEngine and returns the LimitedFPSEngine engine.

```
@Override
public Engine onCreateEngine(EngineOptions pEngineOptions)
{
    return new LimitedFPSEngine(pEngineOptions, 60);
}
```

Figure 14: Creating engine method

After successfully overriding the engine, the game is finally able to use the extension desired by the author. The author then proceeds to code the game according to the flow of the scene planned.

The flow of scene for the games is as follows:

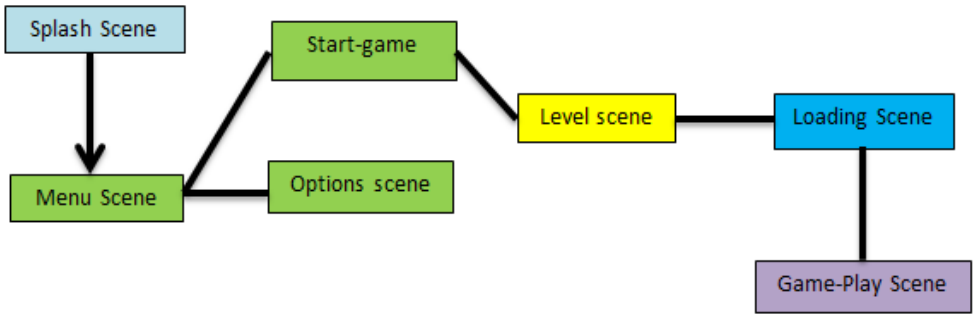

Figure 15: Flow of game scene

Splash scene is the first screen that will appear when the user opens the game. It will show the logo of UTP and BT and will ask the language of the game. Menu scene will show the menu with two buttons which is Start and Options. Options scene screen will show the option of the game such as changing the language. Start game scene screen will lead to level scene screen is where the levels is shown while loading scene screen will show the loading of the game. Game-Play scene is the screen for playing the game.

The switching between the scenes will be controlled by SceneManager class. While switching to the game-play scene, loading scene will be displayed first, unloading menu textures, loading game textures, and creating game scene. If the player is in the game scene, they can exit it, loading scene will be displayed unloading game play scene and loading menu textures.

The SceneManager class will take care for the switching between scenes and keeping track of the current scene display. The SceneManager class is used in the global level of the project. Based from the flow of the scene planned, the author will create 4BaseScene objects which are splash, loading, menu, and game scene. The coding for the SceneManager is as follows:

```
public class SceneManager
{
    //-------------------------------------------
    // SCENES
    //-------------------------------------------
```

```
    private BaseScene splashScene;
    private BaseScene menuScene;
    private BaseScene gameScene;
    private BaseScene loadingScene;
    //-------------------------------------------
    // VARIABLES
    //-------------------------------------------
    private static final SceneManager INSTANCE = new SceneManager();
    private SceneType currentSceneType = SceneType.SCENE_SPLASH;
    private BaseScene currentScene;
    private Engine engine = ResourcesManager.getInstance().engine;
    public enum SceneType
    {
        SCENE_SPLASH,
        SCENE_MENU,
        SCENE_GAME,
        SCENE_LOADING,
    }
    //-------------------------------------------
    // CLASS LOGIC
    //-------------------------------------------
    public void setScene(BaseScene scene)
    {
        engine.setScene(scene);
        currentScene = scene;
        currentSceneType = scene.getSceneType();
    }

    public void setScene(SceneType sceneType)
    {
        switch (sceneType)
        {
            case SCENE_MENU:
                setScene(menuScene);
                break;
            case SCENE_GAME:
                setScene(gameScene);
                break;
            case SCENE_SPLASH:
                setScene(splashScene);
                break;
            case SCENE_LOADING:
                setScene(loadingScene);
                break;
            default:
                break;
        }
    }

    //-------------------------------------------
    // GETTERS AND SETTERS
    //-------------------------------------------

    public static SceneManager getInstance()
    {
        return INSTANCE;
    }

    public SceneType getCurrentSceneType()
    {
        return currentSceneType;
    }

    public BaseScene getCurrentScene()
    {
        return currentScene;
    }
}
```

Figure 16: Scene Manager Class

Internationalization

The author used internationalization in order to make the game playable using multiple languages. Currently, the author is using English and Malay as the medium language for the game. The user can select the language at the Setting page. The reason of having internationalization is to ease the author to upgrade the game to be playable worldwide. Internationalization will allow the system to:

- Be easily localized, or translated, into different languages
- Handle multiple locales at once
- Be easily modified later to support even more locales

Hence, the author can simply add another language such as German or Spanish just by adding their resource bundle in the game package.

As one of the most widely used programming languages, Java must support this requirement. If the implementation of the Java Internationalization is managed properly, the result in the long term management only requires little works or none at all although the requirements may change.

Basically, translation is usually applied only to user interface elements (menus, labels and etc.) and not to data stored in the database. Generally, Internationalization will use ResourceBundle and Locale in the Java. util package. The diagram below shows how internationalization works.

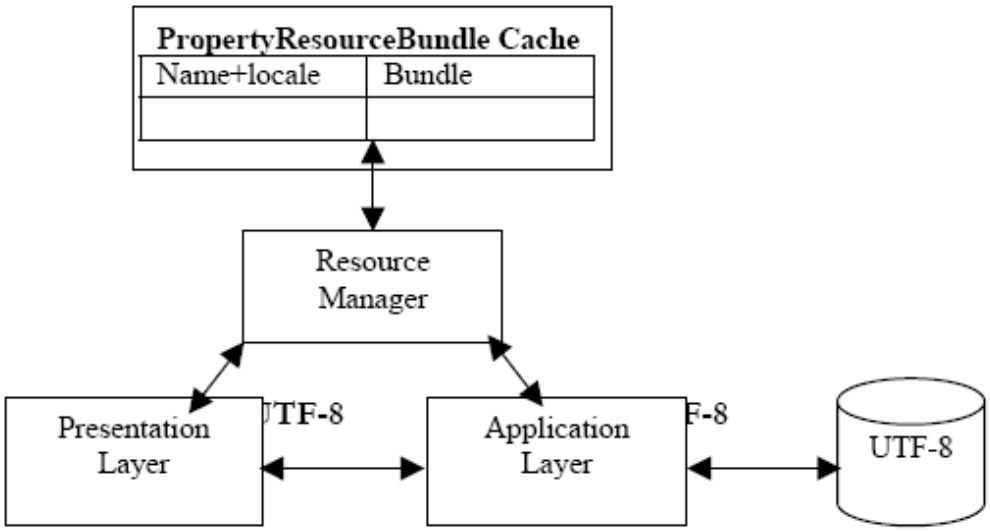

Figure 17: Internationalization Diagram

First the author will create a .txt file with the name of the label and its name in the language. For example:

BT_BTN_ Start Start *Language_en.txt*

BT_BTN_ Start Mula *Language_my.txt*

Resource bundle is a compilation of .text file with a common base name. To differentiate or identifies the locales if the language that will be user, the base name will have an extension with the country codes. For example, the base name of resource bundles might be "Language". The compilation of the group should have a default resource bundle with the base name which is “Language” and will be used as the bundle of last resort if a specific locale is not supported. The group then is allowed to create as many locale-specific members as needed, for example a Malay one named "Language_my".

Each resource bundle in the group contains the same items, however each item have been translated according to the local represented by the resource bundle. For example, both " *Language_en* " and " *Language* _my" may have a String

that's used on a button for starting operations. In " *Language* _en" the String is "Start" and in " *Language_my* " it is "Mula".

To get the locale-specific object, the program will load the ResourceBundle class using getBundle method.

ResourceBundle language =
ResourceBundle. getBundle ("Language ", currentLocale);

The Resource bundles must have a key that uniquely identifies the locale-specific object in the bundle. In the system, each key will have a name that shows the class where the keys belong, type of the components and the string for the components. Eg:

BT_BTN_ Start

BT= class name , BTN = JButton , Start = Start

Currently in the system, instead of using the getString method to get the string, the author used the direct access for each keys using.

MessagesTry.getInstance().getString(MessageKeyTry. BT_BTN_ Start)

3.5.2 Testing

The testing was done to evaluate the design and usability of the mobile games. There are three types of test that will be done in the project which are unit, system and user acceptance test. The unit and system test was done individually by the author while the acceptance test will be done with the selected target user and Asthma Council Malaysia.

The user acceptance testing will be held on week 20 at the Persatuan Asma Kanak-Kanak Malaysia. This is the non-governmental organization that was created to gather around all the children who suffered asthma and supports them in terms of medication and also motivation. Around 25 children tested

the game. The children were given the Android pad and will play the game until the third stage. After that, a questionnaire will be given to them to test on the effectiveness of the game. Some of the questions that included are (See appendix 9):

1. Do you enjoy the game?
2. What is the name of the triggers that you have found?
3. Is the trigger is good or bad?
4. What food is good for you?

3.6 Project Deployment

Demo, Feedback, Support

After successfully passed the testing phase, in the deployment phase, the mobile game is distributed using the Google Play application on Android. All users from all over the world will be able to play the games. They can give a comment or suggestion on the Google Play account. The feedback for this game will be gathered to evaluate the mobile game application. Further improvement on the project will be released for the next updates.

3.7 Project Closing

Project End

The closing phase will be done in January. In this phase, the project will end and the documentation for the project will be given to the management.

CHAPTER 4

RESULTS AND DISCUSSION

4.0 Prototype's Overview

4.1.1 Splash scene and language selection scene

Figure 18: Splash

Splash scene appears when the game started. The existence of the splash scene is to hide the process of loading resources that happened behind the scene. After the resources is successfully loaded, the splash scene dispose and language scene appear.

Figure 19: Language scene

The language scene enables the user to select the language that they prefer. For the time being, there are 2 languages available that is Bahasa Melayu and English.

