A STRATEGIC APPROACH IN DEVELOPING AN INTERACTIVE MULTIMEDIA LEARNING SYSTEM FOR YOUNG LEARNERS (LEARNING MALAY PROVERB)

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ABSTRACT

Research conducted by local linguistic shows that the grasp of Malay Proverbs among younger generation is deteriorating. This dissertation proposes a strategic approach to learn Malay proverbs through interactive multimedia learning system for young learners. This approach employs effective learning strategy that proves its usability to help young learners understand and remember better. The arrangement of how young learners' mind work reflects the stages of human cognition: immediate apprehension, abstract thinking and practice. The three stages are formulated into three steps approach: knowing, understanding and usage. All these three stages are then used to create instructional objective, content and the test items by using rapid prototyping model. Appropriate user interface design was created based on the storyboard. After the implementation, final evaluation was conducted using two methods. The predictive evaluation was conducted by allowing a multimedia designer to use the system. It was concluded that more extensive instructions are needed in order to let the system to be 100% independent. The observing and monitoring usage method showed that 70% of the young learners could perform each task smoothly. The remaining 30% could perform it after they finished the first two units. The system was also evaluated on its learning strategy. 80% of the students found that the three steps approach was easy to follow while the remaining 20% could cope after further elaboration was given.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

The advent of information technology has given impact in the future of education. Many academicians have taken this advantage by producing interactive media learning material for their courses. Producing interactive media learning material has to be done in a strategic manner which comprises many stages from instructional design to conceptual design and implementation. Interactive media is an important tool to enhance the effectiveness of teaching and student's learning capabilities. A good Multimedia learning system is a system that can improve student attentiveness, comprehension and retention by utilizing the elements of multimedia and programming techniques (Boyle, 1997). Such system can be achieved by preparing a set of good instruction. This is where the instructional design approach comes in. Instructional design is a systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction.

1.2 Motivation

The traditional way to learn proverb is to memorize them. This is mentioned by Abdullah Hassan (1993) in Kamus Peribahasa Lengkap and Herbert A. Giles (1958) in A History of Chinese Literature. An observation on the market and in the Internet shows that there are books and websites on Malay proverb. The books and the multimedia learning systems in the market describe the background of Malay Proverbs and how to learn them effectively. The books listed renowned proverbs and compiled it in a book known as "The Dictionary of Proverbs". The multimedia learning systems directly transferred the list of proverbs into a CD-ROM based or a web-based system.

"Riang Ria Bersama Peribahasa Kita" is a multimedia learning system that has 48 lists of Malay Proverbs enhanced with crossword puzzles and games. It provides test

together with student's achievement report page. "Digital Malay Proverbs Dictionary" is a database containing 15,000 Malay proverbs. This digital dictionary is developed by ATMA (The Institute of the Malay World and Civilization) of Universiti Kebangsaan Malaysia. It has a search engine so that users can type in the proverbs they want to know and the meaning will appear. It claims that searching and understanding of Malay Proverbs could be done faster than to refer to a book. Another way to learn proverbs is to learn them through stories. A book entitled "Interesting Stories to Learn Proverbs" by R.K.Murthi, listed selected Indian proverbs in fictional stories for children. By following the stories composed, children are expected to graps the meaning of the proverbs used in that story.

The teaching of Malay Proverbs is mainly done by teachers in school. Students are given a choice to buy reference books on Malay proverb if they wish to learn more about it. Publishing a book is a typical way of compiling a long list of Malay Proverbs. Due to advanced technology, developers find a way to invent a system that turns the hard copy into multimedia learning system. The system has few advantages for example, searching for a particular proverb is made easy as user do not need to flip through thick book anymore. The conclusion can be made by looking at the previous system or work available on Malay proverb that most of the systems are just a collection of Malay Proverbs without appropriate learning strategies. It still leaves the learning process to the teacher and provides students with a long list of proverbs to the students to learn by heart.

This dissertation proposes a strategy to develop interactive Multimedia learning system for one study area. The study area is Malay proverbs and is chosen due to its significant influence as a unique heritage of this country. The rate of secondary school students who master Malay Proverbs is very low and this was shown in a survey done for a respective research to identify the percentage of Malay Proverbs usage among

students. Below are the figures for the statistic of the research in three different situations (Goh Suzie, 1998).

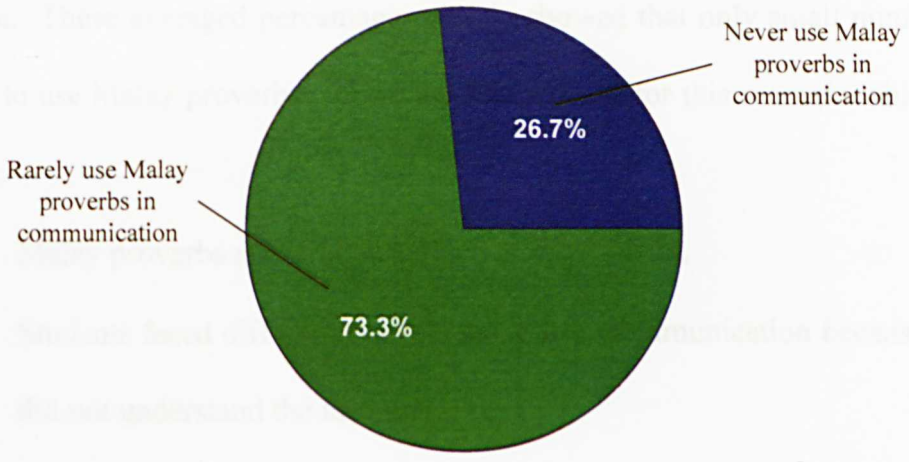

Figure 1.1(a): Communication in School

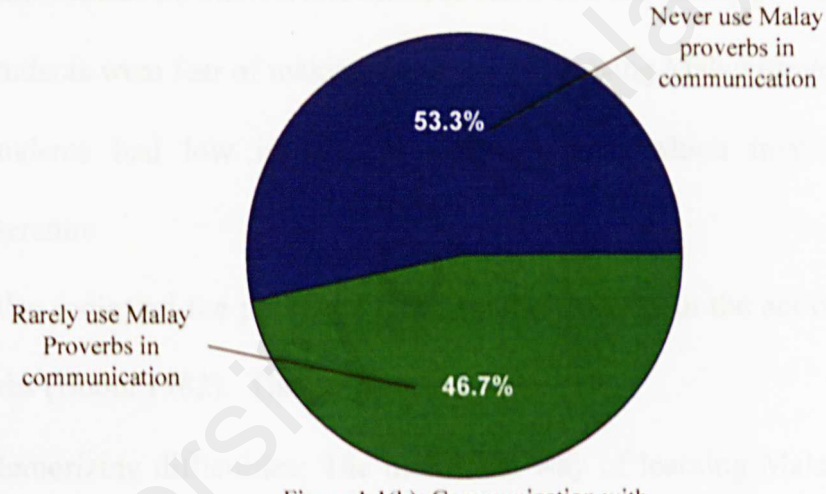

Figure 1.1(b): Communication with family Members

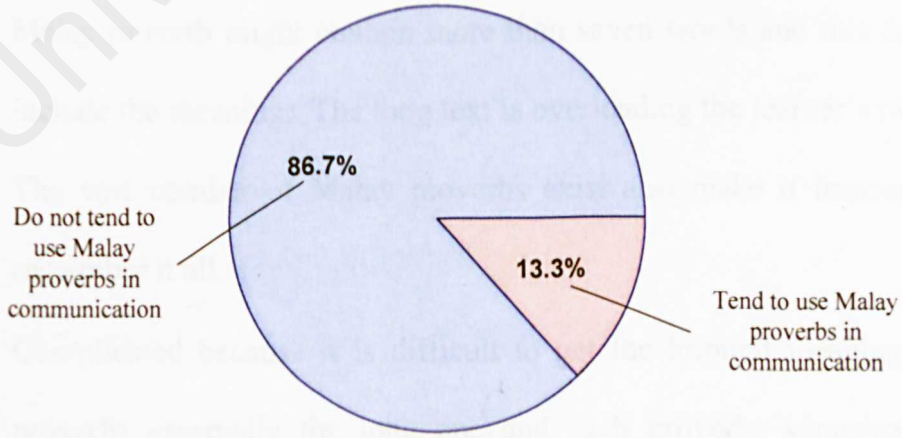

Figure 1.1(c): Communication in Everyday Life

From the statistic in the figure 1.1(a), (b) and (c) above, when average out all the numbers, 26.7% of students never used Malay proverbs in communication either with

friends or family members, 68.9% of students rarely used Malay proverbs and tend not to use it in their conversation. Only 4.4% of students tend to use Malay proverbs in their daily life. These averaged percentages clearly showed that only small number of students tend to use Malay proverbs. There are few reasons for this scenario which are (Boon, 1982):

- Malay proverbs are rarely used in a modern world.
- Students faced difficulties while using it in communication because they did not understand the meaning.
- Non-Malays students do not understand what Malay proverb is.
- Students had no interest and effort to learn and use Malay proverb.
- Students were fear of making mistakes while using Malay proverbs.
- Students had low interest in reading books which involve Malay literature.

The survey also indicated the problems faced by the students in the act of learning the Malay proverbs (Boon, 1982). The problems include:

- Memorizing difficulties: The traditional way of learning Malay proverb is by memorizing the proverb and its meaning. A single sentence of Malay proverb might contain more than seven words and this does not include the meaning. The long text is overloading the learner's memory. The vast number of Malay proverbs exist also make it impossible to remember it all.
- Complicated because it is difficult to get the implicit meaning of the proverbs especially the long one and each proverbs sometimes own several meaning.
- Difficulties in choosing the right situation to apply the proverbs because the meaning might no longer suits with the current situation.

Since the rate of learners who master Malay proverbs are deteriorating a strategic approach is required to lessen this problem in which the learners can understand faster and better using Multimedia learning systems.

1.3 The Objective of the Dissertation

The objectives of this project are:

- to design a strategic approach in developing a prototype of Malay proverbs learning package for young learners;
- to develop a prototype of selected Malay proverbs as medium for evaluation purposes; and
- to evaluate the effectiveness of the strategic approach implemented

For the purpose of developing this multimedia learning system prototype, a strategic approach is formulated which is a combination of formulating learning strategies, designing a set of instruction using instructional design model and implementing good principles of multimedia design into the system. This strategic approach is further explained in Chapter 3: Requirements and Needs.

In the prototype the young learners are taught how to learn and use Malay proverbs. Young learners as young as nine years old have been introduced to Malay proverbs in their school. The content of the prototype follows the three steps formula that provides the historical events of Malay proverbs, a story-telling session that is related to some Malay proverbs and a quick tour on Malay proverbs glossary.

The effectiveness of the strategic approach is evaluated by selecting some students of different ages and races from a small resident area to use the prototype. Results are collected through observation and simple interviews with the students.

1.4 The Structure of the Dissertation

Basically, there are six parts for this report of dissertation starting from this chapter as an introduction to this dissertation. The second chapter provides background knowledge of learning proverbs. The background information is on strategic approach and Malay proverbs in general. Chapter 3: Requirements and needs for the system to be met at the end of the project. This set of requirements and needs are the core things before one can start to design on how the systems going to be look like. Chapter 4: To design and implement the system according to the requirements and needs. The process of implementation is done to make the designed system as a real thing. Chapter 5: Systems evaluation and testing are two things that are vital. This is to look to what extent does the project succeeded. At this stage, observing and monitoring usage and predictive evaluation methods will be applied. Chapter 7: Conclusion and future work gives the conclusion about the project and future work that could be done on the basis of this project.

CHAPTER 2: LEARNING PROVERBS

2.1 Proverbs - An Introduction

There are several views on the definition of proverbs (Mieder, 1999). A proverb consists of a short sentence which contains a general piece of wisdom. It describes situations which happened before and which are repeated again and again. A proverb is a common expression whose origin is not known or has been forgotten. It is a complete poetic sentence which usually contains a moral or didactic message used by the folk to express rules or wisdom concerning life. It is a short, concise, colloquial saying, easily memorized and containing traditional beliefs taken to be true. Hence, a proverb is a phrase, saying, sentence, statement or expression about wisdom, truth, morals, experience, lessons and advice concerning life and is handed down from generation to generation.

In daily communication, people tend to speak out ideas which are in their mind. People from various races and ethnics will observe the environment and the behaviour of their own society before they put the importance of the environment as a medium to teach and to convey advice. Analogical language is one of many ways in which the society of many culture use to convey messages or advice to the receiving party. Different races have their own type of proverbs which mirror the culture of the people.

