CHAPTER 1

INTRODUCTION

1.1. Background of the Study

Mobile learning is a new technology and it can be defined as an educational tool whereby the only technology used is mobile phones and handheld devices [1]. Mobile learning is a new domain and there is a lot of effort being put in on various aspects of the particular subject and in Malaysia, the use of mobile learning is still in the early stages [2]. Ever since the teaching of Science and Math were reverted back to Bahasa Melayu, it has been widely accepted in most schools in Malaysia. This is because it was easier to teach the students in Bahasa Melayu compared using the English language instead. As for the usage of mobile learning in primary schools in Malaysia, it is in the early stages and as far as primary school students are concerned, applications to help with their learning process have yet to be implemented.

By developing this application, it is designed to help Year 1 students understand the subject of Science on a better scale. It is because the subject of science is essential to them right up until their secondary school education. The Science subject is important to be taught at a young age so that they have a good foundation in the subject and gives them a good head start when they face their UPSR examination.

1.2. Problem Statement

Apart from their school textbooks and workbooks, Standard 1 students don't seem to have an alternate to help with their learning process particularly in the subject of Science. Most of the exercises in the textbooks and workbooks have already been completed by them during school hours and they might become bored if they continuously do it.

By developing this application, it is a secondary form of learning for them. Once they have finished their learning at school, they can use this application to enhance their learning of the subject.

Secondly, in the student's timetable, the Dunia Sains dan Teknologi subject is only taught for two periods which amounts to one hour in one week. As a result of having only one hour class in a week, the students might not fully grasp fully the concepts taught and complete the entire syllabus in the stipulated time. Thus, by having a mobile learning application; they would be able to study the subject on their own pace at any time.

1.3. Objectives

- To develop an application that will further facilitate better understanding of the Science subject for Standard 1 students.
- To provide an ideal educational solution that will be beneficial to their learning development.

1.4. Scope of Study

- The scope of study will be mainly targeting Standard 1 students in primary schools in Malaysia.
- It will be mainly concentrating on the subject of Science which is a sub division of the core subject called Dunia Sains dan Teknologi.
- The topics covered include three main chapters and five sub topics.
- The mobile learning application will be mainly using a Tablet based smartphone.

1.5. Feasibility Study

1.5.1. Technology Feasibility

The skills required to develop this application would be Java Programming. Other relevant skills would be knowledge in an academic field such as the subject and syllabus to be used and inserted into the application.

1.5.2. Operational Feasibility

The user interface has to be constantly reviewed so that it is suitable for Standard 1 students. This mobile application is handy and useful because it helps students to understand the subject on a better scale and to prepare them for their test and examinations.

1.5.3. Economic Feasibility

The cost of the entire project is economical. This is because the tools that will be used such as Android System Development Kit and Eclipse to develop the system are freeware and open source tools. This would actually save cost.

1.5.4. Schedule Feasibility

The expected timeline to complete this project is approximately four months. In the stipulated time period, it will cover retrieving information regarding Dunia Sains dan Teknologi syllabus, notes, pictures and animations. It will proceed as scheduled in the Gantt chart. A pilot test is scheduled when the application is fully developed to check for errors and making it an error free code and application.

1.5.5. SWOT Analysis

Figure 1: SWOT Analysis

CHAPTER 2

LITERATURE REVIEW

2.0 Background of the Study

Mobile learning is now concentrating on the mobility and flexibility of the learning process among the youngsters. M-learning is a new domain and there is a lot of effort being put in on various aspect of the particular subject in Malaysia. Besides that, the use of mobile learning is still in early stages [1].

2.1. Mobile Technology

Mobile learning is a new technology. It might be a totally different educational tool wanting to set its own standards and expectations, or it could be in a different type of electronic learning (e-learning), and can be defined as an educational tool whereby the only technology used are mobile phones and handheld devices.

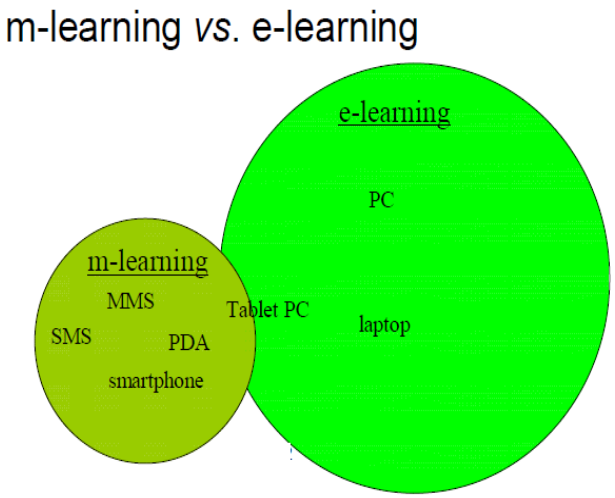


Figure 2: Venn diagram showing the m-learning vs e-learning

The core and characteristics that define mobile learning include such as spontaneous, private, portable, situated, informal, bite-sized, light-weight, context aware and soon to be connected, personalized and interactive[2].

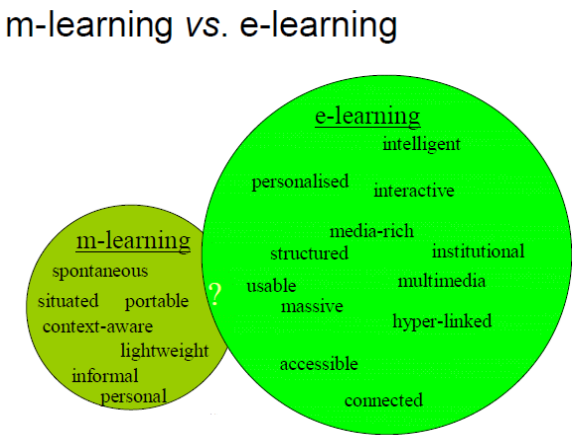


Figure 3: Venn diagram showing characteristics of m-learning vs e-learning.

In a study done on design requirements for mobile learning environments, the designs were reviewed from three angles which include generic mobile environment issues, learning contexts, learning experiences and objectives. As for Generic Mobile Environment Issues, the essential feature is mobility and it is understood in many ways such as user mobility, device mobility, services mobility and should be viewed both technically and contextually. Features such as user interface are important because mobile devices have small screens, low input methods, and short battery life. Therefore the user interface design has to be suitable for end user's needs. Next is on the content of Mobile Learning Contexts. Its main approach is to identify learner's activity, collaboration, spatio-temporal and facility. In learner's activity, it highlights considerations such as psychological properties that relate to their learning experiences. In Activity, a compilation of learning activities can be adapted by mobile systems. In Collaboration, it deals with the workspace that is going to be used such as classrooms or remote area whereby two way interactions will benefit the organization and end user. In Spatial Temporal, it refers to the awareness of a specific time and location. In facility, it refers to the service provided by the telecommunication companies. Lastly, is on learning experiences and objectives. In here, it states that the important element of learning experience is making sure the delivery of contents is properly organized. [3]

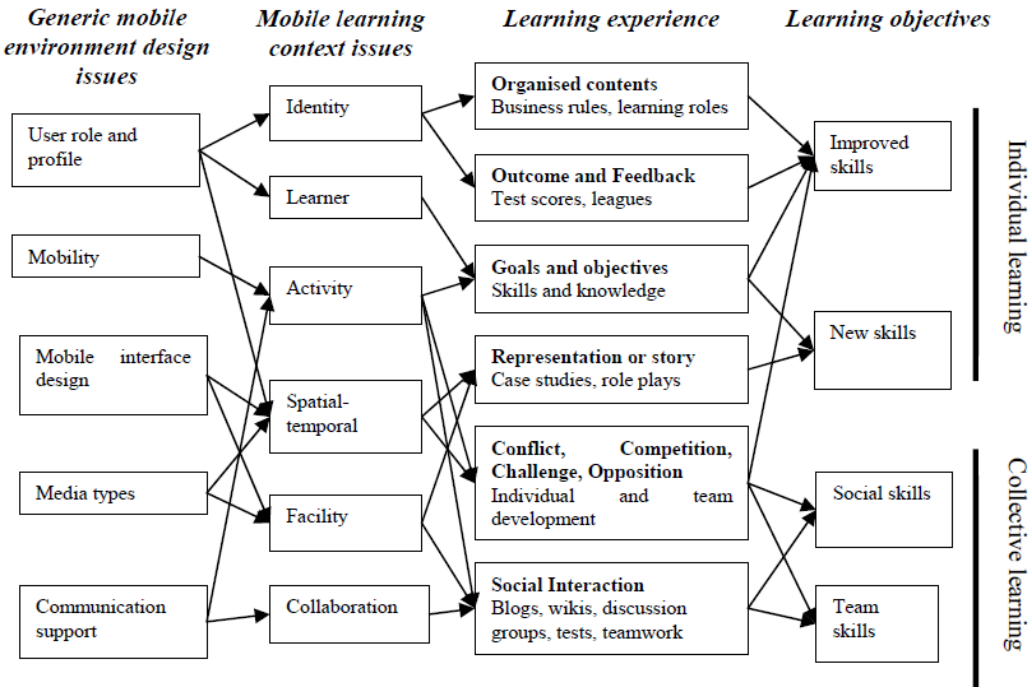


Figure 4: Diagram showing framework of individual and collective learning.

In mobile learning framework, mobile learning is not defined by learning through mobile devices but rather evolution of electronic learning and suits those who study in institutions of higher learning. Three important factors in mobile learning system development include mobile usability, wireless technology and electronic learning system.

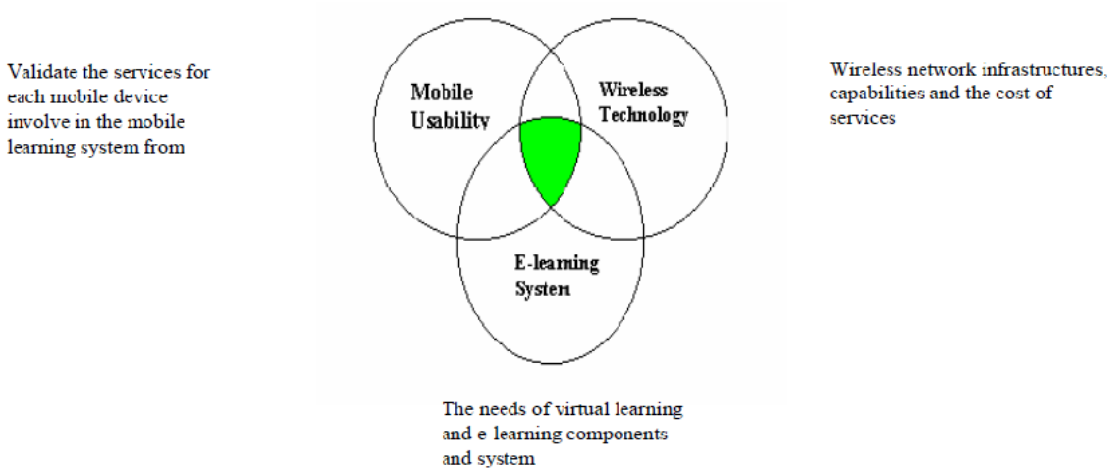


Figure 5: Venn diagram showing the similarities of mobile usability, wireless technology and e-learning system.