4.1.2 Application Home Page and Setting Page

Figure 20: Home and Settings Scene

The figure shows the starting/ home page for the game application. There are 2 options available which are to play the game and manage the settings of the game application. In settings option, the user will be able to change the language that they want to use as a medium for the game which in this case is either English or Malay. The user will also able to control the sounds, vibration and music for the game.

4.1.3 The Stages of the Game

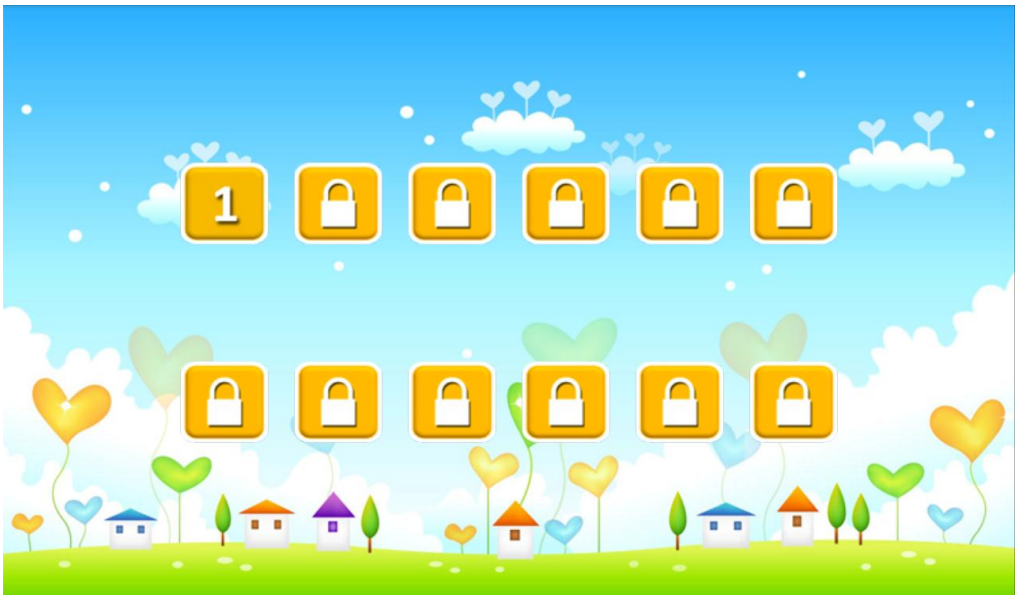

Figure 21: Stages Scene

As shown in figure above, currently there are 12 stages were planned for the game. For each stage, the player needs to pass the task given and collect the talisman given. The task is easy at the earlier stage and gets harder when the stages increases.

Figure 22: Information Scene

The information scene shared the information about the asthma management plan and asthma action plan. The scene appears before the game scene and will disappear after the stipulated time ends. Each of the information scene is related with the mission of each game accordingly.

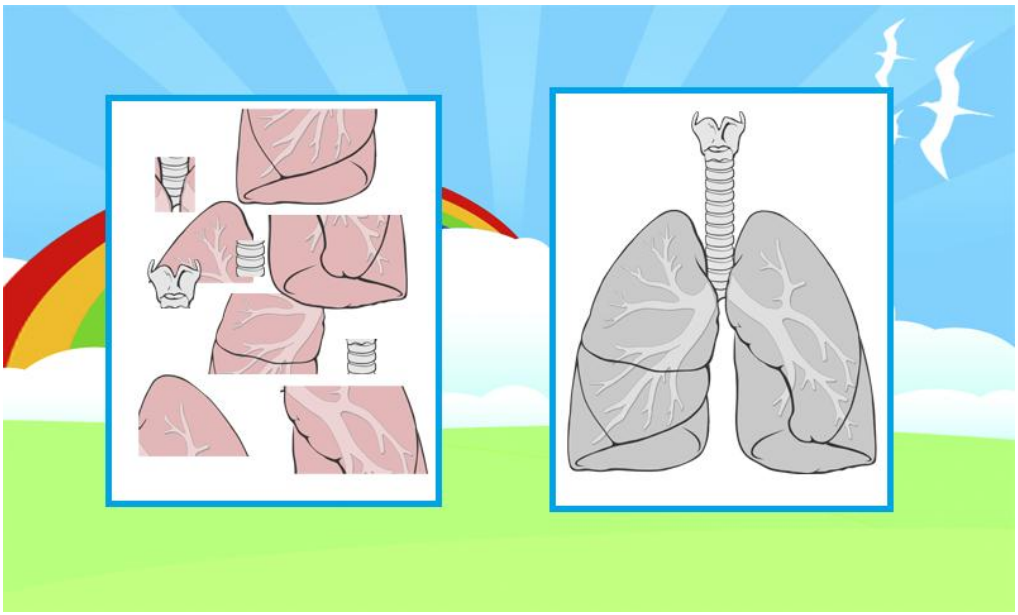

Figure 23: First Stage Game

Figure above shows the first stage of the game. The player needs to match the picture in the left box with the right box to complete the lung diagram. The main reason for this game is to introduce the basic information about asthma to the user as for this stage, the user were introduced with the most important organ for respiration that is lung.