Malay proverb is a unique heritage of Malaysia which is has long existed. It contains the traditional values and represents the culture of the race. It is commonly used in everyday communication especially by the elder generation. They tend to be selective in their choices of words to conserve the feelings of the receiving party. There are two types of proverbs: classical proverbs and modern proverbs (Hassan, Mohd, 1993). Classical proverb is rarely used nowadays because of its archaic language structure. Modern proverb uses standard Malay language, which is the language that is being used nowadays.

Malay proverb has two main functions. Firstly, it is used to replace profane words with courteous words. Secondly, it is used to portray the tradition and the culture of the Malay people. In addition, it represents the intellectualism of that society. To understand a proverb means one has to understand the culture of people.

2.2 Learning Strategy

In attempt to develop a successful multimedia learning system, one has to take into account the impact of cognitive science in education and to apply this approach in instructional design. A learning strategy can then be formulated and later be used in developing the courseware using instructional systems design. Many studies have shown evidence of individual differences and their significance in learning. Individual differences may encompass variables ranging from experience in learning (Dewey, 1935), individual personality (Lewin, 1935), different psychological types (Jung, 1926) to individual perception differences (Asch & Witkin, 1948). In the 1960s, Witkin introduced the term "cognitive style" to describe the concept that individuals consistently exhibit learning style preferences for the ways in which they organize stimuli and construct meanings for themselves out of their experiences (Ayersman & Minden, 1995).

Learning strategy is instructional methods to help students attend, listen, read, comprehend, and study more effectively by helping them organize and collect information systematically (California Dept. of Education, 1994). It can be categorized into cognitive strategies and metacognitive strategies. Cognitive strategies may be referred to as declarative and procedural strategies that help assimilate information into long-term memory. Metacognitive strategies, on the other hand, are referred to as conditional strategies which operate the executive control on the use of learning strategies. Other learning strategies such as advance organizer and concept mapping can serve as both

cognitive strategies and metacognitive strategies. Advance organizers, a brief prose passage to bridge the lesson units, allow learners to plan (selecting, preparing, gauging and estimating) in advance about what they are going to learn and offer an opportunity for learners to attend to (focusing, searching, contrasting, and validating) the learning materials. Concept maps, graphically displaying the relationships between different links in a hypermedia program, help learners encode (elaborate and relate) new knowledge, review (confirm, repeat and revise) existing knowledge and evaluate their learning process (test and judge) (Brezin, 1980). Thus, both tools may serve as metacognitive strategies for learners. In this study, the above-mentioned strategies will be embedded in the multimedia learning system. This study will test on the effects of embedding advance organizer and concept map as metacognitive strategies in the multimedia learning system on learners' metacognitive development.

Each person has his/her own way of knowledge representation. They chunk knowledge and memorize it in a different way. However, they cannot recall or identify the same complex unit with each other. Experts can identify much more complex unit than the novices can do. Therefore, we need to develop learning strategies for the learners to use consistently throughout the time of learning. The learning strategy consists of identifying the goals and objectives that a student will get at the end of the lesson. A research by Koh Boh Boon (1982) regarding on how Malay proverb can be taught effectively in school proposed that the subject can be taught using detail study on things that need to be compared, define the symbolic meaning of the conclusion and evaluate on the precision of proverb within its context.

R.J. Wingfield (1968) demonstrated his approach, which is to make known the culture of where the proverb exist to the students. This helps the students to grasp the background and also the nature of the proverb itself. With reference to the above works, it

is best to develop a Malay proverbs multimedia learning system by describing the Malay culture and its environment and introducing the Malay proverb by using the three steps approach.

2.3 The Malay Culture and Its Environment

Traditional ideas, imagery and schemata decisively influence the formation of proverbs which originates from analogical forms of earlier Proverbs. The composer of a proverbial saying naturally derives his symbolic images in part from his close every day surroundings. In Finland, a dog is a domestic pet and irregularly symbolized as faithfulness (Mieder, 1999). On the other hand, sheeps and lambs are symbols of stupidity of the crowd mentality or as the directly opposite of wolf (Mieder, 1999). While in Malay culture, crocodiles, snakes, chickens, elephants and ants are the most likely animals that represent bad, powerful, good or weak (Hassan, Mohd, 1993). Therefore, a source is used metaphorically to produce pictures in the mind of readers or listeners. Today, we are no longer live with the animals as one community although some wild animals still reside in some rural areas. The changes in social life, every day surroundings and also environment make it difficult for us to see the interrelations between the metaphorical language and the source.

Proverbs have always been part of the Malays. However, the Malay culture has evolved and the life and the surrounding of the old generation are no longer here. What was seen then, are seldom seen now. There are three things which contrast the traditional world and the modern world namely the environment, the culture and the life dependency.

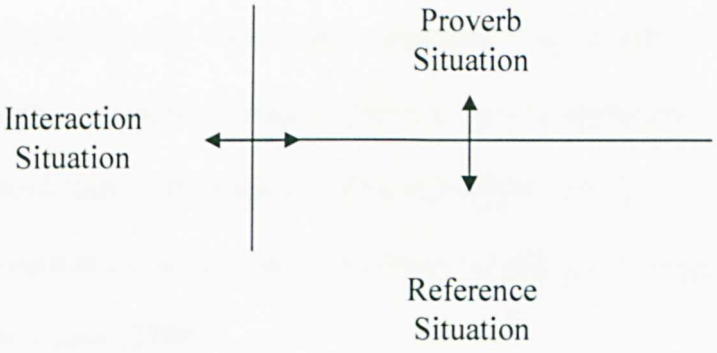

Figure 2.1: Proverb Model (Seitel, 1972)

Figure 2.1 is a heuristic model of the usage of proverbs developed by Seitel (1972). It is based on the central assumption that the interaction situation, which is a situation in which a proverb is actually used, is not identical with the proverb situation which is a situation inherent in the proverb text. Both the interaction and proverb situation are not or need not be identical with reference situation which is a situation the proverb situation refers to. For example, if one sees two siblings fighting with each other (interaction situation), we refer them as "cat and dog" (proverb situation). We know that neither the two siblings are a cat or a dog but according to our experience, we know how a dog and a cat would fight when they both meet (reference situation). However, the way the cat and the dog fight might not be the same way as how two people would fight. Hence, one must relate proverb situation to reference situation and apply it in the interaction situation. This proverb model is then implemented in the three steps approach.

2.4 Introducing the Three Steps Approach

Krikmann (1999) introduces the three steps approach help learners to visualize the meaning of the proverb through three stages. The first step is statement, the second step is evaluation and the third step is prescription. This arrangement as shown in Figure 2.2 also reflects the general succession of the steps of human cognition according to well-known formula developed by Lenin (1969):

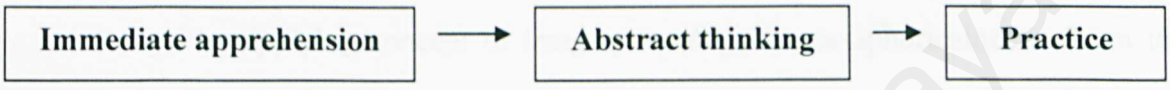

Figure 2.2: Lenin's Three Steps Approach

The statement level consists of proverb text. While evaluation level is where one tries to understand the meaning of the proverb text by taking out the important elements, which is usually the noun in the text and change it into something that make sense. Prescriptive level, on the other hand is about setting a situation in which the proverb text is suitable to use. The new learning strategies will be created using the identified approach which is called as the three steps approach. The three steps are:

Step 1: Knowing

The system makes known the statement consisting of a proverb so that student recognizes the proverb. There are many different structures for proverbs. However, for the purpose of this project, one type of structure will be introduced and implemented. The structure consists of two nouns comparing with each other for example "fight like cat and dog".

Step 2: Understanding

Here students are taught step by step to pick up main elements in the proverb to comprehend the meaning of the proverb as a whole. The steps are the following:

i. Firstly, students need to pick up the main elements which are the objects in the text. An object is usually a noun. For example, "fight like cat and dog". The objects are the cat and the dog.

ii. Then they need to substitute the elements with its value. This can be done by applying concept of imagery, analogy or metaphoricalness. From the above case, cats and dogs represented as one small animal and another one is a bigger animal of the same nature.

iii. Then look at the objects and pick up the verb. The verb is usually in the middle of an object and a subject but this also depends on the structure of the proverb. In this case, the verb is outside of the proverb which is "fight".

iv. After that, students need to compare the elements in reference to the verb. We can see what the object (the first element) does (the verb) with the subject (another element). In this case we can see that cat and dog are fighting but they are not killing each other.

v. Finally, students need to summarize this symbolic meaning. This can be done using the concept of analogy and imagery. In this case, we have to imagine how cat and dog fighting.

Step 3: Usage

After the overall meaning of the proverb is obtained, the last step is to advice the appropriate way of using a proverb. This can be done by taking the analogy that has been used in the previous step and then formulate a cue that can relate the

analogy with real life examples. From the example used above, we can use "fight like cat and dog" when we see two people fighting with each other in which this fighting scene does not lead into crime. Therefore, the student is help to grasp the meaning and use it in the correct way.

2.5 Cognitive Development of Young Learner

The system is designed for young learners of age 11 to 12 years old. Children enter a new stage of cognitive development, concrete operations at about age 7. They have advances in cognitive abilities such as conservation, classification, seriation and transitive inference. They also have greater ability to manipulate symbols. Conservation is the ability to recognize that the amount of something remains the same even if the material is rearranged. Classification is the ability to classify or sort items into categories and enable them to organize and understand their world. Seriation is the ability to arrange things or objects in a series by placing them in order according to one or more dimensions. Transitive inference is the ability to recognize a relationship between X and Y where X and Y are objects. They are able to pay attention, concentrate longer, focus on the information they need while screening out irrelevance information. Once they reach this stage, their processing time decreases. When developing a multimedia learning system, there are few things that need to be taken into account. There are differences between developing a system for an adult and for a child. Table 2.1 shows the differences between adults and children (Papalia, 1999). This helps to identify the elements that need to be taken into account when developing a system for young learners.

Table 2.1: A Comparison of How Adults and Children Learn New Things

Adults	Children
Structure life experience and limit new learning. Their learning is extending the meaning, values, skills, strategies and attitudes.	They have few life experiences. Their learning involves forming basic meaning. Values, skills and attitudes.
Use generalized and abstract thought.	Use specific and concrete thought.
Change factors are related to social and work roles and personal need for continuing productivity and self-definition	Change factors are related to physical growth, socialization and preparing for future work and social roles.
Learning needs to be related to current life situation.	Learning needs to be related to developing organized patterns for understanding future experience.
Express needs through verbal processes and may collaborate in planning their own learning programs.	Express needs through non-verbal processes, so planning is usually done by experts.
Have organized and consistent self-concept and self-esteem and are capable of independent action.	Have relatively unorganized and inconsistent self-concept, so they see themselves as separate but dependent on others.
They are assigned a responsible status in society and are expected to be productive citizens.	They are assigned a non-responsible status in society and are expected to play and learn.

Children's mind works by encoding data, storing it then retrieve it for later use (Papalia, 1999). During encoding, a code will be attached to the information that they want to remember. The code contains data on which folder the information is stored. This is known as organization. In middle childhood, the working capacity is greatly increased. They have several folders in their mind and based on the code attached to the information, they store the information in the appropriate folder. When the data is needed, it is retrieved from the relevant folder. At this stage, they start to understand how their own memory works. If they see two objects, they will remember the one that had just been seeing. At

this time, they also understand that passage of time effects memory, they can memorize better with longer attention, re-learning is easier than learning for the first time, some people remember better and some things are easier to remember than others. They also can plan better to remember something.

There are several strategies that can be used for young learners to remember better. They can do rehearsal by saying out loud the things they want to remember. They can organize information by mentally placing it into related grouping or categories. Younger children however do not organize automatically. They must be shown on how to organize. They can also use the technique of elaboration in which they associate items with an imagined scene or story. Children will remember better when someone else makes up the elaboration.

Before the age of 10, they already understand and better able to interpret communication from others oral and written. They rarely use passive voice and verb tenses that include auxiliary "have" and also conditional sentence. Concrete operational child have increased ability in metacommunication which is awareness of the connection between instruction and result. Young children often do not understand what they see. Hear or read but they may not be aware that they do not understand.

After taking into consideration on the type of audience for this multimedia learning system, the requirement and need to build up the system is then set up. This is further discussed in the next chapter.

2.6 Summary

In this chapter, a literature review on all issues pertaining to this dissertation is conducted. Proverb which is the main subject area of the tentative prototype is been defined. After it is been defined, a research on suitable learning strategy to be implemented is discussed.