In developing a mobile learning system, there are a few factors that need to be taken into consideration. Among them include

- Defining the educational components and services that are going to be used in the application.
- Examining the existing wireless network capabilities and limitations. The best one is then chosen to be used.
- Studying the types of mobile devices that need to be used in the system.
- Educational components and services need to be fitted together based on the network capability and usability requirements of the mobile device.
- Different types of scenarios that express the mobile learning system are then sketched out.
- Prototypes are drafted out following specific guidelines.
- The concept and services are then tested and validated to different services.

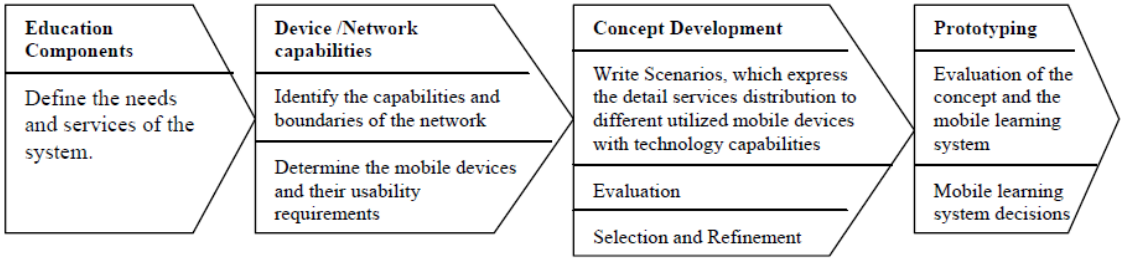


Figure 6

On mobile learning prototype assessments and mobile learning framework, it is defined as giving all the resources to the students anytime and anyplace. Mobile learning system is also suitable for students and employees who are moving all the time constantly [4].

2.2. Education Learning System

Mobile learning provides different methods that support learning processes among which includes mobile devices such as handheld and tablet computers, MP3 players, smartphones and lastly mobile phones. In comparison to e-learning, mobile learning has unique attributes such as it is personal, portable, collaborative, interactive, contextual and situated.

Mobile learning also emphasizes on "just in time learning" because the instructions can be delivered anywhere and anytime. Besides that, it also supports informal and formal learning thus with the potential to change the conveyance of education and training. As for the challenges faced in education, mobile learning is aiming to become one of the key solutions in that field. [5]

Mobile learning can enhance and develop traditional learning difficulties and M-learning is becoming the preferred choice whilst using the Open source technology. The creation of this application using an open source technology helps the education system in the Malaysian schools. Mobile learning has the advantage whereby it can be carried to any place and can be used at any desired time [3].

A plus point of using mobile phones in education is that students could get an instant reply from it and in the long run, it helps students to become more independent in their learning [4].

School teachers need to introduce new ways and methods of making students to make students love the Science subject. The method of teaching the subject should be on the same level with advancement in science and technology [6].

Mobile learning combined together with online learning management systems to provide tools for brainstorming and quizzing. In other ways, mobile learning helps to enhance formal teaching and learning. [7].

CHAPTER 3

METHODOLOGY

3.0 Research Method

In order to develop the mobile application within the stipulated time frame, a fast method is needed to be used. There are a number of software development models but the only certain approaches that can complete a system include spiral model, prototyping model, reuse model, exploratory model and many more.[8].

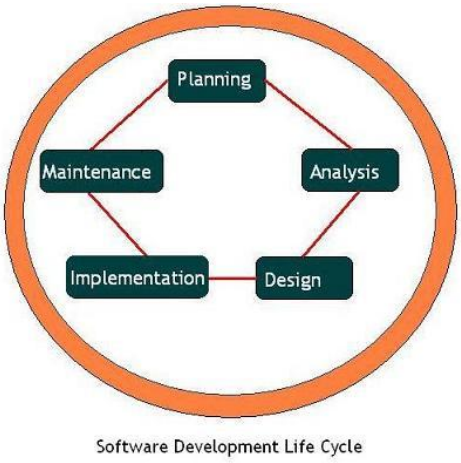


Figure 7: Life cycle of the software developement

The research method that will be used is the Software Development Life Cycle. It will separate into five categories which include Planning, Analysis, Design and Implementation, Maintenance.

3.1.1. Planning

In this phase, research on Dunia Sains dan Teknologi subject syllabus was done. This is to make sure that the developed mobile application is related to what the students are learning. There would be a learning section for each of the chapters and a corresponding exercise.

3.1.2. Analysis

In this phase, the topics that will be covered include Sains Hayat, Sains Fizikal and Sains Bahan. For Sains Hayat, the main focus would be on Benda Hidup & Benda Bukan Hidup and Manusia. In Sains Fizikal, the coverage would be for Mata Untuk Melihat and Lidah Untuk Merasa. As for Sains Bahan, it would be solely focusing on Timbul and Tenggelam.

3.1.3. Design

In this phase, all relevant pictures and notes most of the design of the application will be done using Adobe Photoshop CS3 and Android System Development Kit.

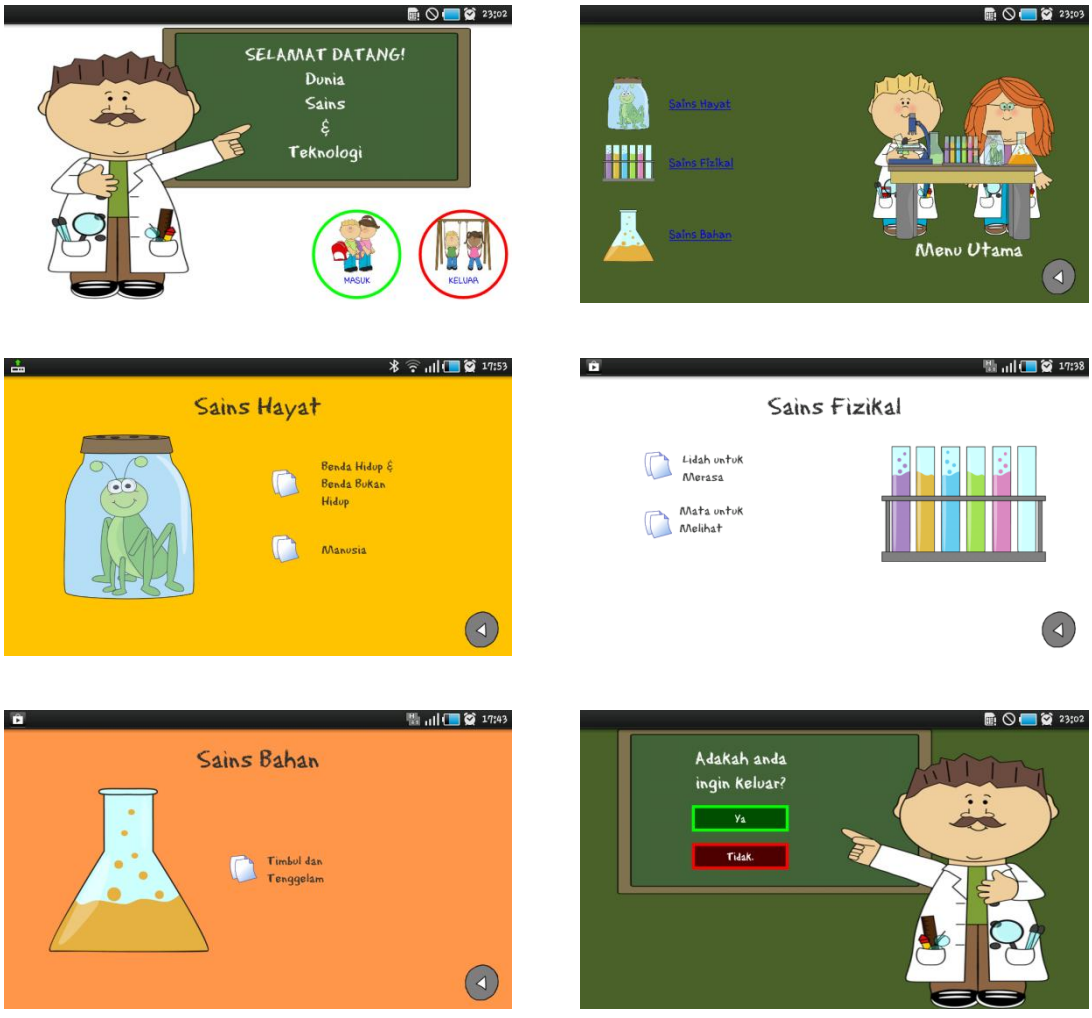


Figure 8: Screenshots of the Mobile Application

3.1.4. Implementation

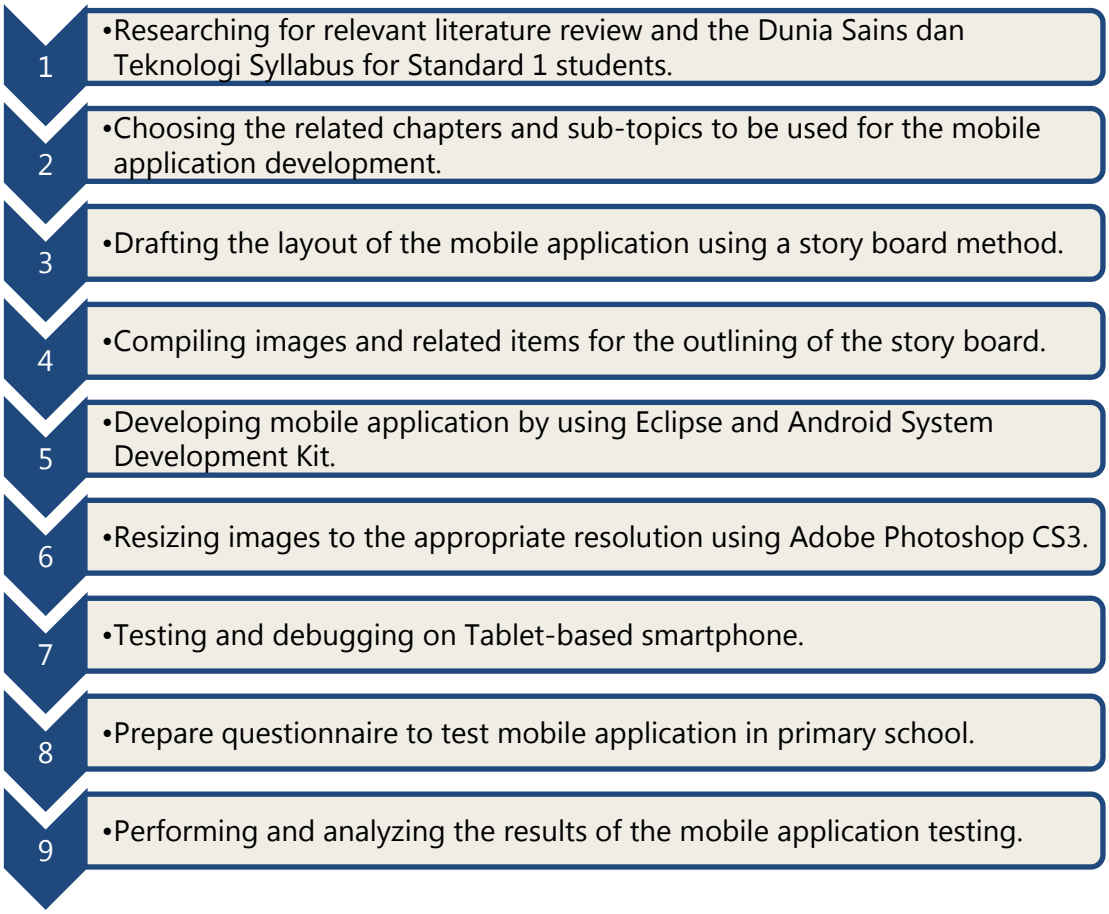
In this phase, the developed mobile application will be tested on Standard 1 students in a respective school to gain feedback. If there are errors within the system, it will be corrected and tested once again.