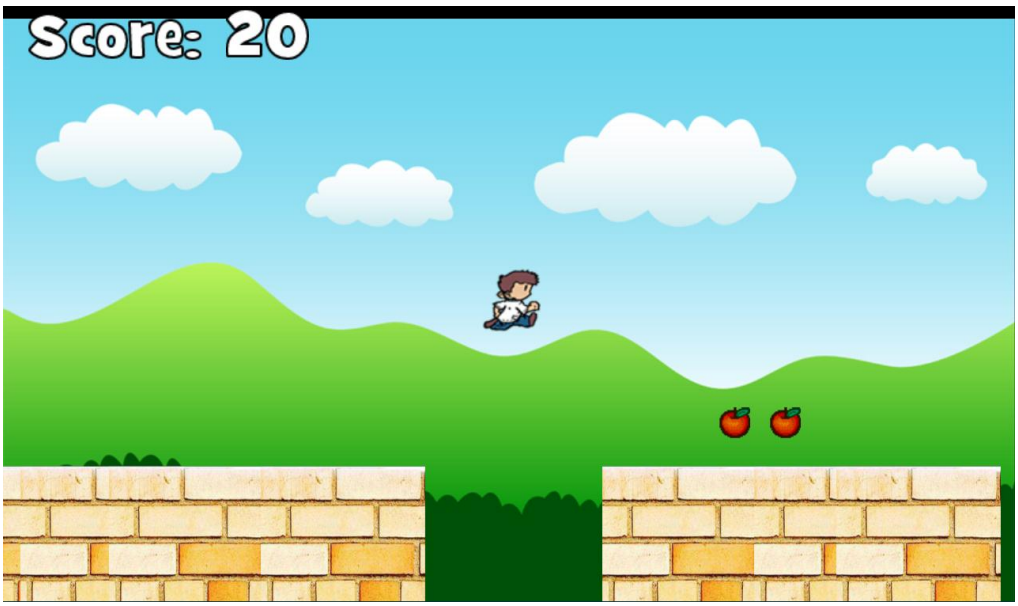

Figure 24: Good food stage

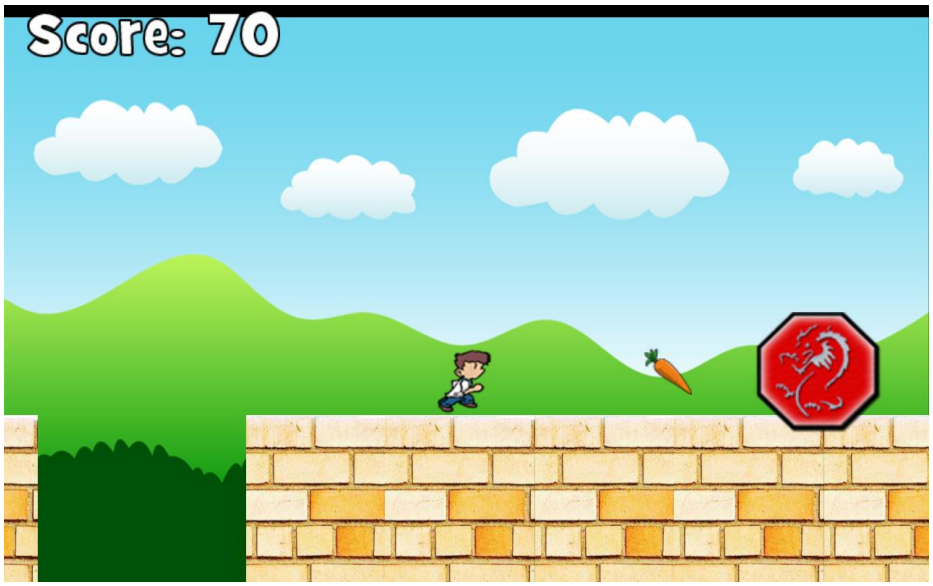

Figure 25: Getting the talisman

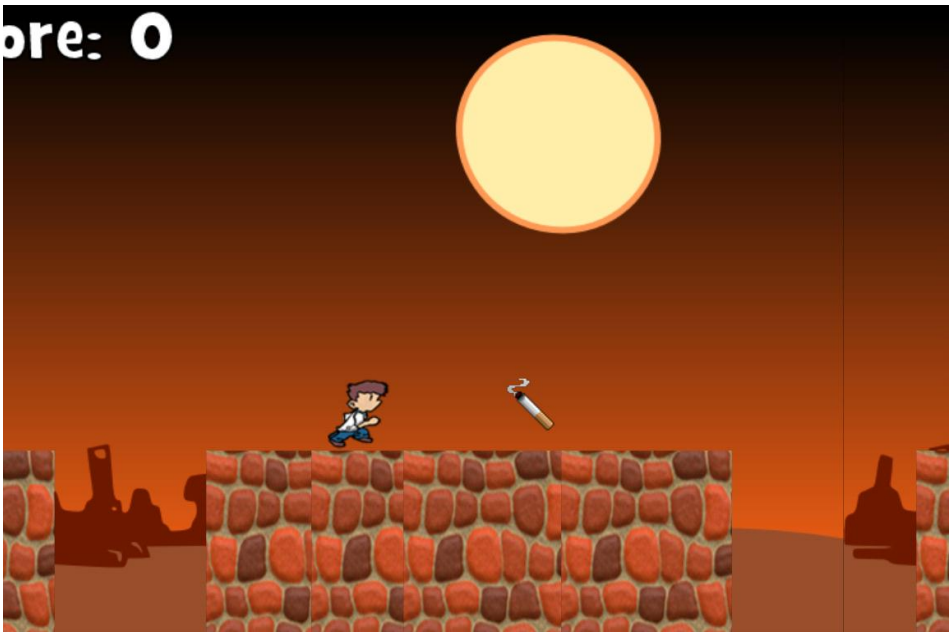

Figure 26: Triggers stage

For good food stage, the player needs to collect the good food that appears on the route that he took. The player also needs to jump to avoid himself from falling into the cliff. If the fall, they failed to complete the mission and need to repeat again. To complete the mission, the player needs to get the talisman that exists at the end of the stage. For the triggers stages, the

player needs to avoid the trigger by jumping crossing it. If the player touches the triggers, they failed the mission and need to repeat again. For the next stages, the player need to avoid the triggers while picking the food, if they touch too many triggers the background turns yellow, and if the condition continues it turns red. If the player still touches the trigger after the background turns red, he cannot continue to play the game anymore as he failed the mission and need to repeat it again.

4.1 Discussion of Findings

A set of questionnaire were distributed to 50 participants. There are two sets of questionnaire (see appendix 7 and 8). One set is for the parents who have asthmatic children, while the other set is for the asthmatic children. The results of the survey are discussed in the next point.

4.2.1 Age of the Asthmatic Children

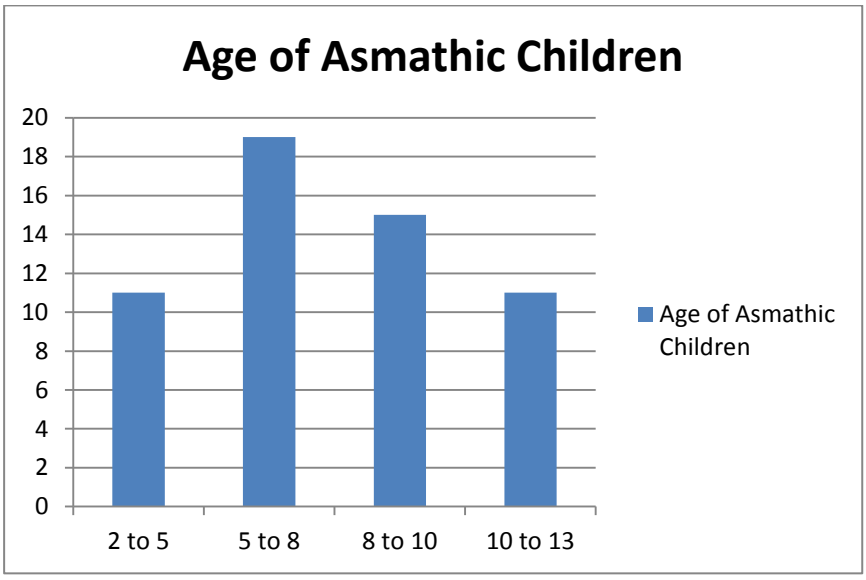

Figure 27: Age of Asthmatic Children Graph

The results were from the sets of questionnaire for the asthmatic children. As shown, most of the asthmatic children are from the range of 5-11 years old. This is because, most of the cases were only found during that period due to the activity of the children. At that age, the children are more active and their curiosity level is high. Hence, the symptoms are clearer to detect as they are prone to the triggers on the surrounding.

4.2.2 The Asthmatic Children Knowledge about Asthma

The results were from the sets of questionnaire for the asthmatic children. The question asked simple information about asthma that the asthmatic children should know. Some of the questions are (See appendix):

1. Do you have asthma?

2. What do you do if you can't breathe?

3. Do you know how to use inhaler? (The picture of the inhaler is given)

4. Give one type of triggers you should avoid.

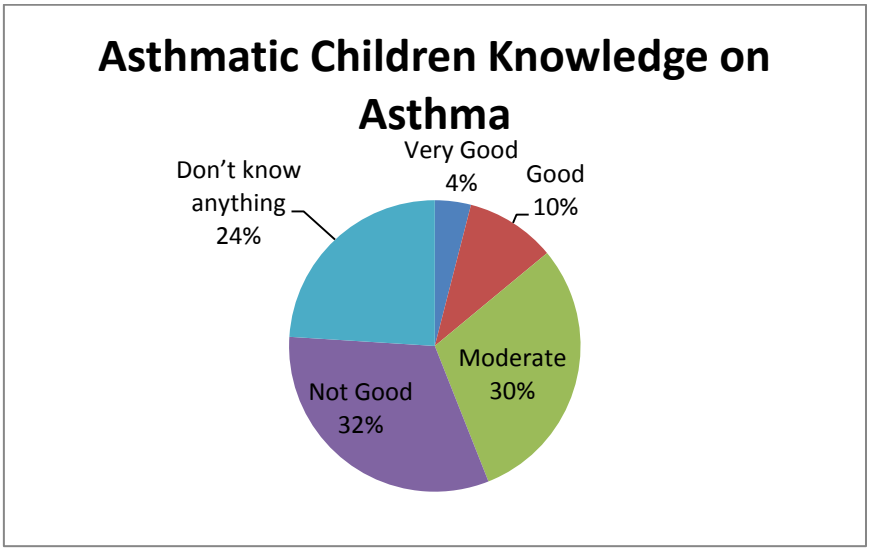

Figure 28: Asthmatic Children Knowledge on Asthma Graph

After answering the question, the marks were calculated and categorized into 5 parts. The result is shown in the pie charts above. Based from the charts, the percentage of the children who have lack of knowledge in asthma is more than 50%. 32% of don't know much about the disease that they have and 24% of them have no idea at all about it. Only 4% of the children were educated about asthma and 10% person have adequate knowledge about it. The last 30% was neutral, where the children know the basic information about asthma.

4.2.3 The Parents Opinion about Existing Asthma Material

The results were from the sets of questionnaire for the parents who have asthmatic children. From the survey, 33 out of 50 respondents thought that the existing material for asthma is not adequate in Malaysia. They found out that material such as pamphlets for Asthma Management Plan and Asthma Action plan is hard to be found.

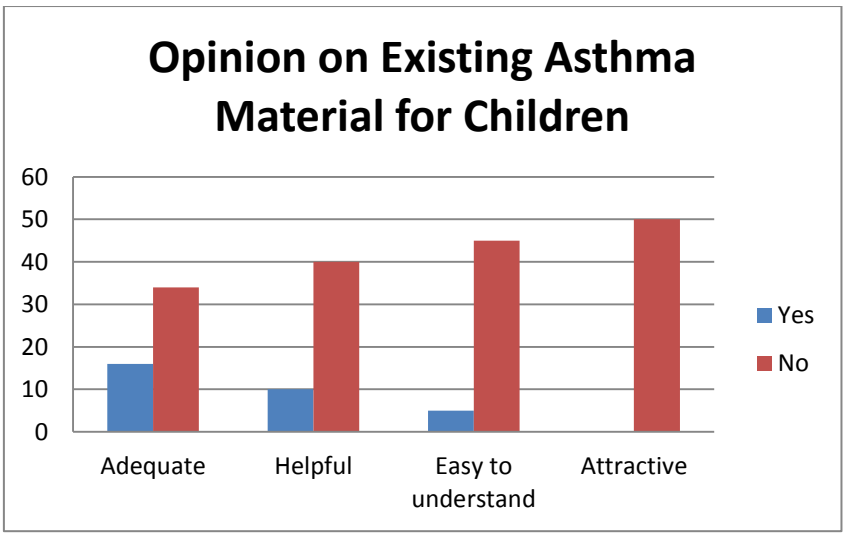

Figure 29: Opinion on Existing Asthma Material for Children Graph

Besides, 40 out of 50 respondents agreed that the existing material is not helpful in sharing the information about asthma to children. Moreover, 45 respondents also agree that the materials existed is hard to be understood

by the children. The explanation in the materials is long and too complex for children especially for the children who cannot read yet.

Lastly, all the respondents agree that the current materials are not attractive for the children. This is because the materials are too formal. They don't provide graphics or pictures that will attract the children to learn it. Moreover, most of the materials were dull, especially for the photo stated material from the government hospitals or clinics. Hence, it does not enhance the possibility for the children to remember the information shared.

