Web-Based Solat Courseware for Children

By

Nuraimi binti Azmi

Dissertation submitted in partial fulfillment of
The requirements for the
BACHELOR OF TECHNOLOGY (Hons)
(BUSINESS INFORMATION SYSTEM)

SEPTEMBER 2013

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

Web-Based Solat Courseware for Children

by

Nuraimi binti Azmi

A project dissertation submitted to the
Business Information System Programme
Universiti Teknologi PETRONAS
In partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(BUSINESS INFORMATION SYSTEM)

Approved by,

_____

DR. ROHIZA AHMAD

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
September 2013

CERTIFICATION OF ORIGINALITY

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

_____

NURAIMI BINTI AZMI

ABSTRACT

Our children today are growing up in the digital age, a courseware is always comes in handy including for fardhu ain education. Fardhu ain is a knowledge that is compulsory to learn and practice by every Muslim and solat is a part of it. Technology assist human in many aspect of their life including education. This web-based courseware can be used on a computer or any portable gadget with an internet browser; therefore parents can let their children to learn about solat independently regardless of place and time. In addition to that, the courseware can also be used as a teaching aid at school. This project represents a framework of personalizing courseware according to the user's characteristic as to ensure to deliver the right and relevant learning contain to the right learner. This project also uses the elements of multimedia such as text, video, audio and interactivity.

ACKNOWLEDGMENT

Alhamdulillah, all praises to Allah for giving me strength, guidance and His blessing to be able to complete Web-based Solat courseware for Children project.

I am deeply grateful to my supervisor, Dr Rohiza Ahmad for her continuous support and guidance. I am thankful to her as she sacrificed her time to guide me for 8 months and her supervision truly help the completion of my project.

I am most grateful to my parents, Azmi Nawang and Norhayati Hassan. They always stand by me as I go through every state of my life and continuously provide me with emotional and financial support. I also wish to express my sincere appreciation to my siblings and friends who have been spending their time helping me in this project. I really appreciate every contributions and supports from each of you.

Last but not least, thank you to any other party who involves directly or indirectly with regards to this project. Although there may be many who remain unmentioned, there are none who remain unappreciated. Thank you.

"Gratitude makes sense of our past, brings peace for today and creates a vision for tomorrow."~ Melody Beattie

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Revolution in technology has been providing us a lot of advantage and potential in various aspect of our life. Besides new invention, human innovate the existing technology to suit our needs and improvise it as to maximize its impact on our life including education sector. There are many research and projects that integrate information technology in education including the use of multimedia as a medium of learning. This project focuses on enhancing the effectiveness in learning solat by using multimedia web-based courseware.

1.1.1 Solat

The majority population of Malaysia is Muslim and one of the Pillar of Islam is solat. It is compulsory for every Muslim to perform solat five (5) times a day. In Sahih al-Bukhari, Abu Huraira r.a. narrates that he heard Rasullullah S.A.W said that "If there was a river at the door of anyone of you and he took a bath in it five times a day would you notice any dirt on him?" They said, "Not a trace of dirt would be left." Rasulullah S.A.W added, "That is the example of the five prayers with which Allah blots out (annuls) evil deeds."[1]

Moreover, it is compulsory for every Muslim to teach their children to solat at an early age. Our Prophet, Rasulullah S.A.W told us to educate our children to solat since the age of 7 years old as state in Sunan Abu Dawood, which was narrated by Adbullah bin Amr bin Al Aas, Rasulullah

[1] Ahadith.co.uk

S.A.W said that "command your children to pray when they become seven years old, and beat them for it (prayer) when they become ten years old; and arrange their beds (to sleep) separately."[2]

Hence, children in Malaysia receive formal education regarding the principle of Islam which includes solat. However, some of them also receive additional lesson from Ustaz/Ustazah at the mosque or from their own parents.

1.1.2 Courseware

The significance of Islamic education and the technology that we have are the strong reasons to utilize technology in educating the children. Hence, an Islamic courseware would be one of the mechanisms.

A courseware is an education method compatible with today's lifestyle and suit the need of our children whom are growing up with a variety of technologies around them. Courseware according to Oxford dictionary means computer programs or other material designed for use in an educational or training course. Courseware can be designed in different format; web-based courseware, downloaded software and also mobile-based software.

