# Li-Booster: INTERACTIVE LITERACY COURSEWARE USING ANIMATION FOR LINUS PROGRAMME

By

Aiman Bin Johanor

An Progress Report submitted in partial fulfillment
of the requirement for the
Bachelor of Technology (Hons)
(Information & Communication Technology)

JANUARY 2013

Universiti Teknologi PETRONAS
Bandar Seri Iskandar,
31750 Tronoh
Perak Darul Ridzuan

# CERTIFICATION OF APPROVAL

**Li-Booster: INTERACTIVE LITERACY COURSEWARE USING ANIMATION FOR LINUS PROGRAMME**

by

Aiman Bin Johanor

A project dissertation submitted to the
Information & Communication Technology Programme
Universiti Teknologi PETRONAS
in partial fulfilment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION & COMMUNICATION TECHNOLOGY)

Approved:

_____

(Assoc. Prof Dr. Wan Fatimah Bt Wan Ahmad)
Project Supervisor

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

January 2013

# CERTIFICATION OF ORIGINALITY

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

_____

Aiman Bin Johanor

# ABSTRACT

Literacy and Numeracy Screening (LINUS) has been created in 2009 to fulfill the objectives of increasing the literacy and numeracy rate in Malaysia, however the programme are not implemented in secondary school whereby there are large number of students that are still not equipped with Literacy and Numeracy skills. The focused groups for the project are secondary students, so more interactive method need to be used to gain the student interest. This project shows the important of multimedia integration into the new teaching method of LINUS programme. The objectives of the project is to do research on interactive multimedia (animation) to be integrated for LINUS programme, develop prototype that incorporates animation, graphic and interactive lesson, and conduct the user acceptance test on the developed prototype. The literature review component discussed about the LINUS programmed, the rationale and method used for LINUS programme in school, then the importance of integrating multimedia in learning especially literacy learning. Rapid Application Design (RAD) has been used for this project methodology because it allows the developer and end user to discuss on developing the courseware. The project phases are being discussed in detail at the methodology section. The courseware has been developed based on the use case, process flow chart and storyboard designed earlier to ease the development process. The prototype are being developed using the concept read-along book and for each story student will have to go through quizzes to test their understanding. The testing has been done at schools with the 30 student involves in the testing and result of the usability and effectiveness has been discussed in the chapter. In the recommendations section, all the related recommendations and some improvements that can be done for the future of this project are listed and elaborated. The conclusion section concludes the overall project.

# ACKNOWLEDGEMENTS

First and foremost, Alhamdulillah and thanked to Allah the almighty for His consent and plentiful of endowment, that allows me to complete this project. I would like to thank my supervisor, Dr. Wan Fatimah for her guidance and continuous support in completing this project. Her willingness to spend time and consult me in my project progress. Her constructive ideas and suggestions were shared to me by her on how to further enhance the project and on how to conduct a good research. Her understandings and encouragement have been inspiring me to be more creative in this project. Her advices motivate me to do my best in trying to complete the whole project. Thank you for this great opportunity.

I owe my deepest gratitude to my friends, Nur Hanisah Mohd Fauzi for her help, support and motivation contributed, to this project. Her advices always encourage and motivate me to be strong until I finish this project, even though there are a lot of challenges up ahead and I almost give up. Regards and blessing also to my family for motivates me to go through many obstacles I faced while completing this project. Thank you for the support, time, money and energy to help me.

Thank you also to all my fellow friends that help me a lot in completing this project. They always give advices and guidance to make sure that I will do the excellent work. Lastly, I would like to thank all of the people who have contributed directly or indirectly towards the success of this project.

# TABLE OF CONTENT

# LIST OF FIGURES



# LIST OF TABLES

# ABBREVIATIONS AND NOMENCLATURES

| | |
|---|---|
| **et al.** | And others |
| **LINUS** | Literacy and Numeracy Screening |
| **KIA2M** | Early Intervention Reading Class |
| **NKRA** | National Key Result Area |
| **Protim** | 3R Remedial Program |
| **GTP** | Government Transformation Program |

# CHAPTER 1

# INTRODUCTION

## 1.1 Background of Study

Literacy and numeracy lay the foundation for learning in primary education and beyond. Without these abilities, it is nearly impossible for students to attain higher education and function in the modern society. However, statistics showed that a sizeable student population in Malaysia are still ill-equipped with basic literacy and numeracy skills.

The Literacy and Numeracy Screening (LINUS) programme is aimed at ensuring that all Malaysian students acquire basic literacy and numeracy skills. For literacy skills, the students are expected to read, write and understand words, simple and complex sentences in Bahasa Malaysia and apply such knowledge in learning and everyday communication.

However current method used by the Education National Key Results Area (NKRA) is more on textual interface, and hand out, where by these methods is less interactive and attractive. It is suggested that the education program should use more interactive method such as using animation, graphic and sounds to attract the student interest to learn. By adding the multimedia element into the teaching material could help in boosting the student interest towards learning in class.

So, the project will research on the suitable method and elements required in developing the courseware for the LINUS programme. The focus of the courseware is the literacy (reading, writing and understanding of sentences) method by applying element such as graphics, animation, and video to the programme.

## 1.2 Problem Statement

In 2010, the LINUS programmed aimed to achieve both literacy and numeracy rates of 90%, while the literacy target fell short by 5% and the numeracy target exceeded the original aim with a 91% rate (*Noel.C, 2011*). The current method used by the Education NKRA for LINUS programme is using textual interface and handout such as paper exercise and books, where by these method is less attractive to the children. Even though the current method used is projecting a positive result, it takes longer time to achieve the goals. Therefore, a research will be conducted to apply interactive programme or system to enchance the LINUS programme.

Studies have shown that students become more motivated when technology and multimedia are allowed for their learning (Kozma, 2005). However a courseware is not yet being developed to assist in the LINUS programme. Developing a courseware with the element of multimedia such as graphic and animation could be used in replacing the current method used by the Education NKRA.

## 1.3 Objective and Scope of Study

For the research of the LINUS programme that going to be developed, it will be focused on literacy to enhance their reading, writing and understanding of words.

I. To do research on various method of interactive multimedia to be integrated for LINUS programme.
II. To develop prototype on the learning of literacy.
III. To conduct a user acceptance test on the developed prototype

The courseware that will be developed will demonstrate lessons for LINUS students through graphics, animation and video. The courseware will provide interactive lessons for LINUS students and interactive activity session in learning. This indirectly can reduce the time spend learning as the student will grasp the concept quicker with the help of the multimedia elements.

The scope of study for this project is Flash and its ability to be used for animation application development. With the help of Flash and its Actionscript 3.0, animation is made possible. The function Adobe Captivate provided to create an e-learning courseware is very helpful. However with the new function and latest feature it is going to be challenging for first time user. The application also allow users to integrate flash animation, video and sound into the e-learning makes it a very powerful tools.

The targeted user for this courseware will be lower secondary students between 13 years old to 15 years old. The teacher in school also will be using the courseware to help them teach the student at school for student under the LINUS programme. The LINUS programme will also be adapt to the lower secondary school. With this, the project is expected to be finished within 8 months, from the initial documentation stage, development, testing until the final touchup of the prototype.

### 1.4 Project Feasibility

The benefit from this project is the LINUS programme in Malaysia can cut down the material used and cut cost. The term of cost here are referring to the cost of buying paper, file and printing for the LINUS programme. Futhermore, cost can also be derived from this project because it can save a lot of money from spending it to the expertise to build the courseware for LINUS programme. The material used currently such as paper, handouts and text books can be replace with the courseware that is more interactive, fun and easy to use.

Other than that, the benefits give an impact to the student under the LNUS programme. By using the courseware in learning, indirectly can reduce the time spend

learning as the student will grasp the concept of matter more quickly with the help of visualization and other multimedia elements.

Within eight months, this project can be completed at least to the minimum requirements. It also depends on the amount of scope that would be encountered which is inevitable. Due to the scope and testing difficulties, it is also difficult to gauge how perfect the system can be within the time frame.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 The Malaysian Education

In Malaysia, The Ministry of Education is responsible in drawing up the National Education Policy based on the National Ideology or also known as the "Rukunegara" adhering to Malaysia aspiration of unity and development.

The Malaysian education system encompasses education beginning from pre-school to university. Pre-school to secondary education is under the jurisdiction of the Ministry of Education (MOE) while tertiary or higher education is the responsibility of the Ministry of Higher Education (MOHE). Under the Government Educational Programme, The Ministry of Education aims to equip students with the essential skills in a holistic and integrated manner, in order to produce individuals who are intellectually, spiritually, emotionally and physically balanced. They want to produced skilled manpower for economic and can contribute effectively towards national development (*Information on Malaysian Education, n.d*).

Since the last ten years the curriculum has been revamped to meet the needs of the country. Among them are the adoption of the "Kurikulum Bersepadu Sekolah Rendah" (KBSR), "3R's" (Reading, Writing and Arithmetic), "Kurikulum Bersepadu Sekolah Menegah" (KBSM), "Early Intervention Reading Class" (KIA2M), and 3R Remedial Program (Protim). The programme has been created to cater issues such as slow learner student and integrate all the education programme in Malaysia.

