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A Habit Builder that Improves Eyesight for Young Children

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Student ID:
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Assessor: Dr. TSANG, PETER W M

Bachelor of Engineering (Honours) in Computer Engineering
Student Final Year Project Declaration

I have read the student handbook and I understand the meaning of academic dishonesty, in particular plagiarism and collusion. I declare that the work submitted for the final year project does not involve academic dishonesty. I give permission for my final year project work to be electronically scanned and if found to involve academic dishonesty, I am aware of the consequences as stated in the Student Handbook.

Project Title : A Habit Builder that Improves Eyesight for Young Children

______________________________
Student Name : Lau Ping Ping

______________________________
Student ID:

______________________________
Signature

______________________________
Date : 24-11-2015
Abstract

A habit builder application called "Healthy Eyes" is built and it aims to improve young children’s eyesight. The application is written in Objective-C and it will be published in the iOS platform. Before the commencement of the project design stage, a questionnaire was distributed to 103 parents and schoolchildren to gather user requirements. After studying the results, the application was developed with 4 functions: (a) "Watch" for monitoring how long a user has been using the mobile device; (b) "Challenges" for giving users multiple eye relaxing exercises and interactive question-and-answer games regarding stereograms; (c) "Trophies" for showing the virtual stamps earned by users in Challenges; and (d) "Setting" for setting rewards and their required stamps. Apart from the functions, the application uses a cartoon-styled theme consisting of animals with the best eyesight. As suggested by the results of a user experience survey distributed in the testing stage, users are generally satisfied with the app functions and user interface although they would welcome more functions and a more fancy-looking interface. Therefore, with the above functions and graphical interface, it is hoped that children’s eye protection habits will be reinforced. In the long run, the application should help to ease the myopia problems among schoolchildren.
Acknowledgements

I would like to express my gratitude to my supervisor, Dr. Kelvin Yuen, who has given me lots of guidance since Semester B, 2014/2015. In the bi-weekly project meetings, Dr. Yuen always initiated discussions on various natural eye care methods. Those useful discussions have helped me to decide what elements should be included in my final product.

I would also like to thank Eron Shum who took part in a similar project in the year of 2014/2015. She has inspired me to explore different approaches of designing a children’s application.
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1 Introduction

The final year project (hereinafter referred as “FYP”) is about designing a habit builder application called “Healthy Eyes”, which improves young children’s eye sight.

Fig. 1.1. The app icon of Healthy Eyes

1.1 Project Description

Before designing the habit builder, there is a need to understand the eye problems among school children and the corresponding solutions. Hence in the early stage of the FYP, a research concerning the topics of eye care habits and natural eye relaxing exercise was conducted. Then “Healthy Eyes” was designed to guide children users to the correct ways of eye protection. It is hoped that the functions in the application will eventually help them to build good eye care habits.

Fig. 1.1.1. An overview of Healthy Eyes
1.2 Problem Statements

Nowadays, with the prevalence of gadgets such as smartphones and tablets, children have more forms of entertainment such as playing interactive games on their smartphones. One significant drawback of children being attached to such electronic devices is that they devote too much time looking at the screen. As a result, their vision deteriorates due to persistent exposure to strong light and looking too close to the screen. If the problem continues to exist, they may develop severe myopia which may in turn lead to diseases such as cataract. Therefore, it is important to prevent children from excessively using electronic devices and at the same time guide them to the correct ways of eye protection. Since children are more attracted to fun learning rather than just being told not to do something, “Healthy Eyes” was created to educate children in the same mobile platform which makes them encounter vision problems.

Fig. 1.2.1. Children over-using their phones

1.3 Target Users

Healthy Eyes aimed at the rapidly growing market of smartphone users who are devoted into using various kinds of applications. In particular, it will target the market of school children aged from 3 to 12. They will be the primary users since eye diseases diagnosed in younger age can be effectively and naturally cured (more details will be discussed in 2.3) through the eye relaxing exercises introduced in the application.

Schoolchildren’s parents or guardians are the secondary users of Healthy Eyes. It is because they can teach their children how to use the application properly and decide whether to turn on the monitor mode or give rewards.
1.4 Project Objectives

There are five objectives to be achieved in the FYP, as listed below:

A. Understand the game playing habits of children and study the consequences
   That is to study children’s motivation in using electronic gadgets and what will happen if they use them for a long period of time.

B. Include a set of eye relaxing exercises in the application
   Eye relaxing exercises are crucial in protecting children’s eye sight so they will be an important element in the application.

C. Monitor users’ device using activities in background
   That means the application will calculate the time of usage by users and the distance between users’ eye and the device screen.

D. Remind children to do eye relaxing exercises or take a break from their game
   Using the monitor function in the application, alerts will be popped out to direct children to open the application or take a rest.

E. Reinforce children’s eye protection habits through fun and positive ways
   This can be achieved by calculating points for each good eye care habit, introducing rewards for specific points and providing constant cheering from cartoon characters in the application.
2 Background Study

Before the commencement of the design stage of Healthy Eyes, some background studies were conducted.

2.1 The Problem of Myopia in Target Users

Also known as shortsightedness, myopia is the most common eyesight problem in Hong Kong. Its rapid development on children as they grow has raised concern from parents. Researches conducted by the School of Optometry (SO) of The Hong Kong Polytechnic University (PolyU) has shown that nearly 80% of youngsters in Hong Kong have fallen victim to myopia. In these days, it is common for youngsters to have severe myopia (i.e. higher than 600 degrees or -6.00D). Besides, it is alarming that more than 80% of the whole adult population will be short-sighted within the next 30 years. Note that severe myopia increases the risk of diseases such as glaucoma, macular degeneration, cataract and peripheral retinal degeneration. Those sight-endangering conditions may result in permanent vision loss and blindness. [13]

2.1.1 Prevalence of Myopia among Hong Kong School Children

Table 2.2.1.1. contains the results obtained from the PolyU SO during an on-site eye screening for 688 students from TWGHs Wong Yee Jar Jat Memorial Primary School (TWGHs WYJJMPS) in early 2014 [13].