The strategy is set by introducing Malay culture to learners. Then the three steps approach (knowing, understanding and usage) is introduced. This three steps approach is implemented by utilizing Lenin's three steps approach: immediate apprehension, abstract thinking and practise. Before we can start building the multimedia learning system, it is essential to know who the system is intended for. Therefore, audience of the system which is the learners between the age of 11 and 12 is discussed. The next chapter discussed about the technical and user requirements of the system.

CHAPTER 3: USER REQUIREMENTS

3.1 Introduction

The method of research and investigation of the user requirements is the process of assembling the necessary tools, information and approach to develop a strategic approach as well as to design Multimedia system. In this chapter the feasibility and requirements of the system and modelling of the important elements of the system will be described. This chapter will also provides a clear differentiation between the user requirements which are vital and have to be met by the required system and those which may be desirable but have been relaxed because they cannot be met within stated acceptable limits. The strategic approach requirements include selecting appropriate content and developing strategic formulae to be used in the system. The software requirements include designing the look and feel of the learning system for young learners and designing a system that will meet the aims and requirements of the users.

3.2 Understanding the User Requirements

As described in the first chapter, most of students are not able to master Malay proverb because of low interest in reading and unable to understand it. Due to this, a strategic approach is developed so that the students can understand faster and better. Multimedia learning systems is a tool in teaching and self-learning. It is an important tool to improve the teaching effectiveness and student's learning. A good Multimedia learning system is one that helps to improve student attentiveness, comprehension and retention by utilizing the ultimate elements of Multimedia.

Various techniques can be applied for achieving the different steps of information gathering. It consists of literature review, interviewing, questioning, observation, measuring and combination of documentation. In this dissertation, all those techniques

have been used to decide the type of multimedia system that is going to be implemented. It is also been used to obtain general insights on how the system should look like and how it should differ from the available systems on the market.

A questionnaire was distributed among experienced instructional designers from BT Media Sdn. Bhd. and Multimedia Synergy Corporation Sdn. Bhd. pertaining to the idea of having multimedia learning system in our society. Although this set of questions are quite subjective, the responses given strengthen the fact that the system can really assist teaching and learning of certain subjects. The complete response from five instructional designers from various companies in Malaysia can be referred in the Appendix A.

Overall, all the respondents agree that a system that has multimedia elements like audio, graphics and animation would help a learner to comprehend and learn better. Other suggestion is to have a computer simulation as a way to attract the leaners. They also agreed that having a multimedia system is a recent educational trend due to the multimedia elements that have the ability to gain leaner's attentiveness. They expected that multimedia system should have many images and sounds that can potray that learning is fun. In their opinion, knowledge is both acquisited and constructed therefore cognitive psychology has a great impact on instructional design. Content and courseware must be reusable, interoperable and easily organized at different levels of complexitity.

3.3 Components of Learning Environment

The first attempt to provide machine based teaching systems is led by Skinner the behaviorist (Boyle, 1997). The most important form of learning was operant conditioning, in which behavior is shaped by its consequences. In the late sixties, computers were widely available and this led to stronger computer based training systems. Gagne (1979) had provided a formal system utilization of learning theory. This formal approach is based

on instructional design, in which it emphasizes a highly disciplined approach to design. This approach was very influential in designing computer aided learning systems and is known as traditional CAI approach.

In order to build to build Multimedia Learning System, there are a few elements that need to be taken into account. Figure 3.1 shows that the design of multimedia learning environment which consists of two layers: conceptual layer and presentation design. The conceptual design is where designer need to adopt specific approach for the design. The presentation design deals with the materialization of the multimedia learning system. Practically, there are several approaches to designing multimedia-learning environment. There are two approaches used by many developers: traditional CAI (Computer Aided Instruction) and Constructivism. Traditional CAI gave explicit didactic expression of the knowledge to be learned while constructivism emphasis providing learners with the resource to construct their own understanding (Boyle, 1997). In constructivism, the learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure. For the purpose of developing a prototype for this system, traditional CAI is used as the framework and Constructivism is adapted at the end of the lesson.

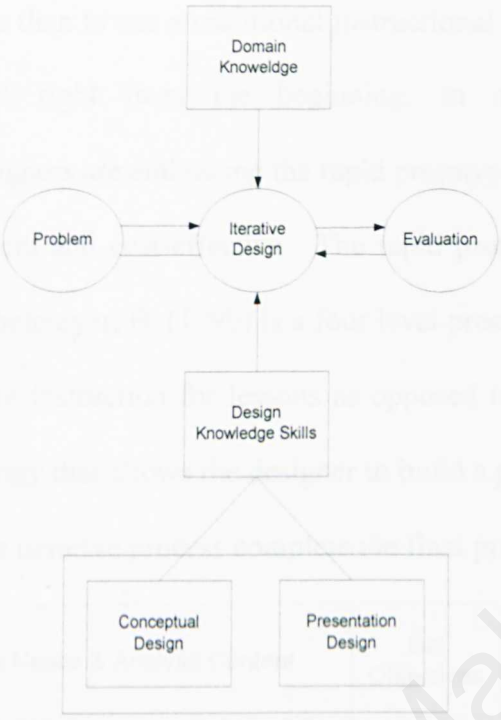

Figure 3.1: Components of Multimedia Learning Environment (Boyler, 1997)

3.3.1 Instructional Design: Analysing the Learning Material

Instructional Design is the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs. It includes development of instructional materials and activities, and evaluation of all instruction and learner activities.

The prototype is built by using rapid prototyping model. It is a more specific type of instructional design model. Rapid prototyping has become a common practice in the world of interactive multimedia design. Its popularity stems from its capability of testing the prototype on the end-users to receive authentic feedback. This ensures a better design and eliminates the risk of abandoning a finished product due to the failure to meet the users' needs. In terms of the cost associated with development and production, it is less expensive to

build a prototype than to use a traditional instructional design model that aims at an end product right from the beginning. In multimedia development, instructional designers are embracing the rapid prototyping model since it is more pragmatic, efficient and cost-effective. The rapid prototyping design model by Tripp, S., & Bichelmeyer, B. (1990) is a four level process (see figure 3.2) that is intended to create instruction for lessons as opposed to entire curricula. It is a design methodology that allows the designer to build a prototype, test and modify it, and through an iterative process complete the final product.

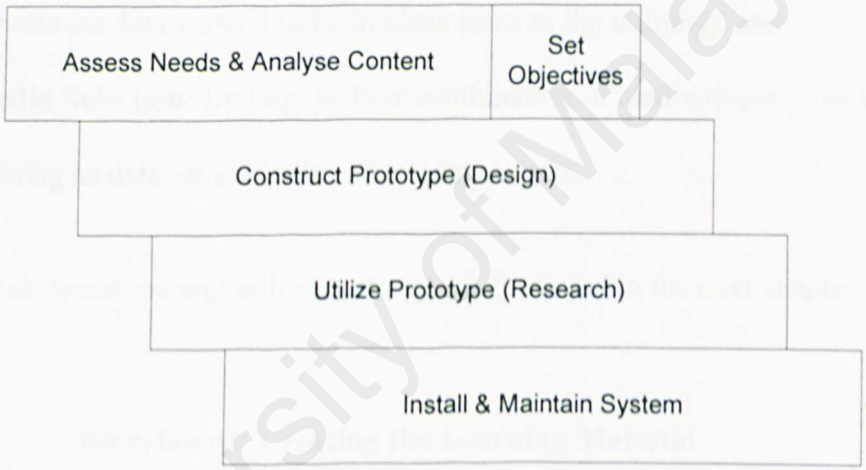

Figure 3.2: The Rapid Prototyping Design Model

By employing the Rapid Prototyping Design Model, the conceptual layer will begin with the first step of the model which is to assess needs and to analyse the content. The aim of this stage is to determine training needs and produce a needs assessment document which is the Analysis Document (see Appendix B). Components include the following:

- **Goal analysis**: reducing abstract desired outcomes to specific performances that can be measured;

- **Performance analysis**: determining the reasons for and solutions to the differences between present behaviour and desired outcomes;
- **Audience analysis:** finding out the relevant characteristics of the potential learners;
- **Instruction Strategies**: specifying how the course to be taught through out the learning process.
- **Task analysis:** specifying and determining the exact nature of the task the students must learn, analysing it into sub-divisions, and deciding which aspects can be assumed to be in place prior to the training; and
- **Media Selection:** finding the best combination of media to carry out the training as determined in the other components.

Construct prototype and utilize prototype is discussed in the next chapter.

3.3.2 Storyboard: Creating the Learning Material

A storyboard is a pictorial and/or written synopsis of text, graphics, videos, animations description and other Multimedia elements in sequence they are to appear in the prototype. Storyboarding allows one to plan out on how the major sections of the narrative look, in what succession they appear and the relationship between them. This storyboard is used in the conceptual layer to organize the content that is to be included in the presentation design. Template for the storyboard is given in Appendix C. Another method for planning out the major flow of a piece is to use Flow Charts. It gives the general idea about the whole system while storyboard is used to describe the content of the system.

3.3.3 Multimedia Elements: Creating the Learning Environment

The term Multimedia refers to the presentation of information using a combination of more than one "natural sensory" medium. By employing multimedia elements in the systems, students learning can be enhanced and student attentiveness can be improved. The multimedia elements include text, document images, photographic images, geographic information system maps, voice commands and synthesis, audio messages, music, graphics, moving graphics (animation), full-motion stored and live video, holographic images and fractals. By combining the elements of multimedia, teachers can present lesson content in ways that better motivate learning. The different elements of Multimedia appeal to students with different learning styles. For instance, the auditory learner retains information better when content is read out loud. A visual learner, in contrast, retains information better when concepts are presented using charts, maps, and other graphical images. Media-rich presentations are built around powerful combinations of images, sounds, animation, text, and video.

Multimedia system is the field concerned with the computer-controlled integration of text, graphics, still and moving images, animation, sounds, and any other medium where every type of information can be represented, stored, transmitted, and processed digitally. These dynamic time-based media contributes to an attention grabbing dimension to multimedia and to the impact of the learning environment. The prototype adapted these three elements. Each one of the elements has its own advantages and those are:

- Still images give visualization of the text making the comprehension of text a lot easier. It can be a powerful element to grab student's attention as well as comprehension.
- Animation adds impact to a presentation and its variation can be used to enhance learning.
- Sound provides powerful element in term of attention grabber in the interactive multimedia learning environment.

Upon taking advantage of the benefits that multimedia can offer, the prototype is built using still images, animation and sound with these four characteristics:

- Multimedia systems must be computer controlled
- They are integrated
- The information they handle must be represented digitally
- The interface to the final user may permit interactivity

3.5 Technical Requirements

Programming languages like C, C++, Visual Basic, JAVA and others are the languages being used to develop software. However, multimedia authoring tools are more suited for the development of multimedia learning system. Many of multimedia authoring tools such as the Macromedia's product have been developed. They focus on designing using time-line rather than focusing on the programming. Figure 3.3 shows the necessary multimedia toolset that are needed before the prototype can be built. Multimedia authoring tools are the tools to build the system. The elements of which are used in the system are prepared

using media editing and capture software. Multimedia hardware platform provides the basic platform for developing and delivering multimedia systems. For the purpose of this dissertation, the basic platform would be normal personal computer (PC) with speaker and meet such minimum requirement; Operating system: WINDOWS 98; Processor: Pentium III with 64 MB RAM; and Hard disk space: 50MB.

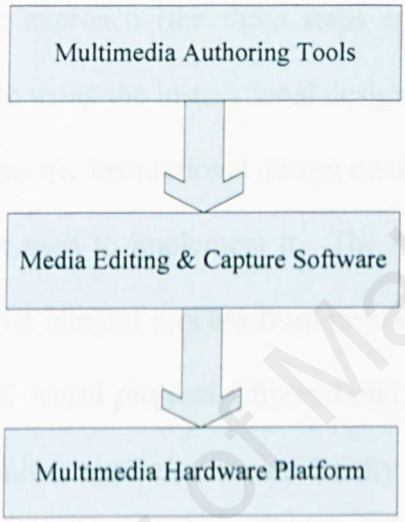

Figure 3.3: Overview of the multimedia toolset

The prototype is developed using Macromedia Flash version MX as the main authoring tool. This is supported by using Actionscript for Macromedia Flash version MX for the programming part. Below are the media editing and capture software that are used in managing the creation of specific media:

- Analysis and storyboarding: Word Processing, MS-Word Version 2000;
- Visualization: Sketching;
- User interface design, graphics and animation: Adobe Photoshop Version 7.0, Adobe Illustrator Version 10.0, Macromedia Flash Version MX;
- Audio: Sound Forge Version 4.0; and

3.6 Summary

This chapter discussed the investigation of the user and technical requirements of the interactive multimedia learning system. The nature of the required system and the facilities provided are established in this chapter by explaining the multimedia elements used in the system and its advantages. One of the major requirements of the system is to develop the formulated strategic approach (the three steps approach) discussed in the previous chapter into the prototype using the instructional design model. This chapter also discussed on the needs of using specific instructional design model as a base to develop the instruction and how storyboard is used to implement it. The rapid prototyping model is chosen for the whole process for its integral process from needs assessment to evaluation, pragmatic and prescriptive for real world projects, efficient and economic production and user-centred methodology. Technical requirements are briefly explained on multimedia toolsets needed for the whole process which include multimedia authoring tools, media editing and capturing software; and multimedia hardware platform. Once the three steps approach had been validated through further reviews and research, the design process began. The whole implementation issues are discussed in the next chapter.