### 2.1.1 National Key Result Areas (NKRA)

The National Key Result is another effort by the Malaysia Government to fulfill the needs of public in Malaysia. It was implemented on September 2009 with six principal elements:

- Reduce crime rate
- Fight against corruption
- Expanding excess to quality and affordable education
- Improve the living standards of low-income households
- Improve the infrastructure in rural and remote area
- Improve the public transportation service

Each of the objectives are handle by a different ministry in Malaysia. The Ministry of Education are responsible for the third objectives that is; Expanding excess to quality and affordable education.

### 2.1.2 Education NKRA

Part of the six principal elements in NKRA was expanding excess to quality and affordable education whereby this ideal is the responsibility of the Ministry of Education. Deputy Prime Minister, Tan Sri Muhyiddin Yassin said the subs-objectives for Education NKRA are:

- Expanding and strengthening the preschool education
- Increase the Literacy and Numeracy rate
- Create high-performing school
- Monetary incentives and non-financial support to school leadership

To achieve the second sub-objective; Increace the Literacy and Numeracy rate, The Ministry of Education has created LINUS to achieve the objectives. They aim that all child will be able to acruire basic literacy and numeracy skills

after 3 years of mainstream primary education by the end of 2012 (Education NKRA Lab, n.d).

## 2.2 Understanding LINUS

### 2.2.1 Definition of LINUS

LINUS is an acronym for Literacy (LI), Numeracy(NU) and Screening (S). So LINUS stand for Literacy and Numeracy Screening (*Apa Maksud Program Linus, 2011*). This program is being developed to enhance the current program call 'Early Intervention Reading Class' (KIA2M), and to ensure that the student dominate the fundamental of reading, writing and calculate at the end of their learning.


Figure 2.1: Flash cards are used to teach Bahasa Malaysia vocabulary.

A literacy skill is the ability to read, write and understand the meaning of sentences and apply the knowledge in learning and daily communication (*Kang.S.C, 2011*). The student is expected to be able to read, write and understand the meaning of sentences in Bahasa Malaysia and could apply those knowledge in learning and everyday communication at the end of the program. With literacy skill student will be able to read and understand basic sentences and allowed them to apply those skill in their daily life such as reading newspaper.

Numeracy skills is defined as the ability to read, write, count and arrange (in order) whole numbers from one till 1,000 (*Kang.S.C, 2012*). According to Kang the student also expected to demonstrate the ability to solve basic mathematical operations, apply mathematical skills and knowledge in everyday activities involving time, currencies and measurements. Basic mathematical operation is going to help student in understanding basic mathematical operation such as adding and apply those skill in their daily life.

### 2.2.2 Rationale of LINUS

Contributing factors to low academic achievement within three main domains is self-efficacy and cognitive ability, support system and socio-economic (*Shahrina et al., 2012*). This shown that low academic achievements are effected by those factors and the needs of extracurricular in school could help in the student learning.

A lot of programs have been done by the Education Ministry to cater students that does not master the basic 3M (*Mendengar, Membaca dan Menulis*) skills, however it is yet to be fully resolved (*Program Linus Sekolah, 2010*). Example of the programme :-

I. 'Early Intervention Reading Class' (KIA2M) programme for student in Year 1 and been implemented on 2006.
II. Recovery program for student in Year 2 and 3, managed by the teacher from the school itself.
III. 3R Remedial Programme (Protim) for students in level 2.
IV. PROTIM after UPSR.

So under the Government Transformation Programme (GTP), the Education National Key Result Area (NKRA) aims to cater the issue, detect and recover as early as possible and come out with Literacy and Numeracy Screening (LINUS) programme that are more integrated.

### 2.2.3 Implementation Strategy for LINUS in school

LINUS programme must be carried out in every school in Malaysia; *Sekolah Kebangsaan, Sekolah Jenis Kebangsaan Cina, dan Sekolah Jenis Kebansaan Tamil*. There will be three screening each year; first screening on March, second screening on June and third screening on September. All Year 1 students will go through a LINUS test to determine their basic skill.

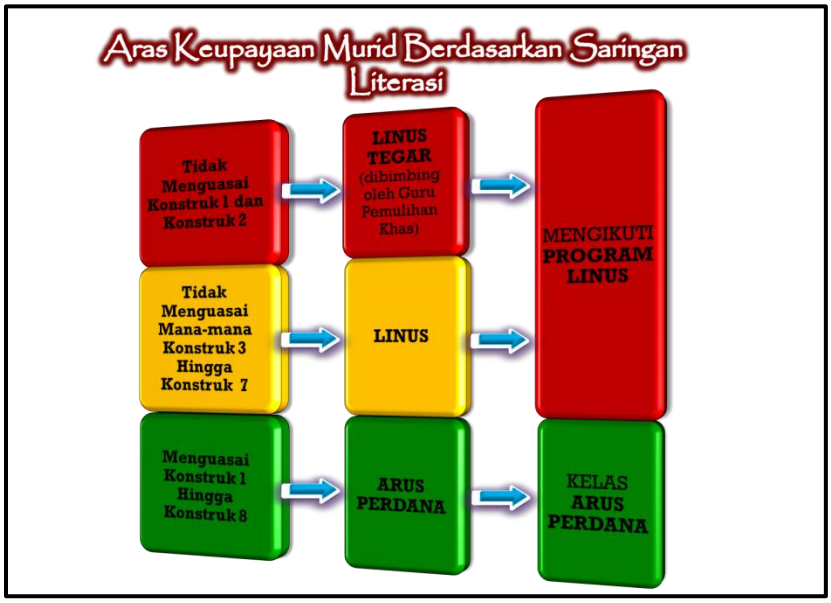



Figure 2.2: Students level based on literacy screening

Student will be classified into three (3) stages. The first one is the student that does not master any of the construct conducted by the school and will be put under the LINUS programme and been guide by the teacher. The second is the student that does not master the third till seventh construct conducted by the school and the student will go through the LINUS programme. For the student that master the entire construct conducted by the school they does not have to go through the LINUS programme.

### 2.2.4 Method Used for LINUS

Intensive training for teacher has been implemented since the lack of teacher needed to teach student for literacy and numeracy to strengthen the knowledge of the teacher to teach the students. Lots of campaigns have been done to create awareness among teachers, and parents so that they can fulfill their role in the programme.

The learning module for the LINUS programme will be based on the concept that the student will be mastering the literacy and numeracy. Concepts that have been taken account are integrated approach, progression, repetition, and fun lesson. The module will include several technique need to be thought and other activities and exercise.

| LITERASI | TAHAP 1 | | |
|---|---|---|---|
| Membaca dan menulis | Menguasai dan memahami minimum 1000 patah perkataan mudah | | |
| | Membaca, menullis dan memahami ayat tunggal | Membaca, menullis dan memahami ayat tunggal dan ayat majmuk (menggunakan kata hubung 'dan') | Membaca, menullis dan memahami ayat tunggal dan ayat majmuk (menggunakan kata hubung 'dan') dalam perenggan |

**DEFINISI KONSEP**

| NUMERASI | TAHUN 1 | TAHUN 2 | TAHUN 3 |
|---|---|---|---|
| Aplikasi | Mengenal mata wang Malaysia hingga RM10 | Mengenal mata wang Malaysia hingga RM100 | Mengenal mata wang Malaysia hingga RM1000 |
| | Menyatakan bahagian dalam sehari | Menyatakan waktu dalam jam pada muka jam analog | Menyatakan waktu dalam jam dan minit pada muka jam analog |
| | Mengukur dan menyatakan ukur panjang objek dalam unit relatif | Mengukur dan menyatakan ukur panjang objek dalam unit yang betul | Mengukur dan menyatakan ukur panjang objek dalam unit yang betul (cm sahaja) |

Figure 2.3: Module for LINUS programme

Screening will be done three times a year so student will go through three different modules each screening. From the module student will be tested and determined how much have they learn and progress. Difficulties of each module will be different and increase in each phase.

## 2.3 Interactive Multimedia

The definition of multimedia is the exciting combination of computer hardware and software that allows you to integrate video, animation, audio, graphics, and test resources to develop effective presentations on an affordable desktop computer (Fenrich, 1997). Multimedia is characterized by the presence of text, pictures, sound, animation and video; some or all of which are organize into some coherent program (Philips, 1997). In today's modern world multimedia is known as the combination of the five elements of multimedia that is graphic, text, sound, animation and video. Interactive multimedia is defined when end user could control or interact with the multimedia project.


Figure 2.4: Multimedia elements

Multimedia have been used in a lot of ways in the modern days, besides being a powerful tool for making presentations, multimedia offer advantages in the field of education. For instance, text alone does not allow student to understand the tone of poem and a story expression. Multimedia enables us to provide a way which learners can experience their subject in a various way.

With multimedia, the process of learning can become more goals oriented, more participatory, flexible in time and space, unaffected by distances and tailored to individual learning styles, and increase collaboration between teachers and students

(*Multimedia in an education tools, n.d*). So making a multimedia courseware for the LINUS programme could help in the student education and boost their interest in learning. It is very crucial for student to participate with teachers in learning and using multimedia could increase the effectiveness of LINUS programme. Moreover, studies have shown that students become more motivated when technology and multimedia are allowed for their learning (Kozma, 2005).