3.1.5. Maintenance

In this phase, In here, it is mainly to fix any errors that occur within the application. Among the errors include image compatibility whereby in android applications, GIF animated images are not supported. Therefore the images need to edited and resized in Adobe Photoshop.

Other issues would be screen resolution whereby some tablet smartphones have different screen resolution in which the application needs to be resized to suit the device.

3.2. System Flowchart



3.3. Project Activities

As for this mobile application, it will be progressing as planned in the Gantt chart for FYP1 and FYP2.For FYP 1, the main activities that will be carried out will include gathering all possible materials such as the syllabus, relevant exercises for each topic. Secondly, there would be a rough sketch of the user interface that is going to be used for the application. For FYP II, it is more to develop the application using various kinds of software, inserting the relevant materials needed and testing the application.

3.4. Key Milestone

For FYP 1, the relevant notes and exercises will be chosen and syllabus has been compiled and waiting to be inserted into the mobile application. For FYP2, it will be fully developed with all the relevant details and a working application is generated.

3.5. Gantt chart

(Refer appendix)

3.6. Tools

Table 1: Hardware components used for development

Hardware	Specification/Requirement
Mobile Device	Tablet Based Smartphone (Samsung Galaxy Tab 2 (7”)
Operating System	Windows XP Professional, Windows Vista Home Premium, Windows 7 Ultimate
Processor	Intel Dual Core(E2140),1.6Ghz
Disk Space	4GB
Memory	2GB RAM
Peripherals	Mouse, Keyboard, Printer, Speaker, USB Cable.

Table 2: Software components used for development

Software	Description
Android SDK	To build, test and debug Android Application. Consists of Eclipse + Android Developer Tools, Android SDK Tools, Android Platform Tools, Android Platform and Android system image emulator.
Eclipse Standard 4.3	To develop and debug. Comprises of Eclipse Git Team Provider, Eclipse Java Development Tools, and Eclipse Plug in Development Environment.
Adobe Photoshop CS3	To create and edit graphics and photographs

CHAPTER 4

RESULTS & DISCUSSION

4.0 Results

4.1. System Design

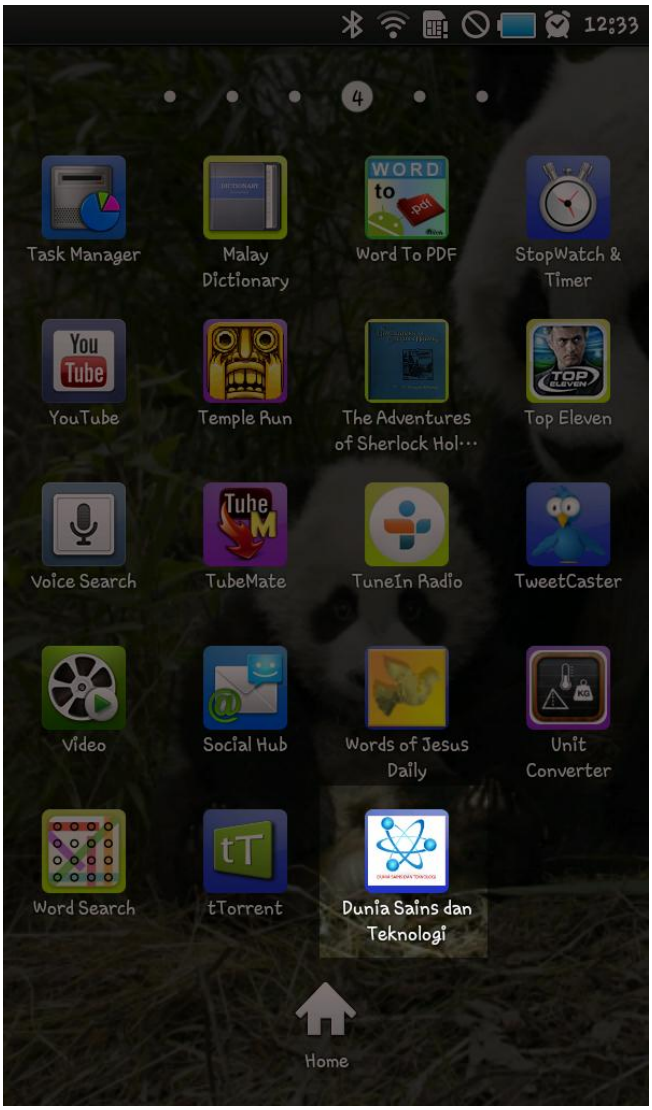


Figure 9: Screenshot showing the application icon.

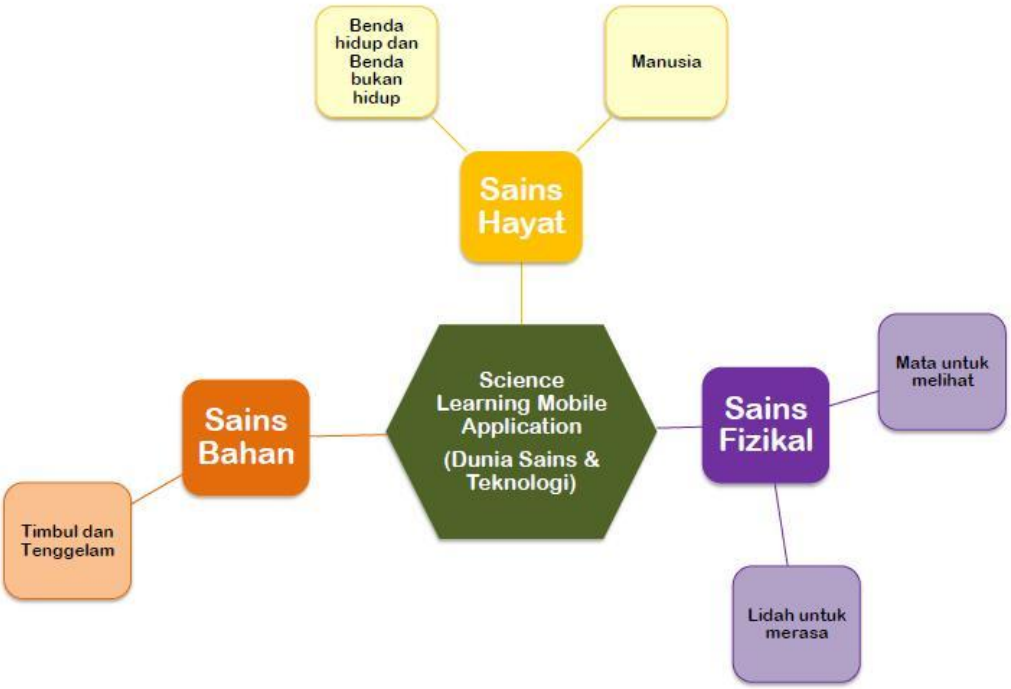


Figure 10: Mobile Application Diagram

4.2. Data Gathering and Analysis

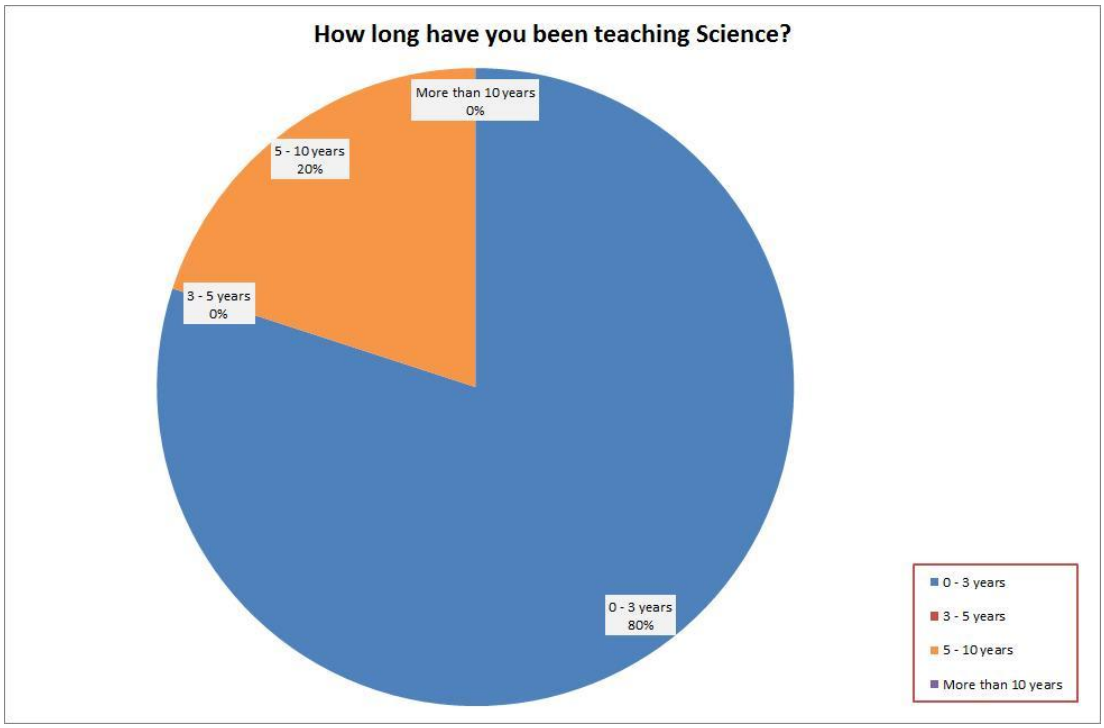


Figure 11: Survey Question 1

Based on the chart above, 80% of the teachers have been teaching the Science subject for less than 3 years. The remainder 20% of the teachers has been teaching the Science subject between 5-10 years.