CHAPTER 4: DESIGN AND IMPLEMENTATION

4.1 Introduction

Conceptual design is a set of techniques concerned with helping the user build an understanding of how to use an interactive system. It is known that conceptual design is a crucial stage because it may help avoid conceptual mismatch and also to improve learn ability. In this stage, a conceptual model for the system will be designed and the structure of the whole system will be created.

4.2 Conceptual Layer of Prototype

The Rapid Prototyping Model then moves into the following stages of development where a pair of parallel processes involved within "design and research, or construction and utilization" (Braxton, Bronico, & Looms 1995) comes into play. The main characteristic of this model is where design and development are intertwined. Hence the aim of this phase is to develop a blueprint of how the finished product will look, and to produce a storyboard and flowchart of the whole structure of the finished product. This phase involves the programmers, graphic artists, writers and subject matter experts filling out the specifications in the blueprint. During this phase, a working model is developed, and this is then formatively evaluated, with the feedback being integrated into the ongoing development process. The outcome of this phase should be the full learning program. There are several key design issues to be resolved at this stage. Among the issues are like the following:

- **Interface design:** developing a consistent, user-friendly, attractive layout for the basic controls and functions. Figure 4.1 is the sketch for basic user interface design. Each frame follows the same structure as the sketch. There are areas for all the

necessary components such as the main title, the unit's title, still images or animation, text and buttons. The frame uses bold colours and special character suitable for students aged between 10 to 12 years old. Button consists of previous, next, home and exit button.

- **Sequencing:** deciding on the best educational order in which to place the different lessons and sub-components. Figure 4.2 shows the flow chart of the overall structure of the prototype. It shows where the content appears.
- **Lesson design:** developing the strategies to be followed within each lesson to best put across the teaching point, with the emphasis being on retaining motivation and maximising retention. The lesson plan from the analysis document is used to transform it into sequence of story in a storyboard. As stated in the analysis stage, the system consists of seven units. Therefore, seven storyboards are produced, and one represents each unit. Storyboards for Unit 1 until Unit 6 are portrayed in the Appendix D. Unit 7 is a supplementary unit in the system. It makes available selected proverbs for the student as reference and as well as to make known other types of proverbs that are available for them to learn.
- **Learner Control:** deciding how much control the learner can have over the lesson flow, and identifying key decision points in the lesson sequence. Each student has to go through from the first unit till the last. However, they have the control to skip some units (units that they already learnt before) by hitting the HOME button. They can also hit EXIT button to close the system. For each unit, they have the control to go back and forth.

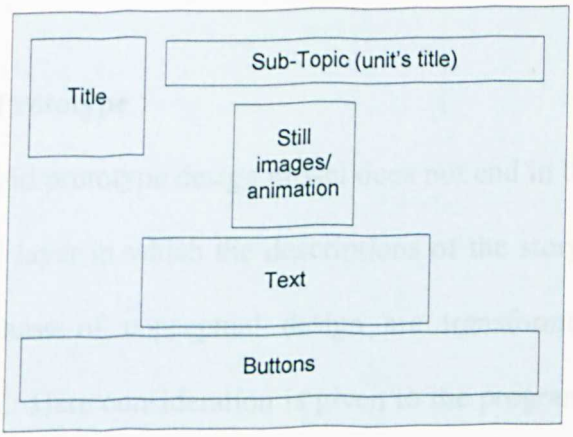

Figure 4.2: The Interface Design

Using the principle of instructional design, a set of instruction is transferred into storyboards which are able to accommodate the content of the instruction and also the description of the multimedia elements that needs to put in the system. The storyboards are used during the implementation phase where system is being encoded.

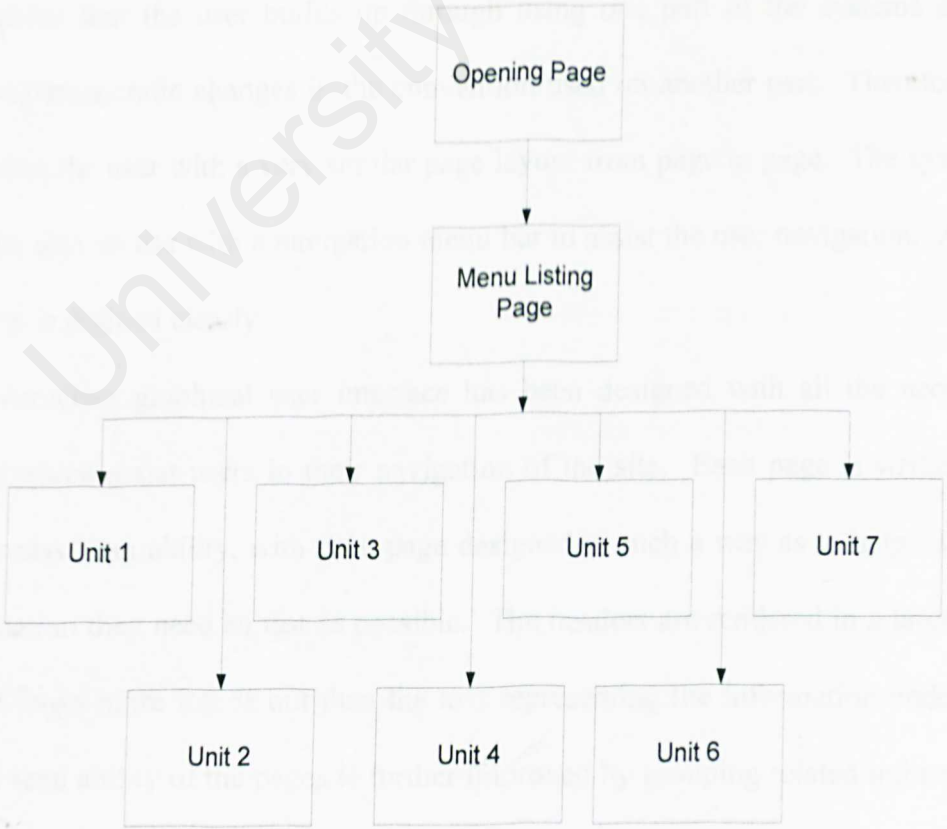

Figure 4.2: The Structure of the Whole System

4.3 Physical Layer of Prototype

The second phase of the rapid prototype design model does not end in the conceptual layer. It continues in the physical layer in which the descriptions of the storyboards constructed during the construction phase of conceptual design are transformed into a working multimedia learning system. Here consideration is given to the programming environment and the user interface. Most of the implementation involved the actual screen design and writing of code and text, which appear on the screen. The implementation consists of constructing the graphical user interface of the prototype using the principle of good design.

The hierarchical structure of the system provides a means for designing a naturally occurring dialogue. This is to ensure that the user does not significantly alter the approach to the task in hand, in order to interact with the systems. The design of the pages ensures that expectations that the user builds up through using one part of the systems are not frustrated by idiosyncratic changes in the convention used on another part. Therefore, the system provides the user with a very similar page layout from page to page. The system is designed to be easy to use with a navigation menu bar to assist the user navigation. All the necessary term is defined clearly.

An interactive graphical user interface has been designed with all the necessary helpful links, which assist users in their navigation of the site. Each page is written and organised for easy scan ability, with each page designed in such a way as to help students get the information they need as fast as possible. The headers are rendered in a large/bold font so that it looks more stands out than the text representing the information under that heading. The scan ability of the pages is further improved by grouping related information under one heading. The system is rather graphic intensive. Graphics helps to attract young learner's attention. Graphics will be used to create a joyful and colourful environment for

the young learners. Therefore, the look and feel of the system is important to ensure that learner will stay wide open longer than they used to be in a class or while reading books. Too many colours may create a joyful environment to young learners. Therefore, the system used bold and lively colours that attract the young learners' eyes. It makes the systems look livelier, less serious, fun and help the students to learn in a happy environment.

4.4 The Implementation

The storyboards created in the design phase are implemented by mapping the instructions into the system using Multimedia elements. All the text in the storyboard is transferred into the system and all graphic description is visualised into usable images and animation that relates with the text in that one frame. Selected text is recorded as sound and is embedded into the system. Figure 4.3(a) shows the basic interface for the system on the interface design in the conceptual layer. Figure 4.3(b) shows the screenshots based on the structure of the whole system in Figure 4.2.

Figure 4.3(a): Screen Shot of Basic Interface

Legend:

1 = previous button going to previous frame

2 = home button going back to the menu screen

3 = next button going to the next frame

4 = exit button, window will be shut down

5 = area where note will be displayed especially on item that need to be explained in greater detail.

Figure 4.3(b): Screenshots of the whole system

Figure 4.3(c) shows the screen shot of the glossary in Unit 7. In this screen shot, proverb is displayed together with its meaning, the visualization (graphics) for that proverb and also the example of sentence using that proverb. Figure 4.3(d) below shows the screen shot when the student does not enter his/her name in the designated box. A pop-up alert box appears that instruct the student to re-enter name.

Figure 4.3(c): Screen Shot of the Glossary

Figure 4.3(d):Screen Shot of Error

Figure 4.3(e) below shows the screen shot of the use of note ('nice-to-know' item or item that need greater explanation). The note will appear occasionally as a help to the student.

Figure 4.3(e): Screen Shot of Note

Figure 4.3(f) shows the screen shot of exercise and quiz in the prototype. The example of feedback also can be seen in the same screen shot.

Figure 4.3(f): Screen Shots of Quiz

4.5 Utilizing Prototype

Once the prototype construction has been completed, the whole system is reviewed and all errors are corrected. A focus is placed on issues such as production difficulty, multimedia elements resolution, and file size. After the self-error-correction is completed, a focus group is selected in order to help assess the quality of the prototype. 4 people from Dawama Sdn. Bhd. who are experienced multimedia designers are selected. A checklist is developed and is used as a method for the use of the focus group. Appendix E shows the checklist prepared. Table 4.1 shows the result from this evaluation set for the focus group. The answer to each question depends on how the focus group engaging themselves with the system. The result with 'NO' answers were revised and appropriate action took place. Some of the areas for example for question number 5, has not been changed due to time constraint on where new instructions need to be constructed. After the prototype had begun its final round through the revision loop, a final self-error-correction is done again. It is the final purpose of this error correction to gain a final evaluation of the factors that are related to this prototype and make note of any significant changes that have been made to the prototype.