4.2.4 The smartphone availability and usage

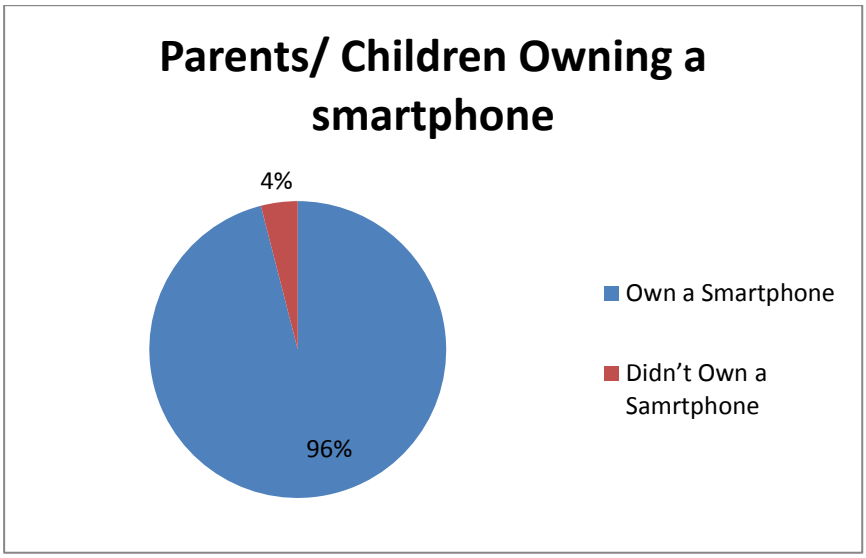

Figure 30: Parents/ Children Owning a smartphone Graph

From the survey sets to the parents, 96% of the parents admit that they own a smartphone or their children own a smartphone. Only 4% of them doesn't use smartphone neither the parents nor the children.

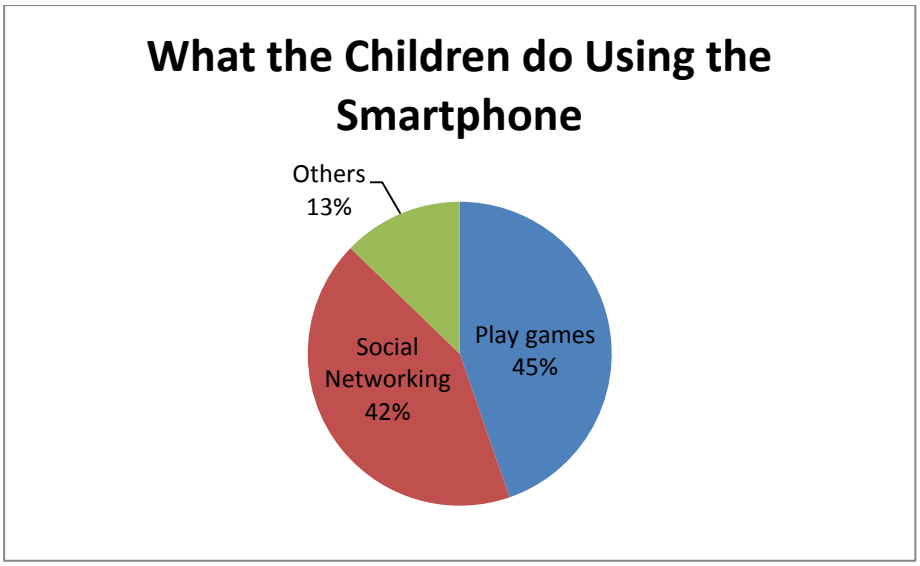

Figure 31: What the Children do using the Smartphone Graph

Figure 31 shows the percentage of the activity done by the children when they are using the smartphone. 45% of the children use the smartphone to play the games such as Angry Birds, Fruit Ninja or Candy Crush. Another 45% use smartphone as a tool for social networking. However most of the children that use the social networking age are in between of 7-12 years old. The last 13% is for other activity such as for photography, emergency, entertainment and also learning.

4.2.5 The Parents Opinion about Education Mobile Games to Children

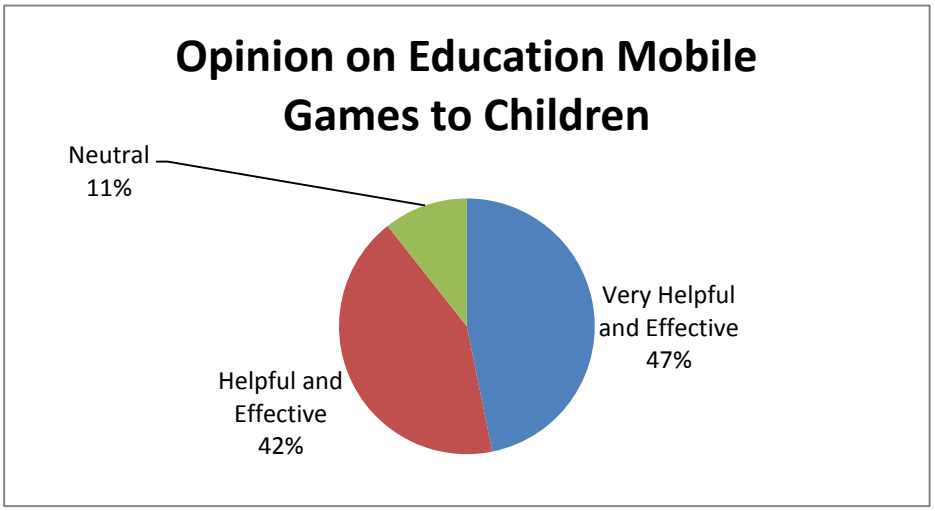

Figure 32: Opinion on Education Mobile Games to Children Graph

According to the survey, 89% of the respondents agree that education mobile games are beneficial in helping them to teach their children about asthma. Moreover, they also agree that education mobile games is one of the effective medium for education in this era where technology are much more advanced than before. Only 11% of the respondents have neutral opinion about education mobile games. This is because, for them any method for teaching is good and the results of the teaching depend on the learner itself.

4.3 System Evaluation

There are three types of testing that has been done in the project that are unit, system and user acceptance testing.

4.3.1 Unit Testing

In unit testing, each component is tested to the requirements required for the units to perform. Unit testing is done by the author itself during the development phase of the mobile game application. Each testing was done every time the author had finished coding the unit and the testing was repeated until the desired outcome achieved. The unit was built separately in its own package and class. The results of the unit testing were tabulated in a table.

Types of testing /Result	**Pass**	**Fail**	**Remarks**
Internationalization			
Getting name from Resource Bundle	/		
Showing the language available	/		
Switching the language	/		
Splash Scene			
Appear correctly	/		
Suitable size of the logo	/		
Go to the menu after loading resources	/		**(**The scene stuck at first trial due to the large size of the logo)
Menu			

Background appearance	/		
Title appear correctly	/		
Buttons allocate at desired place	/		
Buttons functioning to go to the next scene	/		
Buttons enlarge when the user focus on it	/		
Loading Scene			
Manage to loading items for the next scene	/		
Stages Scene			
Stage shown according to order	/		
Locked button remain locked		/	Didn't use the locking currently
Unlocked button after stages clear		/	
Load to game scene after clicked	/		
Game Scene			
Player image appear accordingly	/		
Control Player	/		User can control the movement of the player
Player able to move	/		Does not stuck
Items achievable	/		
Items disappear after achieved	/		
Game over shown if user lose	/		
Star shown if level clear		/	In progress

Table 5: Unit testing results

4.3.2 System Testing

System testing is done after the integration of the all the scenes which are the splash, menu, stages, loading and game scene. The testing was done by the author after she managed to complete the unit testing for each component. The game was run on the Samsung Galaxy Table 10.1 with JellyBean Android version and Samsung Galaxy Wonder with Gingerbread Android Version. The results of the test are shown below

Types of testing /Result	**Pass**	**Fail**	**Remarks**
Scene Movement			
Splash - > Menu	/		
Menu -> Stages	/		
Stages -> Loading	/		
Loading -> Game	/		
Game -> Stages	/		
Resources Loading			
Loading of item for each scene	/		
Item loaded from resource folder	/		
Internationalization			
Only one selected language appeared for all scene	/		
Ability to change the language for the game	/		
Design			
All buttons are functioning	/		
Image appear correctly	/		
Image does not distorted	/		
Location of all the items appeared correctly	/		

Game			
All finished game are playable	/		(Small lag in loading resources)
The flow of the stages move in correct order	/		
Manage to go to the next stage after mission accomplished	/		(Small lag in loading resources)
System			
Can exit the game properly	/		
No system crash	/		
Game does not stuck	/		

Table 6: System testing results

4.3.3 Usability / User Acceptance Testing

As shown in the Gantt Chart for FYP2 (see appendix 2), the user acceptance testing was done on 23rd and 24 November 2012. The testing was done with 25 asthmatic children who are available on that date range from age 5- 11 years old. Each of the asthmatic children was given a specific time for them to play the game based from their age. Children from 5-6 years old were given maximum of 1 hour and 15 minutes, 7-8 years old were given maximum of 1 hour and lastly 9-11 years old were given maximum of 45 minutes. The differences exist based from their ability to understand and learn how to play the game. Within the stipulated time, they were able to play the game from stage to stage and repeat any stage that they want. After that, they were given the questionnaires to be answered with the guidance from the author as well from their parents. The questionnaires consist of the question related with asthma action plan, asthma management plan, design of the game and the attractiveness of the

game. Diagrams also were used in the questionnaires to help the children to answering the questions (see appendix 9). The result of the testing is as follow.