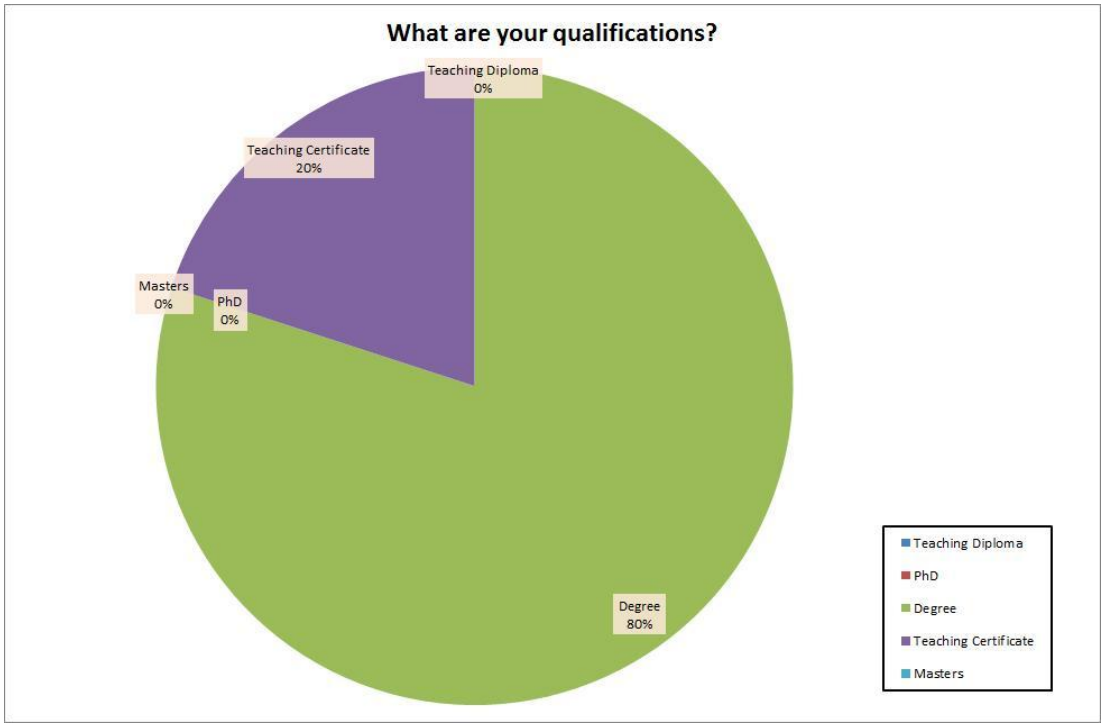


Figure 12: Survey Question 2

Based on the chart above, 80% of the teachers possess relevant Degrees and a remainder of 20% that possess teaching certificate.

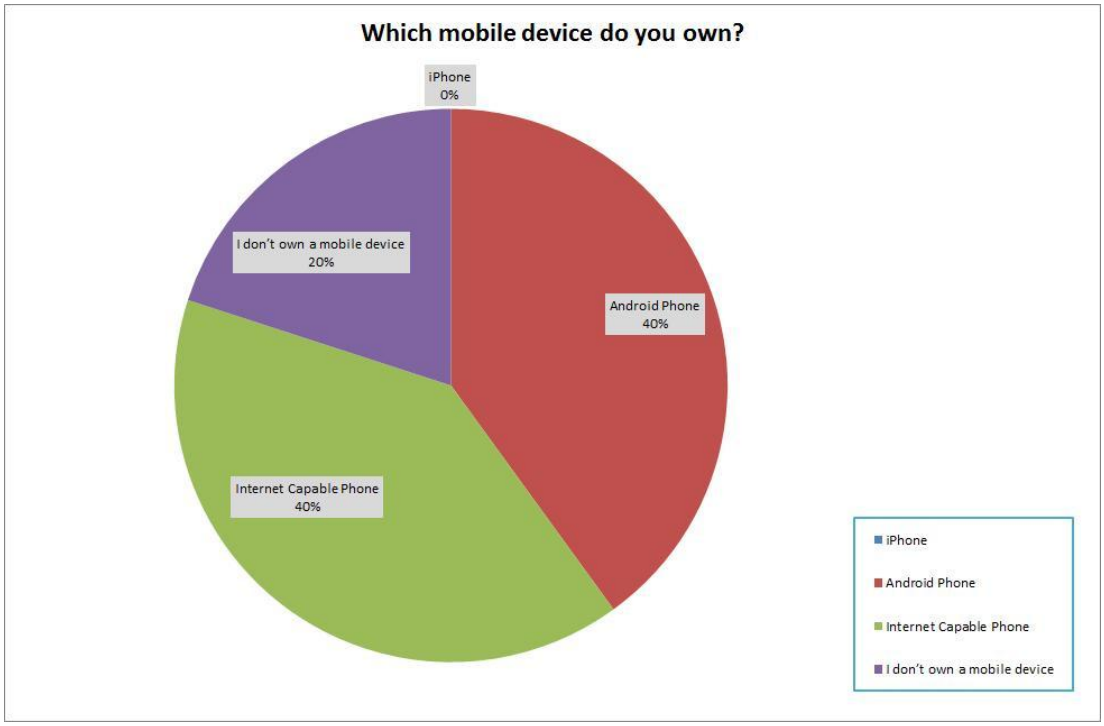


Figure 13: Survey Question 3

Based on the chart above, 40% of the teachers own Android based OS phones. Secondly, another 40% of teachers own internet capable phones. Thirdly, 20% of the teachers do not own any mobile devices.