Table 4.1: Result by the Focus Group

No.	Question	'YES'	'NO'
1	• Skills instruction	4	-
	• Knowledge instruction	4	-
2	• The range of skills taught matches the range specified in my instructional objectives	4	-
	• The skills can be taught in the allocated time	2	2
3	• Skills required for the performance of other skills are taught first.	4	-
	• Skills are cumulative	4	-
4	• Instruction is presented in steps that are appropriate for the target audience.	4	-
5	• There is structured lesson to teach specified objectives	4	-
	• The lessons contain a section that teaches instructional background	4	-
	• There is an appropriate balance between 'need-to-know' and 'nice-to-know' information.	4	-
	• A detailed description of how to perform the skill is provided.	4	-
	• The lessons contain useful examples.	4	-
	• Students are encouraged to practice skills taught in formal exercises.	4	-
	• Exercise clearly relate to the performance of the skills.	4	-
	• Exercises require the use of skills taught in previous lessons.	4	-
	• Interactive exercises are provided (the skill is practised in context	-	4
	• Enough exercises are provided.	3	1
	• Feedback is provided about required response	1	3
	• Feedback gives clear description of required response.	1	3
	• Where appropriate, feedback is explained in detail.	2	2
	• If a response is incorrect, additional exercise and feedback are provided.	-	4
	• Feedback anticipates students' concerns, problems, and questions and addresses them.	2	2
6	The instructional format of the program is appropriate.	4	-
7	• Content is appropriate for the age of the target population.	4	-
	• Mechanics of the program (instructions, response mode, feedback, and graphics) are appropriate for the target population.	4	-
	• Instructional style is appropriate for the purpose of the program.	4	-
	• Content is closely related to instructional objectives.	4	-
	• Accuracy and completeness	3	1
8	• Content is accurate.	4	-
	• Content is complete	1	3
9	• Lessons lean towards successful learning.	4	-
	• The program uses a variety of motivational techniques.	2	2
	• Content is presented in an interesting style.	4	-
10	• The program is free from bias and stereotypes	4	-
	• The program contains role models for the target population.	-	4
11	• The program does not contain spelling, typographical or grammatical errors.	-	4
	• The style is clear, concise and interesting.	4	4
12	• The program is compatible with the desired method of delivery of instruction.	4	-
	• Teacher directed	4	-
	• Independent	-	4

4.6 Summary

The design implementation stage used the information gathered in the first stage of rapid prototyping model to materialize the developed instructions into multimedia learning system. At this stage, the three steps approach mentioned in Chapter 2.4 is validated. This is to check that every step fits well in the development of the storyboard. It is built based on assess needs and analyse content stages. The analysis document is used to develop storyboard in construct prototype (conceptual design) stage. The construct prototype (presentation design) stage refers to the actual delivery of the instruction as a multimedia learning system which is portrayed in the screen shots. The prototype is built by following a set of principle of good design to attain the look and feel of multimedia learning system for young learners. The utilize prototype stage then occurred where the system is fully reviewed by a focus group. The purpose of this stage is to determine the effectiveness and efficiency delivery of instruction. The result from the checklist filled up by the focus group is then used to correct some errors in the system.

CHAPTER 5: SYSTEM EVALUATION

5.1 Introduction

Evaluation is concerned with gathering data about the usability of a design or product by a specified group of users for a particular activity within a specified environment. It is vital because it clarifies on how users employ the system in their environment and observes as to ensure that the targets set on earlier stage have been met and conform to the standard set.

As already noted in the previous chapter, the philosophy behind the design of the systems was that excellence and success of system's design is on how the user is able to access the information in the documents. Indeed, usability of the systems is believed to be crucial element in the success of the system's design. By usability one means the ease of learning, ease of use, flexibility of use, and effectiveness of use and user satisfaction with the systems. Therefore usability is defined as the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in particular environments.

5.2 Evaluation

There are different kinds of evaluations that can be used in order to test the usability of the system. It can be by observing and monitoring usage, collecting users' opinion, experimenting and benchmarking, evaluating interpretively or predictively. This dissertation has chosen two types of evaluation methods. The first one is predictive evaluation and the latter is observing and monitoring usage. By using these two evaluation methods, developer managed to obtain enough data to test the usability of the system and therefore helped designer to engineer the system towards a target, to understand the real world and to compare designs.

For the predictive evaluation, one multimedia designer was chosen as the expert to perform the test. As for the later evaluation method, 40 random students between

the ages of nine to twelve from different races were selected from Sekolah Kebangsaan Lembah Keramat. These 40 random students were broken into two groups. One which is Group A is a group of students with computer literacy and another group which is Group B is a group of computer illiterate students. There were 14 students in Group A and 9 students in Group B.

5.2.1 Evaluation I – Predictive Evaluation

The predictive evaluation predicts the kind of problems that users may encounter when using the system without actually testing the system with the users. This technique is used for the finalised prototype. This is done by employing a psychological modelling technique by getting experts to review the design to predict the problems that typical users of the system is likely to experience.

The predictive evaluation is done by preparing a checklist to be filled by the multimedia designer who has adequate experiences in developing educational software from Dawama Sdn. Bhd. The result from the previous chapter shows that 78.13% of the system (including its learning strategy) is usable. The remaining 21.87% of the system needs to be changed or repaired. A blank checklist was given to the evaluater for them to note down comment on the flow of the system. The checklist contains errors or difficulties in using the system. Table 5.1 is the checklist which had been filled by the tester. The description and the note from the table show the areas that need to be improved for the specific frame number in the system. From the checklist, the concerned area was on the interaction between a student and the system. It shows that the system lacks of feedback and instructions. Those two elements are important when the students are to do self-studies. Even though there are instructions in the system, more extensive instructions need to be

included. The lack of those two would hinder the students to further use the system.

Table 5.1: Checklist for Predictive Evaluation

Bil	Frame No.	Description	Note
1.	Unit 1, Frame 1	The previous button leads students to nowhere.	The previous button on the first frame should be removed.
2.	Unit 2, Last frame	The next button leads students to nowhere	The next button on the last frame should be removed.
3.	All unit for Frame 1	The previous button leads students to nowhere.	The previous button on the first frame should be removed.
4.	All unit for last frame	The next button leads students to nowhere	The next button on the last frame should be removed.
5.	Unit 3- Exercise	Students expect direct feedback after they answer each of the questions. Giving out feedback after all the exercises are done will not give any impact to the students as they didn't know which one is right and wrong.	More specific and diagnostic feedback is needed here.
6.	Unit 5- Exercise	Students hardly think of the words that need to be filled up.	More clue and hint is needed here.

5.2.2 Evaluations II- Observing and Monitoring Usage

Observing and monitoring usage can be quite informal and may seem easy but it is not as straightforward as it may seem. There are various ways that can be used in this type of evaluation. This includes direct observation with the observer making notes about interesting behavior or recording their performance or indirect observation by using video logging. Direct observation will be used instead of video logging because no such facility is provided for the evaluation process. This first way of doing this evaluation is by recording the observations. This is done by

noting events using pen and paper. Each one of the random students from both groups (Group A and Group B) is called to use the system. A clear instruction was given out on how to use the system as well as what the system is for. Group A finished the task earlier than group B. While Group B, took quite sometime to familiarize themselves with the computer and the system. Continuous guidance is given to them throughout their trial. Table 5.2 shows the finding through this evaluation technique.

Table 5.2 Evaluation for Group A and group B

No	Test Description	Group A	Group B
1.	Opening screen – student need to key in their name.	Pass	Pass after verbal instruction was given.
2.	Click the menu accordingly	10 out of 14 students	None
3.	Unit 1-Follow the narration	7 out of 14 students	All 9 students with guidance
4.	Unit 2- Follow the narration	7 out of 14 students	All 9 students with guidance
5.	Unit 3- Follow the narration	All 14 students	All 9 students with guidance
6.	Unit 4- Follow the narration	All 14 students	All 9 students
7.	Unit 5- Follow the narration	All 14 students	All 9 students
8.	Unit 6- Follow the narration	All 14 students	All 9 students
9.	Unit 7-Glossary	5 out 14 students	All 9 students

From the table, we can conclude that there was no problem with the opening screen. Every student keyed in their name and the system brought the student to the menu screen. Most of the students randomly clicked at the menu on the screen. An instruction had to be given to tell them that the system is designed according to structured units and students should start to learn from the first unit. Some of the students found the first unit as interesting as they follow the narration. While some

of them just clicked the next button and ignored the content. Most of the students paid more attention on the Unit 3 until Unit 5 of the system where animations of the system caught their attention. Most of the students were eager to do the exercise. This is based on observation on their behaviour and facial expression. At the end of the lesson, most of them successfully try out the system. When asked whether or not these students would apply Malay proverbs in their daily life, most of them said 'yes'.

Further evaluation is set out for 30 random students from the same school where they were given a questionnaire (see Appendix F). This is done to evaluate their understanding on the learning strategy. Table 5.3 shows the responds given by the students.

Table 5.3: Feedback from the Questionnaire

Question No.	Yes	No
1	26	4
2(a)	30	0
2(b)	30	0
2(c)	19	11
2(d)	21	9
2(e)	18	12
2(f)	30	0
2(g)	30	0
3(a)	17	13
3(b)	15	15
3(c)	14	16
4(a)	21	9
4(b)	21	9
4(c)	30	0
5(a)	23	-
5(b)	7	-
6	30	0
7	30	0

26 students know what a Malay proverb is (1). The other 4 students who are non Malay have little understanding on what a proverb is. With simple and brief

introduction to it, all of the students feel that the first two units are easy to follow (2a and 2b). However, on average 15 students feel that the the three steps approach introduced in the system is hard to follow (3a, 3b and 3c). After an explanation, 21 students feel that they get to know proverb better using the first step. 21 students find that using the second step helps them to understand the meaning of the proverb. All of them agree to use the proverb in the future using the third step. 23 of them choose to make use of the approach for their future study (5a). The remaining feels that it is easier to memorize the definition of the proverb than to apply the introduced approach (5b). All of them agree that the approach is usable for their future study and will use the approach in the future (6 and 7).

From this evaluation, we can conclude that good instructions and animation plays a great role in producing educational software. Some of them felt that the instructions in the system are inadequate and extra instructions are needed from the demonstrator. This can be seen after further elaboration on how the approach works and oral exercise is given after they used the system. The findings from these two evaluation technique are applied to test on each aspect in the system testing.

5.3 System Testing

Part of the objectives of the usability testing is to determine which elements of the design and environment of the prototype are least intuitive or comfortable to users. This is to give valuable insight to refine the broader prototype architecture, to make it easier and more comfortable to use. Therefore, in this evaluation stage, the system is tested on four different aspects which are:

- User's orientation
- Clear navigation;
- Clear communication;
- Cross platform compatibility

5.3.1 Testing on User Orientation and Clear Navigation

Here the usability objective was to measure the efficiency and the extent to which the prototype able to orient the students to learn Malay proverb. The findings from the two evaluation techniques show that the lack of extensive instructions in the system slows down the learning process. This also means that the students take time to become accustom to the new system. This can be seen from the checklist prepared by the expert and also from observation where some students still had to ask on what to do next. Since there was no specific reference on the strategic approach to learn Malay proverb available, it is difficult to assure what should be put into the system and what should not. However, the most of the students (70%) can perform each task smoothly from the beginning while the remaining 30% of the students can perform each task smoothly after finishing the first two units. Therefore, the objective usability of the system in terms of user orientation and clear navigation is met since students can orient themselves in self-studies after learning the first two units.

5.3.2 Testing on Clear Communication

Here user satisfaction and enjoyment in using the systems is the key measurement of the success of the system. The basis interaction is the prospective students'

desire to meet three basic elements: transaction, interest and form relationships. Through observation, 100% of the students found that the system is enjoyable. This is due to the interface design and the multimedia elements used in the system. The transaction which is the interaction between the students and the system is also made successful. This can be seen where 100% of students from Group A managed to learn unit 3, 4 and 5 and did the quizzes, whereas, all students from Group B managed to do all that after some guidance. Therefore, the objective of usability of the system in term of communication is met.

5.3.3 Testing on Cross Platform

This multimedia learning system is developed and tested using personal computer. The system can be compiled into an autorun system which can be used by personal computers, Macintosh or LINUX machines provided that special programming code is attached to it. Since there was no modification needed in the system itself, it can be said that the objective of usability of the system in term of cross platform is also met.

5.4 Summary

This chapter presents the evaluation and testing process of the multimedia learning system. The evaluation methods yield two broad types of information that is qualitative and quantitative. The choice of method is influenced by a number of factors. It includes the purpose of the project, the stage in the project when the evaluation is done, cost-benefit considerations and appropriate mix of methods. In this evaluation stage, two methods are chosen: predictive evaluation and observing and monitoring usage. The methods were chosen because it provides direct evidence of system effectiveness and usability and it is

easy to use informally. The findings from the evaluation are used to evaluate the usability of the system in term of user orientation, clear navigation, clear communication and cross platform. The results from the evaluation are also used to evaluate the effectiveness of the three steps approach. From the statistic mentioned in each section, the objective of usability of the system is successfully met. Further evaluation on the three steps approach took place where on average 80% of the students (refer to table 5.3 for question 4(a), 4(b) and 4(c))feel that the learning strategy is easy to follow and will be using the approach in the future. The next chapter concludes the dissertation and provides a general evaluation of these findings and recommends some suggestion for future work.

CHAPTER 7: THE CONCLUSION AND FUTURE WORKS

6.0 The Conclusion

A prototype of a multimedia learning system for young learners learning Malay proverbs has been developed into a small prototype. The developed prototype provides background knowledge of the Malay Proverbs by introducing the Malay culture. This is done by putting some flash back of how the Malay ancestors lived and use proverb in their communication.