Effectiveness

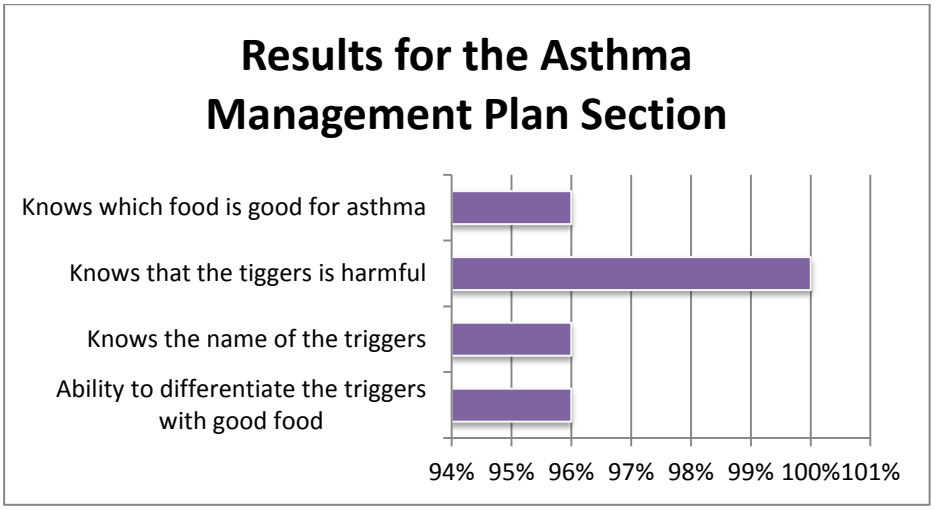

Figure 33: Asthma triggers and protector (Asthma Management Plan)

The section of asthma management plan asked the children to differentiate the triggers with the food that is good for asthma. The result shows that 96% of the children are able to answer correctly. The children who get the answer wrong are because they thought that ice is good for asthma. This is because at they like ice cream and still didn't realize that it may trigger their asthma. The results are the same for the questions about the name of the triggers and what food is good for asthma. The 4% of the children prefer that ice is a good thing and not a trigger. However, all of them managed to answer correctly when they are being asked whether the triggers are harmful for them or not. Hence, based from the results gathered, it can be seen that the project managed to improve the knowledge about asthma. They learned about the existence of triggers and

know what food to eat to manage their asthma. To solve the matters with the "ice" triggers, the author is planning to include a further but simple explanation of how ice can trigger their asthma.

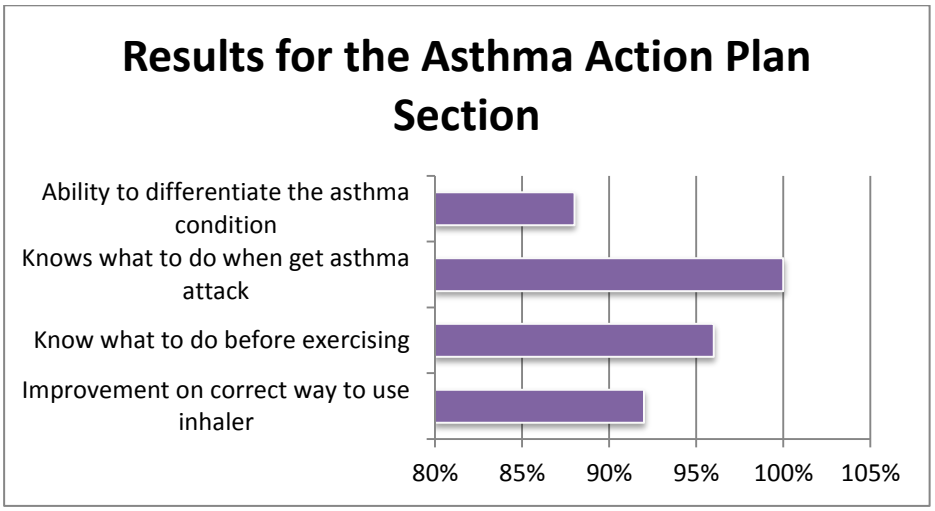

Figure 34: Asthma Action Plan Testing Result

The asthma action plan section questions asked the children few simple questions about the asthma action plan. The children were asked to remember the traffic light analogy that is used in the game to describe about asthma action plan. Based from the results, 82% of the children are able to differentiate the four stages of asthma action plan. The children who gets the wrong answer is because they are confuse with stage 2 and stage 3 of the action plan. Besides, the children managed to choose the right action that need to be done when they have asthma attack or before exercising. There is also an improvement for the children in following the correct way of using inhaler. This shows that the game managed to share beneficial knowledge about asthma action plan to the children. The analogy of the traffic light is also helping the children in remembering the stages of the asthma action plan.

Design & Attractiveness of the game

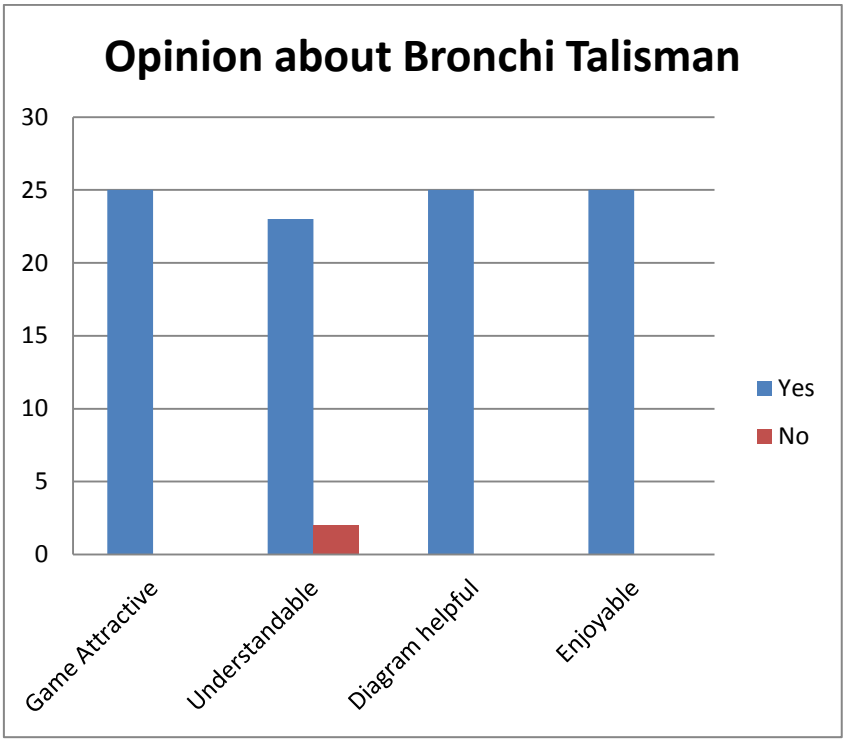

Figure 35: Opinion about Bronchi Talisman

This section asked about the children opinion about the design and attractiveness of the game. Since the children are from age 5-11 the author decides to use yes or no question instead of giving range question that might confuse the children. All of them agreed that the game is joyful, attractive and the diagram is helpful for them. However, 23 of them agreed that the game is understandable while 2 of them disagree with the statement. After, a thorough check up, the author found out that the 2 children didn't understand the first stage game as they missed to read the instruction for that game. As a solution the author extends the instruction view time and the instruction will only disappear when the player click ok button.

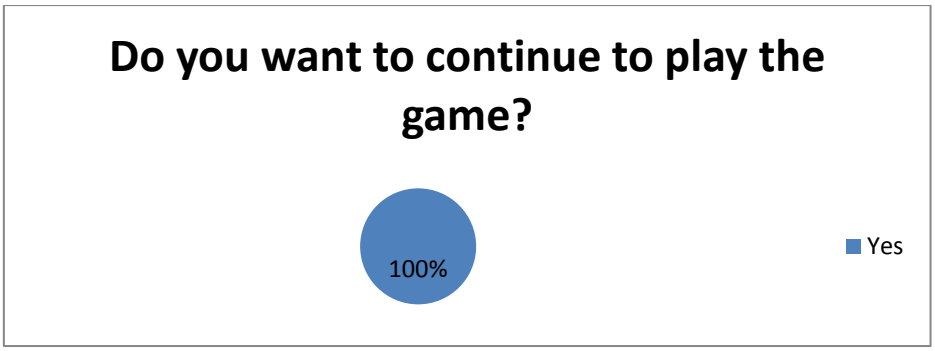

Figure 36: Asthmatic children interest to continue playing the game

The last question found out that all of the children would like to continue to play the game. Therefore, the author took the email address of the children or their parents in order to share the link of the full version game once the game is uploaded in the Google Play.

Suggestion Received

From the asthmatic children

The children want the player to be able to shoot the trigger in the game. Besides, they also suggested that the journey for each stage to be prolonged. Lastly, they suggested that the avatar "Ace" to talk with them.

From parents

Although the testing is for the target user which the asthmatic children from age 5-11, the author did also gave the parents to play with the game and take the suggestion from them. Most of the parents like the game because they can also learn something from the game while releasing their stress while playing. The parents suggested that more level should be added in the game. Besides they also suggested that the author can also add some video animation about asthma in the game so that when the children don't want to play the game, they can watch the animation.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

This chapter will summarize the project study and conclude the results achieved. As stated, there are two objectives that will be achieved in the project. Both of the objectives are achieved in this project. The first objective that is to know about the importance of asthma is achieved by doing the survey on the asthmatic children via online questionnaire. The results shown that, asthma education is essential in controlling and managing asthma for children. Besides, the author is also succeeds to achieve the second objective that is to develop the asthma mobile application game. The game is in progress of adding more stages and being improved technically in to solve the loading resources lag.

The future plans for this project are to add an online management plan for the application that can be viewed by the parents. The management plan includes the reminder for the children to take the inhaler on schedule and the ability for the parents to keep on track for their children medication. Moreover, the project can also add on providing an animation video or story that can teach the children about asthma. Besides, instead of just focusing on one disease the game can be broaden by including other disease that related with lungs or bronchi such as cancer or pneumonia.