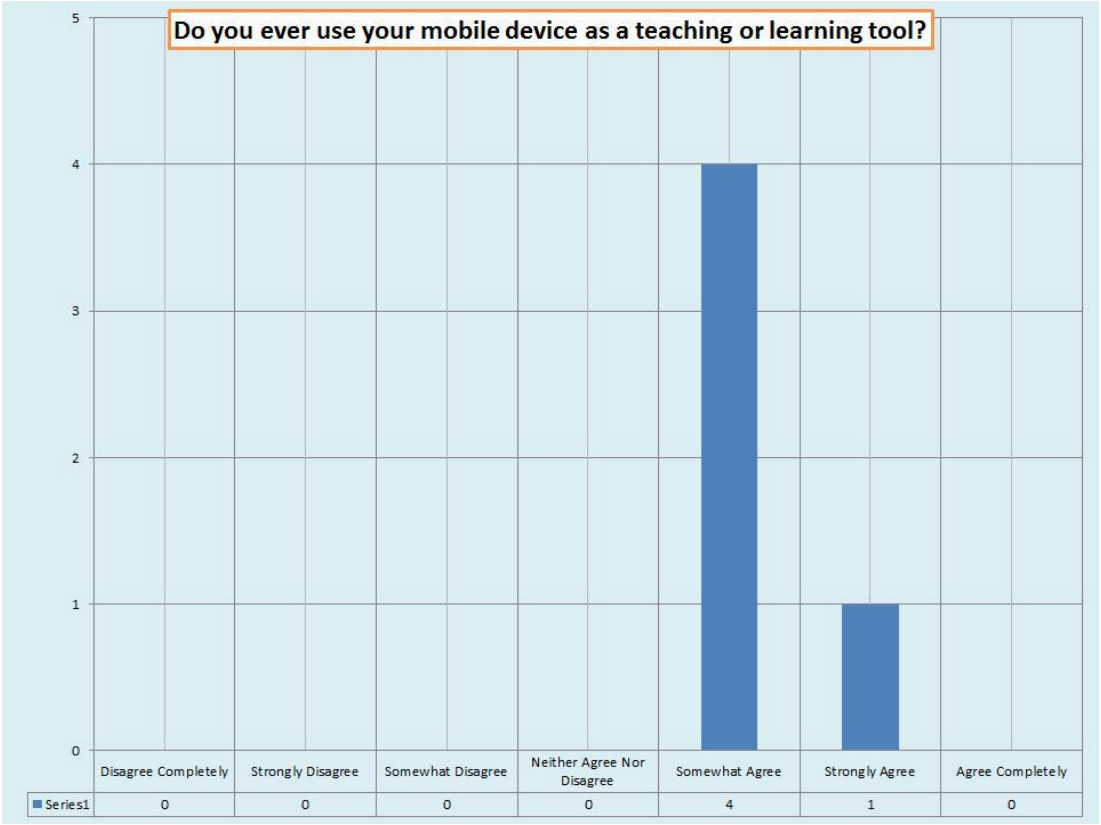


Figure 14: Survey Question 4

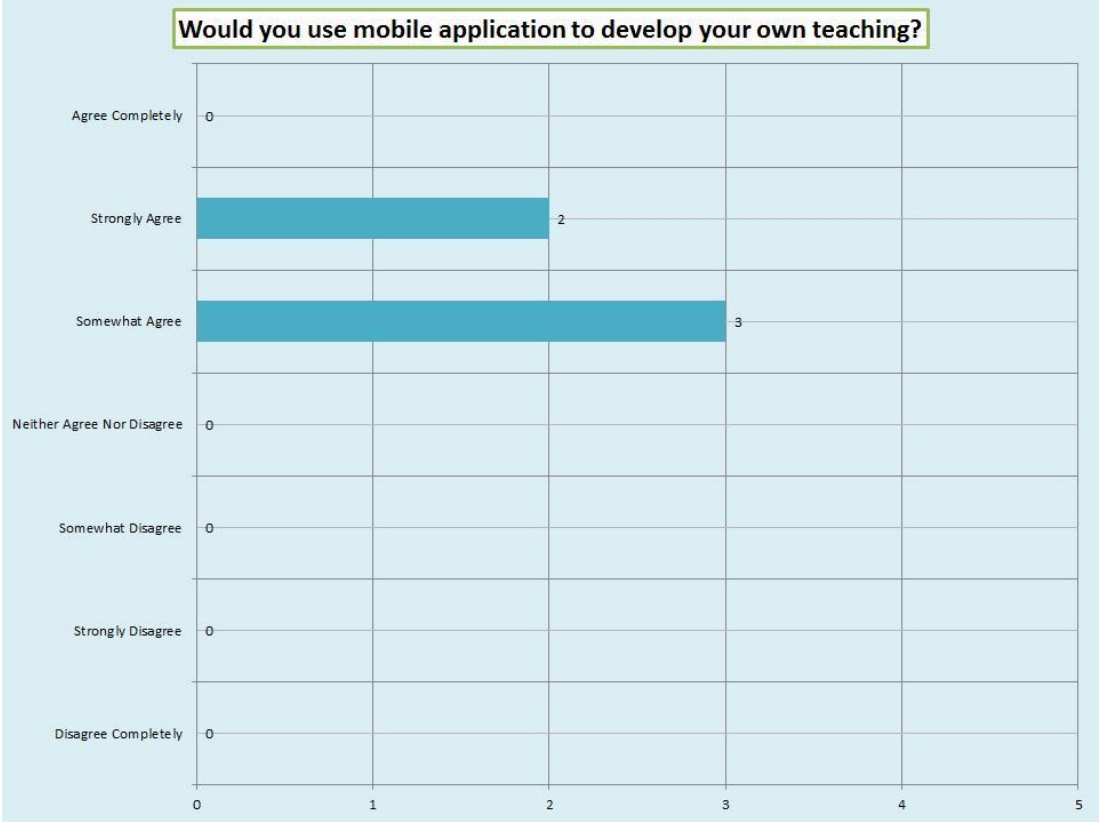


Figure 15: Survey Question 5

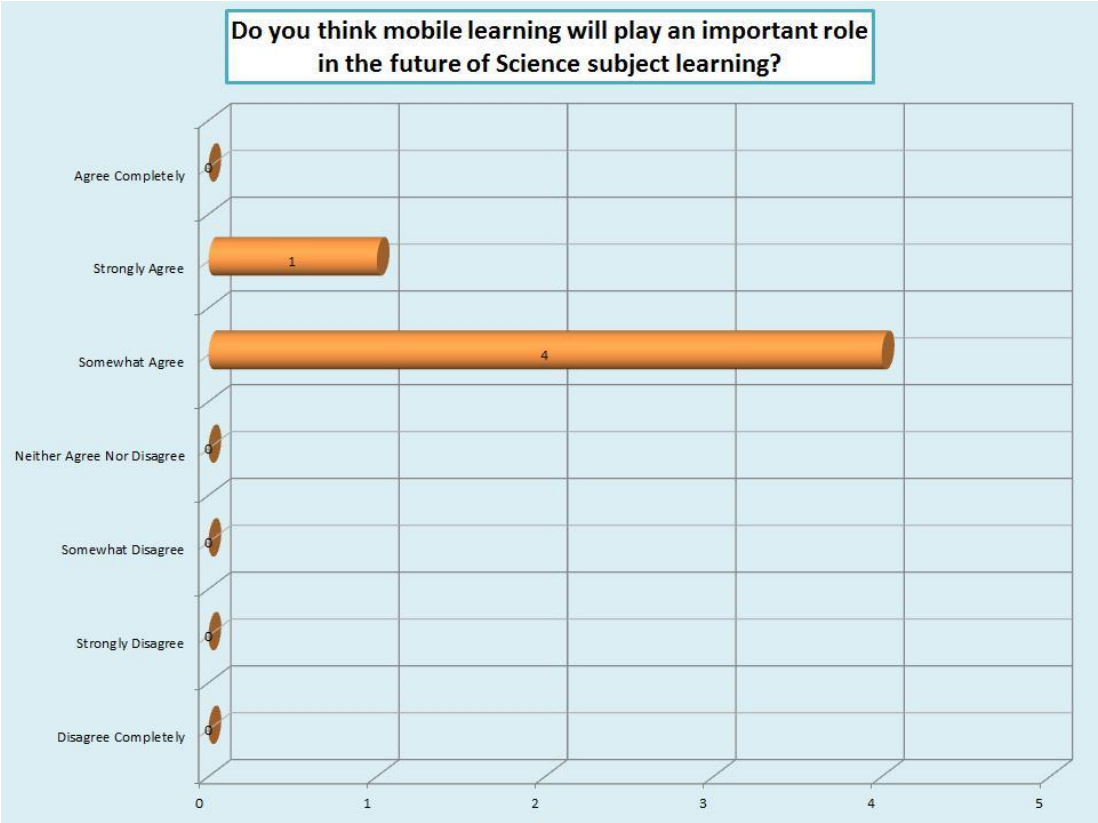


Figure 16: Survey Question 6

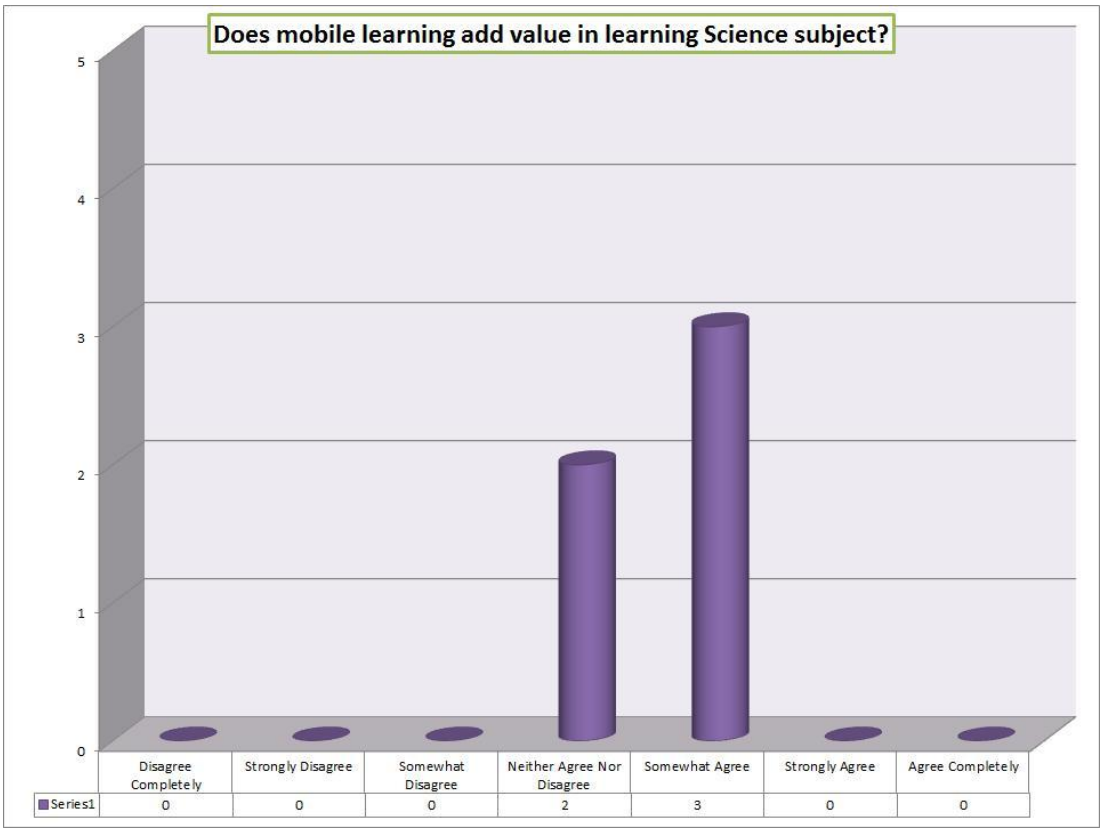


Figure 17: Survey Question 7

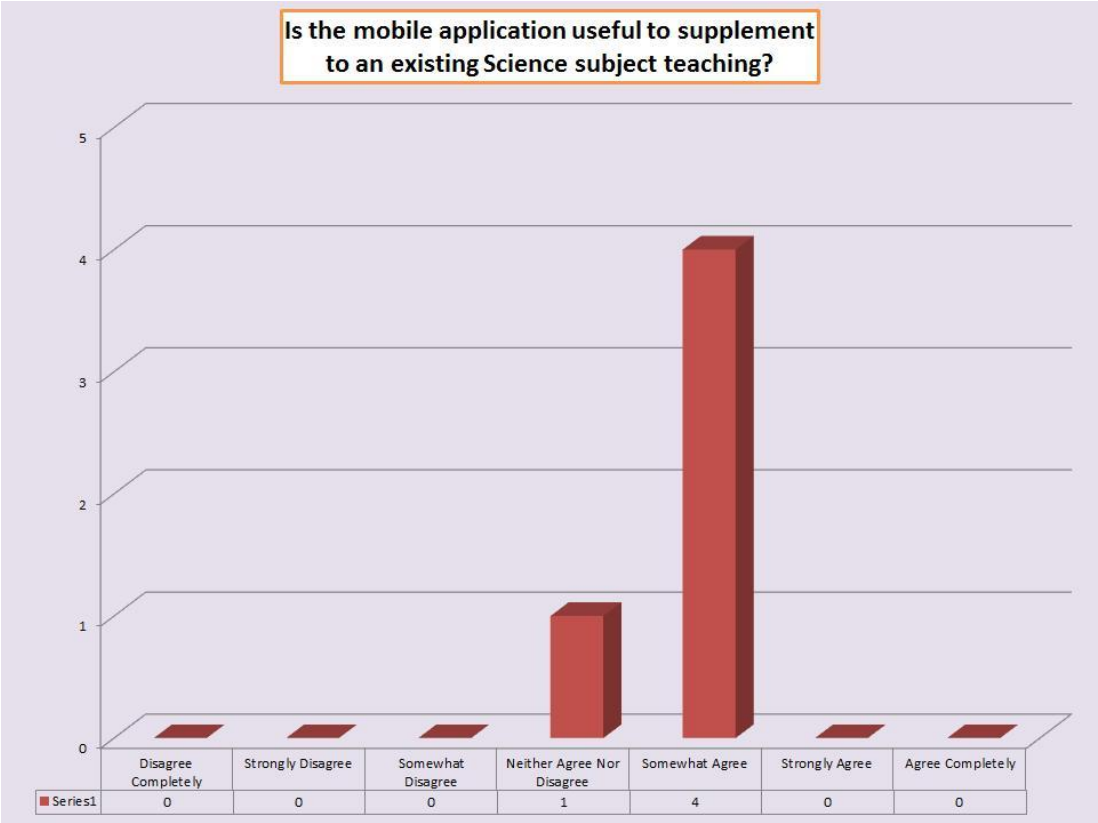


Figure 18: Survey Question 8

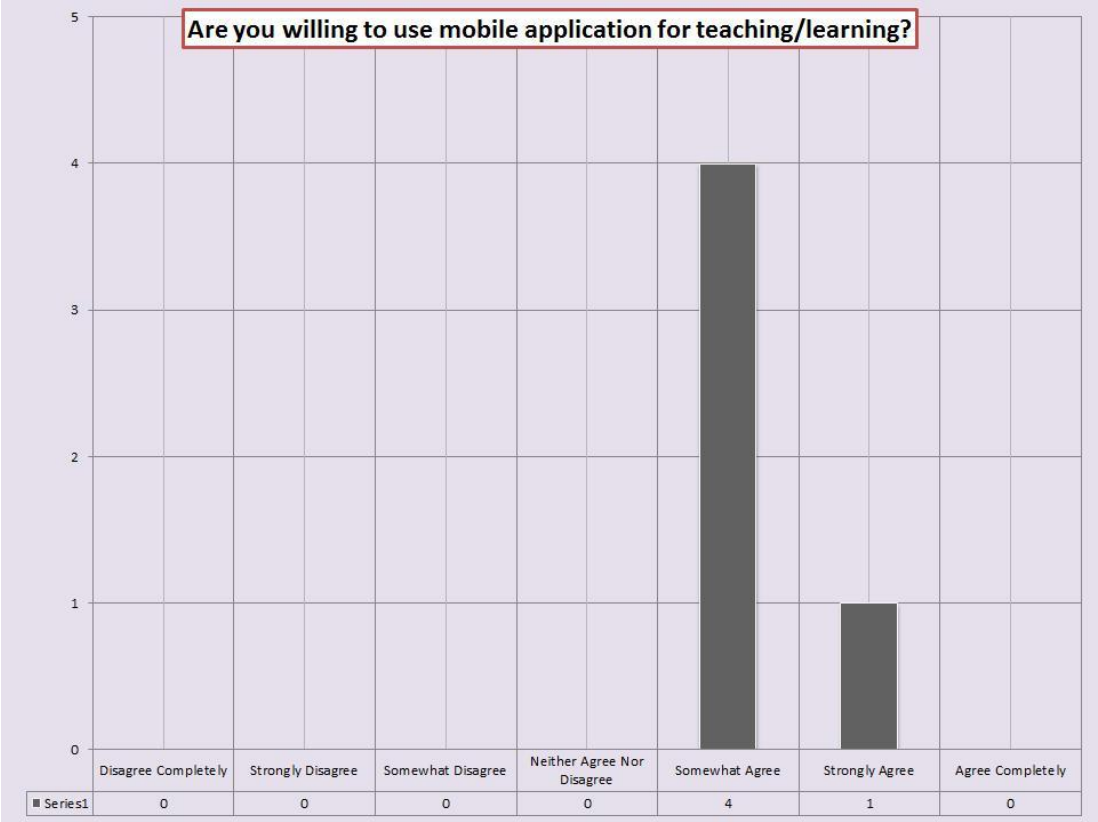


Figure 19: Survey Question 9

4.3. Discussion

An interview session was conducted with five primary school teachers on the subject of introducing mobile learning application to students in primary schools. The feedback that was collected from them included that Standard 1 students are active in using mobile application at a young age. They tend to use their parents mobile phones to play all sorts of games which include Angry Birds, Fruit Ninja, Speed Racing and many more. While playing these games, the students are somehow exposed to the world of mobile phones and they have the tendency to download more applications on their parents' phones thus exploring the applications and mobile devices. By doing so, it does help with their learning process in terms of stimulating good and useful ideas.