<table>
<thead>
<tr>
<th>Year</th>
<th>1991 (Lam et al.)</th>
<th>2005-2010 (Lam et al.)</th>
<th>2014 (TWGHs WYJJMPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Participants</td>
<td>383</td>
<td>2651</td>
<td>688</td>
</tr>
<tr>
<td>Age</td>
<td>6-17</td>
<td>6-12</td>
<td>6-12</td>
</tr>
<tr>
<td>Aged 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low myopia %</td>
<td>25.0%</td>
<td>17.6%</td>
<td>12.1%</td>
</tr>
<tr>
<td>High myopia % (more than 600 degrees)</td>
<td>0%</td>
<td>0.7%</td>
<td>0%</td>
</tr>
<tr>
<td>Average degree of myopia (D)</td>
<td>-0.03</td>
<td>-0.06</td>
<td>+0.21</td>
</tr>
<tr>
<td>Low myopia %</td>
<td>60.0%</td>
<td>57.7%</td>
<td>57.1%</td>
</tr>
</tbody>
</table>
### Results of Myopia in School Children from the PolyU SO

<table>
<thead>
<tr>
<th>Aged</th>
<th>High myopia % (more than 600 degrees)</th>
<th>Average degree of myopia (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>4.0%</td>
<td>-1.45</td>
</tr>
<tr>
<td></td>
<td>3.8%</td>
<td>-1.67</td>
</tr>
<tr>
<td></td>
<td>9.5%</td>
<td>-2.08</td>
</tr>
</tbody>
</table>

Table 2.2.1.1. Results of Myopia in School Children from the PolyU SO

It is found out that the degree of myopia among primary students is on an alarming rising trend compared to previous years’ results. Despite the decrease in the percentage of low myopia in school children aged 6 and 12, the percentage of school children having high myopia (more than 600 degrees or -6.00D) is significantly increasing at 9.5%, as compared to 3.8% a few years ago, causing great attention from parents and schools. [13]

As shown in Fig.2.2.1.1, the percentage of myopia is increasing over age according to a news article [12] issued by the Hong Kong Association of Private Practice Optometrists (HKAPPO). The situation is the worst in the age group of 21-30 as nearly 85% of adults have myopia. Those results are alarming and they prompt for immediate actions to reduce the cases of myopia.

![Prevalence of myopia among different age groups](image-url)
2.1.2 Estimation of the Number of Myopia Cases in Hong Kong in 2025

As estimated in [12], 10 years later, there may be a yearly increase of 14000 cases of severe myopia. Meanwhile, the increasing cases of myopia in children will lead to more cases of myopia in adults when those children grow up. Since myopia can be inherited, there will be more cases of myopia in the next generation. As a result, a vicious cycle is formed.

Therefore, there is a need for designing an educational application that can help ease the myopia problem among youngsters so as to reduce the number of shortsighted adults in the future population.

2.2 Psychology of Young Children

Before starting designing the application, it is necessary to understand what a children’s application should satisfy in order to decide the suitable contents. According to Child, Youth and Family, a service of the Ministry of Social Development in New Zealand [1], there are ten things children need most with three of them being important to the application.

A. Plenty of praise
It is believed that praising children for their good performance will motivate them to be better and make them satisfied at themselves. It will also prompt them to put more efforts in learning and achieving the app’s expectations.

B. An opportunity to learn new things
Besides, it is a child’s nature to learn new things. Hence the application should provide new experiences for children because that can arouse their curiosity and interest in the content. As a result, they will acquire as much knowledge about eye protection as the application expects them to.

C. Rewards and special treats
It is important to constantly encourage children to listen to instructions. When children’s good behavior is noticed and rewarded, they will be driven to continuously do their best. On the other hand, giving children instructions without paying attention to their behavior will make them feel neglected and thereby discouraging them from following disciplines.
2.3 Eye Protection Exercises and their Effects on Myopia

According to Angart’s book [8], there exists a number of exercises that can help relax eye muscles and even restore a person’s eyesight in a natural way. In the book, various vision tests are provided for testing one’s vision and recording one’s improvement after doing the various sets of eye exercise.

2.3.1 The Principle of Eye Relaxing Exercises

One prominent example of [8]’s proposed exercise is the Tibetan Eye Chart as shown in Fig.2.3.1.1. It is believed that the chart can make eye muscles stronger so as to improve vision.

![Fig.2.3.1.1. The Tibetan Eye Chart](image)

The principle behind such exercises is to gaze at the given chart without wearing eyeglasses or contact lens for a period of time. Also, it is important to move only the eyes. Meanwhile, it may be necessary for a person to be in a sitting position with a straight spine and without moving the head.

2.3.2 Effects of Stereograms on Eye Health

As stated in the website of The New Enlightenment [14], stereograms are 3D images having hidden contents of images or text. Seeing the hidden contents requires coordination of eye muscles and proper looking angle. This is because a stereogram consists of a surface level with disorganised patterns and colours, making people hard to concentrate on looking at the hidden content. Only by constantly adjusting the eyes’ movement while relaxing the eyes can a person look through the stereograms.

![Fig.2.3.2.1. Example of a stereogram](image)
The website suggested that the best way to look through stereograms is to gaze until the eyes are out of focus to outline the 3D structure. In the process, the out-of-focus vision will simulate an environment for far-point vision, i.e. looking at objects in a far distance. It is proved that far-point vision will help relax the eye muscles. On the other hand, a near-point vision, i.e. closely looking at something, will make one’s eyes converge on the objects. Therefore, the eye muscles maintain a certain degree of convergence. Consequently, eye strain or fatigue of eye muscles will occur. Those symptoms will disappear will On the other hand, if the convergence of eyes has lasted for long periods of time, it may become irreversible and thereby causing myopia.

2.4 Eye Care Tips
Among numerous eye care tips, the 20-20-20 rule was an important indicator for achieving the objective of monitoring the time of usage. The rule stated that every 20 minutes after looking at the computer screen, a person needs to look at things which are at least 20 feet away. Fig.2.4.1 showed the mechanism of the rule, as given by Visian ICL [4].
2.5 Market Research

Currently, there are two eye care applications in the iOS platforms hence there is a need to introduce Healthy Eyes which is a more all-round eye care application in iOS.

2.5.1 Existing Eye Care Applications

A. How to protect your eyesight [11]

This iOS application provides one eye exercise regarding following a rotational ball along different paths. Apart from that, it includes numerous useful tips such as eye relaxing exercises and food for improving eye sight.