Technically, a courseware is beneficial in term of easily accessible and also the user can learn independently. However, it is essential to focus on effectiveness of the courseware as a learning tool especially for children. "Children are less efficient learners than adults. For instance, they have shorter attention spans, a smaller working memory capacity, and a smaller and less integrated knowledge base to which they can relate new information and events." (T.M. McDevitt and J.E. Ormrod, 2009).

[2] Ahadith.co.uk

1.2 Problem Statement

Solat consist of both practical and memorizing prayers. Usually, it is easy for the children to learn the step in solat but it is quite challenging for them to memorize all the compulsory prayer in solat because the prayers are in Arabic. They will easily lost interest to learn because they do not understand the prayer.

1.2.1 Existing Solat Education

Children learn solat formally at school. In Malaysia, solat is part of the syllabus that consists of both theoretical and practical. To perform solat, they need to master the entire step and memorize the prayer in the solat. However when they learn in a group of more than twenty (20) teach by a teacher; it could be less affective as the teacher could hardly focus on each of them. Thus, parents usually will send their children to an extra class to learn fardu ain (including solat) in a smaller group.

Today's lifestyle hinders our society to give an extra care for the children education. The parents have no time to teach their children about solat and they do not even have time to send them to the additional class.

1.2.2 Personalization in Courseware

Personalization is an important element in a courseware as to deliver the right and relevant information to the right learner. A courseware fails in achieving its objective if it fails in helping users in their lesson. Lack of personalization is one of the reasons of a fail courseware. The personalization is a customization of the courseware for specific user which could be in the form of environmental, level of language, visual stimulation and the activities that will be used to test the children's knowledge.

Moreover, courseware for children is much more complicated as it should design to suit the children's psychology and behavioral. A lack of interactive elements in children's courseware will cause failure in luring their attention. It is important to create friendly environment for them as to increase their concentration and accelerate the learning process. Moreover, the courseware should integrate challenge and curiosity elements in the activity part to motivate children's learning desire. As wrote by Carinoss & Mannion (2001), "As Norman (1988) points out, for any

design to be successful, in terms of developing usable and understandable products, then that design must be based on the needs and interests of the users and be informed by an understanding of their limitations and capabilities."

1.3 Objectives and Scope of Study

This project aims to develop a web-based courseware that suit with the children development and learning style.

Below are the objectives of this project:

i. To design/develop web-based solat education courseware for children
ii. To embed personalization into the courseware
iii. To conduct usability testing of the prototype

The scopes of the project include:

i. The target users are the children around five (8) to ten (10) years old
ii. The courseware consists of step-to-step of five (5) daily solat (Fajr, Zuhr, Asr, Maghrib and Isha') and compulsory (*wajib*) surah and doa in solat
iii. Multimedia elements (text, graphic, audio, video and interactivity)

1.4 Feasibility

Children will be able to benefits from this courseware as it can be used with teacher guidance at school or independently at home. Moreover, this courseware provides an interactive and personalized learning medium which is essential to prolong their focus in learning. Teacher can also use this courseware as a teaching aid in order to increase student's understanding.

This project can be completed at least to the minimum requirements within eight months. However, it also depends on the result of system, testing that will be done on the prototype with the target user. More complex improvement might be needed in order to reach user satisfaction. Therefore it is difficult to measure the level of completeness of the system that can be finished within the time frame.

CHAPTER 2

LITERATURE REVIEW

2.1 Teaching of Islamic Principles to Children

"Solat is a pillar of the religion (Islam). He, who establishes it, establishes religion; and he who destroys it, destroys religion." (Tabrani)

Based on the cited hadith above which is from Sahih Tabrani, solat is a foundation of the faith of every Muslim. Hence, it is a duty to all Muslim to emphasize on Islamic principles in their children to solat since the age of 7 years old which was narrated by Abdullah bin Amr bin Al Aas in Sunan Abu Dawood, Rasulullah S.A.W said that "command your children to pray when they become seven years old, and beat them for it (prayer) when they become ten years old; and arrange their beds (to sleep) separately".[3]

Children are innocent and naïve, they absorb what they see and try to imitate other's action which would be another reason to teach and guide our children with the life of Islam as early as possible. The knowledge that they receive is the inception and children will grow up practicing what they had learn.