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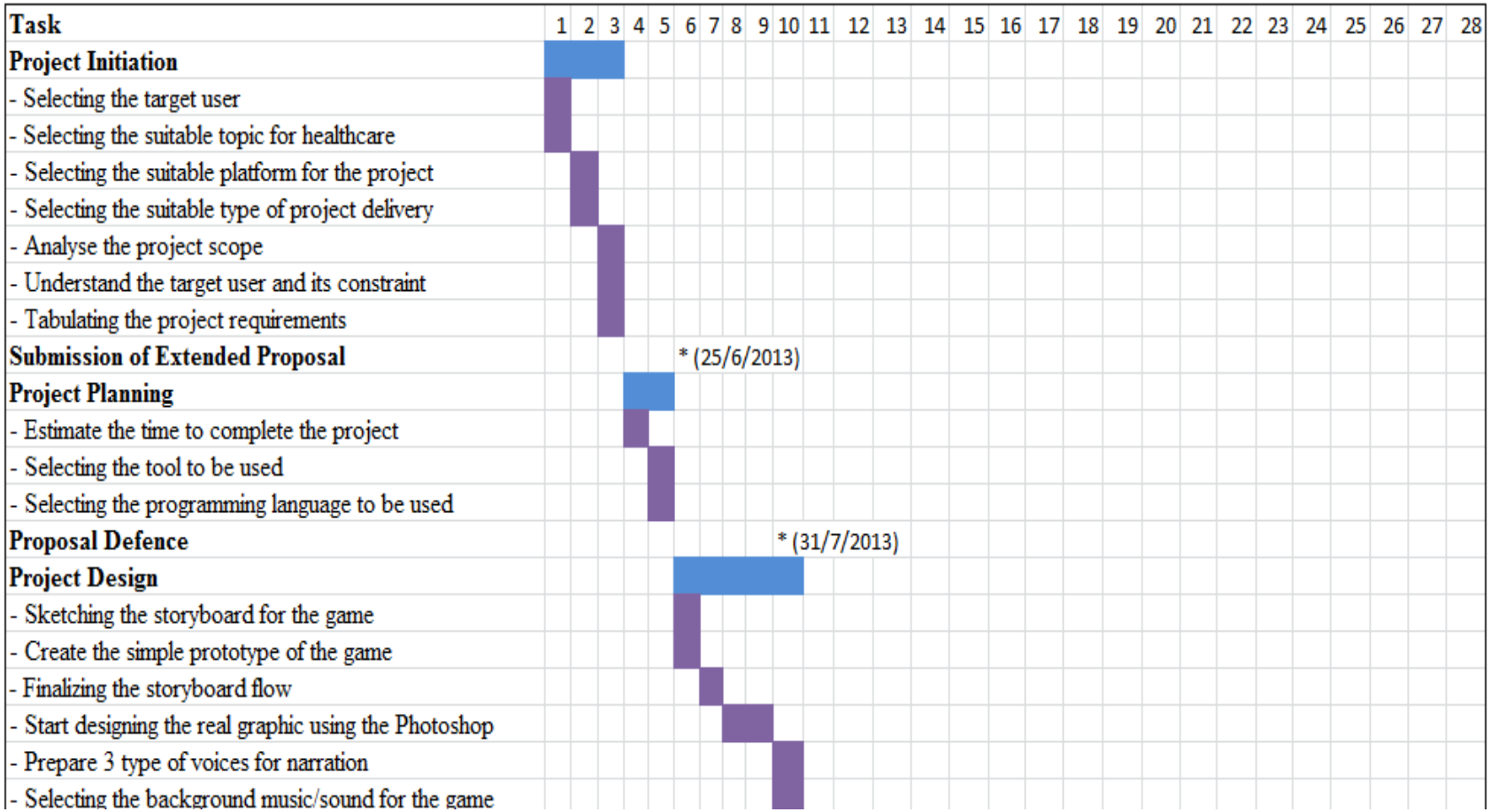
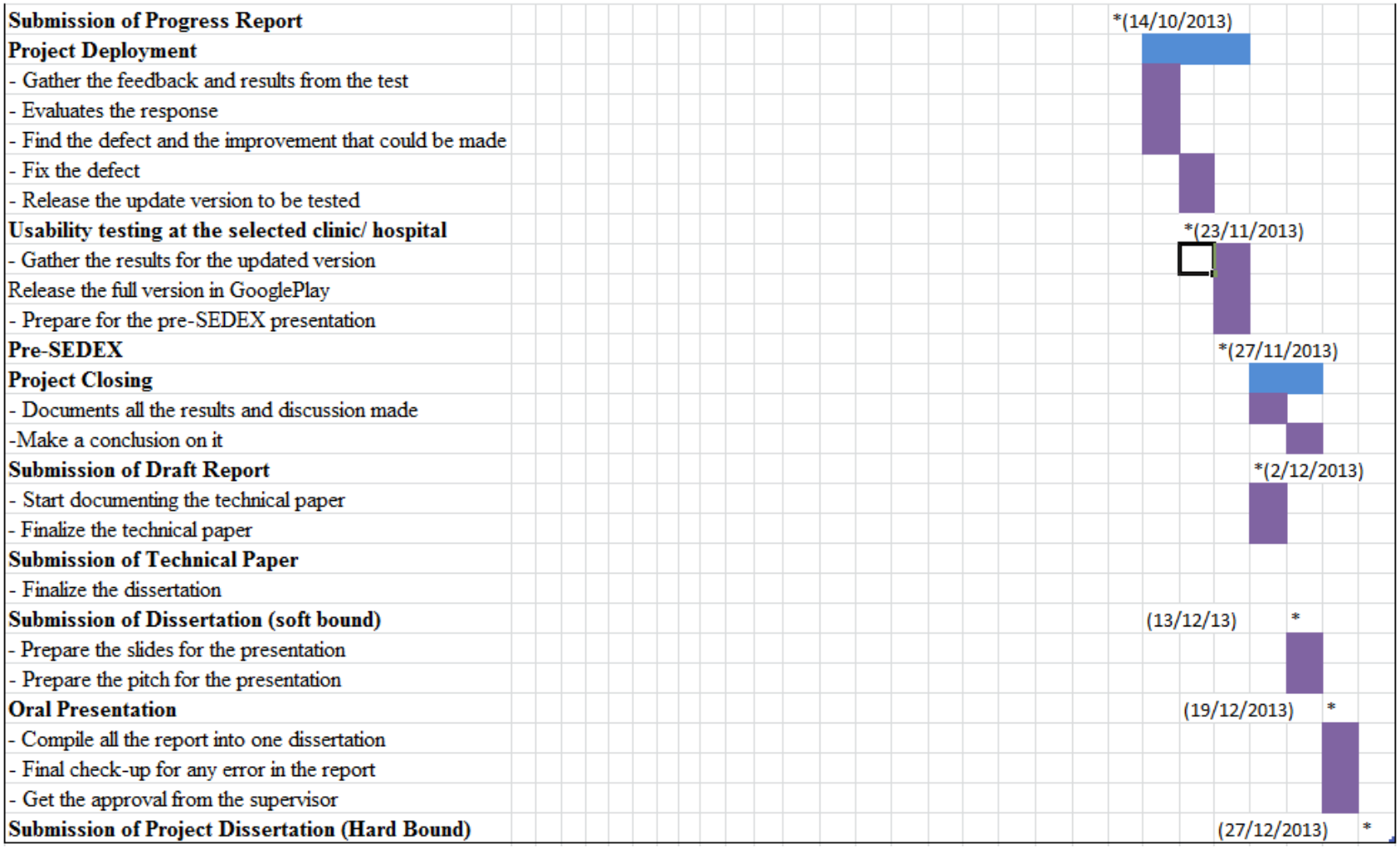
APPENDICES