![Fig.2.5.1.1. The eye exercise page](image1)

![Fig.2.5.1.2. The eye care tips in 3 categories](image2)

![Fig.2.5.1.3. The content of one of the eye care tips](image3)

Limitations:

- There is only one eye exercise for user to practise.
- It was last updated on 2010 so it does not work on some newer operating systems
- All the tips are lengthy texts thus it is difficult for them to arouse children’s interest
- The white text in light green background causes eye strain
- The eye exercise is not working for most of the time

B. Eye Timer [5]

As its name tells, this iOS application is a timer in which users can set the time for a reminder of phone usage. It also has one page of eye care tips.
Limitations:

• There is only one function which is not enough for promoting eye care.

• If there is only the timer function, the app can simply be replaced by the default alarm or timer in iOS devices.

• The eye care tips are too general and not detailed enough.

• The user interface is not attractive for children users.

C. EyeFooU Eye Care APP [6]

This Android application provides eye exercises, a timer function (Fig.2.5.1.6) and a blue light filter (2.5.1.7).
Limitations:

- There are too few functions.
- The user interface is plain looking so it does not interest children.
3 Methodology

During the development of Healthy Eyes, questionnaires were distributed to target users so as to gather user requirements. Then the user requirements were transformed to product specifications.

3.1 User Requirements

As mentioned in 2.1, the primary target users of Healthy Eyes are school children aged from 3 to 12 while the secondary users are parents. After analysing the results of 103 questionnaires gathered from parents and children, here are the different levels of the user requirements of Healthy Eyes.

3.1.1 Primary Users’ Requirements

Here are the requirements from primary users.

• **Must-have 1: easy to use**
  It is of utmost importance that an application should be easy to use. Otherwise, users will be dissatisfied with the app for not being able to use it smoothly. Hence the app functions should be simple for users to understand.

• **Must-have 2: interesting contents**
  It is important that app contents should be perceived in an interesting way such as having illustrations.

• **Must-have 3: glamorous design of user interface**
  A themed application with cartoon characters in the UI is preferred by children users as it would arouse their interest in using the app.

• **Must-have 4: motivating**
  Children are more reluctant to follow direct orders. They prefer having motivation to finish a task rather just being told to do so [1]. Therefore, the app should be motivating so that they voluntarily do the tasks in it. Since 2.3 pointed out that children love praise and rewards, the app should introduce a reward system to encourage good performance.
• **Delighter 1: have gaming elements**
  One of the many reasons that children over-use their phones or tablets is that they are addicted to games such as “Angry Birds” or “Candy Crush”. Hence the application will attract more children if it is a fun game application with many levels or challenges.

3.1.2 **Secondary Users’ Requirements**
Here are the requirements from secondary users.

• **Must-have 1: easy to use**
  Same as the primary user requirement, an easy-to-use application is important to parent users.

• **Must-have 2: educational**
  The app should be educational and teach children correct eye care habit

• **Satisfier 1: reasonable price**
  Most users will expect the application to be free-of-change. Even if the app is a paid one, they will prefer a reasonable price that is below HKD $28.

• **Delighter 1: glamorous design of user Interface**
  Parents will be delighted by a good design of user interface.

• **Delighter 2: frequent updates**
  Users may expect frequent functional updates of the application. For example, they will be satisfied by an improved monitor function. They will be further amazed if new functions are provided or new contents are included. Besides, optimisation of the application means smoother operation of it, resulting in satisfaction from users.

• **Delighter 3: Auto-backup**
  Most application users may face the problem of app crash when using it. Hence an auto-backup of data during the usage of app is desired. In the case of Healthy Eyes, it will be much more convenient for users if their data such as the input of rewards can be recovered from the sudden breakdown of the app.
Note that it is impossible to include all the user requirements into the product specifications in the design stage since requirements can be unlimited and changing constantly.

In order to transform the necessary customer requirements to product specifications, three levels of customer requirement were analysed in 3.1. Among the three levels, “must haves” are vital so they must be transformed to product specification.

Concerning the “Satisfier” and “Delighter” levels, they will not be taken into the product specifications during the design stage. In fact, they will only be considered in future development.

### 3.2 Project Specifications

The project specifications can be divided into non-functional specifications, functional specifications and data specifications.

#### 3.2.1 Non-functional Specifications - Hardware

The following computer hardware devices were required to develop Healthy Eyes:

- **A Macbook, iMac, Mac Mini or Mac Pro**
  
  Only those products from Apple Inc. are suitable for iOS development. No other brands’ computers can be used.

  ![Apple’s Mac products](image)

- **Hard disk, CD-ROM or DVD-ROM** for data storage
- **Cables, optical fibers, router or home-plug** for internet connection
- **An iOS device**
In fact, the application can be tested in the computer by using a software called Xcode Simulator. However, some functions such as the hand gesture must be tested in iOS devices which includes iPhones, iPod Touches or iPads.

![iOS devices (iPads, iPhones and iPod Touches)](image)

**Fig. 3.2.1.2. iOS devices (iPads, iPhones and iPod Touches)**

### 3.2.2 Non-functional Specifications – Software

Healthy Eyes is compatible with and viewed at:

- **iOS devices** (iPhones / iPads / iPod Touches) with operating system of **iOS 7.0** or later.

For app development, the specifications include:

- **Xcode 6 or later**
  
  Xcode is an integrated development environment (IDE) development tool that is exclusive for iOS development. Xcode 6 or later versions is required because only those versions support iOS 7.0.

![Logo of Xcode](image)

**Fig.3.2.2.1. Logo of Xcode**

- **OS X Mavericks 10.9** or later for installing Xcode 6 or later

- **Objective-C** as the programming language
  
  Objective-C is used for iOS apps [2]. It is a superset of the C programming language and provides object-oriented capabilities and a dynamic runtime. That means Objective-C inherits the syntax, primitive types, and flow control statements of C but it has different syntaxes for defining classes and methods.
3.2.3 Functional Specifications

It was specified that Healthy Eyes would have the following features and functions:

A. Watch
   - There is a monitor that can be switched on and off to calculate the time of usage of device.

B. Eye Exercises
   - There are sets of eye exercises with graphical and text descriptions.
   - Virtual stamps for good performance.

C. Stereogram Games
   - Multiple choice questions of guessing the hidden contents inside stereograms.
   - Tips will be given for better view of the stereograms.
   - Virtual stamps for good performance.