In Malaysia, Muslim children receive Islamic education from their formal secondary education where they learn it at school. Recently, there is a new initiative from JAKIM (Jabatan Kemajuan Islam Malaysia) which is KAFA (Kelas Pengajian Al-Quran and Fardhu Ain), an additional class for students under age 6 to 12 years old which are taught in primary school in all states in

[3] Ahadith.co.uk

Malaysia. The purpose of this program is to form a strong foundation of Islamic knowledge among the children (Azilawati, Mat Atar, Mohd Sufian, Suhailan Wan Malini, & Wan Mohd Rizlan. 2010).

2.2 Courseware

Beside a formal classroom education, the Islamic principles can also be taught with the help of technology for example, a courseware. Multimedia courseware can be used as Computer Assisted Instruction (CAI) and Computer Assisted Learning (CAL) tools at school or at home for various subjects and it able to provide positive impact toward the understanding of the subject matters (Zurina Muda & Ros Emilia, 2006).

Nowadays, courseware has become increasingly important applications in the internet. According to Aldo de Moor (2007) “ubiquitous computing and life-long education is rapidly making electronic learning more feasible and acceptable”. Courseware is effectively used in a few subjects of fields such as computer science, mathematics and also engineering. There are a few types of courseware, for example e-book and text, CD-ROMs, web-based and latest is mobile-based. The advancement of technology enable human to improvise the courseware as to make it more sophisticated and effective.

2.2.1 Islamic Courseware

As mentioned before, courseware has been widely used in a lot of education area. However, in term of Islamic courseware; it is still very few in the market.

FIGURE 1. Alsunna.org

Figure 1 shows a screen shot of the main page of Alsunna.org which is an example of online Islamic courseware that is available in the internet. Alsunna.org has an objective to teach about Islam and spread the teaching of our Prophet Muhammad S.A.W. It contains a few module as well as solat. It demonstrates step of solat with picture and text as shown in Figure 2.

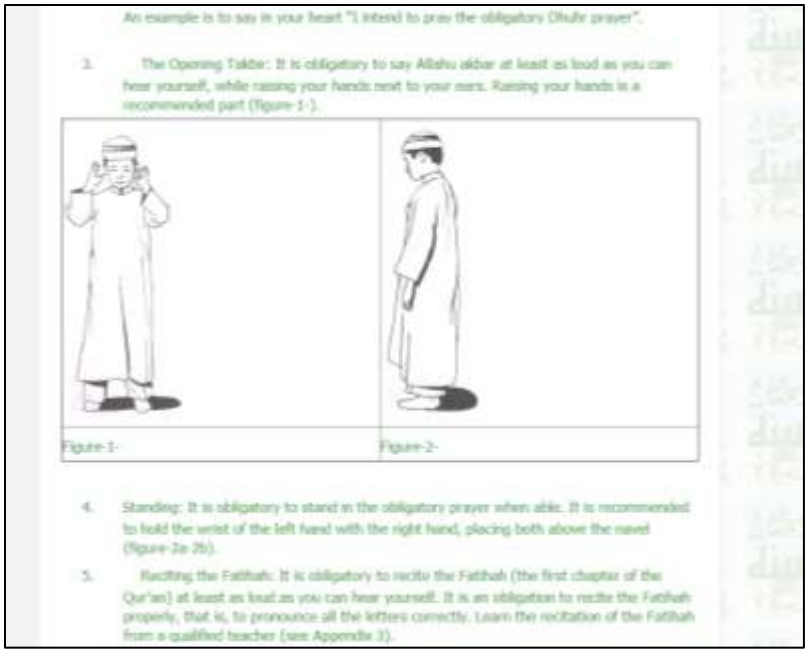

FIGURE 2. Demonstration of Solat in Alsunna.org

2.2.2 Interactive Multimedia Courseware in Education

Courseware can be made static or interactive. According to Oxford dictionary, interactive means "allowing a two-way flow of information between a computer and the user; responding to user's input". The content of the courseware can be only textual or mixed with multimedia elements. According to Zurina & Ros Emilia (2006), the element of multimedia such as text, graphic, animation, audio, video and the interactivity could contribute in improving the quality of the multimedia courseware. The common benefits of interactive multimedia courseware are; it improves learning and it also provides interactivity, flexibility, modular, consistency, timely, engaging and it is also cost-effective (Hick, 1997). Multimedia can create a high quality learning environment while interactively enables users to have control over the delivery of information. Hence, the integration of multimedia and interactivity create a learning environment that enhances the learning process (Cairncross & Mannion, 2001).