Besides that, these students have a basic understanding on how to use a mobile device and when they see a creative application, they would be attracted to it and start using it immediately. There were a few concerns on the mobile learning application. Firstly, the application has to be visually appealing and the use of visual aids to it make more creative so that the students will be attracted and not get bored using it. Secondly, not all students in the rural area will be having and using this kind of technology. This application would be well known in the urban area schools whereas students in the rural schools might not have heard about this application unless it was taught or showed to them by their school teachers. The reason being is because most of the students in the rural area are not technology savvy and the only tools for studying that they have are their textbooks. Thirdly, the application has to help them with their studies and facilitate better understanding of the subject and not to be used as a mere tool for enjoyment.

Based on the questionnaire distributed to the teachers, the data received is not persuasive enough because of the small scale of respondents which in this case is five teachers. In order to get better outcomes, the survey should be participated by significant number of teachers. By doing, the discussion will have more insights and perception from teachers on how they interpret, represent and understand the sensory information.

Besides that, the level of knowledge in new technology among teachers is just average because they are just using normal internet capable mobile devices. Based on the questionnaire most of the teachers use mobile applications for social networking, games, music, and entertainment purposes. Therefore there is little knowledge on mobile learning application such as this project and how it can be incorporated into the teaching and learning process. Apart from that, the awareness level of mobile learning application is not strong according to the replies received, they are just "*somewhat agree*" to the questions given.

Understanding the questionnaire assessment and results, they teachers may not want any changes to their way of teaching. They are accustomed and comfortable of using textbooks. For them, it might be a big hassle and additional work to learn and apply mobile learning to their profession. Some of them prefer the traditional methods of teaching such as classroom learning practice. In this setting, there is a student-and-teacher interaction whereby the knowledge is conveyed directly from teacher to student.

CHAPTER 5

CONCLUSION & RECOMMENDATION

5.1. Conclusion

In the initial phase of this project, most of the activities performed were to understand what mobile learning is all about, how is to develop a mobile learning application and how to incorporate mobile learning for primary school students. The main objective for this application is to provide an interactive learning platform for primary school students to understand the subject of Science on a better scale thus transforming the old textbook learning method.

Overall, this science learning application can further assist standard 1 student in learning the Science subject. In addition, it encourages independent learning among students and studying it using the mobile application can be handy.

The education system in Malaysia is constantly revised from time to time for the benefit of the students. The Ministry of Education is also constantly bridging the gap in terms of information and communication technology to the students across the nation in various ways. The rapid development in Information and Communication Technology has changed the way learning is conducted from the ancient ways of teaching to the current version towards e-learning and lately into mobile learning.

Mobile learning has been developed and implemented in fast paced countries and has positive effects. It has the potential to gradually transform the old methods of textbook learning to a more interactive learning method. With a proper structure creating a proper Mobile learning application for primary school students, it not only can be used as a tool in the subject of Science alone, but can be incorporated into various other subjects for the benefit of the younger generation in the field of education.

5.2. Future Works

It can be further enhanced by adding user profile account for every user that uses the application. Users can type their name upon welcome screen and start using the application. Apart from that, after performing the exercises, there would be a high score for each user that gets the correct answers in the quickest time possible.

It can be customized to add more sub topics from the main chapters for the learning section. In the learning section there would be a teacher that would teach them on a particular topic and then proceed to the exercise section. For every sub topic, there would be at least three exercises to further enhance their learning on that particular chapter. After completing the exercises, a mini test for respective chapters and sub topics can be added. Upon learning and completing the exercises, there would be an assessment section which contains graphs in each user account profile to show their progress on all topics.

In order to make the application more interesting for Standard 1 students, sound effects can be added for the learning section as well as the exercises. With regards to sound, it can make the application more lively and interactive for students.

REFERENCES

[1] Mahamad, S., Ibrahim, M. N., Malek Foad, M. I., & Taib, S. M. (2008). International Journal of Human and Social Sciences. Open Source Implementation of M-Learning for Primary School in Malaysia.

[2] Traxler, J. (2005). IADIS International Conference Mobile Learning. Defining Mobile Learning, 1-6.

[3] Parsons,D , Ryu,H.A Study of Design Requirements for Mobile Learning Environment.

[4] Hosseini, A.M, Tuimala, J(2005).Mobile Learning Framework. IADIS International Conference Mobile Learning.

[5] Nadler, J. (n.d.). *ICT in Education: Mobile Learning*. Retrieved July 28, 2013, from UNESCO: http://www.unesco.org/new/en/unesco/themes/icts/m4ed/

[6] Yusof, A. M., Daniel, E. G., Low, W.Y., & Aziz, K. A. (2011). Teachers' Perception on Mobile Learning for Special Needs Learner: A Malaysian Case Study. Kelantan.

[7] Mohamad,M. Woollard,John. Bringing Change in Secondary Schools : Can Mobile learning Via Mobile Phones Be Implemented In Malaysia?.

[8] *A Survey of System Development Process Models*.(1998). Center for Technology in Government, University of Albany.

[9] Abdul Ghani, N. Hamim, N. Ishak, N I. (2006).Malaysian Online Journal of Instructional Technology(MOJIT).Applying Mastery Learning Model in Developing E-Tuition Science for Primary School Students.

[10] Mohd Suki,N. Mohd Suki,N. (2010).The usage of mobile device for learning A Case Study.

APPENDIX A:

GANTT CHART

FYP 1

Activities/Weeks	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Research Work a.) Teaching Materials b.) Exercises Materials c.) Visual Aids(Pictures, Charts)														
Submission of Extended Proposal														
Proposal Defense														
Project Work a.) Rough Sketch of User Interface b.) Suitable User Interface c.) Compiling relevant teaching and exercise materials to be included. d.) Coding Process														
Interim Draft Report														
Interim Report														

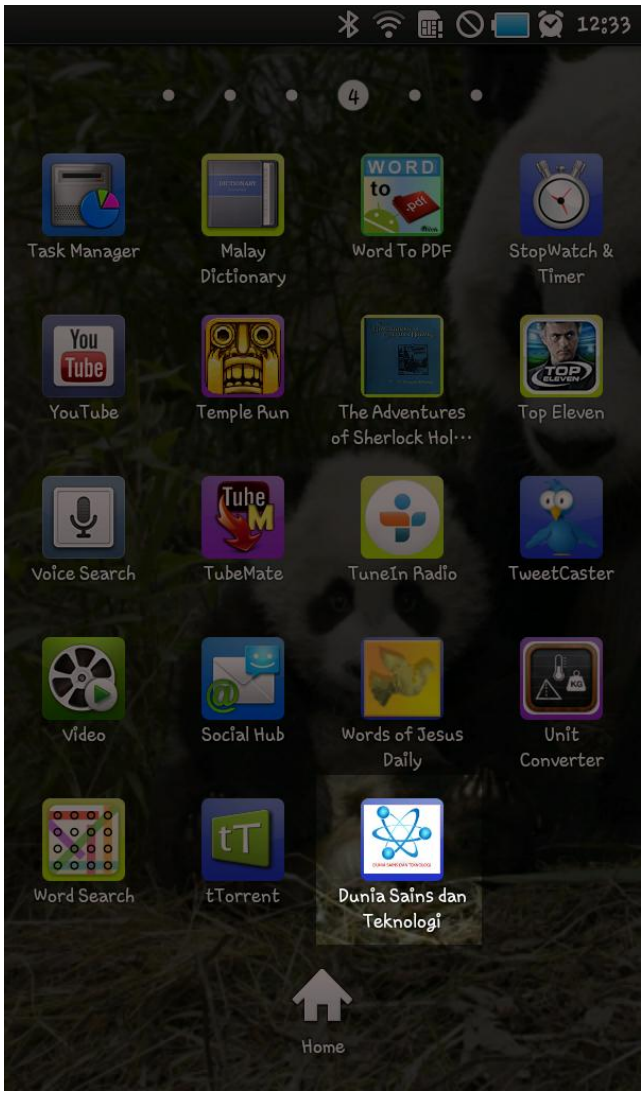
FYP 2

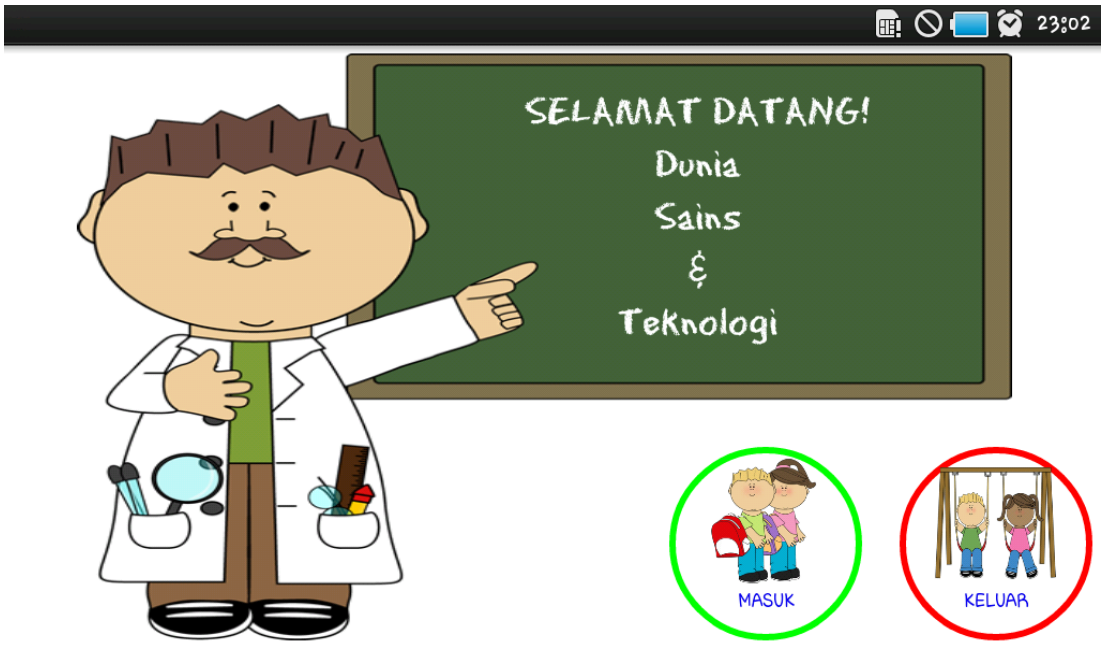
Activities/Weeks	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Project Work a.) User Interface b.) System Interface c.) Graphic User Interface d.) Learning Chapters/Tutorial Lessons														
Progress Report a.) Complete System Interface b.) Working Tutorials and Exercises c.) Error/Problems Faced d.) Development Status														
Project Work a.) Application Testing b.) Correction of Minor Errors c.) Error Free Code d.) Running on Android Platform e.) Test Run f.) Finalized and Working Application														
Pre-Sedex														
Draft Report														
Dissertation(Soft Bound)														
Technical Paper														
Oral Presentation														
Project Dissertation(Hardbound)														