D. Trophies
   - Stamps collected will be displayed.
   - Rewards can be redeemed.

E. Setting
   - Rewards can be set by typing the reward name and the number of required stamps.

F. Others
   - Virtual stamps for open the application (only one stamp can be earned for every 24 hours).
3.2.4 Data Specifications

After summarising the functional specifications, the data inside Healthy Eyes can be generalised by the following diagram.

<table>
<thead>
<tr>
<th>Monitor Switch</th>
<th>Eye Exercise</th>
<th>Stereogram Game</th>
<th>Stamps Collected</th>
<th>Rewards</th>
</tr>
</thead>
<tbody>
<tr>
<td>• state: bool</td>
<td>• exName: string[10]</td>
<td>• questionNum: int[36]</td>
<td>• stamps: image[]</td>
<td>• rewards: object[]</td>
</tr>
<tr>
<td></td>
<td>• exDetails: image[10]</td>
<td>• answer: string[36]</td>
<td></td>
<td>• rewardName: string</td>
</tr>
</tbody>
</table>

![Fig.3.2.3.1. The data table](image)

Firstly, the switch state will be declared as a boolean value (bool state) where true will represent “switch on” and false for “switch off”.

For the eye exercise, a fixed array, say an array with 10 indices will be used to store the exercise name (string exName[10]), illustration (string exPic[10] (image: “path://”)) and details (string exDetails[10]).

Similarly, in the stereogram game, a fixed array, say an array with 36 indices will be used to store the question number (int questionNum[36]), stereogram image (string stereogramPic[36] (image: “path://”)), answers (string answer[36]). The tips for viewing stereograms will be declared as a string (string tips).

For the stamps collected, they will be stored in a dynamic array of image paths (string stamps[] (image: “path://”)) because the number of stamps will always increase after earning new ones or decrease after redemption of rewards.

Lastly, the rewards will be declared as a dynamic object array. In each reward object, there are the name of reward declared in string (string rewardName) and the number of stamps declared in integer (int noOfStamps).
4 Design Details

In the design stage of Healthy Eyes, the theme and organisational structure were first figured out, followed by the storyboard and activity diagram.

4.1 Theme of Design

As stated in 1.3, Healthy Eyes is targeted at children. After studying children’s psychology as analysed in 2.2, it was decided that the application will use a cartoon theme with 4 characters:

- Owlie, a female owl
- Eago, a male eagle
- Goata, a female goat
- Leo, a male leopard

Those animals were chosen because they have the best vision in the world [9].

![Fig.4.1.1. The theme of Healthy Eyes](image_url)

Apart from the theme, the colour scheme of the app will be green because the colour green can rest the eyes. [10]
4.2 Organisational Structure

Here is the organisational structure of Healthy Eyes. It has a main page with buttons linking to 4 pages, namely “Watch”, “Challenges”, “Trophies” and “Setting”. In the Challenges page, there are sub pages of “Eye Exercise” and “Stereogram Game”. In the Trophies page, there is a sub-page of “Redeem Rewards”.

Fig. 4.2.1. The organisational structure of Healthy Eyes
4.3 Storyboard

![Storyboard Diagram]

Fig. 4.2.1. Sketch of the storyboard
5 Implementation

During the implementation stage, the storyboard was transformed into the app pages which are referred as “view controllers” in Xcode’s terms. The view controllers are connected to each other and they have different functions.

5.1 Detailed Technical Description

Four main functions of Healthy Eyes were developed. They were put in a tab view controller (Fig.5.1.1) and each of them represent a tab.

![Monitor the Usage Time](image)

**Start monitoring?**

Monitor : Off

*By turning on the switch, our app will be able to watch if your kid uses the device for more than 20 minutes.*

Fig.5.1.1. A tab view controller showing the 4 main functions

5.1.1 “Watch” Function

This function aims to monitor how long a user has been using the device. By turning on the switch, the monitor function will be activated (Fig.5.1.1.1) and it will run in background (that means it will still work when users close the app). The monitor function will be deactivated (Fig.5.1.1.2) when the switch is turned off. When the switch is on, after 20 minutes of usage, an alert will pop out to remind users to take a rest or go back to the app to have some eye relaxing exercises as shown in Fig.5.1.1.3.
Here is the void function written for calculating the time usage and popping alert.

```c
- (void) addLocalNotification{
    for (int i=1 ; i<64; i++) {
        UILocalNotification *localNotification = [[UILocalNotification alloc] init];
        localNotification.fireDate = [NSDate dateWithTimeIntervalSinceNow:1200];
        localNotification.alertBody = @"You have used the device for 20 minutes, please take a rest or go to the app";
        localNotification.alertAction = @"Open Healthy Eyes";
        [[UIApplication sharedApplication] scheduleLocalNotification:localNotification];
    }
}
```
5.1.2 “Challenges” Function

A number of eye exercises and stereogram guessing games are included in the “Challenges” tab. Firstly the tab will display 2 categories, namely “1. Eye Exercise” and “2. Stereogram Game” as shown in Fig.5.1.2.1.

<table>
<thead>
<tr>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eye Exercise</td>
</tr>
<tr>
<td>2. Stereogram Game</td>
</tr>
</tbody>
</table>

Fig.5.1.2.1. The categories of challenges

Then when “Eye exercise” is chosen, users will be directed to another page displaying a list of eye exercises as shown in Fig.5.1.2.2. When a particular exercise is clicked, users will be directed to the details of that exercise including an illustration and a text description. After finishing an eye exercise, users can click the “Finish” button on the top right as shown in Fig.5.1.2.3 so as to gain a virtual stamp.

Fig.5.1.2.2. The page showing a list of eye exercises

Fig.5.1.2.3. The page showing the details of a particular eye exercise
Back in the category page, if “Stereogram Game” is chosen, users will be directed to another page displaying a list of questions as shown in Fig.5.1.2.4.

![Fig.5.1.2.4. The page showing a list of stereogram questions](image)

Those questions are about guessing images behind stereograms. In the page of each question (Fig.5.1.2.5), there will be a question and four options. Users will have to guess what hidden content the stereogram shows and choose the correct option. After clicking the confirm button, users will know whether they answer correctly or wrongly. A virtual stamp will be earned for each correct answer (Fig.5.1.2.6.). No stamps will be earned for a wrong answer (Fig.5.1.2.7).