### 2.3.1 Definition of Animation

Animation, animated and animator all derive from the latin verb, *animare*, which means 'to give life to'. Even though animation has been used since the early 90's, computer animations are still not well understood. According to Paul Wellis (2003) an animation is a film made by hand, frame-by-frame, providing an illusion of movement which has not been directly recorded in conventional photographic sense. In other word, animation is a moving image created from an overlapping of images to create an illusion of movement.

Animation is a process of simulating real and dynamic behavior of objects and events using rules of computer graphics, multimedia and the physics of particle dynamics (Malay K., 2010). According to her animation can also be defined as making a static object into a realistic visualization by incorporating colors, shades, structure lighting and movement to the object.

An animation can also be thought as making the object moving. Desai (2008) define computer animation as a generation of time sequence of visually changing objects in their shapes, color, orientation, translation, rotation, transparencies, etc. Betrancourt and Tversky's (2000) on the other hand define computer animation to any application which creates a series of frames, so that each frame appears as an alteration of the previous one, and where the sequence of frames is determined either by the designer or the user.

### 2.3.2 Animation in Education

Advance in media, technology and psychology have had an enormous effect on how students learn and how teachers teach. Over the last two decades several studies have investigated the effects of diagrammatic animation on learning. However, the research into the use of animation in education has generally resulted in inconsistent findings, not only in terms of whether or not animation is beneficial to learning, but also in terms of the specific factors that may influence those cognitive benefits or disadvantages.

Throughout several study done, children become more engage in playful interaction with stories which are likely motivating (DeJong & Bus, 2003). On the other hand, James (1999) found that children didn't navigate through an entire story, seemed distracted by pictorial details, and became engrossed in less relevant and entertaining animations after an initial pass through the story. Furthermore children reading electronics stories explored the story in a seemingly random order focusing more on appealing animation (Mayer, 2005).

Rieber's (1990, 1991) has done an experiment between groups of students to see the different effect on learning towards animation and static graphics. From his findings 80% of the learners in the animation group displayed more learning persistence (when interacting with learning materials) than the students in the static graphic groups. The animation group demonstrated more positive attitude than the graphics group (Feng *et al*., 2006). So from the statistic Rieber's (1990, 1991) claim that animation is an engaging tool that encourages continuing learning motivators.

### 2.3.3 Animation for Literacy Learning

Multimedia education proves to be more effective that traditional printed material because the dynamic and interactive settings are more expensive in presenting abstract concept and can inspire creative thinking and engagement (Irene *et al.,* 2010). Animation is a part of multimedia element whereby this element can be

used to teach in literacy learning. Research and development of animation courseware for literacy learning has been done.

Student could benefit from animation in their learning and animation could engage with the learning material and gain more knowledge from it. Children just starting to read have also been found to benefit from talking books with accompanying text and reinforcement text (Lewin, 2000). Adding text and sound could help in making the courseware to be more helpful in teaching. Animation and special effects may improve the quality of the story model by providing multi-sensory cues to children with language and literacy disorder (McKenna *et al.,* 1999).

Lots of animation literacy courseware has been made to help in literacy learning for English and Bahasa Malaysia literacy. However the courseware focuses more for children age 6 and above. Since the scope for the project is for children 13 to 15 years old some of the courseware are not suitable. There are several courseware in the market for example “The animated-Alphabet Story, Song, & Action Book”, “The Book of Pattern Reading, Wrinting , & Singing Activities” by  and “The Animated-Literacy Beginning & Advanced Workbooks” all by Jim Stones.

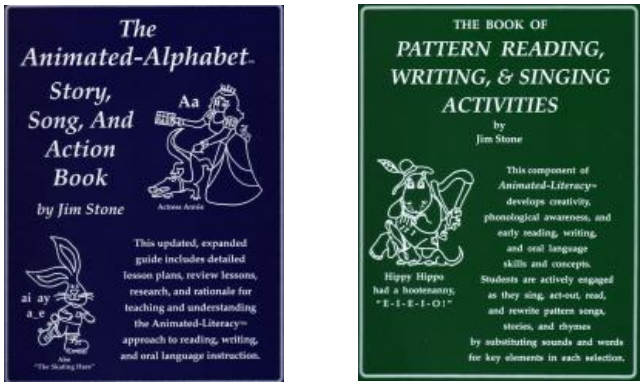


Figure 2.5: Cover for the animated-literacy learning courseware

# CHAPTER 3

# METHODOLOGY

## 3.1 Introduction

Methodologies mean a ways of how the process of the system will be made. In process of making a system, there are numerous types of software development methodologies. Examples of the methodologies that are available are Structured System Analysis and Design Method (SSADM), Joint Application Design (JAD), Prototyping, and Rapid Application Development (RAD). The methodology used in this project is a combination of a Rapid Application Development (RAD) and Waterfall Model. All phases in waterfall model is included in RAD but at a compress and intensify rate. Phases in RAD are; Requirements Planning, User Design, Construction, and Cutover.

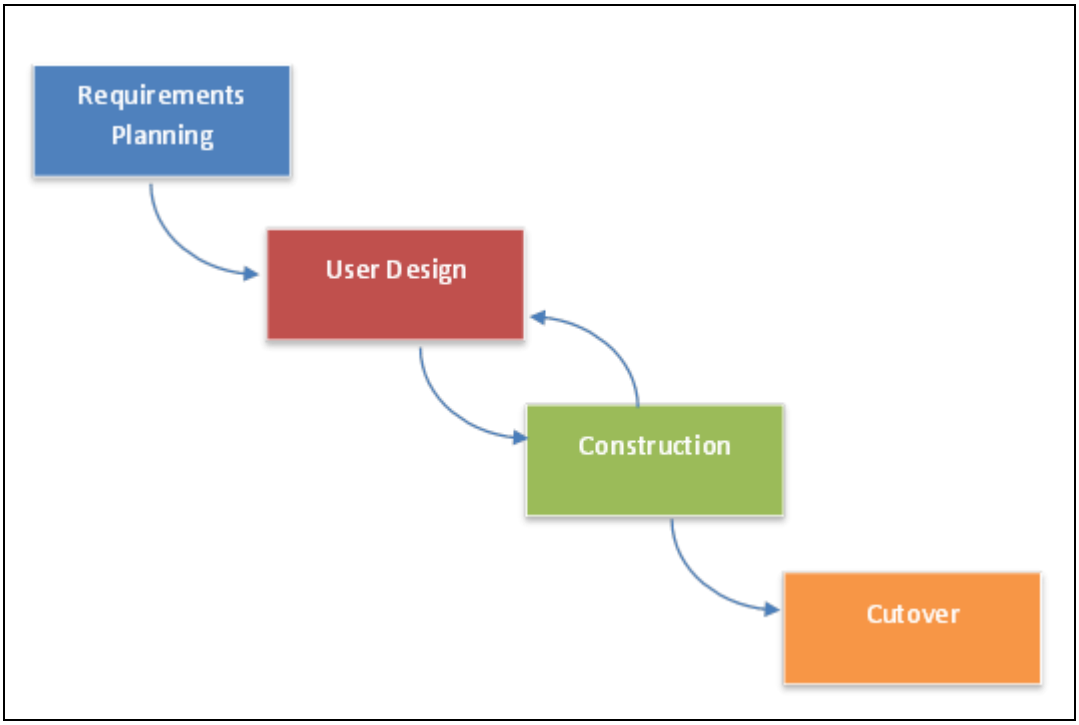



Figure 3.1: Rapid Application Development (RAD) Diagram

Rapid application design is an approach to the developing of the information system that do promise the better and cheaper system with rapid development by having system developers and end users work together jointly in real time to develop system. It is perceived as a system methodology, a method for developers to change their development processes or as RAD tools to improve development capabilities (Beynon-Davies, 1999). RAD grew out of the convergence of two trends:

- The increase speed and turbulence of doing business in the late 1080s and early 1990s.
- The ready availability of high powered, computer-based tools to support systems development and easy maintenance.

The ready availability of increasingly powerful software tools is created to support RAD also increased interest in this approach. RAD tools, and software created to support rapid development, almost provide for the speedy creation of Web-based applications. RAD the emphasis is low cost and fast delivery.

- Analysis and Planning was done before coding is initiated
- Design was done based on needs and requirements
- Coding, testing and debugging done as a whole activity
- Requirements change and testing results pushed for re-coding

### 3.2 Project Phase

Phase1: Requirements Planning

In the RAD life cycle, requirements planning incorporate elements of the traditional planning and analysis phase. During this phase, knowledgeable end users determine systems requirements, but the determination is done in the context of a discussion of problem statement. Once specific systems have been identified for development, users and developer had discussion to reach agreement on system requirements. The overall

planning process is not all that much different form planning in the traditional waterfall model.

- Outcome
  i. An outline system area model which are entity and process models.
  ii. A definition of the system's scope

For the requirement planning research has been done for the literature review and an experiment has been conduct for the next phase.