APPENDIX B:

MOBILE APPLICATION

SCREENSHOTS


12:33
Task Manager
Malay Dictionary
Word To PDF
StopWatch & Timer
YouTube
Temple Run
The Adventures of Sherlock Hol…
Top Eleven
Voice Search
TubeMate
TuneIn Radio
TweetCaster
Video
Social Hub
Words of Jesus Daily
Unit Converter
Word Search
tTorrent
Dunia Sains dan Teknologi
Home

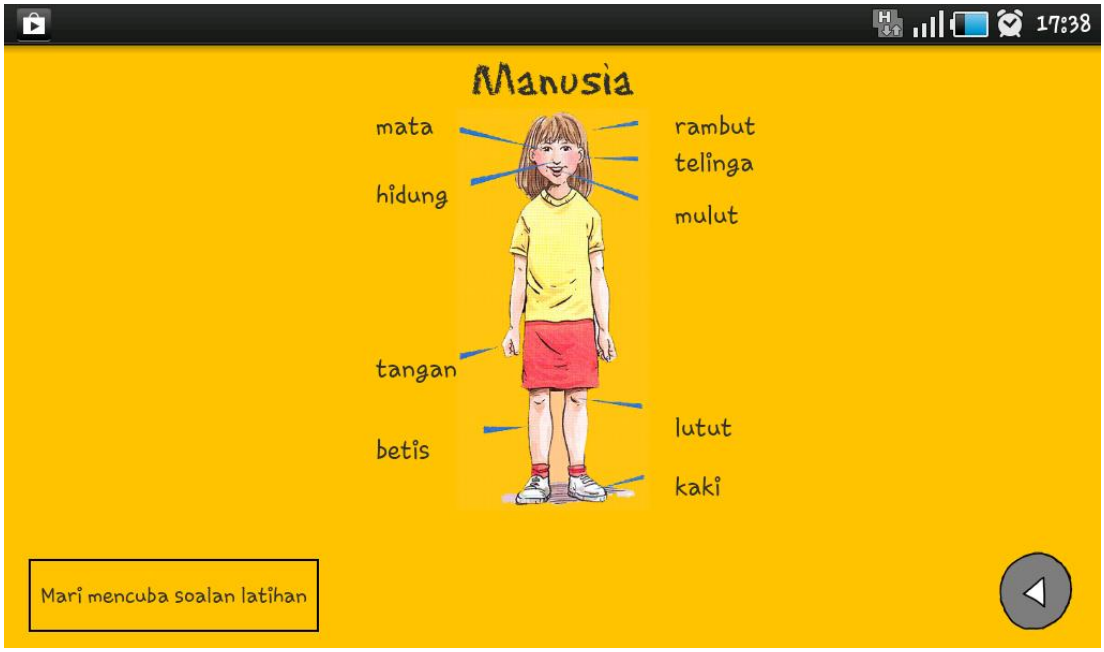

23:02
SELAMAT DATANG!
Dunia
Sains
&
Teknologi
MASUK
KELUAR


23:03
Sains Hayat
Sains Fizikal
Sains Bahan
Menu Utama


17:53
Sains Hayat
Benda Hidup &
Benda Bukan
Hidup
Manusia


17:37
Benda Hidup & Benda Bukan Hidup
Benda Hidup
-Kanak
-Monyet
-Pokok
-Burung

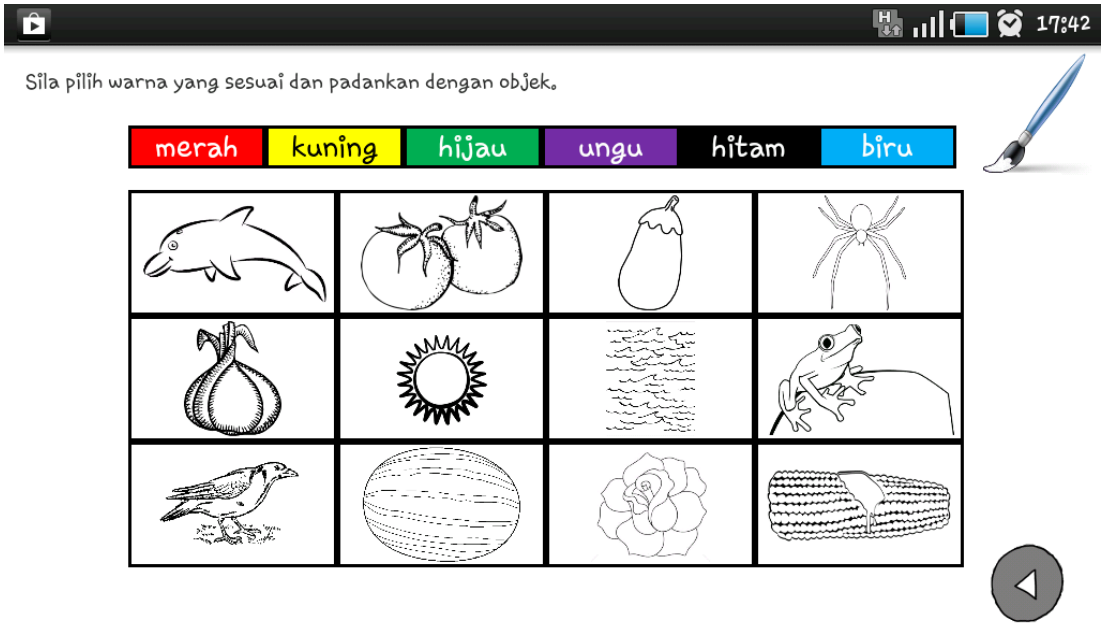

17:37
Benda Hidup & Benda Bukan Hidup
Benda Bukan Hidup
-Kereta
-Jam Dinding
-Televisyen
-Radio
Mari mencuba soalan latihan


17:38
Manusia
mata
hidung
tangan
betis
rambut
telinga
mulut
lutut
kaki
Mari mencuba soalan latihan

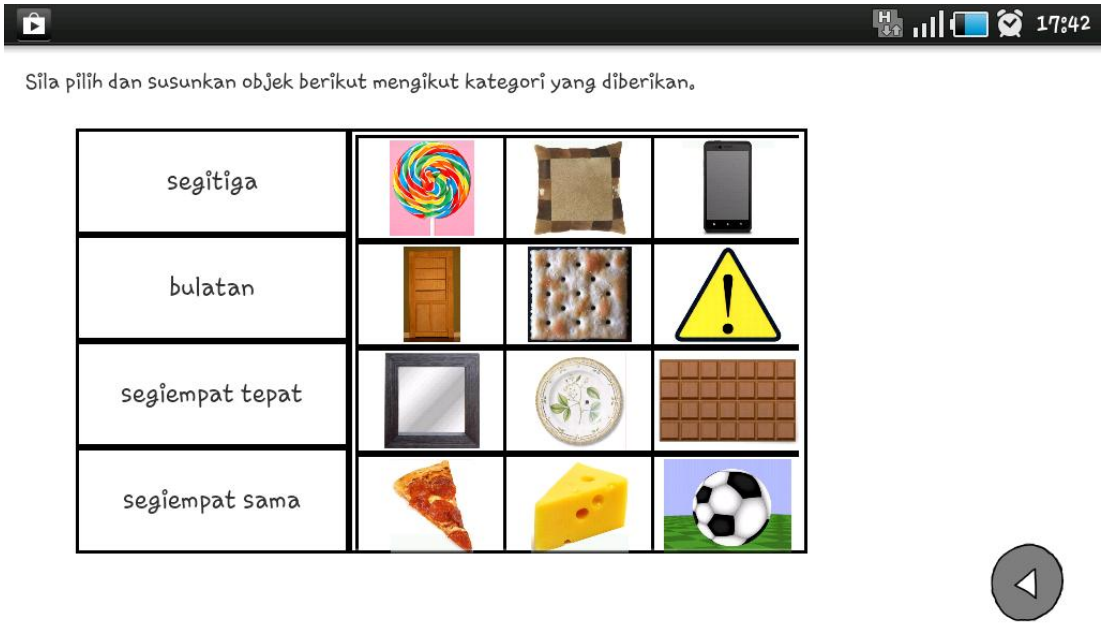

17:38
Sains Fizikal
Lidah untuk
Merasa
Mata untuk
Melihat


17:38
Lidah untuk Merasa
pahit
masin
manis
masam
Mari mencuba soalan latihan


17:39
Mata untuk Melihat
kuning
merah
ungu
biru
hijau
hitam
Mari mencuba soalan latihan


17:42
Sila pilih warna yang sesuai dan padankan dengan objek.
merah
kuning
hijau
ungu
hitam
biru

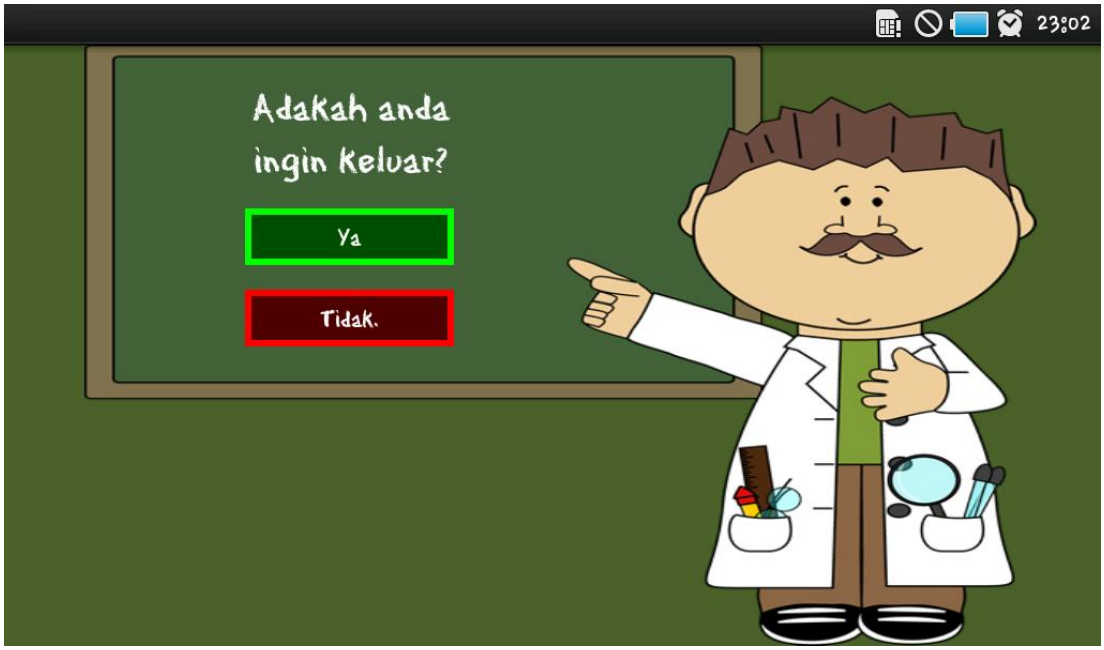

17:42
Mata untuk Melihat
segitiga
segiempat sama
segiempat tepat
bulatan
Mari mencuba soalan latihan


17:42
Sila pilih dan susunkan objek berikut mengikut kategori yang diberikan.
segitiga
bulatan
segiempat tepat
segiempat sama


17:43
Sains Bahan
Timbul dan
Tenggelam


23:16
Timbul dan Tenggelam
Mari mencuba soalan latihan


23:19
Tahniah!
Anda telah berjaya menyelesaikan semua soalan.