![Fig.5.1.2.5. The question page](image)

![Fig.5.1.2.6. Correct answer](image)

![Fig.5.1.2.7. Wrong answer](image)
Since some users may not be able to look through stereograms, they can click the “i” (which stands for information) icon on the top right corner in each question page to read tips for looking at stereograms (Fig.5.1.2.8). Besides, in order to avoid guessing the answers by choosing all the four options, the options will be randomly listed every time when users click a question. That means the correct answer will never belong to the same option. Moreover, the three incorrect options will be different every time, as shown in the program below.

```c
- (NSMutableArray *)GetRandomWithStartIndex:(int) startIndex and EndIndex:(int) length {
    int endIndex = startIndex + length;
    NSMutableArray *arr = [NSMutableArray arrayWithCapacity:length];
    NSMutableArray *arr1 = [NSMutableArray arrayWithCapacity:length];
    for (int i = startIndex; i <= endIndex; i++) {
        [arr1 addObject:NSString stringWithFormat:@"^d",i];
    }
    for (int i = startIndex; i <= endIndex; i++) {
        int random = arc4random_uniform([arr1 count]);
        int radom = [arr1[index] intValue];
        NSNumber *num = [NSNumber numberWithInt:radom];
        [arr addObject:num];
        [arr1 removeObjectAtIndex:index];
    }
    return arr;
}
```

Fig.5.1.2.8. Tips for looking at stereograms

### 5.1.3 “Reward” Function

The reward function aims at giving users virtual stamps for good performance when using the application. Users will be given a stamp once a day when they open the application (Fig.5.1.3.1). Besides, in the “Challenges” tab, users will gain a stamp whenever they finish an eye relaxing exercise (Fig.5.1.3.2) or answer a stereogram question correctly.

![Fig.5.1.3.1. A stamp gained by opening the app](image1)

![Fig.5.1.3.2. A stamp gained by finishing one exercise](image2)
The stamps collected will be displayed in the “Trophies” tab (Fig. 5.1.3.3). After clicking the “Redeem” button in the top right corner, a small window will pop up for users to choose rewards requiring different numbers of stamps as shown in Fig. 5.1.3.4.

![Trophies tab showing collected stamps](image1)

![Redemption window](image2)

After redeeming a reward (Fig. 5.1.3.5), the required stamps will be deducted and the reward will be shown in the redemption record (Fig. 5.1.3.6). Alerts will pop out for insufficient stamps when redeeming a prize, as observed in Fig. 5.1.3.7.

![Re redeeming a reward](image3)

![Redemption record](image4)

![Alert for insufficient stamps](image5)
5.1.4 “Setting” Function

In the setting tab, parent users can enter rewards and the corresponding numbers of stamps (Fig.5.1.4.1). After clicking “Save” button, the rewards will be saved (Fig.5.1.4.2) and displayed in the redemption window in the “Trophies” tab.

Fig.5.1.4.1. The Setting tab

Fig.5.1.4.2. After saving the reward information
5.2 Class Structure and Relationship

In Xcode, the main class of an application is referred as the “AppDelegate” class. Then a page of an application is generally referred as a UIViewController class. Depending on the contents that a page wants to show, different kinds of UIbservers are provided in Xcode.

Hence in developing healthy eyes, the whole application was wrapped in a UINavigationController and UITabBarController, whose properties such as colours and fonts were declared in the AppDelegate class. Those two view controller classes were used to design the top bar and the bottom tab bar of the app respectively.

In the Challenges page, Eye Exercise sub-page and Stereogram Game sub-page all implemented UITableViewCellControllers which can list items. Each item was referred as a UITableViewCell. In the Trophies page, a UICollectionViewController was used to list the virtual stamps in grids. Each stamp was referred as a UICollectionViewCell.

The rest of the pages simply implemented UIViewController to display their contents. Apart from them, for popping alerts, UIAlertView class was referenced. In addition, the small windows for stereograms viewing tips and redeeming rewards implemented UIView classes.

Fig. 5.2.1 showed the classes implemented in Healthy Eyes.
Fig. 5.2.1. The class structure
## 6 Scheduling Review

<table>
<thead>
<tr>
<th>Tasks / Weeks in Semester B, 2014/2015</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>Semester Break</th>
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<tbody>
<tr>
<td>Setting project aims and objectives</td>
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<td>Background study and literature search</td>
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<tr>
<td>• Doing books, papers, literature and academic study research on eye exercises and writing applications</td>
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<td>• Gathering user requirements</td>
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<td>• Milestone: ✓ Master at least 2 types of eye-relaxing exercises</td>
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<td>Methodology and work approach</td>
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<td>• Learn how to write iOS applications in Objective-C</td>
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<tr>
<td>• Milestone: ✓ Write a “Hello World” program in Objective-C ✓ Design an application in both single page and tabbed pages</td>
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<tr>
<td>Implementation</td>
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<tr>
<td>• Write the programs needed for the application one by one</td>
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<tr>
<td>• Milestones: ✓ Write the first page of the app ✓ Divide the app into several tabs for different functions ✓ Provide some instructions of eye relaxing exercise ✓ Write a background running program</td>
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<tr>
<td>Continuous debugging of the programs</td>
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</table>

Table 6.1.1. Work done in Semester B, 2014/2015
<table>
<thead>
<tr>
<th>Tasks / Weeks in Semester A, 2015/2016</th>
<th>Term Break</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>Implementation (continued)</td>
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<td>• Complete the whole application in terms of its functions</td>
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<tr>
<td>✗ The camera inside the device can detect whether a user looks too closely to the screen</td>
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<tr>
<td>✓ Reminders can be popped out to prompt users to do exercise and take a break</td>
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<td>✓ A complete reward system is created</td>
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<td>Continuous debugging of the programs</td>
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<td>Design and fine-tune the user interface of the application</td>
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<td>✓ Design a memorable logo</td>
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<tr>
<td>✓ Name the application</td>
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<td>✓ Create cartoon characters for the application</td>
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<tr>
<td>Complete and upload the project abstracts</td>
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Table 6.1.2. Work done in Semester A, 2015/2016
### Tasks / Weeks in Semester A, 2015/2016

<table>
<thead>
<tr>
<th>Term Break</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>9</th>
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<th>13</th>
</tr>
</thead>
</table>
| Testing and maintenance of the application  
- Recruit one or two children and parents as test subjects to try the application, then ask for opinions  
- Start the final debugging and fine-tuning work  
- Milestones:  
  ✓ Run all the functions provided in the application in optimal time without crashes |   |   |   |   |   |   |   |   |   | <mark>delayed</mark> |   |   |   |
| Demonstration of the final product |   |   |   |   |   |   |   |   |   | <mark>green</mark> | <mark>green</mark> | <mark>green</mark> |   |
| FYP project presentation - Preparation |   |   |   |   |   |   |   |   |   |   | <mark>purple</mark> |   |   |
| Complete and submit the Final Report |   |   |   |   |   |   |   |   |   |   |   |   | <mark>red</mark> |

Table 6.1.3. Work done in Semester A, 2015/2016 (cont’d)

Some tasks stated in the schedule of Semester A, 2015/2016 have different allocated weeks as anticipated in the progress report. Reasons will be discussed in 8.2.2.
7 Discussion

In the testing and maintenance stage of the development of “Healthy Eyes”, the user experience was taken into account. Other than that, the pros and cons of the application were reviewed. Then the limitations of the app were analysed together with assumptions based on the usage.