This dissertation begins with a motivation to develop a strategic approach to learn Malay proverbs. Proverbs have long existed in every culture and race. However, the younger generation seems to have a very low interest and understanding about this valuable heritage. Living in a modern world gives a slightest worry that this heritage will be forgotten and therefore cultural identity will no longer be recognised. A lot of research and surveys have been done by local linguistic researchers and their findings proved that the grasp of Malay proverbs within the younger generation is being deteriorated. Knowing this, a strategic approach is formulated as to increase the level of awareness of Malay proverbs as an important subject.

The explosive growth of the multimedia system and its penetration in the academic commercial and domestic environments has been well documented in the third chapter. It also discusses on the need of using specific instructional design model as a base to develop the instruction. Technical requirements are briefly explained to conform the multimedia requirements and needs with some technical limitation for this prototype. Once the formulae which is the three steps approach discussed in Chapter 2 is validated through further reviews and research, the design process began. As evaluation is a continuous procedure through out the construction of the system, a checklist was designed and was used as a way to evaluate the built prototype. The prototype is designed to exhibit a clear

understanding of the importance of content on the topic of Malay proverbs. However, due to information and technical constraints or lack of, only a limited amount of content is available on the system. However, this is not a handicap. The evaluation phase has successfully been implemented for the system. By applying predictive evaluation and observing and monitoring usage techniques, valuable results were gathered from the point of view of an expert and also the students.

6.2 To what extent does the prototype succeed?

A strategic approach to learn Malay proverb is successfully created. The three steps approach: Make known, understand and use, can be used by anyone who wishes to learn Malay proverb without having to memorise the entire proverbs together with its meaning. It can also be used in traditional teaching or applied in the multimedia learning system. For the purpose of this dissertation, the strategic approach is been applied into the multimedia learning system. A small prototype containing selected proverbs is successfully developed. It is been tested and evaluated by experts and also students of different age and races. The system is then evaluated in four different aspects of which all the objectives are successfully met. Overall, the objective of this dissertation is successfully met.

6.3 Future Work

The prototype however has its own limitation. This can be seen in terms of its contents and comments made by experts. Due to that fact, there are several recommendations that can be considered to improve the usability of the system. The main suggestion for the future work involves expansion of the content and test item and not only limited proverbs of certain type. This can be done by implementing database into the

system. It will have more benefit if the system is built using database where it stores more words and multimedia elements thus, making learning more beneficial. The system can be made online if the system is to be accessed by a lot of people. If the system is created to be a stand alone system, then special programming code need to be attached so that it can be installed and run in any operating systems. The system itself must equip with database software. The statistic in evaluation stage shows that 33% of the students found that the learning strategy is hard to follow. However, their level of understanding increased after they were asked whether they can understand it when the strategy is explained and exercise are given orally. Therefore, a special intelligent system should be inserted into the system where each question can be rephrased when students fail to give the correct answer.

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APPENDIX A
TRANSRCRIPT OF QUESTIONNAIRE AND FEEDBACK

Below is a transcript of the questionnaire and had been distributed to instructional designers of multimedia companies.

Questions:

1. Most of the Multimedia learning systems available now are a complete transferal from textbooks to the systems, whereas a successful learning systems should do better than delivering the content just like the textbook.

   a. What sorts of tools that should be available in a multimedia learning system so that it can do much better than a textbook can?

   b. How it might improve student's attentiveness, comprehension, retention and learning capabilities?

2. Do you see learning as a process of knowledge acquisition or knowledge construction?

3. Do you think cognitive psychology has a great impact on instructional design? Why and how it can be implemented?

4. What kind of approach is the most suitable in designing Multimedia learning systemss for young learners (age 10-12 years old)? Why?

Below are the feedback responded by the instructional designers.

Question 1:
Respondent 1:
More audio systems would help a learner to comprehend and learn better. After all, by just reading from a Multimedia learning systems doesn't really help. A learner needs a variety of input to stimulate one's understanding. Thus, audio would be essential.
Respondent 2:
By having simulation in Multimedia learning, it can attract the learners and make the topic interesting. The learners can understand the topic by visualization. Mind mapping is a must for learners to understand the flow of the learning systems. Navigation is to ensure that learners be able to aware of where they are in the flow. Interactive questions bank is an on-going practice for learners to measure their understanding the particular topic and to gauge their weaknesses in certain area of topic.
Respondent 3:
Need to include interactive learning-linking instructors and learners frequently & intensely (while adjusting to users' requirements) graphics, text, video, audio and animations.
Respondent 4:
Graphics, animation & video, sound, interactive game and text.
Respondent 5:
Multimedia elements itself such as video, graphics, animation, sound and etc. Play a role of effective educator. Interactive CD communication with students and able to do graphical explanation. Have an element of goof textbook that is easy to understand and user-friendly.

Question 2:
Respondent 1:
It can really improve one's understanding and all the criteria mentioned above as students will be able to concentrate more compared to a normal textbook. Audio systems will require students to concentrate and listen carefully in order to understand what is trying to be taught. This will definitely improve students attentiveness, comprehension, retention and learning capabilities.
Respondent 2:
Recent trends in education include shift from teaching to a learning paradigm (self-directed learning). Multimedia learning Systems allows for independent, interdisciplinary learning tailored to individual's needs. Students can go through the CD at his/her own pace. Simulated events (animation) questions that are realistic help students to apply the factual information they have learned.
Respondent 3:
The Multimediaelements will bring color, movement, sound effects will arouse student attentiveness.
Respondent 4:
By using the advantage of Multimediainteractive graphics, sound, animation, video and etc.
Respondent 5:
No answer.

Question 3:
Respondent 1:
Both are inter-related. Learning begins as a process of knowledge acquisition. Once student acquire the knowledge, they will then proceed to construct their own knowledge.
Respondent 2:
Knowledge construction that is learners should actively engage in building knowledge structures.
Respondent 3:
Both
Repondent 4:
Both
Repondent 5:
Both

Question 4:
Respondent 1:
Cognitive psychology has a great impact on instructional design since the development of cognitive psychology helped confirm the importance of learning strategies.
Respondent 2:
Yes. ID is embracing a new method and computer design tools that allow greater flexibility in the management and order of design activities. It also allows users to start immediately on meaningfully realistic tasks, encourage users to reason about what they are doing, give strong linkage between instructional systems & target systems, use content, situated learning, modeling & explanation, coaching & feedback exploration.
Respondent 3:
Yes, cognitive are learning process, comprehension process, acquisition knowledge and perception learning. Give a student chance to question, to analyze, to understand, to answer, to conscientious information, question and subject.

Respondent 4:
Yes because ID is the foundation which means the first phase of implementation. So, it must be implemented with knowledge in education.
Respondent 5:
No answer.

Question 5:
Respondent 1:
Definitely with loads of graphics and sound. Young learners are easily distracted thus a Multimedia learning systems needs to be interesting.
Respondent 2:
"Learning is fun" approach is very suitable for young learners. In designing the Multimedia Systems for them, we should incorporate a lot of colors, animation and cartoon characters. By integrating these elements without ignoring the content of learning, more young learners will engage themselves to learn.
Respondent 3:
Content and courseware must be reusable, interoperable & easily organized at different levels of complexity. Simple interactive & educational experiments so that allow them to discover & understand the topics thus develop a taste for knowledge & learning and educational & fun material.
Respondent 4:
Interesting, challenging and real.
Respondent 5:
Educative information but exciting because this can make them interested to explore and gain benefit (knowledge).

APPENDIX B
ANALYSIS DOCUMENT

This analysis document is created to plan the structure of the course. It contains the goal, the strategy, and the curriculum together with its objectives. This document does not follow any format but includes the vital information for instructional designer when creating the content.

DOKUMEN ANALISA

NAMA KURSUS:
PERIBAHASA MELAYU UNTUK SEKOLAH RENDAH (5&6)

Maklamat:

Matlamat kursus ini adalah:

- Mendedahkan para pelajar dengan khazanah Melayu;
- Membantu para pelajar dalam memahami makna Peribahasa Melayu dengan lebih mudah;
- Menggalakkan penggunaan peribahasa Melayu di dalam penulisan dan komunikasi kepada para pelajar.

Analisa audien:

Audien bagi system ini merupakan pelajar-pelajar sekolah rendah darjah 5 dan 6 yang mengambil perperiksaan Ujian Penilaian Sekolah Rendah (UPSR)

Audien dianggap tidak mempunyai sebarang pengetahuan dalam peribahasa Melayu.

Strategi arahan keseluruhan:

Kursus ini akan dijalankan secara berperingkat bagi memastikan bahawa para pelajar dapat memahami sepenuhnya tentang peribahasa Melayu.

Kursus akan dimulakan dengan menceritakan tentang latar belakang seta asal usul peribahasa Melayu. Kemudian makna peribahasa itu sendiri dihuraikan berserta dengan contoh.

Kaedah tiga cara kenal-faham-guna diperkenalkan dan dipecahkan melalui tiga unit, unit kenal, unit faham dan unit guna. Setelah ketiga-tiga kaedah ini diperkenalkan, latihan akan diberikan sebagai latih tubi kepada para pelajar Untuk menguasai teknik melalui kaedah tiga cara ini.

Pada penghujung kursus ini para pelajar akan disajikan dengan cerita berdasarkan peribahasa Melayu sebagai hiburan dan juga sebagai contoh untuk mengarang ceritakan berdasarkan sesuatu peribahasa Melayu yang diberi.

Glosari peribahasa menyediakan kumpulan peribahasa-peribahasa Melayu yang terpilih sebagai rujukan para pelajar.

Penggunaan bunyi audio, grafik dan animasi akan digunakan sepanjang pembelajaran.

Kurikulum:

Kursus ini mengandungi 7 unit. Tajuk-tajuk bagi setiap unit adalah seperti berikut:
Unit 1: Pengenalan
Unit 2: Apa Itu Peribahasa?
Unit 3: Kenal
Unit 4: Faham
Unit 5: Guna
Unit 6: Mari Bercerita
Unit 7: Glosari Peribahasa

Unit 1: Pengenalan
Objektif:
Pada penghujung pelajaran ini, para pelajar akan dapat memahami serta menggambarkan latar belakang peribahasa Melayu.

Unit 2: Apa Itu Peribahasa?
Objektif:
Di akhir pelajaran ini, para pelajar dapat mengetahui apakan yang dimaksudkan dengan peribahasa.

Unit 3: Kenal
Objektif:
Di akhir pelajaran ini, para pelajar dapat mengkategorikan jenis-jenis peribahasa untuk mendapatkan makna awal peribahasa tersebut.

Unit 4: Faham
Objektif:
Di akhir pelajaran ini, para pelajar dapat memahami makna sesuatu peribahasa dengan lebih mudah dan cepat dengan mengurangkan beban kognitif.

Unit 5: Guna
Objektif:
Di akhir pelajaran ini, para pelajar dapat mengetahui cara-cara menggunakan sesuatu peribahasa dan mendapat motivasi untuk menggunakan peribahasa dalam komunikasi seharian.

Unit 6: Mari Bercerita
Objektif:
Di dalam unit ini, para pelajar disajikan dengan cerita berdasarkan dari sebuah peribahasa dan dengan ini dapat memberi gambaran tentang cara menulis karangan berdasarkan peribahasa yang diberi.

Unit 7: Glosari Peribahasa

Objektif:

Di dalam unit ini, para pelajar akan disediakan dengan kumpulan peribahasa-peribahasa terpilih yang mengutamakan falsafah keperibadian dan nilai-nilai murni masyarakat Malaysia.

APPENDIX C
STORYBOARD TEMPLATE

This is a template of storyboard used for the purpose of arranging the content into the real system. This template does not follow any specific format as there is no specific format exists for creating storyboard.