Phase 2: User Design

During the second phase of RAD life cycle, end users and the developer participate in discussion, where those involved used integrated CASE tools to support the rapid prototyping of system design. Users and the developer work closely and quickly to create prototypes that capture systems requirements and that become the basis for the physical design of the system being developed. Users' signs off on the CASE-based design-there are no paper-based specifications. Because user design ends with agreement on a computer-based design, the gap between the end of design and the handing over the new system to users might takes several weeks.

- Outcome
  i. Diagrams defining the interactions between process and data
  ii. Preliminary layout of screen
  iii. Prototypes of critical procedures

Phase 3: Construction

During this phase, the developer who created the design now generates code using the Adobe Flash CS5. End users also participate, validating screens and other aspects of the design as the application system is being built. Construction can be combined with user design into one phase when developing smaller systems.

- Outcome
  i. Design has been finalized
  ii. The system builds using the Adobe Flash CS5

Phase 4: Cutover

Cutover is the delivery of the new system to its end users. Planning for cutover must begin early in the RAD process because the RAD approach is so fast. Cutover involves many of the traditional activities of implementation, including testing the system, training users, dealing with organizational changes, and running the new and old systems in parallel, but all these activities occur on a accelerated basis.

- Outcome
  i. The new system been implemented
  ii. Managing the change from the old system environment to the new one

### 3.3 Key Milestone

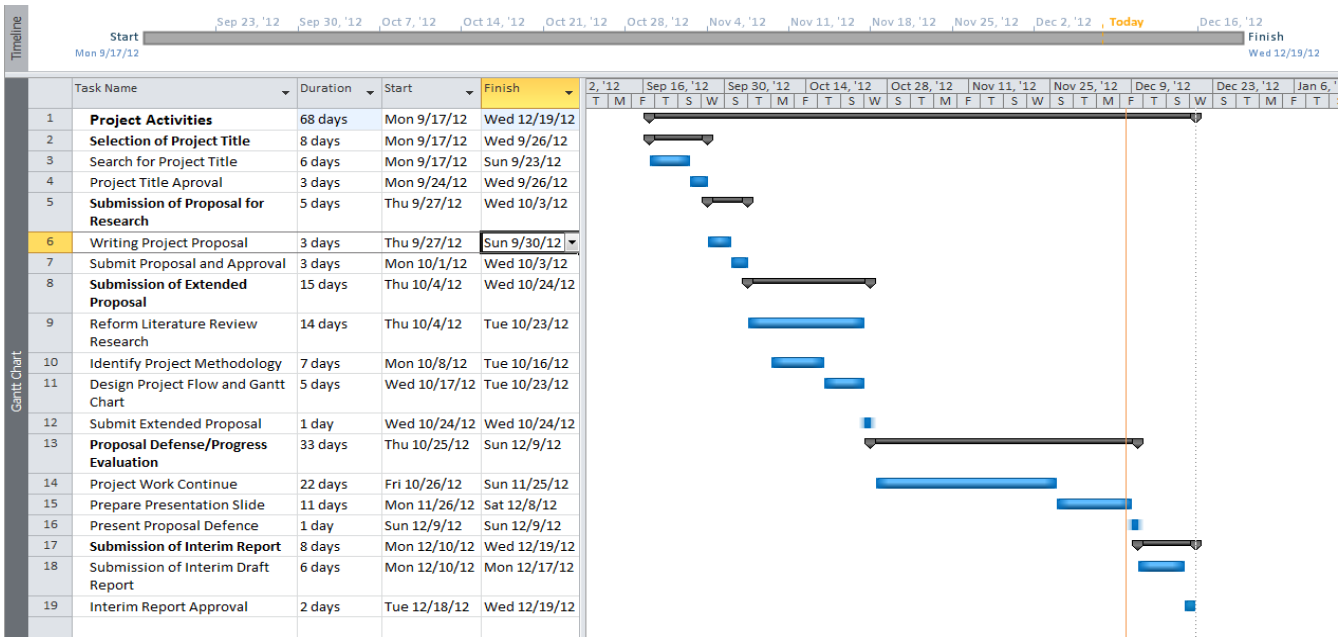
Below are the milestones of the project. The first activity is finished before being able to continue to the next according to the waterfall model sense.

| **Activities for FYP 1** | **Week** |
|---|---|
| Selection of Project Title | 2 |
| Submission of Proposal for Research | 3 |
| Submission of Extended Proposal | 6 |
| Proposal Defense and Progress Evaluation | 13 |
| Submission of Interim Report | 14 |
| **Activities for FYP 2** | |
| Submission of Progress Report for FYP 2 | 4 |
| Pre-EDX | 10 |
| Submission of Dissertation | 11 |
| Final Presentation VIVA | 13 |
| Submission of Final Dissertation | 14 |

Table 3.1: Key Milestone

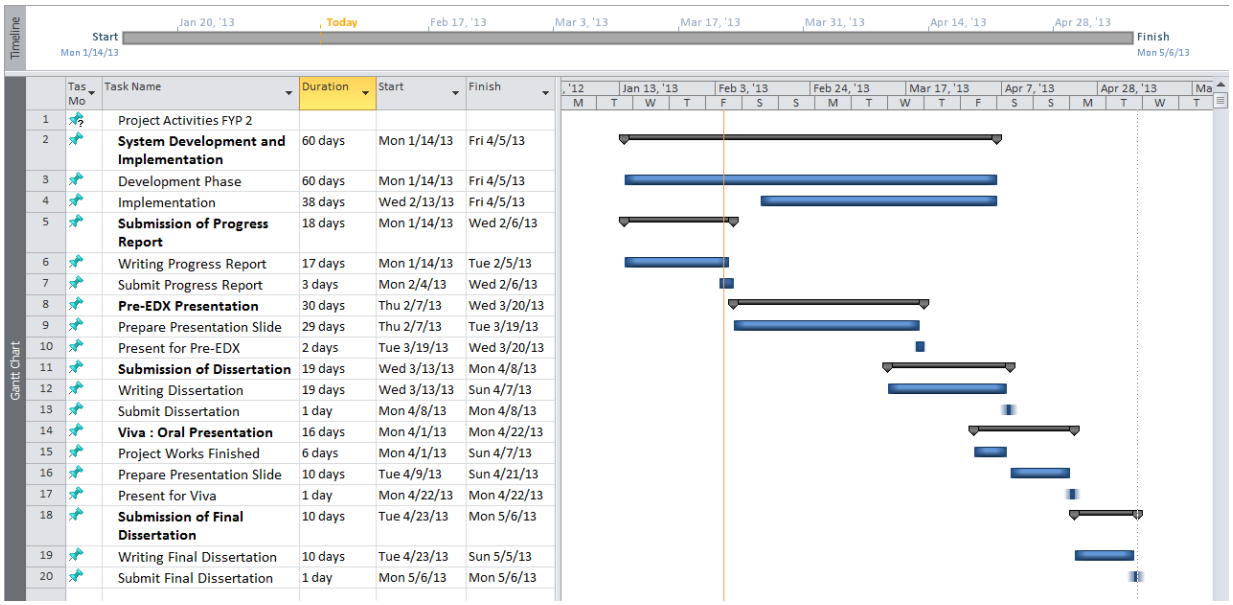
### 3.4 Gantt chart

To ensure that the project to-be will not run behind schedule, a Gantt chart had been proposed to marks the time and datelines for every steps/methodology of the project.




| | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | **Project Activities** | 68 days | Mon 9/17/12 | Wed 12/19/12 |
| 2 | **Selection of Project Title** | 8 days | Mon 9/17/12 | Wed 9/26/12 |
| 3 | Search for Project Title | 6 days | Mon 9/17/12 | Sun 9/23/12 |
| 4 | Project Title Aproval | 3 days | Mon 9/24/12 | Wed 9/26/12 |
| 5 | **Submission of Proposal for Research** | 5 days | Thu 9/27/12 | Wed 10/3/12 |
| 6 | Writing Project Proposal | 3 days | Thu 9/27/12 | Sun 9/30/12 |
| 7 | Submit Proposal and Approval | 3 days | Mon 10/1/12 | Wed 10/3/12 |
| 8 | **Submission of Extended Proposal** | 15 days | Thu 10/4/12 | Wed 10/24/12 |
| 9 | Reform Literature Review Research | 14 days | Thu 10/4/12 | Tue 10/23/12 |
| 10 | Identify Project Methodology | 7 days | Mon 10/8/12 | Tue 10/16/12 |
| 11 | Design Project Flow and Gantt Chart | 5 days | Wed 10/17/12 | Tue 10/23/12 |
| 12 | Submit Extended Proposal | 1 day | Wed 10/24/12 | Wed 10/24/12 |
| 13 | **Proposal Defense/Progress Evaluation** | 33 days | Thu 10/25/12 | Sun 12/9/12 |
| 14 | Project Work Continue | 22 days | Fri 10/26/12 | Sun 11/25/12 |
| 15 | Prepare Presentation Slide | 11 days | Mon 11/26/12 | Sat 12/8/12 |
| 16 | Present Proposal Defence | 1 day | Sun 12/9/12 | Sun 12/9/12 |
| 17 | **Submission of Interim Report** | 8 days | Mon 12/10/12 | Wed 12/19/12 |
| 18 | Submission of Interim Draft Report | 6 days | Mon 12/10/12 | Mon 12/17/12 |
| 19 | Interim Report Approval | 2 days | Tue 12/18/12 | Wed 12/19/12 |