Appendix 1 Project Gantt Chart FYP1

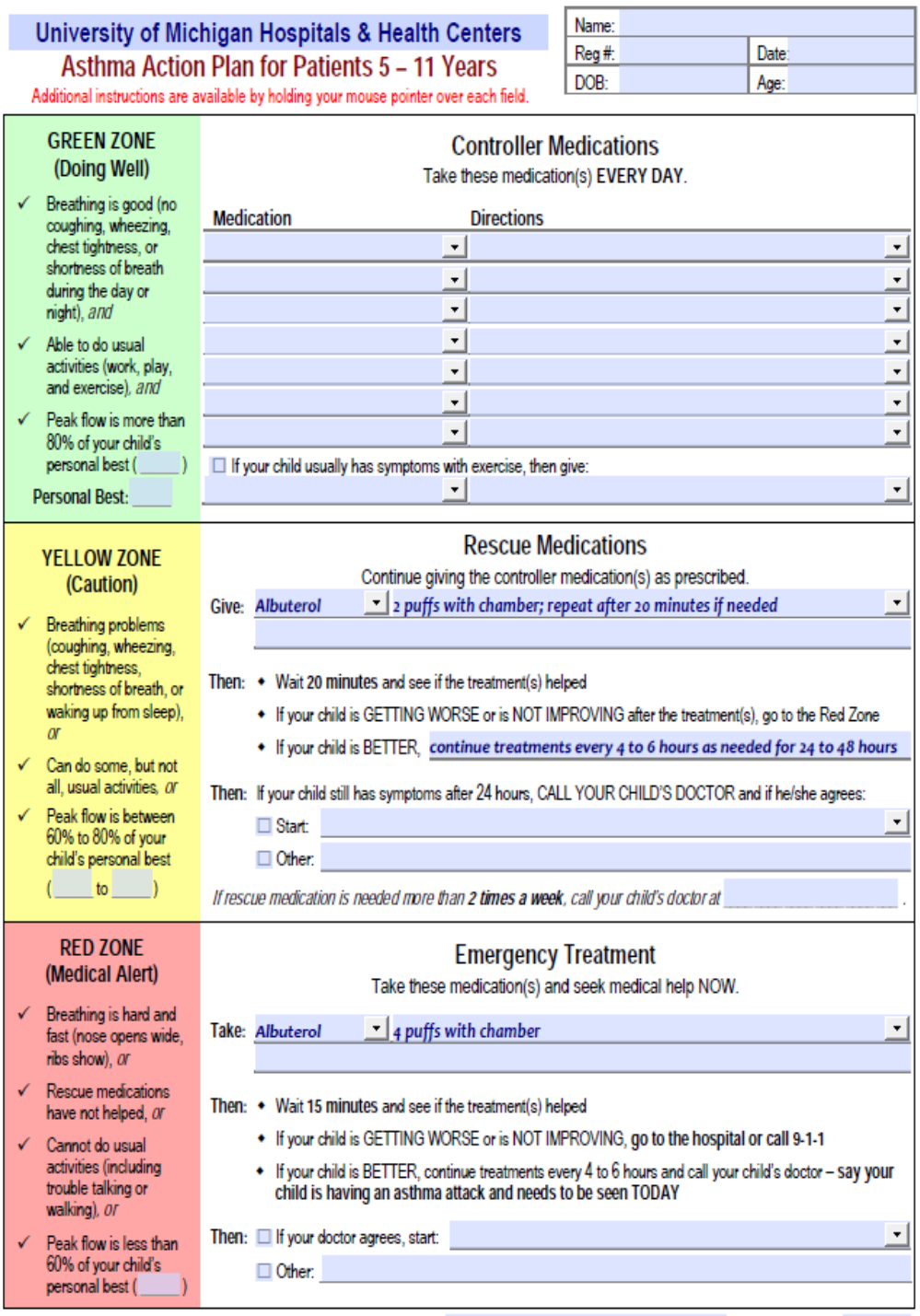


Project Develop	
- Start developing the interface for the game	
- Proceed with the adding the listeners to the interface	
- Inserting the graphic and narration for the games	
- Complete the whole games	
- Implement the procedure and guide to play the games	
- Make the unit testing	
- Make the system testing	
- Release the Beta version for user acceptance testing	
Submission of Interim Draft Report	*(16/8/2013)
Submission of Interim Report	*(20/8/2013)

Appendix 2 Project Gantt Chart FYP2



Appendix 3 Asthma Action Plan



University of Michigan Hospitals & Health Centers

Asthma Action Plan for Patients 5 – 11 Years

Additional instructions are available by holding your mouse pointer over each field.

Name:			
Reg #:		Date:	
DOB:		Age:	

GREEN ZONE (Doing Well)

- ✓ Breathing is good (no coughing, wheezing, chest tightness, or shortness of breath during the day or night), *and*
- ✓ Able to do usual activities (work, play, and exercise), *and*
- ✓ Peak flow is more than 80% of your child's personal best (____)

Personal Best: ____

Controller Medications

Take these medication(s) **EVERY DAY.**

Medication	Directions

☐ If your child usually has symptoms with exercise, then give:

YELLOW ZONE (Caution)

- ✓ Breathing problems (coughing, wheezing, chest tightness, shortness of breath, or waking up from sleep), *or*
- ✓ Can do some, but not all, usual activities, *or*
- ✓ Peak flow is between 60% to 80% of your child's personal best (____ to ____)

Rescue Medications

Continue giving the controller medication(s) as prescribed.

Give: *Albuterol* | *2 puffs with chamber; repeat after 20 minutes if needed*

Then:
- Wait **20 minutes** and see if the treatment(s) helped
- If your child is GETTING WORSE or is NOT IMPROVING after the treatment(s), go to the Red Zone
- If your child is BETTER, *continue treatments every 4 to 6 hours as needed for 24 to 48 hours*

Then: If your child still has symptoms after 24 hours, CALL YOUR CHILD'S DOCTOR and if he/she agrees:

☐ Start:

☐ Other:

*If rescue medication is needed more than **2 times a week**, call your child's doctor at* ____ .

RED ZONE (Medical Alert)

- ✓ Breathing is hard and fast (nose opens wide, ribs show), *or*
- ✓ Rescue medications have not helped, *or*
- ✓ Cannot do usual activities (including trouble talking or walking), *or*
- ✓ Peak flow is less than 60% of your child's personal best (____)

Emergency Treatment

Take these medication(s) and seek medical help NOW.

Take: *Albuterol* | *4 puffs with chamber*

Then:
- Wait **15 minutes** and see if the treatment(s) helped
- If your child is GETTING WORSE or is NOT IMPROVING, **go to the hospital or call 9-1-1**
- If your child is BETTER, continue treatments every 4 to 6 hours and call your child's doctor – **say your child is having an asthma attack and needs to be seen TODAY**

Then: ☐ If your doctor agrees, start:

☐ Other:

Appendix 4 Bernama News on Haze

MUTAKHIR

Penyakit berkaitan jerebu meningkat: KP Kesihatan

2013/06/24 - 16:26:27 PM

Emel Kawan Cetak

Like 0 Tweet +1 0

PUTRAJAYA: Terdapat peningkatan pesakit asma serta penyakit berkaitan mendapatkan rawatan di hospital dan klinik di sekitar Johor dan Melaka, sejak jerebu melanda kedua-dua negeri itu.

Ketua Pengarah Kesihatan, Datuk Dr Noor Hisham Abdullah, berkata berlaku peningkatan melebihi seratus peratus bagi penyakit asma semenjak krisis jerebu.

"Di Johor pesakit asma meningkat kepada 122 peratus manakala di Melaka meningkat dengan ketara iaitu 127 peratus," katanya pada sidang media selepas melancarkan 'Kempen dan Seminar Keselamatan Pesakit Peringkat Kebangsaan' di sini hari ini.

Beliau berkata turut meningkat ialah jangkitan saluran pernafasan iaitu di Johor sebanyak 38.5 peratus dan Melaka 20.7 peratus.

Peningkatan juga berlaku terhadap simptom konjunktivitis atau sakit mata dengan Melaka mencatat peningkatan 63.6 peratus manakala di Johor tiada peningkatan, kata Dr Noor Hisham.

Justeru itu, Dr Noor Hisham menasihatkan orang ramai supaya mengurangkan aktiviti di luar rumah atau menggunakan penutup hidung dan mulut ketika berada di luar rumah.

HANGAT

- PECAT SAJA RAJA!
- Nasib Rajagobal
- Pengasas AmBank mati ditembak
- Guling kerajaan cara revolusi
- Nasi berlauk ayam 'lipas'

PILIHAN TERTINGGI

- Nasib Rajagobal
- Syarat Farid buat mentua
- Pengasas AmBank mati ditembak
- WANITA ISLAM SERTAI RATU CANTIK: Penyertaan tetap haram
- Terima Adira seadanya

PILIHAN EDITOR

- Pengasas AmBank mati ditembak

Appendix 5 Bernama News on Haze

MUTAKHIR

Bilangan pesakit di empat daerah di Johor naik akibat jerebu

2013/06/21 - 19:19:00 PM

Emel Kawan Cetak

Like 1 Tweet 0 +1 0

JOHOR BAHRU: Cuaca yang berjerebu di negeri ini memberi kesan kepada kesihatan orang ramai apabila bilangan individu yang mendapat rawatan pesakit luar di empat daerah meningkat.

Pengarah Kesihatan Johor, Dr Khairi Yaakub berkata rawatan radang pernafasan, batuk dan selsema meningkat sehingga 70 peratus pada minggu ini manakala penyakit asma mencatatkan peningkatan 20 peratus.

"Peningkatan dicatatkan di empat pusat kesihatan iaitu di Muar, Pasir Gudang, Kota Tinggi dan Larkin Lama," katanya ketika dihubungi, di sini, hari ini. Dr Khairi berkata bekalan ubatan ketika ini mencukupi untuk orang ramai yang mahu mendapatkan rawatan.

Justeru, beliau menasihatkan orang ramai terutama kanak-kanak dan warga emas supaya mengurangkan aktiviti luar memandangkan mereka lebih berisiko mendapat penyakit berkaitan jerebu.

Sementara itu, Penolong Pengarah Jabatan Pelancongan Johor, Amirrul Asyraf Ibrahim berkata penerbangan sulung pesawat Malindo Air dari Lapangan Terbang Subang ke Lapangan Terbang Sultan Ismail, Senai, dibatalkan hari ini kerana masalah jerebu.

HANGAT

- PECAT SAJA RAJA!
- Nasib Rajagobal
- Pengasas AmBank mati ditembak
- Guling kerajaan cara revolusi
- Nasi berlauk ayam 'lipas'

PILIHAN TERTINGGI

- Nasib Rajagobal
- Syarat Farid buat mentua
- Pengasas AmBank mati ditembak
- WANITA ISLAM SERTAI RATU CANTIK: Penyertaan tetap haram
- Terima Adira seadanya

PILIHAN EDITOR

- Pengasas AmBank mati

Appendix 8 Bernama News on Haze

Jumlah pesakit URTI meningkat 33 peratus

JOHOR BAHRU 24 Jun - Jumlah pesakit luar yang mengalami Upper Respiratory Tract (URTI) atau iritasi saluran penafasan di negeri ini sepanjang minggu lalu bermula 17 Jun meningkat sebanyak 33 peratus berbanding minggu sebelumnya.

Pengarah Kesihatan negeri, Dr. Mohd. Khairi Yakub berkata, dalam tempoh berkenaan sebanyak 862 kes URTI direkodkan berbanding 647 kes pada minggu terdahulu.

Beliau berkata, kes melibatkan penyakit asma juga meningkat sebanyak 124 peratus dengan 119 kes berbanding 53 kes dalam tempoh yang sama.

"Keadaan itu berikutan beberapa kawasan di Johor yang mencatat bacaan Indeks Pencemaran Udara (IPU) tidak sihat. Sehubungan itu, sepanjang 'minggu jerebu' ini, orang ramai disarankan mengurangkan sebarang aktiviti yang menyebabkan mereka mudah terdedah dengan jerebu," katanya dalam kenyataan di sini hari ini.