7.1 User Experience

As mentioned in 3.1, among the 103 participants of the user requirements survey (sample in Appendix A and Appendix B), 7 participants (3 parents, 4 children) from 3 families were willing to take part in the testing of “Healthy Eyes”. In the testing sessions, those participants used the app thoroughly. After that, they were asked to complete a user experience survey consisting of 11 questions (refer to Appendix C).

As reflected in the results, all participants described Healthy Eyes as “easy to use” and “educational” while a majority of them found the app attractive and comprehensive. On the scale of 1 to 10 marks, the average mark given to the app by the participants were 7.43.

Although all participants rate the app to be easy to use or even very easy to use, most of them felt frustrated when playing the stereogram guessing game. The reason was that they were unable to master the skills to find the hidden contents behind the stereograms even though they have read the tips.

When asked about one thing they would change in the app, all the parent participants said that they would also add more eye exercises and information such as eye protection habits, food for improving eye sight and useful websites concerning eye health. For children users, they would change the theme of the app to characters that they are familiar with, such as Hello Kitty, Rilakkuma, Tsum Tsum and so on.

Most parents believed that they could live without the feature of a reward system but they could not live without the watch function and the feature of eye exercises. On the other hand, it was found that children could not live without the reward system but they could live without the watch function. With those findings, it was not surprising that all children like the reward system best. Besides, for parent participants, one-third of them like the watch function best and
two-third of them like the eye exercises best. For features that participants like least, about 71% of them answered the stereogram games.

For improvement of Healthy Eyes, it was suggested that the app should have more appealing appearance with more illustrations and the use of attractive fonts. Other than that, suggestions were made for improving the eye exercise. That is, instead of showing all the exercise procedures in one page, only one step is shown in a page, followed by the next step and so on. For the stereogram games, it was reflected that users should be allowed to zoom the stereogram images so as to increase the chance of seeing the hidden contents. Other suggestions include making the app cross-platform (i.e. in Android or even in Windows computer).

Overall, the participants were satisfied with Healthy Eyes and they would recommend the app to their friends. Nevertheless, they are looking forward to more advanced functions.

### 7.2 Advantages of the Application

Here are some of the advantages of Healthy Eyes.

A. Children users can be alerted when they use the device for more than 20 minutes  
B. The eye exercises are relaxing to children’s eyes  
C. The stereogram Q&A game can create a leisure environment for children users who love playing games.  
D. Finding the hidden contents of the stereograms can relax children’s eye muscles by creating a far-point vision.  
E. The reward system is motivating for children users to keep a good performance in eye care

### 7.3 Assumptions and Limitations

When using Healthy Eyes, the following assumptions have to made for desirable user experience.

**A. The monitor switch is turned on only when children are using an electronic gadget**  
The monitor function allows the app to act as a reminder for users to stay away from the gadget after 20 minutes of usage. Hence this assumption will make the app have a starting
point to calculate the time of usage. Otherwise, alerts will keep popping out in circumstances such as the phone being put idle for some time with the screen on.

B. **Children users do the eye exercises in the app correctly**
   This assumption means that children users will do the eye exercises voluntarily or when being told their parents. Then they will follow the procedures of the eye exercises, finish them correctly and thereby successfully relaxing their eyes.

C. **Parent users input rewards in the setting tab**
   It was assumed that parents will enter rewards and the required stamps in the setting tab from time to time.

D. **The rewards set by parent users are tempting for children users**
   Using this assumption, good rewards will result in children having motivation to finish tasks in the app.

E. **Users will take a break or do eye exercises upon getting a usage alert**
   Whenever an alert is popped out, users will follow the instructions of the alert to take a rest or go to the application to do some eye exercises and answer stereogram questions.

Currently, as a beta application, it is of no doubt that Healthy Eyes is still limited in certain aspects. Here are the limitations.

A. **There is no validation check for the inputs.**
   The inputs of rewards will still be saved even if they do not make sense. For example, if “dcfhgehrehgh” is entered as one of the rewards, saving will still proceed.

B. **Insufficient data**
   At the moment, there are 10 set of eye exercises and 36 stereogram guessing questions. Therefore, users may soon be fed up with repeating the same exercises or answering the same questions all over again.

C. **The stereogram images cannot be zoomed-in or zoomed-out**
   This may affect users from seeing the hidden contents behind the stereograms.
D. There is no monitor of whether users have done the eye exercises correctly
   The ideal case is that after following the instructions, children users can do the eye exercises correctly and thereby relaxing their eyes. However, at the moment, their exercise movements cannot be monitored.

E. Users may still collect stamps without doing eye exercises
   As mentioned in (D), users will not be monitored when they are doing eye exercises. Therefore, they can still get a virtual stamp when they simply click the “Finished” button in each exercise.

F. Users can ignore the alerts
   After an alert has popped out, it is possible that users may still be using the device until another 20 minutes have passed and a new alert has popped out.
8 Conclusion
Overall, in the process of developing Healthy Eyes, most of the objectives were fulfilled. On the other hand, there were problems encountered in technical implementation and project management. Solutions were suggested to ease the problems. Then future work was introduced to improve the application and keep the FYP sustainable.

8.1 Overview of the Project Achievement
Here is an overview of the objectives achieved in the FYP.

A. Understand the game playing habits of children and study the consequences
   A research was conducted to study children’s motivation in using electronic gadgets and the consequences of over-using them.