Kursus: [The title of the course to be taught]
Tajuk: [The title of topic of the course]

Bil	Teks	Diskripsi Grafik	Nota
1	**Description of text that will be used in the system**	**Description of Multimedia element**	**Note that need to be taken care by the programmer**
2			

APPENDIX D

(i) STORYBOARD UNIT 1

Kursus: Peribahasa Melayu
Tajuk: Unit 1: Pengenalan

Bil	Teks	Diskripsi Grafik	Nota
1	Peribahasa telah wujud berkurun lamanya. Waktu kewujudannya seiring dengan kewujudan bangsa dan masyarakat Melayu itu sendiri. Oleh kerana itu, peribahasa Melayu mempunyai unsur-unsur tradisi dan adat resam orang Melayu.	Gambar orang Melayu dahulu. (Berpakaian Melayu tradisional)	
2	Sudah menjadi lumrah masyarakat Melayu yang suka berkias semasa berkomunikasi. Mereka tidak suka menyatakan sesuatu perkara secara terus terang kerana dikhuatiri orang yang diperkatakan itu akan tersinggung. Maka dengan menggunakan peribahasa mereka dapat menyampaikan mesej tertentu dengan cara yang baik.	Gambar org Melayu berbual sambil tersenyum.	
3	Anda perlu memahami budaya serta adat resam orang Melayu untuk memahami makna peribahasa. Ini kerana, persekitaran serta budaya yang diamalkan oleh masyarakat Melayu dahulu berlainan dengan persekitaran serta budaya masyarakat Melayu sekarang. Maka sesetengah perkara yang dahulunya biasa di amalkan tidak lagi biasa diamalkan pada masa kini.	Gambar Pengisar Vs. Lesung batu.	
4	Masyarakat Melayu pada zaman dahulu hidup dalam suasana perkampungan. Rumah-rumah kayu beratapkan daun nipah, lantainya beralaskan tikar mengkuang dan dapurnya bertungkukan kayu api sudah menjadi keperluan asas. Kebiasaannya, mereka menternak ayam dan itik di kawasan halaman rumah mereka.	Gambar rumah kayu lama di kelilingi pokok kelapa. Ada gambar perempuan menyapu sampah dan ayam-ayam di persekitaran rumah. Background kawasan lembah bukit ada sawah padi.	
5	Kawasan perkampungan biasanya terletak berdekatan dengan tempat	3 Gambar: 1. rumah tepi	

	mencari rezeki seperti di tepi sungai, di tepi pantai dan di lembah bukit sesuai sebagai kawasan pertanian untuk mereka menanam padi, sayur-sayuran, ubi kayu, jagung.	sungai 2. rumah tepi laut 3. rumah di lembah bukit (gambar di atas)	
6	Kawasan itu juga dikelilingi oleh hutan rimba yang belum diterokai. Oleh kerana itu, mereka sering terjumpa haiwan-haiwan seperti gajah, harimau, pelanduk, ular, buaya serta binatang-binatang yang lain.	Kawasan hutan rimba, ada harimau, gajah dan haiwan-haiwan lain.	
7	Oleh kerana sering berhadapan dengan haiwan-haiwan tersebut, mereka dapat melihat sendiri sifat-sifat serta tabiat haiwan itu dan membandingkan secara terus sifat haiwan dengan sikap manusia. Contohnya seperti "garang macam harimau."	Gambar harimau garang vs. gambar org lelaki garang.	
8	Masyarakat Melayu dahulu bergantung hidup dengan pertanian, perikanan dan penternakan. Maka kebanyakan mereka adalah pesawah padi, penoreh getah, petani/pekebun, nelayan dan penternak ayam, itik, kambing dan lembu.	Gambar pesawah padi, nelayan, penoreh getah, pekebun dan penternak.	
9	Melalui pekerjaan juga, mereka dapat melihat sifat kejadian semulajadi yang boleh dikaitkan dengan sikap manusia. Contohnya, "padi semakin berisi semakin tunduk", "mencurah garam ke laut" dan "air yang tenang jangan disangka tiada buaya".	Gambar org lelaki berdiri sambil melihat persekitarannya.	
10	Kebanyakan peribahasa-peribahasa yang wujud adalah pengalaman-pengalaman masyarakat dahulu yang pernah meraka lalui pada waktu itu. Secara tidak langsung persekitaran mereka turut mempengaruhi cara mereka berkomunikasi. Objek-objek sekeliling seringkali di gunakan untuk membuat perbandingan terhadap sifat dan sikap manusia.	Gambar seorang budak lelaki dan uasana persekitara berpusing.	

11	Sesuatu yang jahat atau buruk akan dikaitkan dengan bangkai kerana ia berbau busuk, buaya dan harimau kerana ia suka menyerang manusia yang akhirnya membawa kesengsaraan kepada manusia dan ular kerana ia juga merupakan musuh manusia dengan menyengat melalui lidahnya yang bercabang dua.	Gambar bangkai, buaya, ular dan harimu.	
12	Sesuatu yang baik biasanya dikaitkan dengan objek-objek yang mendatangkan hasil seperti padi dan jagung. Perhubungan yang baik biasanya dikaitkan dengan dua objek yang tidak boleh dipisahkan seperti isi dengan kuku, aur dengan tebing dan sebagainya.	Gambar paadi, jagung, isi dgnkuku, aur dengan tebing.	
13	Anda telah pun melihat suasana serta persekitaran masyarakat Melayu dahulu. Dengan ini, anda telah pun melihat bagaimana peribahasa wujud dalam komunikasi masyarakat melayu dahulu serta bilamana ianya digunakan.		

(ii) STORYBOARD UNIT 2

Kursus: Peribahasa Melayu
Tajuk: Unit 2: Apakah Itu Peribahasa?

Bil	Teks	Diskripsi Grafik	Nota
1	Hari ini anda akan belajar tentang peribahasa. Anda tentu pernah mendengar atau membaca ayat seperti ini, "Seperti isi dengan kuku"? Ayat ini merupakan salah satu daripada beribu-ribu peribahasa yang terdapat di dalam bahasa Melayu.	Tajuk "Peribahasa" keluar. Kemudian gambar isi dengan kuku keluar.	
2	Peribahasa merupakan unsur kekayaan bahasa dan bangsa Melayu. Ianya telah digunakan sejak zaman berzaman secara formal atau tidak formal. Peribahasa juga wujud dalam masyarakat lain seperti masyarakat di Eropah dan di serata dunia. Namun begitu, struktur peribahasa tersebut tidak sama dari satu masyarakat dengan masyarakat yang lain.	Gambar pelbagai bangsa, Eropah, China, India dan Melayu silih berganti.	
3	Apakah itu peribahasa? Peribahasa merupakan rangkaian *bahasa kiasan. Mengikut Kamus Peribahasa Lengkap yang ditulis oleh Abdullah Hassan dan Ainon Mohd., peribahasa mempunyai empat cabang iaitu simpulan bahasa, pepatah, perumpamaan dan bidalan. Namun begitu, perumpamaan sering diertikan sebagai peribahasa. Usia kewujudan peribahasa sama dengan kewujudan bangsa dan bahasa Melayu.	Peribahasa: • Simpulan bahasa • Pepatah • Perumpa maan • bidalan	*bahasa kiasan ialah ayat yang tidak dapat diketahui maknanya dari perkataan itu sendiri ataupun daripada sususan tatabahasanya.
4	Peribahasa merupakan suatu ungkapan yang mengandungi makna yang *tersirat. Ini bermakna ungkapan tersebut tidak dapat dilihat maksudnya secara terus dari perkataan itu sendiri.	Gambar budak dan ada keluar buih di atas kepala. Di dalm buih ada gambar org dan kepalanya adalah batu. Tulis perkataan	*tersirat adalah adalah perkataan yang mengandungi makna lain di sebalik perkataan yang ditulis.

		"kepala batu"	
5	Peribahasa sering digunakan di dalam perbualan harian dan juga di dalam penulisan. Anda tentu pernah membaca cerita-cerita berdasarkan peribahasa. Anda juga pernah diminta untuk membuat karangan berdasarkan peribahasa.	Gambar sekumpulan manusia sedang bercakap-cakap.	
6	Kaedah yang akan anda gunakan nanti pasti dapat membantu anda dalam menulis karangan berdasarkan peribahasa dengan baik sekali. Mari kita mulakan dengan kaedah yang pertama iaitu kaedah kenal.	Gambar budak sedang menulis di dalam Peperiksaan.	

(iii) STORYBOARD UNIT 3

Kursus: Peribahasa Melayu
Tajuk: Unit 3:Kenal

Bil	Teks	Diskripsi Grafik	Nota
1	Anda telah pun tahu tentang kehidupan masyarakat Melayu zaman dahulu. Anda juga telah membaca sebuah cerita yang berkait rapat dengan kewujudan peribahasa. Di dalam sesi ini, anda akan dikenalkan kepada bentuk-bentuk peribahasa yang wujud dan kaitannya dengan makna peribahasa tersebut.	Animasi perkataan "kenal"	
2	Peribahasa biasanya membuat perbandingan makna yang sangat jelas. Oleh itu kebanyakkan peribahasa mempunyai perkataan yang dimulai dengan "seperti", "bak", "umpama", "bagai" dan lain-lain. Contohnya, "seperti anjing dengan kucing".	Carta: PERIBAHASA • seperti • bak • umpama • bagai	
3	Ada juga peribahasa yang tidak dimulai dengan perkataan-perkataan tersebut. Contohnya, "ada gula, adalah semut". Ia tidak menunjukkan perbandingan makna sebaliknya ia ingin menyatakan bahawa jika wujud sesuatu benda, akan wujud sesuatu benda yang lain.	Gambar animasi semula berkumpul pada gula.	
4	Sebagai permulaan, anda akan mempelajari peribahasa yang mempunyai struktur "seperti…dengan…"	Carta struktur "seperti… dengan…"	
5	Peribahasa yang mempunyai struktur "seperti A dengan B" menunjukkan bahawa A dan B adalah pasangan yang sama padan, sama baik, sama tidak padan atau sama tidak baik. Contohnya; Seperti lepat dengan daun	Carta: Seperti A dengan B yang mana A dan B mempunyai anak panah bagi menunjukkan samada kedua-duanya itu: • sama padan • sama baik	

	maknanya sangat karib Seperti anjing dengan kucing maknanya selalu bergaduh Seperti cincin dengan permata maknanya sama cocok Seperti langit dengan bumi maknanya sangat berbeza	• tidak padan • tidak baik	
6	Terdapat juga peribahasa yang berstruktur "seperti …dengan …" tetapi maknanya bukanlah perbandingan antara dua objek yang sama jenis. Contohnya "seperti anjing dengan baying-bayang" yang mana maknanya peribahasa ini boleh didapati di dalam cerita yang telah anda baca sebelum ini.	Carta: Spesis anjing dan kucing berserta dengan gambar. Ada anak panah menunjukkan bahwa keduanya adalah objek.	
7	Anda dapat membezakan peribahasa-peribahasa ini dengan melihat kepada objek-objek yang terkandung di dalam peribahasa tersebut. Contohnya: "Seperti anjing dengan kucing" Objeknya : anjing dan kucing Anjing dan kucing adalah dua binatang yang berbeza. Anjing bukan sebahagian dari kelompok kucing dan juga sebaliknya. Oleh itu, peribahasa ini adalah tentang sepasang manusia yang sama baik atau sebaliknya.	Gambar anjing dengan kucing sedang bergaduh.	
8	Contoh kedua: "Seperti daun delima dengan bunganya" Objeknya: daun delima dan bunganya Daun delima dan bunganya adalah dua objek yang berbeza tetapi berasal dari pokok yang sama iatu pokok delima. Maka peribahasa ini bukanlah tentang sepasang manusia yang sama baik atau sebaliknya. Tetapi peribahasa ini ingin	Gambar daun delima dan bunga delima dalam satu tangkai.	

	menyatakan bahawa dua objek yang berkaitan tersebut berguna ataupun sebaliknya.		
9	Maka formula yang digunakan untuk mengenal peribahasa adalah seperti berikut. 1. Keluarkan objek-objek yang terkandung di dalam peribahasa tersebut. 2. Pastikan samada kedua-dua objek tersebut adalah dua objek yang berbeza atau pun dua objek yang saling berkaitan. 3. Jika ia adalah dua objek yang berbeza maka peribahasa itu adalah tentang dua manusia/benda yang mempunyai sifat/sikap yang berbeza atau sama. 4. Jika ia adalah dua objek yang berkaitan maka peribahasa itu ingin menunjukkan sama ada dua objek itu berguna atau sebaliknya.	Carta formula: Langkah 1 → Langkah 2 → Langkah 3 → Langkah 4	
10	Latihan: Tentukan jenis peribahasa-peribahasa yang berikut: 1. Seperti birah dengan keladi 2. Seperti bulan dengan matahari 3. Seperti gajah dengan sengkelanya 4. Seperti garuk dengan sisir 5. Seperti mentimun dengan durian 6. Seperti anjing dengan kucing A. Dua objek yang berbeza Dua objek yang berkait rapat	Isi tempat kosong.	Untuk jawapan yang betul: Ya, anda betul! Untuk jawapan yang salah: Jawapan anda salah. Sila cuba sekali lagi. Jawapan: 1. A 2. A 3. B 4. A 5. A 6. B

(iv) STORYBOARD UNIT 4

Kursus: Peribahasa Melayu
Tajuk: Unit 4: Faham

Bil	Teks	Diskripsi Grafik	Nota
1	Sekarang para pelajar telah pun dapat mengenal pasti ayat-ayat yang mengandungi peribahasa. Sekarang para pelajar akan belajar untuk memahami maksud peribahasa tersebut tanpa perlu menghafal makna peribahasa itu sendiri.	Keluar perkataan "Faham"	
2	Para pelajar telah pun dapat mengenal pasti peribahasa-peribahasa yang diberikan di dalam latihan sebeblum ini. Ini dapat membantu dalam memahami maksud peribahasa itu pula. Sebagai contoh, "seperti lepat dengan daunnya" merupakan dua objek yang berkait rapat. Ini kerana, para pelajar tahu bahawa daun akan digunakan untuk membungkus lepat dan lepat bukanlah sejenis daun. Maka kita katakan bahawa dua objek itu berkait rapat.	Gambar kuih lepat	
3	Menggunakan contoh yang sama, "seperti lepat dengan daunnya", para pelajar harus membuat analisa tentang dua objek yang diperkatakan ini. Objek pertama ialah lepat dan objek kedua ialah daun.	Gambar kuih lepat dan daun pisang.	
4	Para pelajar boleh membuat analisis dengan melihat kepada ciri-ciri yang ada pada objek seperti yang dilakukan sebelum ini. Dengan ini, para pelajar akan dapat mengagak makna peribahasa tadi.	Gambar budak dan ada buih di atas kepala. Di dalam buih ada tanda soal dan gambar kuih lepat.	
5	Lepat merupakan kuih tradisional yang diperbuat dari tepung dicampur dengan ubi atau pisang. Kuih lepat biasanya akan dibungkus menggunakan daun pisang. Maka kuih lepat tidak akan dikatakan sebagai kuih lepat sekiranya ia tidak dibungkus dengan daunnya.	Animasi orang membungkus kuih lepat guna daun.	