Beliau turut menasihatkan orang ramai mengambil langkah-langkah pencegahan seperti mengehadkan aktiviti luar rumah, sentiasa memakai penutup hidung dan mulut khususnya bagi penunggang motosikal dan mereka yang bertugas di tempat yang berisiko tinggi.

"Orang ramai juga dinasihatkan membasuh muka dan bahagian kulit yang terdedah dengan air bersih, minum air yang banyak dan menggunakan pendingin hawa semasa memandu dengan menggunakan mod kitaran dalam.

Mohd. Khairi turut menasihatkan orang ramai yang mengalami gejala seperti batuk, sakit tekak, pedih mata dan gatal kulit untuk mendapatkan rawatan lanjut dan nasihat doktor di klinik berhampiran.

Appendix 7 Questionnaire for Parents (Data collection)

Page 1 of 3

Asthma Education Mobile Game for Children

This survey is proposed in order to gather the information for the Final Year Project of a student in Universiti Teknologi PETRONAS.

The objectives of the study is :
a) To study the importance of asthma education in children.
b) To develop a mobile game application that will increase the awareness of the people starting from their childhood about asthma management.

Basic Information

Please select your relevant age of group *
- ○ 18 to 25
- ○ 26 to 32
- ○ 32 to 39
- ○ Option 440 or above

What is your gender? *
- ○ Male
- ○ Female

Please state your occupation. *
- ☐ Government workers
- ☐ Private workers
- ☐ Own business
- ☐ Other:

How many children do you have? *

How many of them are asthmatic?

Please select your relevant income of gorup
- ○ Less than RM 1000
- ○ RM 1001- RM 2000
- ○ RM 2001- RM 3000
- ○ RM 3001 and above

Knowledge of Asthma/ Management Plan

Do you know how asthma happens?

1 2 3 4 5

Not much ◯ ◯ ◯ ◯ ◯ Very well

Do you know about the asthma triggers?

1 2 3 4 5

Not much ◯ ◯ ◯ ◯ ◯ Very well

Do you think that asthma education is essential to be taught for your asthmatic children?

- ◯ Yes
- ◯ No

Does the doctor or health professional provide you with asthma management plan?

- ◯ Yes
- ◯ No
- ◯ Not sure

Do you really know what to do when your child has an asthma attack?

1 2 3 4 5

Not much ◯ ◯ ◯ ◯ ◯ Very well

Do you think the information in the asthma management plan is adequate?

- ◯ Yes
- ◯ No

Does the asthma management plan really is really helpful for you?

- ◯ Yes
- ◯ No

Is it easy to understand the asthma management plan?

- ◯ Yes
- ◯ No

Is it the asthma management plan attractive?
(In terms of design, the flow)

- ◯ Yes
- ◯ No

Page 3 of 3

Mobile Application Opinion

Do you or any of your family own a smartphone?

- ○ Yes
- ○ No

What do you/ they usually do with their smartphone?

- ☐ Play games
- ☐ Social Networking
- ☐ Other:

Do you think that mobile application is good as a emerging medium for learning / teaching?
(According to the current trend and worldwide usability)

- ○ Yes
- ○ No

What is your opinion if asthma education is taught using a mobile game application?
(Does it will be helpful and effective or not?)

	1	2	3	4	5	
Not helpful and effective	○	○	○	○	○	Very helpful and effective

Thank you

Appendix 8 Questionnaire for Children (Data collection)

Asthma Education Mobile Game for Children

This survey is proposed in order to gather the information for the Final Year Project of a student in Universiti Teknologi PETRONAS.

The objectives of the study is :
a) To study the importance of asthma education in children.
b) To develop a mobile game application that will increase the awareness of the people starting from their childhood about asthma management.

Basic Information

Please select your relevant age of group *
- Less than 5
- 6 to 8
- 9 to 10
- 10 to 13
- 13 and above

What is your gender? *
- Male
- Female

Asthma History

Do you have asthma? *
- Yes
- No

When was the last time you faced difficulty to breath?
- Yesterday
- Last week
- Last month
- Last year
- Other:

Have you been admitted to hospital because of asthma?
- Yes
- No

Knowledge of Asthma/ Management Plan

Have you heard of asthma management plan?

- ◯ Yes
- ◯ No
- ◯ Not sure

Is it easy to understand the asthma management plan?

- ◯ Yes
- ◯ No

Is it the asthma management plan attractive for you?

- ◯ Yes
- ◯ No

What is the organ that is related with asthma?

- ◯ Heart
- ◯ Brain
- ◯ Lungs
- ◯ Liver
- ◯ Other:

Do you know about the asthma triggers?

- ◯ Yes
- ◯ No
- ◯ Not sure

Is trigger good?

- ◯ Yes
- ◯ No

Please give at least one name of the asthma triggers that you know.

Do you know about the asthma action plan?

- ◯ Yes
- ◯ No
- ◯ Not sure

Can you do an exercise like normal person?
(Eg: Swimming, running)

- ○ Yes
- ○ No
- ○ Not sure

Do you know about the right way to use an inhaler without the help from your parents?

- ○ Yes
- ○ No
- ○ Not sure

What do you do if you have an asthma attack?
(Stage 3 of action plan)

- ○ Sleep
- ○ Take inhaler within 3 hours
- ○ Take inhaler within 6 hours
- ○ Call ambulance
- ○ Other:

Page 3 of 3

Mobile Application Opinion

Do you or any of your family own a smartphone?

- ○ Yes
- ○ No

What do you/ they usually do with their smartphone?

- ☐ Play games
- ☐ Social Networking
- ☐ Other:

Do you like to play game?

- ○ Yes
- ○ No

If there is a game created specially for you about asthma education, will you play it?

- ○ Yes
- ○ No

Thank you

Appendix 8 (Usability Testing to the target user)

Basic Information

Please select your relevant age of group *

- 5 to 6
- 7 to 8
- 9 to 10
- 10 to 12

What is your gender? *

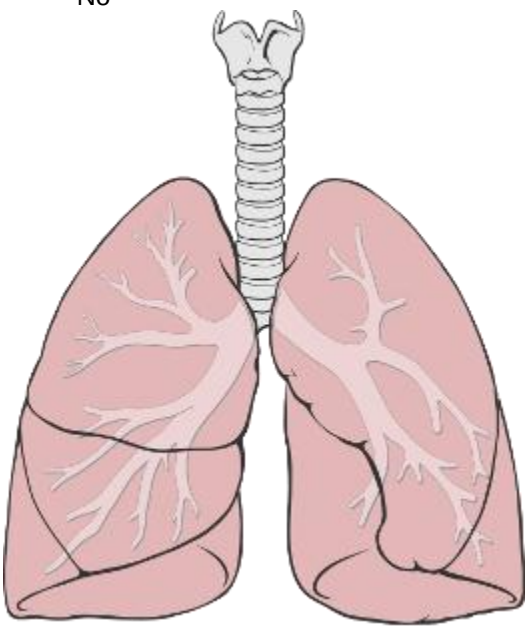
- Boy
- Girl

Effectiveness

Basic about asthma

Do you think that asthma education is important for you?

- Yes
- No



What is the organ that is related with asthma?

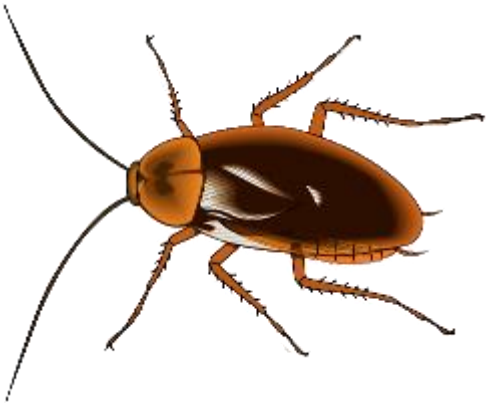
- Heart
- Brain
- Lungs

- Liver
- Other:

Asthma triggers and protector

Is this good or bad for you?(Eg: Swimming, running)

- Good
- Bad



Is this good or bad for you?(Eg: Swimming, running)

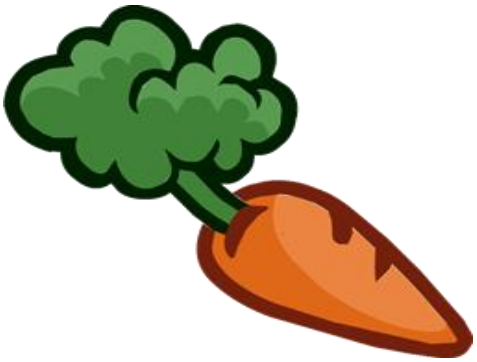
- Good
- Bad

Is this good or bad for you?(Eg: Swimming, running)

- Good
- Bad

Is this good or bad for you?(Eg: Swimming, running)

- Good
- Bad



Is this good or bad for you?(Eg: Swimming, running)

- Good
- Bad

Asthma action plan

What is this?

- Inhaler
- Pipe
- Binokular
- I dont know

Do you know how to use it?

- Yes
- No

How many step that you should follow to use the inhaler?

- 4
- 5
- 6

Can you do an exercise like normal person?(Eg: Swimming, running)

- Yes
- No

What should you do before start exercising?

- Take the inhaler
- Drink a lot of cold water
- Wear improper attire
- Dont do anything

What do you do if you have an asthma attack?(Stage 3 of action plan)

- Sleep
- Take inhaler within 3 hours
- Call ambulance
- Other:

Design

Do you enjoy this game?

- Yes
- No

Does this game attractive to you?

- Yes
- No

Do you understand the instruction given?

- Yes
- No

Does the diagram help you to learn more about asthma?

- Yes
- No

Do you want to continue to play this game?

- Yes
- No

Will you tell/ share to your friends about this game?

- Yes
- No

Thank you