B. Include a set of eye relaxing exercises in the application
   10 sets of eye relaxing exercises were chosen and included in the category of “Eye Exercise” in the “Challenges” tab page of Healthy Eyes.

C. Monitor users’ device using activities in background
   In the watch function of Healthy Eyes, a switch is present. When it is turned on, the app will start calculating the time of usage of device by users. As long as users are using the device, the app will keep calculating in either background mode or in-app mode.

D. Remind children to do eye relaxing exercises or take a break from their game
   Using the monitor function in the application, alerts will be popped out to direct children to open the application or take a rest after some time of usage.

E. Reinforce children’s eye protection habits through fun and positive ways
   This was achieved by a reward system in which virtual stamps are given for good performance in Healthy Eyes. Then the number of stamps collected can be used to redeem rewards entered in the app. Good performance includes opening the app every day, doing eye exercises and giving correct answers to the stereogram questions.
8.2 Problems Encountered and Possible Solutions

During the development of Healthy Eyes, there were technical problems and project management problems.

8.2.1 Technical

The technical problems in developing Healthy Eyes are discussed below.

A. The function of monitoring the distance between the eyes and screen was not working

As stated in the objective, the monitor function of the app was expected to not only calculate the time of usage of device, but also detect the distance between the device screen and the eyes. However, the latter could not be achieved because the iOS platform does not allow background monitoring. In fact, the iOS system restricts multi-tasking where multiple apps are kept active in the background. Therefore, apps which are not in use will only run for a short period of time before being set to a suspended state [3]. In the case of Healthy Eyes, it is impossible for it to be kept active in background so it cannot monitor the distance between users’ eyes and the device from time to time.

Solution: Develop an exclusive version of Healthy Eyes for iPad Air 2 and iPad Pro

The recent release of Apple’s iOS 9 includes a “dual screen” function. This function is referred as “Split View” and it is applied best in iPad Air 2, and iPad Pro which is Apple’s newest product in the iPad series. The reason is that the Split View mode allows 2 apps to split the screen and then both apps will be kept active at the same time [7].

Fig.8.2.1. How Split View is applied in iPad Air 2
Hence in order to monitor the distance between users’ eyes and the device screen, a new version of Healthy Eyes will have to be deployed in iOS 9 and run in iPad Air 2 or iPad Pro. In this version, the original functions will still be present together with the new monitor function. On the other hand, the version of Healthy Eyes that runs in other iOS devices will only have the originally implemented function.

B. The algorithm for detecting users’ eye movement was complicated
Difficulties were encountered in writing a logical algorithm for detecting users’ eye movement when doing eye relaxing exercises. Several attempts were made by importing the face detection library called “Square Cam” in the detection program. However, upon testing, the app failed to precisely detect eye movement by only detecting the position of the eyes in the camera screen.

Solution: The detection function was passed to future development
Due to limited time for the FYP, the eye movement detection function was regrettably forgone. It is hoped that the future version of Healthy Eyes will successfully include an algorithm that can detect the eye movement and thereby allowing users to see whether they are doing the eye exercises correctly.

C. Difficulty to create an eye catching user interface
After writing the functions in Healthy Eyes, the user interface is transformed from a basic one to a more eye catching one by adding illustrations, changing fonts and changing the colour schemes. It was a bit difficult to combine those elements to make a decent UI.

Solution: Use the trial-and-error approach
By constant adjusting the UI, the effects of the graphics, fonts and colours on the UI were analysed. As a result, the most suitable combination was used as the eventual UI.

8.2.2 Project Management
Throughout the year of finishing the FYP, the following problems were encountered.

A. The actual progress of the project is slower than the proposed progress
As initially proposed in the project, it was expected that by week 4 of Semester A, 2015/2016, the whole application would be completed in terms of function. However, due
to lack of sufficient programming skills, the functions could not be implemented on schedule. As a result, tasks such as UI design and app testing after implementation had to be delayed.

**Solution: Refine the implementation**

At the last few weeks of the implementation process, some of the proposed functions such as background monitoring of eye distance and detection of eye movements when doing eye exercises were forgone. Then the implementation time was delayed for 3 weeks and subsequent tasks such as UI design and app testing were delayed for 1 week. Besides, the time allocated for writing project abstract was shortened from 3 weeks to 1 week so as to free more time for UI design and app testing.

### 8.3 Further Problems

Below are some of the further problems existing in Healthy Eyes.

**A. The application is not long lasting**

Although Healthy Eyes is an educational and informative app, it lacks a long lasting power. For instance, after answering all the stereogram questions correctly, there is no point in playing the Q&A game again. Besides, doing the same 10 sets of eye exercises every day can be tedious. As a result, it is possible that children users may soon lose interest in the app. Long lasting games such as Candy Crush or Line Rangers will keep increasing the number of levels to prevent users from abandoning the apps after finishing every level. Therefore, Healthy Eyes still do not have this long last power given its fixed content.

**B. Legal problems regarding the copyright of images**

Healthy Eyes has used images of the eye exercises and stereograms directly downloaded from the Internet. If the app is released, there may be legal problems as those images were obtained without the owners’ consents.

**C. Data are prone to being erased**

When Healthy Eyes is deleted from the iOS device, all the data including the virtual stamps and rewards will be deleted as well. Those data can neither be backed up nor restored upon
re-installing. The only exception is that the app will be backed up upon the backup of an iOS device. Otherwise, the app will be deleted upon clean restoration of the iOS device.

8.4 Future Development

Future work has to done to transform Healthy Eyes to an all-round eye care habit builder app. Here are the suggestions that could be considered in the near future.

A. Expansion of app contents

This can be achieved by the following methods:
- Add more eye exercises and stereogram questions
- Introduce tips concerning eye care habits and ways to improve eye sight

B. Improvement of existing app functions

This can be achieved by the following methods:
- Fine tune the monitor function to let users set the desired time for alerts
- Allow zooming of the stereogram pictures for better view

C. Addition of new functions / features

The new functions/features include:
- Monitor the distance between users’ eyes and the device screen
- Detect eye movements when users are doing eye exercises
- Make the setting page password-protected
- Make the turning on of the monitor-switch password-protected
- Support multiple languages
- Integrate a server side to store app data in the server for backup and restoration
- Integrate social media platform for users to share useful information of the app
- Cooperate with stores to give more rewards for redemption

D. Expansion of platforms

This is the ultimate development of Healthy Eyes with an intention to make the app applicable to more target users. Measures include:
- Introduce PC version
- Introduce Android version
Fig. 8.4.1. The Android platform

- Introduce iPad Air 2 and iPad Pro versions
- Let the iOS version of the app interact with the Apple Watch
References


[13] The Hong Kong Polytechnic University, 'Tung Wah Group of Hospitals and PolyU's School of Optometry collaborate on "Smart Eye@Campus" to promote eye care and excel in research endeavours', 2014.