Figure 3.2: Gantt Chart for FYP 1




| | Task Mo | Task Name | Duration | Start | Finish |
|---|---|---|---|---|---|
| 1 | | Project Activities FYP 2 | | | |
| 2 | | **System Development and Implementation** | 60 days | Mon 1/14/13 | Fri 4/5/13 |
| 3 | | Development Phase | 60 days | Mon 1/14/13 | Fri 4/5/13 |
| 4 | | Implementation | 38 days | Wed 2/13/13 | Fri 4/5/13 |
| 5 | | **Submission of Progress Report** | 18 days | Mon 1/14/13 | Wed 2/6/13 |
| 6 | | Writing Progress Report | 17 days | Mon 1/14/13 | Tue 2/5/13 |
| 7 | | Submit Progress Report | 3 days | Mon 2/4/13 | Wed 2/6/13 |
| 8 | | **Pre-EDX Presentation** | 30 days | Thu 2/7/13 | Wed 3/20/13 |
| 9 | | Prepare Presentation Slide | 29 days | Thu 2/7/13 | Tue 3/19/13 |
| 10 | | Present for Pre-EDX | 2 days | Tue 3/19/13 | Wed 3/20/13 |
| 11 | | **Submission of Dissertation** | 19 days | Wed 3/13/13 | Mon 4/8/13 |
| 12 | | Writing Dissertation | 19 days | Wed 3/13/13 | Sun 4/7/13 |
| 13 | | Submit Dissertation | 1 day | Mon 4/8/13 | Mon 4/8/13 |
| 14 | | **Viva : Oral Presentation** | 16 days | Mon 4/1/13 | Mon 4/22/13 |
| 15 | | Project Works Finished | 6 days | Mon 4/1/13 | Sun 4/7/13 |
| 16 | | Prepare Presentation Slide | 10 days | Tue 4/9/13 | Sun 4/21/13 |
| 17 | | Present for Viva | 1 day | Mon 4/22/13 | Mon 4/22/13 |
| 18 | | **Submission of Final Dissertation** | 10 days | Tue 4/23/13 | Mon 5/6/13 |
| 19 | | Writing Final Dissertation | 10 days | Tue 4/23/13 | Sun 5/5/13 |
| 20 | | Submit Final Dissertation | 1 day | Mon 5/6/13 | Mon 5/6/13 |

Figure 3.3: Gantt Chart for FYP 2

### 3.5 Tools Required

To develop this project, there are several tools and requirements needs to be filling to run the system. Below is the minimum requirement and tools required:

- Personal computers with Windows platform, 1GB RAM (minimum), 80GB hard-disk space, including 115MB of available space on the hard disk that contains the operating system.
- Adobe Photoshop CS4 for design
- Adobe Flash CS4 for animation.
- Adobe Captivate 6.0 for courseware development.

# CHAPTER 4

# RESULTS AND FINDINGS

## 4.1 Literature Review Findings

From the research done for the literature review, books, article from website, journal, and newspaper article has been used for the research, and the findings are:

- There are still large numbers of student in Malaysia especially secondary student are ill equipped with literacy and numeracy skills
- LINUS had been created to help in student literacy and numeracy. It has been implemented to primary school with target student from standard 1 to standard 3. The programme has not been implemented to secondary school.
- Multimedia has been a successful tool in education and could help in boosting student interest in learning.
- Animation can be used to teach student in literacy learning. Lots of research has been done and it show that it does have positive and negative impact towards student.

## 4.2 Interview Findings

An interview has been done with a teacher about LINUS programme, the findings from the interview are:

| Question | **Answer** |
|---|---|
| **Do you know about LINUS programme?** | Yes. |
| **Does your school have LINUS** | Yes and has been implemented since |

| | |
|---|---|
| **programme?** | 2010. |
| **Are you one of the teacher involve in the programme at your school?** | Yes. |
| **Could you explain about LINUS?** | LINUS is part of the education programme done by the government to help the student with their literacy and numeracy skills. It is being implemented from the early stage so that the student won't be having difficulty with their literacy and numeracy in higher level. |
| **The current result for LINUS screening?** | From the statistic that we have, for 2010, 2011 and 2012 we achieve 100% in literacy and numeracy screening. |
| **Do you aware there are still large numbers of student in secondary school still having problem with their literacy and numeracy skills?** | Yes, but does not know in detail regarding the issue. |
| **Can LINUS programme be implemented for lower secondary?** | Yes, but with different approach. |
| **Could multimedia be helpful in the LINUS programme?** | Yes, because student could gain more interest in learning and will be helpful to the teachers as well. Could lessen the use of material like papers, and text book. |
| **Your recommendation for the programme?** | This programme is a very helpful for student for their early learning of literacy and numeracy. A different approach like multimedia software could benefit both teacher and the student. I would recommend the programme be adapt to higher level since as mention there are |

| | |
|---|---|
| | still large number of secondary student having problem with their numeracy and literacy skills. However different approach should be taken since the target audience are different. |

Table 4.1: Interview Findings

## 4.3 User Design

### 4.3.1 Use Case Diagram

Be the courseware can be build, diagram such as use case diagram, process flow diagram need to be develop so that the development phase can be done smoothly. This will also help the developer to determine the important process and focus on the right process need to be develop. Below are the use case diagrams for the courseware.

The courseware will focuses on student as the user. The student could access the entire menu shown in the diagram. The user could interact with the courseware and learn from the courseware.

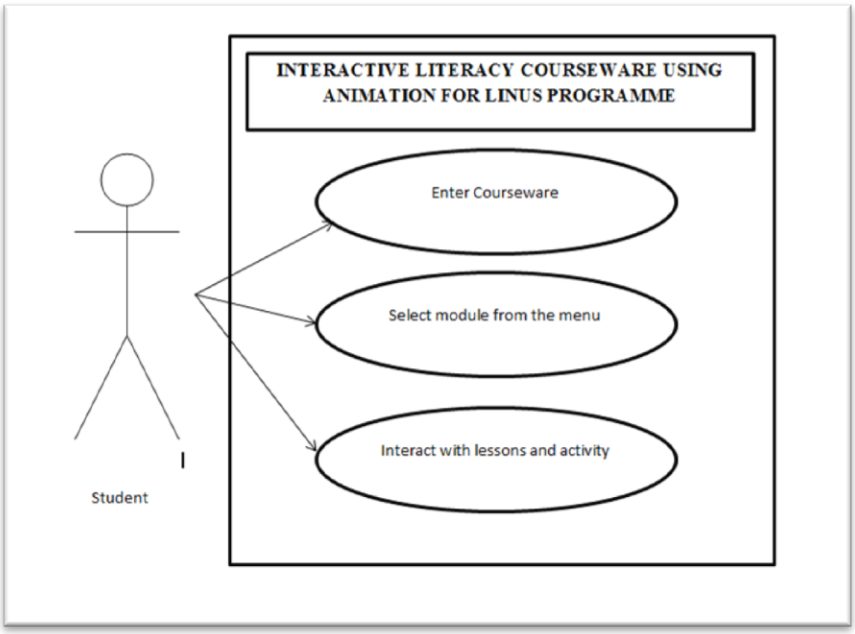



Figure 4.1: Use Case Diagram

### 4.3.2 Process Flow Chart

Flow chart diagrams represent a process, showing steps-by-step of a process happening in a courseware. Flow chart will help in determining the process needed for the courseware and process that will happen after another. Below is the flow chart diagram for the courseware.