6	Daun pula merupakan sebahagian dari tumbuhan. Daun banyak kegunaanya dan salh satu darinya ialah membungkus kuih seperti koci, lepat, tapai dan lain-lain lagi.	Animasi: orang membungkus kuih lepat guna daun.	
7	Setelah para pelajar melihat ciri-ciri kedua-dua objek itu tadi, para pelajar boleh membuat rumusan seperti yang berikut: 1. Lepat = sejenis kuih 2. Daun = sejenis tumbuhan yang kadang kala digunakan untuk membungkus kuih. 3. Kuih lepat = memerlukan daun untuk dibungkus 4. Daun untuk membungkus kuih = daun pisang membungkus kuih lepat. 5. Maka, lepat memerlukan daun dan daun boleh digunakan untuk membungkus kuih. 6. Seperti kuih lepat yang memerlukan daun untuk dibungkus dengan daun yang boleh digunakan untuk membungkus kuih.	Gambar rajah rumusan.	
8	Rumusan di atas dapat membentuk andaian yang berikut: 7. kuih lepat tidak boleh dipisahkan dengan daun. 8. daun digunakan untuk membungkus kuih Kedua-dua andaian ini boleh memberikan beberapa makna apabila kita memasuki kaedah yang ketiga iaitu kaedah Guna.	Gambar perempuan memegang lepat yang masih tidak berbungkus dengan muka sedih melihat pokok pisang yang tiada lagi daunnya.	
9	Pada tahap ini, para pelajar dapat mengagak makna peribahasa yang dibincangkan tadi. Untuk mengetahui lebih lanjut makna peribahasa itu, para pelajar akan mempelajari kaedah yang ketida iaitu kaedah guna.	Tajuk:Guna	
10	Latihan: Cuba berikan makna kepada	(Isi tempat kosong) Klik pada peribahasa berikut.	

	peribahasa berikut: 1. Seperti aur dengan tebing. 2. Ada bau adalah bangkainya 3. Air dicincang tak akan putus	1. Seperti aur dengan tebing. Aur = _____ Tebing=_____ Adakah aur dengan tebing boleh dipisahkan? 2. Ada bau adalah bangkainya. Bau=_____ Bangkai=_____ Jika terdapat bangkai bolehkah dihilangkan baunya? 3. Air dicincang tak akan putus air=____ cencang=_____ Adakah air boleh putus setelah dicincang?	

(v) STORYBOARD FOR UNIT 5

Kursus: Peribahasa Melayu
Tajuk: Unit 5: Guna

Bil	Teks	Diskripsi Grafik	Nota
1	Di dalam kaedah Faham yang lepas, para pelajar telah pun dapat membuat dua premis dari peribahasa yang berbunyi "seperti lepat dengan daunnya". Dari kedua-dua premis ini, para pelajar akan dapat memahami maksud sebenar peribahasa tersebut dengan menggunakan kaedah Guna.	Gambar lepat dan daun.	
2	Dengan menggunakan contoh peribahasa yang sama, dua premis tersbut adalah: Kuih lepat tidak boleh dipisahkan dengan daun Dan Daun digunakan untuk membungkus kuih Dari kedua-dua premis ini, jelas menggambarkan keadaan di mana sesuatu objek tidak boleh wujud dengan sempurna tanpa kewujudan objek yang menyokongnya atau yang menjadi sebahagian daripadanya. Ia juga menggambarkan keadaan yang mana sesuatu objek berguna kepada sesuatu objek yang lain.	Gambar dua objek yang sgt rapat.	
3	Dari gambaran yang telah diberikan, para pelajar boleh menyimpulkan bahawa makna peribahasa "seperti lepat dengan pisang" adalah seperti berikut: Dua objek yang sangat rapat atau karib dan objek ini biasanya di rujuk sebagai manusia.	Gambar dua org yang sangat akrab	
4	Kesimpulan yang sedemikian di buat adalah hasil gambaran yang telah diberikan bahawa lepat dan daun adalah dua objek yang berkait rapat dan tidak boleh dipisahkan. Dari perkataan pisah para pelajar dapat menggambarkan keadaan dua objek yang sangat rapat.	Gambar dua org yang sangat akrab	

5.	Latihan: Bilakah boleh digunakan peribahasa berikut? 1.Seperti aur dengan tebing. 2.Ada bau adalah bangkainya 3.Air dicincang tak akan putus	Gambar aur dengan tebing. (Isi tempat kosong) Orang yang suka/tidak suka ____ tolong menolong anatara satu dengan lain. Gambar bau bangkai (Isi tempat kosong) Jika ada sesuatu percakapan mengenai kejahatan, maka ada/tidak ada ___ perbuatan jahat yang telah dilakukan. Gambar air dicincang (Isi tempat kosong) Sesuatu perbalahan di dalam sesuatu keluarga dapat/tidak dapat_____ memutuskan persaudaraan.	

(vi) **STORYBOARD UNIT 6**

Kursus: Peribahasa Melayu
Tajuk: Unit 6: Mari Bercerita

Bil	Teks	Diskripsi Grafik	Nota
1	Cerita yang akan dipaparkan nanti bertajuk "Anjing dengan Bayang-bayangnya." Pernahkah anda mendengar peribahasa yang berbunyi "seperti anjing dengan bayang-bayang"? Cerita inilah yang mewujudkan peribahasa tersebut. Mari saksikan cerita ini.	Tajuk: Anjing dengan baying-bayang Gambar anjing.	
3	Pada suatu hari seekor anjing mendapat seketul tulang daripada sebuah kedai. Dia melarikan dirinya sebelum orang menangkapnya.	Imej terimbas:	
4	Dia sampai ke sebuah sungai lalu meniti jambatan di situ. Bila dia memandang ke dalam sungai itu dinampaknya ada seekor anjing lain pula sedang menggonggong seketul tulang!	Imej terimbas:	
5	Dia tidak tahu bahawa anjing yang dinampaknya di dalam air itu adalah bayang-bayang dirinya sendiri. "Anjing itu mempunyai seketul tulang yang besar pula," katanya. "Untunglah saya jika dapat merebutnya daripada anjing itu." Dengan demikian dia pun terjun ke dalam sungai itu.	Imej terimbas:	

6	Ketika dia berada di dalam sungai itu, didapatinya anjing itu tidak ada dan dia pun tidak berjumpa tulang itu. Tulang yang ada pada mulutnya pun telah hilang juga kerana terjatuh ketika terjun tadi. Disebabkan tamaknya, anjing itu telah tidak mendapat apa-apa pun akhirnya.	Imej terimbas:	
7	Pengajarannya, orang yang tamak itu akhirnya akan mendapat kerugian. Maka peribahasa "seperti anjing dengan baying-bayang" mempunyai maksud seperti yang terkandung di dalam pengajaran cerita di atas.	Imej terimbas:	
8	Imbas semula: Apakah yang dimaksudkan dengan: "Seperti anjing dengan baying-bayang"? Klik pada jawapan yang betul. A. Orang yang yang suka berangan-angan. B. Orang yang tamak selalunya rugi.	Imej terimbas:	Untuk jawapan betul: Betul! Untuk jawapan yang salah: Maksud peribahasa tadi ialah orang yang tamak selalunya rugi.

APPENDIX E
CHECKLIST FOR THE PROTOTYPE

CHECKLIST

Response with a 'yes' or 'no' to the following. The quality program will be indicated by agreater percentage of 'yes' answers.

1. Teaching skills (performance) and knowledge (information). The major emphasis of my educational needs is on:
____ Skills instruction.
____ Knowledge instruction.

2. Scope
____ The range of skills taught matches the range specified in my instructional objectives.
____ The skills can be taught in the alloted time.

3. Sequence
____ Skills required for the perfomrance of other skills are taught first.
____ Skills are cumulative.

4. Manageable steps
____ Instruction is presented in steps that are appropriate for the target audience.

5. Lesson Structure
____ There is structured lesson to teach specified objectives
____ The lessons contain a section that teaches instructional background
____ There is an appropriate balance between 'need-to-know' and 'nice-to-know' information.
____ A detailed description of how to perfomr the skill is provided.
____ The lessons contain useful examples.
____ Students are encouraged to practice skills taught in formal exercises.
____ Exercise clearly relate to the performance of the skills.
____ Exercises require the use of skills taught in previous lessons.
____ Interactive exercises are provided (the skill is practised in context_
____ Enough exercises are provided.
____ Feedback is provided about required response
____ Feedback gives clear description of required response.
____ Where appropriate, feedabck is explained in detail.
____ If a response is incorrect, additional exercise and feedback are provided.
____ Feedback anticipates students' concerns, problems, and questions and addresses them.

6. Format
____ The instructional format of the program is appropriate.

7. Appropriateness
____ Content is appropriate for the age of the target population.
____ Mechanics of the program (instructions, response mode, feedback, and

graphics) are appropriate for the target population.
____ Instructional style is appropriate for the purpose of the program.
____ Content is closely related to instructional objectives.

8. Acuracy and completeness
___ Content is accurate.
____ Content is complete

9. Interest and student motivation
____ Lessons lean towards successful lerning.
____ The program uses a variety of motvational techniques.
____ Content is presented in an interesting style.

10. Cultutral bias and stereotypes
____ The program is free from bias and stereotypes
____ The program contains role models for the target population.

11. Quality of writing
____ The program does not contain spelling, typographical or grammatical errors.
____ The style is clear, concise and interesting.

12. Method of delivery
____ The program is compatible with the desired method of delivery of instruction.
____ Teacher directed
____ Independent

APPENDIX F
QUESTIONNAIRE FOR THE USER OF THE SYSTEM

Setelah menggunakan CD Pembelajaran Peribahasa Melayu,
(Tandakan (√) pada senarai soal selidik berikut)

1. Adakah anda faham mengenai peribahasa sebelum menggunakan CD pembelajaran ini?	☐
2. Adakah anda dapat memahami dengan mudah bagi a. Unit 1 b. Unit 2 c. Unit 3 d. Unit 4 e. Unit 5 f. Unit 6 g. Unit 7	☐ ☐ ☐ ☐ ☐ ☐ ☐
3. Adakah cara yang dikemukan adalah susah bagi a. Unit 3 (Kenal) b. Unit 4 (Faham) c. Unit 5 (Guna)	☐ ☐ ☐
4. a. Bagi Unit 3 (Kenal): Adakah selepas mempelajari teknik ini anda dapat mengenali peribahasa dengan lebih mudah? b. Bagi Unit 4 (Faham): Adakah selepas mempelajari teknik ini anda dapat memahmi maksud peribahasa dengan lebih mudah? c. Bagi Unit 5 (Guna): Adakah selepas mempelajari teknik-teknik di atas anada akan menggunakan peribahasa di dalam karangan atau perbualan anda?	☐ ☐ ☐
5. Yang manakah yang lebih mudah: a. menggunakan teknik yang disebutkan di dalam CD pembelajaran; atau b. menghafal makna peribahasa itu	☐ ☐
6. Adakah teknik ini berguna untuk pembelajaran yang akan datang?	☐
7. Adakah teknik ini akan digunakan untuk pembelajaran yang akan datang?	☐