<table>
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<tr>
<th>Glossary</th>
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<td>Xcode’s main class</td>
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<td>Bool</td>
<td>Boolean data type storing true or false value</td>
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<tr>
<td>Collection View Controller</td>
<td>An application page with a grid view</td>
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<td>Int</td>
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<td>Myopia</td>
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<td>Navigation View Controller</td>
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<td>Objective-C</td>
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<td>Stereogram</td>
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<td>String</td>
<td>A data type storing text</td>
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<td>Tab View Controller</td>
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<td>Xcode</td>
<td>An IDE tool for writing iOS, MacOS or Apple Watch application</td>
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Appendix A - User Requirements Questionnaire for Parents

A Habit Builder that Improves Eyesight for Young Children (Parent)

Hello, I am a computer engineering student from the City University of Hong Kong. I want to design a eye care habit builder mobile application in my final year project (FYP). The application will focus on guiding children to correct eye care habits and thereby improving their eyesight. Hence as parents, your opinions matter. Please help me to understand what my app needs by filling in this questionnaire. If you have questions, please feel free to contact c@my.cityu.edu.hk, thank you.

*Required

1. Do you allow your children to use the mobile phone or tablet? *
   - Yes (Go to Question 3)
   - No (Go to Question 2)

2. What are your concerns when your children are using their mobile phones or tablets? *
   You can choose more than one answer.
   - Time of usage
   - Distance between the eye and the screen
   - Content of the apps or games they are using or playing
   - Other: ________________

3. Do you want an application that can help improve your children’s eye sight? *
   - Yes
   - No (This is the end of the questionnaire, thank you for participating.)

4. Which functions would you like to be included in the application? *
   You can choose more than one answer.
   - A timer function for calculating how long has a user been using the mobile phone.
   - Providing children exercises and/or games which can relax the eyes
   - Giving eye care tips
   - Having a scoring system for measuring good performance
   - Other: ________________

5. Are you willing to buy the application? *
   - Yes (Go to Question 6)
   - No (Go to Question 7)

6. What is the acceptable price (in HK$) of the application? *
   You can choose more than one answer.
   - $8-$18
   - $18-$28
   - $28-$38
   - $38 or above

7. Would you like to join a testing session once the app is created? *
   - Yes (Please contact the email mentioned above)
   - No

Submit
Appendix B - User Requirements Questionnaire for Children

A Habit Builder that Improves Eyesight for Young Children (Child)

Hello kids, I'm a student from the City University of Hong Kong and I'm writing an application about eye care. The app will teach you how to protect your eyes. In order for the app to be fun and meaningful to you, I need your opinions. If you don't understand the questions, you may ask your parents for help. You may also contact me at pieman@cityu.edu.hk if you have doubts or any questions.

*Required

1. Do you have a smartphone (iPhone/Samsung Galaxy/Xiaomi...etc) or a tablet (iPad/Galaxy Tab...etc)? *
   - Yes (Go To Question 2)
   - No (Go To Question 4)

2. How often do you use your phone or tablet?
   - Every day
   - Once a week
   - Twice a week
   - Three times a week
   - Four to Six times a week

3. How many hours do you usually spend on your phone or tablet in a single day?
   - Less than 1 hour
   - 1 to 2 hours
   - 2 to 3 hours
   - More than 3 hours

4. Do you want an application that can help improve your eye sight?
   - Yes
   - No (This is the end of the questionnaire, thank you for participating)

5. Which of following elements do you want in the application?
   - A timer function for calculating how long you have been using the phone / tablet
   - Eye relaxing exercises
   - Eye care tips
   - Cartoon characters
   - Mini games
   - Prizes for good performance
   - Other: ______________________________________________________________________
6. What do you think of those characters?

1 2 3 4 5

I don't like them at all. ☐ ☐ ☐ ☐ ☐ I like them very much.

7. Which interface of the app do you prefer more?

☐ A
☐ B
8. Would you like to join a testing session once the app is created?

- Yes (Please ask your parents to arrange a meeting)
- No

Submit
Appendix C - User Experience Survey

Healthy Eyes - User Experience

Thank you for testing "Healthy Eyes"! Please answer the questions below to help us improve:

*Required

How would you describe Healthy Eyes in one or more words? *
- Attractive
- Comprehensive
- Convenient
- Easy to Use
- Fun
- Educational
- Useful
- Other: 

If you were to review Healthy Eyes, what score would you give it out of 10? *

What do you find most frustrating about Healthy Eyes? *
You may give up to 3 answers

Overall, how easy to use do you find Healthy Eyes? *
- Very easy to use
- Easy to use
- Neither easy nor difficult to use
- Difficult to use
- Very difficult to use

If you could change one thing about Healthy Eyes, what would it be and why? *


Which features could you live without? *

☐ Theme and cartoon characters
☐ Watch Function
☐ Eye relaxing exercises
☐ Stereogram games
☐ Rewards system (i.e. collect stamps to redeem prizes set by parents)
☐ Other: 

Which features could you not live without? *

☐ Theme and cartoon characters
☐ Watch Function
☐ Eye relaxing exercises
☐ Stereogram games
☐ Rewards system (i.e. collect stamps to redeem prizes set by parents)
☐ Other: 

What do you like best about Healthy Eyes? *

☐ Theme and cartoon characters
☐ Watch Function
☐ Eye relaxing exercises
☐ Stereogram games
☐ Rewards system (i.e. collect stamps to redeem prizes set by parents)
☐ Other: 

What do you like least about Healthy Eyes? *

☐ Theme and cartoon characters
☐ Watch Function
☐ Eye relaxing exercises
☐ Stereogram games
☐ Rewards system (i.e. collect stamps to redeem prizes set by parents)
☐ Other: 

How can we improve Healthy Eyes? Give us your ideas and suggestions. *
Anything else you wish to share?

Would you recommend Healthy Eyes to a friend? *
- Yes
- No

Submit

Never submit passwords through Google Forms.