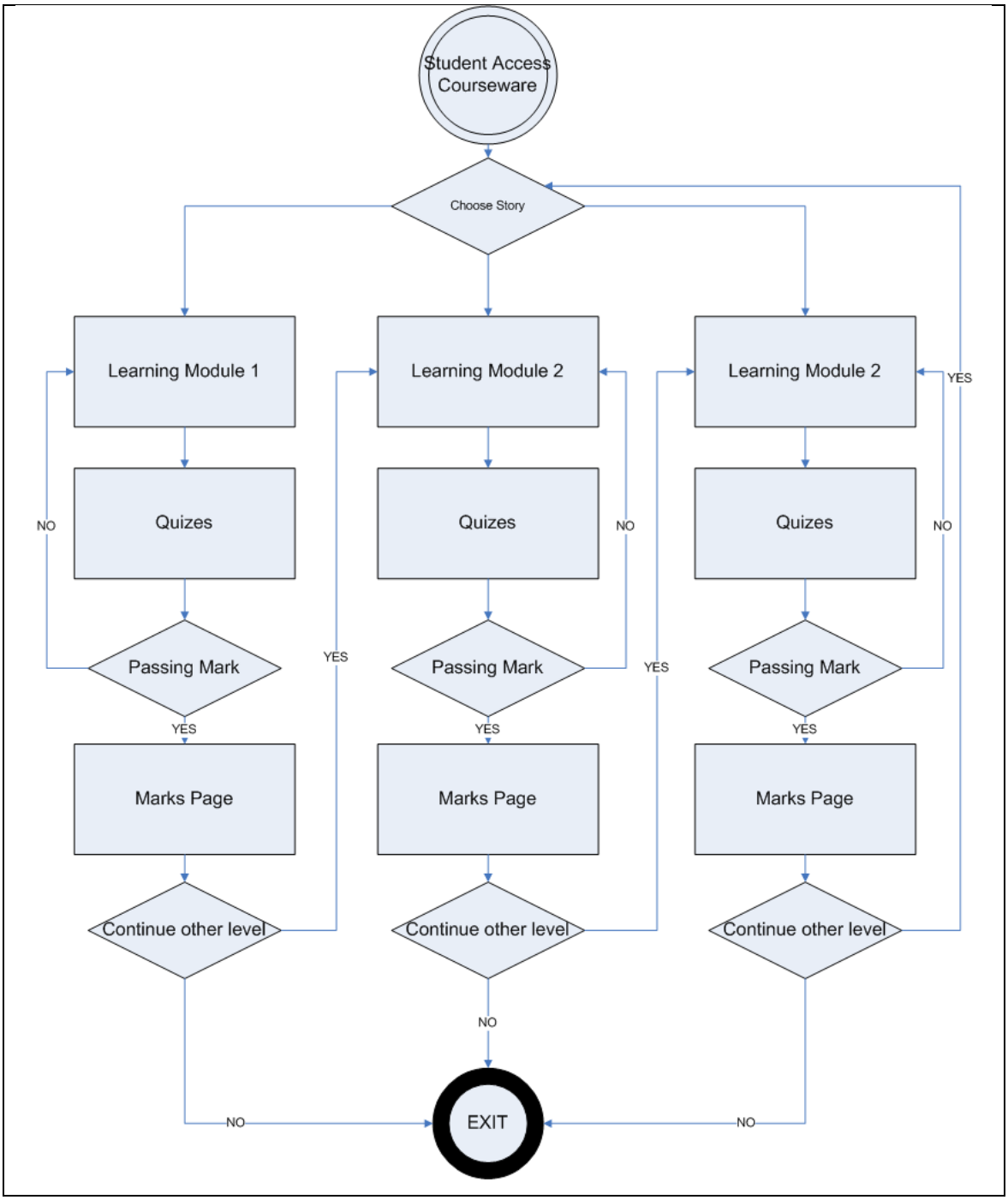



Figure 4.2: Flow Chart Diagram

From the flow chart above the student will start accessing the courseware. At the beginning there will be a welcome page student will have to choose the start menu to go to the next page. Next student could choose level for the

module. There will be three story for the courseware that is ‘story 1’, ‘story 2’ and ‘story 3’.

Once the story have been chosen, student will go through a learning module, whereby student will be teach on literacy and the module are according to the level. After they have completed the learning module they have to go through the quizzes. If their mark pass the minimum requirement they will proceed to congratulation page and if not they will be directed to the learning module again and when through the same process again.

If the students manage to pass the minimum mark they will be directed to congratulation page. From here they could choose whether to continue or end the process. If they end the process the courseware will exit. If they want to continue it will directed to the level page and they continue to the next level.

### 4.3.3 Storyboard

The second phases in methodology are user design. The storyboards are part of making the user design. The finalize user design will be done before the development phase. The welcome pages are design as below. There will be a label in the middle of the page and a button that allow user to go to the next page.

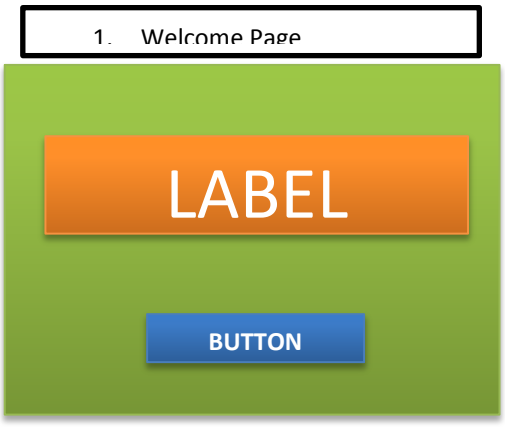



Figure 4.3: Storyboard Welcome Page

Next is the menu page. In the middle of the menu page there will be the label for the page. There will be 3 menu and each menu represent the level of the lesson/activity. Each of the menus can be click after the previous level has been unlock. So that mean student need to start from level 1 and complete it before they can proceed with the next level.


Figure 4.4: Storyboard Menu Page

The third menus are the activity and lesson page. There will be an image or animation or a text at the top of the frame and it will be accompany by an animation or a text below of it. There will be “next” button or answer button for the page.

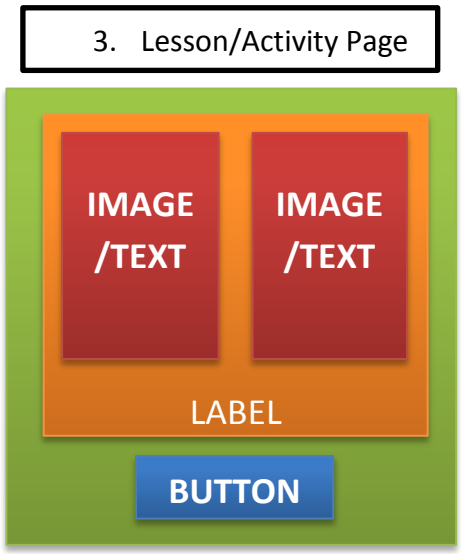



Figure 4.5: Storyboard Lesson/Activity Page

Lastly is the exit page. The student are given the choice to exit or return to the previous menu.


Figure 4.6: Storyboard Exit Page

### 4.4 System Development

From the research done, the prototype has been developed based on the requirement and need of the courseware. In the development stage the courseware are being design and develop using Adobe Flash, Adobe Captivate 6.0 and Adobe Photoshop for image editing. Transition process between page of courseware are being done using Adobe Captivate. This software will help in producing pages for the courseware and also in basic animation. The read-along animation is developed using Adobe Flash. The animation files are then embedded into Adobe Captivate. The quizzes are also being developed using Adobe Captivate. Below are the screen shot for the courseware.

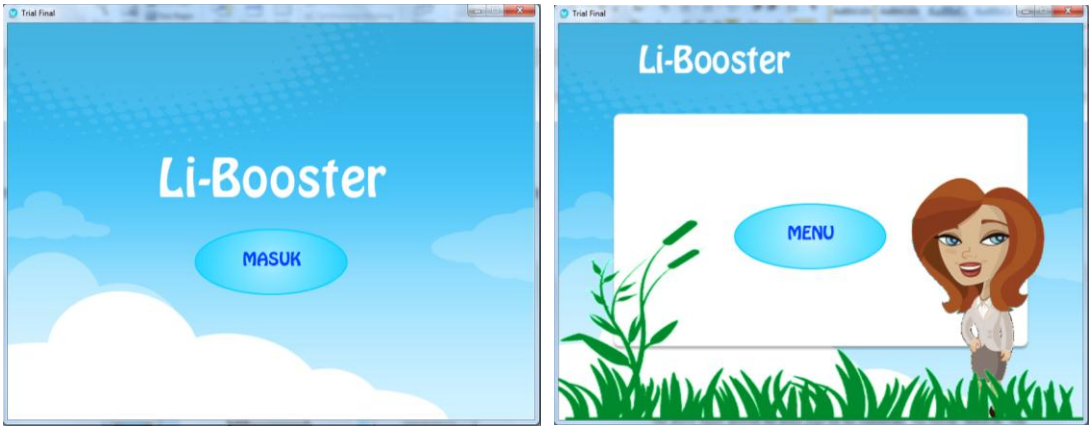



Figure 4.7: Start Page

The above figure showed the menu page for the courseware. The button "MASUK" will direct the page to the next page that is the welcome page. At the welcome page user will be introduce to the system.


Figure 4.8: Menu Page

The above figure showed the menu page page for the courseware. There are 3 stories that represent as easy, intermediate and hard. The user could choose the story and went through the learning module. Each of the stories is in different difficulties. The first story is easy whereby, less word and slow pacing and the words will be a lot more and pacing of the story are increase to the next story.

Three learning module has been developed for the courseware that represent different difficulties; easy, intermediate, and hard. The learning module has been developed based on the read-along concept whereby, each of the text will be accompany with sound. There will be image on the side to represent the meaning of the text. Each of the stories has been chosen based on the difficulties of the story.