23:02
Adakah anda
ingin keluar?
Ya
Tidak.

APPENDIX C:

MOBILE APPLICATION

STORY BOARD

Science Learning Application (Story Board)

- The Science Learning Application is mobile learning application to further enhance the Standard 1 (7 year old) students studying Science and Technology Subject.

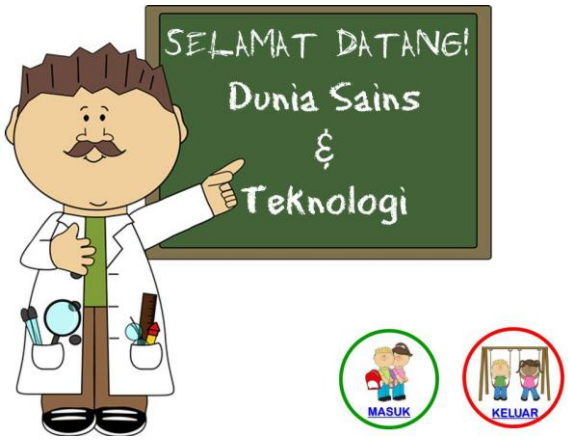
- There will be different topics for learning and exercises included in the application. The following topics are:
  - Sains Hayat
    - Benda Hidup dan Benda Bukan Hidup
    - Manusia
  - Sains Fizikal
    - Mata untuk Melihat
    - Lidah untuk Merasa
  - Sains Bahan
    - Timbul dan Tenggelam

- For the science learning application entitled "Dunia Sains dan Teknologi". The application contains Welcome Page, Menu Utama, Sains Hayat, Sains Fizikal, Sains Bahan, Exit Page.

- Upon completion of every exercise for certain topics, there will be a greeting message saying, "Tahniah! Anda telah berjaya menyelesaikan semua soalan".

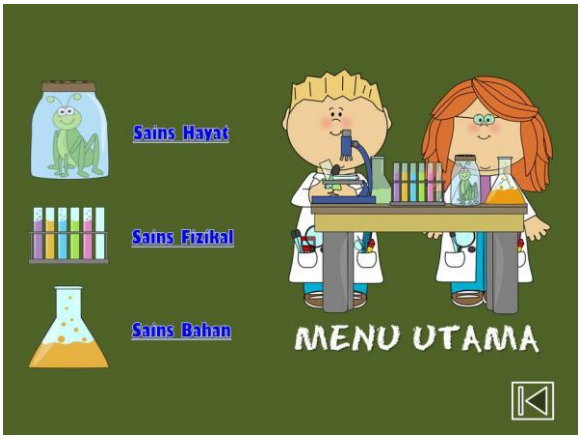
1.) WELCOME PAGE

- There will be two buttons used: MASUK and KELUAR button.
- For the MASUK button, when users click it, it will proceed to the Menu Utama page.
- For the KELUAR button, it will go to the Exit page.



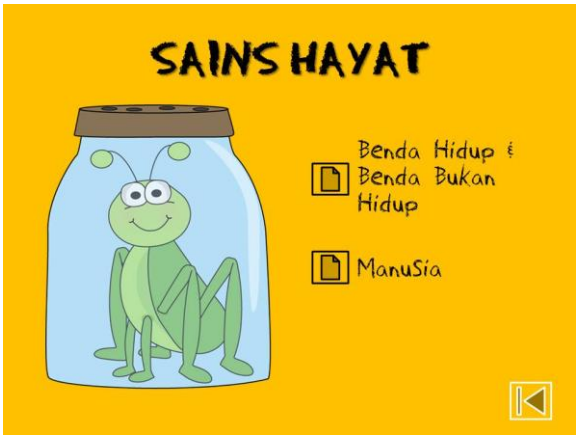
2.) MENU UTAMA

- In here, there will be four buttons. Sains Hayat, Sains Fizikal, Sains Bahan and Back button.
- When users click Sains Hayat, it will go to the Sains Hayat page.
- When users click Sains Fizikal, it will go to the Sains Fizikal page.
- When users click Sains Bahan , it will go to the Sains Bahan page.
- If users want to go back to the previous screen, they can click the Back button at the bottom right of the page and it will be directed to the Welcome Page.



3.) SAINS HAYAT

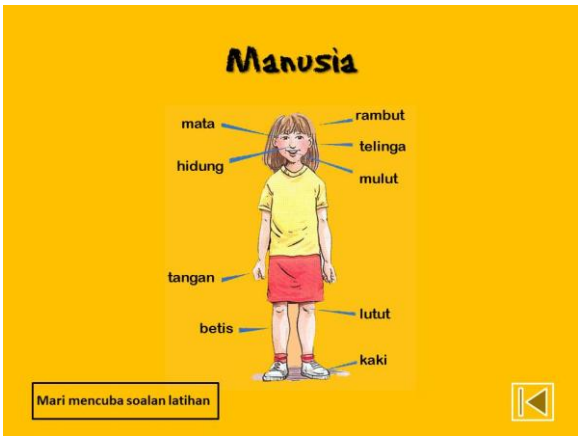
- In here there will be three buttons: Benda Hidup & Benda Bukan Hidup, Manusia and Back Button.



- When users click Benda Hidup & Benda Bukan Hidup, the screen must appear exactly as shown in the Figure B below.

- Benda Hidup: Kanak, Monyet, Pokok, Burung (with its respective images).
- On the same screen (Benda Hidup), there will be two buttons accessible.
- Back button to go to previous screen (Sains Hayat Menu).
- Next button to go to the next screen (Benda Bukan Hidup).
- Once next button is selected, it should be directed to Benda Bukan Hidup page. In this page, four (4) objects will be shown accordingly: (See Figure C below)

- Benda Bukan Hidup: Kereta, Jam Dinding, Televisyen, Radio (with its respective images).
- Once all the four objects have appeared, there should be a button called Mari Mencuba soalan latihan which links directly to the exercise page.
- After doing the exercise, there will be a message screen showing the following: "Tahniah! Anda telah berjaya menyelesaikan semua soalan".
- On the Tahniah Screen, there will be a button that will direct the user back to the Sains Hayat Page and will be able to continue to choose another topic (Manusia).
- Once the user chooses Manusia, there will be a picture shown for learning (See Figure D below).



- After the learning, same as the previous one, there will be a button to do the exercise "Mari mencuba soalan latihan". There will be also a Back button to direct user back to Sains Hayat Menu Page.
- Tahniah Message will appear after completion of the exercise.

4.) SAINS FIZIKAL

- In the Sains Fizikal landing page, there should be three buttons: Mata Untuk Melihat, Lidah untuk merasa and Back button. (As shown below)

- Upon selecting Mata untuk Melihat, there will be learning shown below:

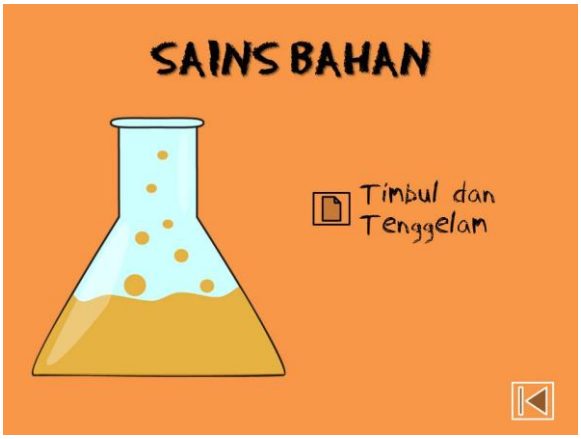
- There will be two buttons accessible.
  - Mari mencuba soalan latihan button to direct user to the latihan.
  - Back button to go back to the Sains Fizikal Menu Page.
- Then after completing the exercise, Tahniah Screen will appear and there will be Back Button to go back to Sains Fizikal Menu Page and, Next button to direct to next learning (Mata untuk melihat).

- After learning, the user will be to choose from the two buttons:
  - Mari mencuba soalan latihan button to direct user to the latihan.
  - Back button to go back to the Sains Fizikal Menu Page.
- Then after completing the exercise, Tahniah Screen will appear and there will be Back Button to go back to Sains Fizikal Menu Page in able to continue to the next topic Lidah untuk Merasa.
- Lidah untuk Merasa page will have the mari mencuba soalan latihan button for exercise and back button to direct back to Sains Fizikal Menu Page. (As shown below)

- After completing the exercise, Tahniah Screen will appear and there will be Back Button to go back to Sains Fizikal Menu Page and next button to direct to a new topic, Sains Bahan.

5.) SAINS BAHAN

- For Sains Bahan, there will be one sub-topic available, Timbul dan Tenggelam. Back button is also available to direct back to the Menu Utama Page.



- Upon selecting Timbul dan Tenggelam, there will pictures for learning. The sequence of the pictures is shown at the presentation slide. (See preview picture below)

- Like the other topics, there will be two buttons presented:
  - Mari mencuba soalan latihan button to direct user to the latihan
  - Back button to go back to the Sains Bahan Menu Page.
- After the exercise completed, Tahniah message will pop-up. There are two buttons available:
  - Back button to go back to Sains Bahan Menu Page
  - Close button to exit the application. Once the close button is selected, it will be directed to the EXIT page.

6.) EXIT PAGE

- The Exit page will be shown when the Keluar button is chosen from the Welcome page and the Close button from the last exercise.
- To buttons can be chosen from the Exit page:
    - YA to end and close the application
    - TIDAK to cancel and will be directed back to Welcome Page.

APPENDIX D:

QUESTIONNAIRE

Name of School	
Class Section	
Number of students	
Teacher's Name	

PART I: RESPONDENT'S PROFILE

How long have you been teaching Science?			
	0 – 3 years		5 – 10 years
	3 – 5 years		More than 10 years

What are your qualifications?			
	None		Teaching certificate
	Teaching diploma		Masters
	PhD		Others, please specify:_____
	Degree		

PART II: Mobile Device

Which mobile device do you own?			
	iPhone		Android Phone
	Internet capable phone		I don't own a mobile device

Which mobile device(s) do you plan to buy?			
	iPhone		Android Phone
	Internet capable phone		I'm not planning to buy a mobile device

Please indicate (√) the extent to which you agree with the following statements:							
	Disagree Completely	Strongly Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Strongly Agree	Agree Completely
Do you ever use your mobile device as a teaching or learning tool?							
Would you use mobile application to develop your own teaching?							
Do you think mobile learning will play an important role in the future of Science subject learning?							

PART III: Mobile Learning

Please indicate (√) the extent to which you agree with the following statements:							
	Disagree Completely	Strongly Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Strongly Agree	Agree Completely
Does mobile learning add value in learning Science subject?							
Is the mobile application useful to supplement to an existing Science subject teaching?							
Are you willing to use mobile application for teaching/learning?							

Do you have any recommendation or suggestion that will improve this mobile application?