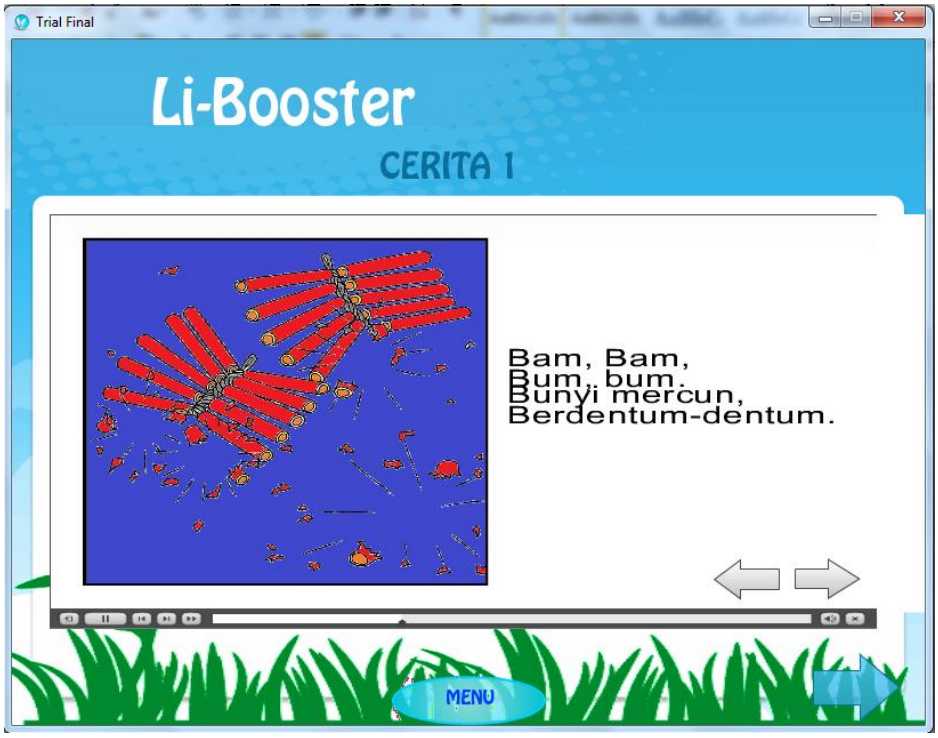



Figure 4.9: Learning Module Story 1

The first story is “Gedebak-gedebuk” that is the sound of falling fruits. The pronunciation of the text is being accompanied by a sound to help users to understand the words and learn how to read the text. Image to represent the meaning and sound are in the animation to help users understand. For the first story, the words are short and pace of animation are slower.

User could skip to the next page at the animation page or go back to the previous page at the animation. The menu button are also included so that user could choose other menu. The page can be skip using the blue arrow button that will appear at the end of the animation. This is to make sure user has gone through the learning modules.


Figure 4.10: Learning Module Story 2

The second animation are "Pokok Durian", that is about a Durian tree that is arrogant. The pronunciation of the text is being accompanied by a sound to help users to understand the words and learn how to read the text. Image to represent the meaning and sound are in the animation to help users understand. For the second story, the words are longer than first story and the pace of animation are faster than first story. Student could also learn some value from the story.

User could skip to the next page at the animation page or go back to the previous page at the animation. The menu button is included so that user could choose other menu. The page can be skip using the blue arrow button that will appear at the end of the animation. This is to make sure user has gone through the learning modules.


Figure 4.11: Learning Module Story 3

The third animation are “Semut Melawan Gajah”, that is about an ant that is brave to face the elephant. The pronunciation of the text is being accompanied by a sound to help users to understand the words and learn how to read the text. Image to represent the meaning and sound are in the animation to help users understand. For the third story, the words are longer and the pace of animation is faster. Student could also learn some value from the story.

User could skip to the next page at the animation page or go back to the previous page at the animation. The menu button is included so that user could choose other menu. The page can be skip or proceed to next page using the blue arrow button that will appear at the end of the animation. This is to make sure user has gone through the learning modules.


Figure 4.12: Quizzes Module

For each story there will be quizzes to test out the student understanding of the story. The quizzes for each story are in different format. The first story quiz is matching quizzes, whereby users are required to drag and drop the answer on the correct match. The second quiz is the true and false question, whereby users need to choose between right or wrong from the statement. Last is the multiple choice quizzes, whereby for each question there will be several answer and the users need to choose the right answer.

All of the questions are related to the story at the learning module, so users need to understand the story to be able to answer the question. Each quiz consist of 5 questions, so a total of 15 questions for the quizzes. Student need to answer the entire question before they can proceed. Student can check their marks at the end of the quiz.

### 4.5 User Testing and Result

The user testing has been conducted in secondary schools that have been identified with low academic achievement in Bahasa Malaysia subjects. Student with difficulties in reading and understand text have been chosen for the testing. The purposes of the testing are:

- To test the effectiveness of the courseware developed in helping user to read and able to understand the content in the courseware.
- To test the courseware usability.

To achieve both purposes, a total of 30 students from the schools have participated for the user testing. All the students have been identified with low academic in Bahasa Malaysia and also had difficulties in reading and understanding text. Teachers for each school have also participated for the usability testing.

The testing has been done in the computer lab at the schools. Two sessions has been done for testing the courseware effectiveness. The first part student has been given a set of story and question and they need to read and answer the question in the paper. This is the manual way, whereby users are being test with the current method used in schools, which is using papers. The students are required to read the story and answer the question based on the story. Once they have finished the first part they will precede to the second sessions that is testing using the courseware. Student has been given verbal method on how to use the courseware.

Before the testing with the group of students was done, a teacher and two students are being given 20 minute to test and use the courseware without any instruction. They were observed and the purpose of doing this is to test the usability of the courseware. After that they were interviewed on the usability of the courseware. From this testing, the effectiveness, consistency and ease of use the courseware can be determined.

### 4.5.1 Method Result

The test result for the courseware can be divided into two parts, first is the effectiveness of the courseware compared to the current method and second is the usability of the courseware. For the first part, there are 15 questions in total, 5 questions for each story. The results were calculated by total of percentage and it is showed in the diagram:

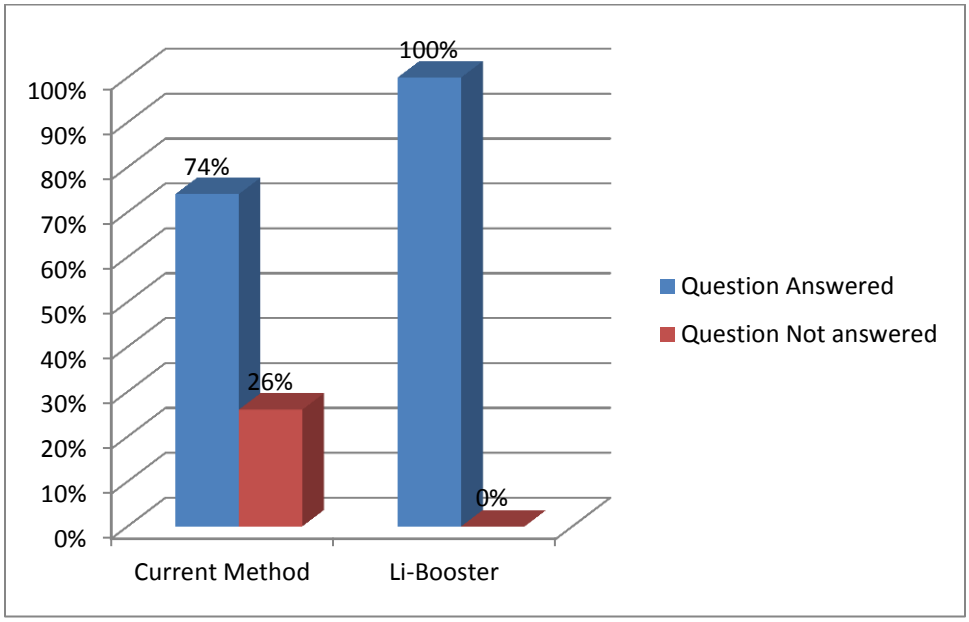



Figure 4.13: Question answered

From the figure above, for the current method, some of the student did not answer the question. However for Li-Booster the student answer all of the question. Part of the feature, students have to answer all the question before they can proceed.

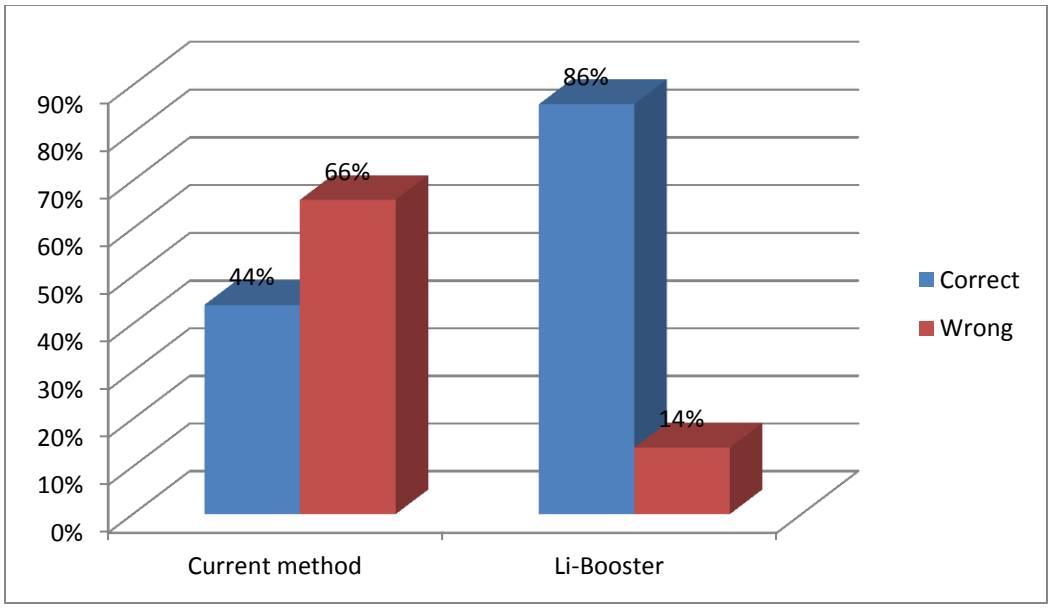



Figure 4.14: Correct answered

From the figure above, the question that has not been answered are considered wrong. Most of the students answer wrongly for the current method and they were able to answer correctly most of the question using Li-Booster.

### 4.5.2 Usability Result

It is very crucial that a usability testing should be done because it could help in improving the courseware, know the feedback from the users, and enable the courseware to be evaluated. For the usability, a teacher and 2 students were given 20 minute to test and use the courseware without any instruction. They were observed and interviewed after the testing. This is to get feedback from the users on the courseware usability.

Within the 20 minute given, the teacher and student were observed whether they are able to use the courseware without any instruction or manual and does the user interface help in assisting the users. From the observation:

- Teacher: Able to use the courseware without any help, however having problem at the matching quiz. However managed to solve

it with the help of the instruction caption. The button and instruction caption provided in the courseware were helpful in assisting the user.

- Student 1: Able to used and navigate through the function of the courseware. Having the same issue in answering the quizzes. The students were able to use it after they try several "click" and "drag and drop". The buttons were helpful to help in navigation the courseware.
- Student 2: Able to use the courseware however this student is a bit slow in understanding the instruction caption.

Once the testing have finished, the three users were interview to get their feedbacks on the courseware. This could help in getting the opinion of the users regarding the courseware.

| Question | Feedback |
|---|---|
| **Was the courseware user interface helpful in increasing the interest to use the courseware? (The color, font and consistency)** | **Teacher**: "Yes, the color used for the courseware was bright and really attractive. The font was big enough and readable. The place of menu button and navigation button are consistent, so I know where it is and it going to appear. Overall it could help in increasing the student interest."<br>**Student 1**: "Yes it could help increase our interest, the color is cheerful and the font is readable."<br>**Student 2**: "Yes it does and the design was attractive for me, the color used is interesting and the font is perfect" |
| **Was the courseware easy to use?** | **Teacher**: "Yes, because it is very simple to navigate and with the help of the |

| | |
|---|---|
| | instruction caption it does really help".<br>**Student 1**: "Yes, the design was simple and I do not have to read instruction to read it"<br>**Student 2**: "Yes, the navigation does help in navigating me through the courseware. However the quizzes part audio instruction should be included". |
| **Was the menu and navigating button helpful?** | **Teacher**: "Yes"<br>**Student 1**: "Yes"<br>**Student 2**: "Yes" |
| **Should the courseware be improve? If "Yes", which part?** | **Teacher**: "Yes, the design and background for grass should not be interfering with the text, however the courseware is very helpful especially the animation part. Add more story that can be relate to the student example "cerpen" used in their studies" |

Table 4.2: Usability Interview Findings

From the observation and interview done, there are several improvement can be done to improve in increasing the usability of the courseware. Few students have been ask about the courseware after the testing. Most of the feedbacks saying the animation help them in understanding the text better. The courseware are more interactive compare to the current method. However if the quizzes part is also assist with sound to help explain the question it would be much more helpful.

# CHAPTER 5

# RECOMMENDATION AND CONCLUSION

There are several recommendations need to be made regarding this project. Recommendations are not meant to be used to change this project wholly, but to allow improvements in certain aspects and to put some factors into considerations before proceeding with the development of the software.

The courseware develop could be enhance and improve so that it would be more user friendly. Adjusting some of the background image to suit the interface could enhance the usability. The quizzes should also be assist with voice instruction because some of the users are still not able to read and cause some of the users do not understand how to use the courseware. More story can be animated and include in the courseware.

The courseware is developed in Bahasa Malaysia because the main objective is to help cater in reading and understanding problem. However the courseware has the potential to be adapted into other subject. For example the courseware can be developed in English subject to help student in learning English language. The concepts for the animation are read-along concept so it can also be used for other language for language learning at higher level.

As a conclusion, this courseware with animation, audio and interactive lessons has found to be useful for the students and it is hoped that the courseware could assist the student in future learning, and will improve the learning method of education in Malaysia. By the end of the stage, the system should work fine as it is intended for the objectives of this project have been achieved successfully.

# REFERRENCES


48,520 murid sekolah rendah, menengah bermasalah dalam pembelajaran (2012, December 6). Sinar Harian. Retrieved from http://www.sinarharian.com.my/nasional/48-520-murid-sekolah-rendah-menengah-bermasalah-dalam-pembelajaran-1.110313

Beynon-Davies, P., Carne, C., Mackay, H. & Tudhope, D. (1999), *Rapid Application Development (RAD): an empiricial review*, European Journal of Information Systems, vol. 8, pp. 211-233

Carol, D. (1993). Educational Media International. *Multimedia in Education, vol. 30*(4), 193-198.

Education NKRA (2010). Official Portal Ministry of Education. Retrieved from http://www.moe.gov.my/?id=244&lang=en

Feng, K., Huifen, L., Yu-Hui, C., & Francis, D. (2006). Effects of Animation on Multi-Level Learning Outcomes for Learners with Different Characteristics: A Meta-Analytic Assessment and Interpretation.

Irene C., Lluis V.C., Anup B. (2010) Multimedia in Education: Adaptive Learning and Testing. *Introduction and Overview*. 3.

Kang, S. C. (2012, September 5). *LINUS programme for early learning*. The Star Online. Retrieved from www.thestar.com.my

Kozma, R. (2005), National policies that connect ICT-based education reform to economic and social development, *Human Technology, vol. 1*, pp. 117-156.

Lewin, C. (2000). Exploring the effects of talking book software in UK primary classrooms. Journal of Research in Reading, 23, 149–157

LINUS PPD KUALA KANGSAR (2011). *APA MAKSUD PROGRAM LINUS (2011)*. Retrieved from http://portallinus.ppdkualakangsar.edu.my/?p=1

LINUS PPD SEBERANG PERAI UTARA (2011). *Literasi*. Retrieved from http://linusppdu.blogspot.com/p/literasi.html

Lowe, R. (1999). Extracting information from an animation during complex visual learning. *European Journal of Psychology of Education, 14*, 225-244.

Mayer, R.E. (2005). The Cambridge Handbook Of Multimedia Learning. *Multimedia Learning Reading (23)*, 355-365.

Mayer, R.E., & Moreno, R. (2002). Aids to computer-based multimedia learning. *Learning and Instruction, 12*, 107-119.

McKenna, M.C., Reinking, D., Labbo, L.D., & Kieffer, R.D. (1999). The electronic transformation of literacy and its implications for the struggling reader. Reading and Writing Quarterly, 15, 111

Moreno, R. Mayer, r. E., Spires, H., & Lester, J. (2001) The case for social agency in computer based teaching: Do students learn more deeply when they interact with animated pedagogical agents? *Cognition and Instruction*, 19, 177-214.

Multimedia as an Educational Tool (n.d). Retrieved from http://cemca.org/EMHandbook/Section2.pdf

Noel, C. (2011, September 19). *Ensuring literacy with Linus*. The Star Online. Retrieved from www.thestart.com.my

Phillips, R. (1997). *The develop handbook to interactive multimedia: A practical guide for educational developers* (p.8). London: Kogan Page.

PROGRAM LINUS SEKOLAH (2010). *LINUS: Literacy And Numeracy Screening*. Retrieved from http://www.cikgublog.com/program-linus-sekolah/

Program LINUS. (2010) *PROGRAM LITERASI DAN NUMERASI (LINUS) TAHUN 1*. Retrieved from http://sktuaridtaud.forumotion.com/t215-program-linus

Reinmann, P. (2003). Multimedia learning: Beyond modality. Learning and Instruction, 13(2), 245-252.

Rieber, L. P. (2000). *Computers, graphics and learning*. Madison, WI: Brown & Benchmark.

Schnotz, W., & Bannert, M. (2003). Construction and interference in learning from multiple representation. *Learning and Instruction, 13 (2),* 141-156.

Selwyn, N., Gorard, S., Furlong, J., & Madden, L. (2003). Older adults‟ use of information and communications technology in everyday life. *Ageing & Society, 23(5*), 561-582.

Shahrina Md Nordin, Wan Fatimah Wan Ahmad, M Yunus Nayan, Noorhana Yahya, & Azrai Abdullah. (2012). A Conceptual Framework in Examining the Contributing Factors to Low Academic Achievement: Self Efficacy, Cognitive Ability, Support System and Socio-economics. Universiti Teknologi PETRONAS.