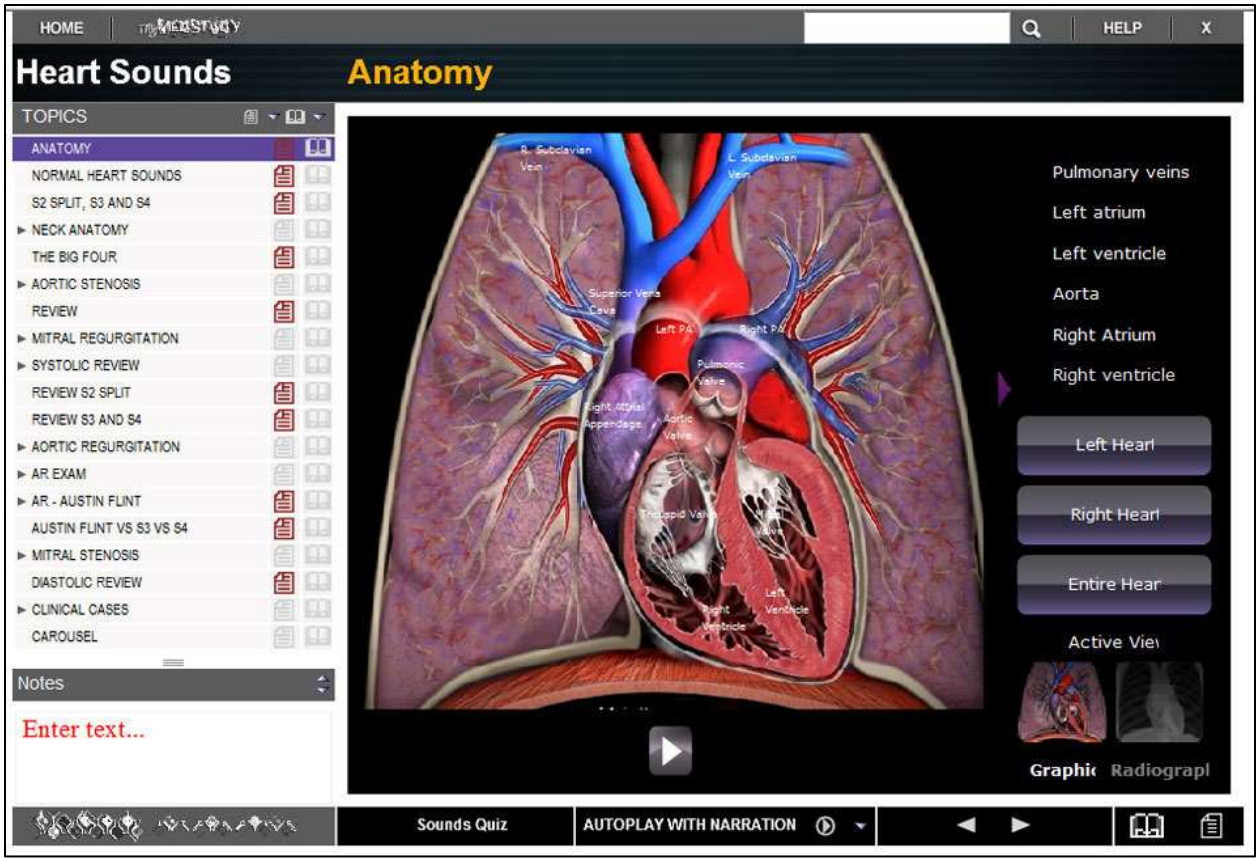

FIGURE 3. Snapshot of Medical Courseware Portal

Figure 3 for instance, is a sample of a courseware that uses multimedia elements in its presentation of the anatomy of the heart. Users are given option to enhance their understanding by utilizing their sense of sight and hearing. In the sample, the audio feature is to play the sound of the heart and also the narration of the lesson.

2.2.3 Sample of Interactive Multimedia Courseware for Children

2.2.3.1 Basic Mathematics Preschool

Basic Mathematics Preschool is a prototype developed by Zurina and Ros Emilia (2005) for their project entitles "Multimedia Design and Development in Mathematics Learning Courseware for Preschool Education".

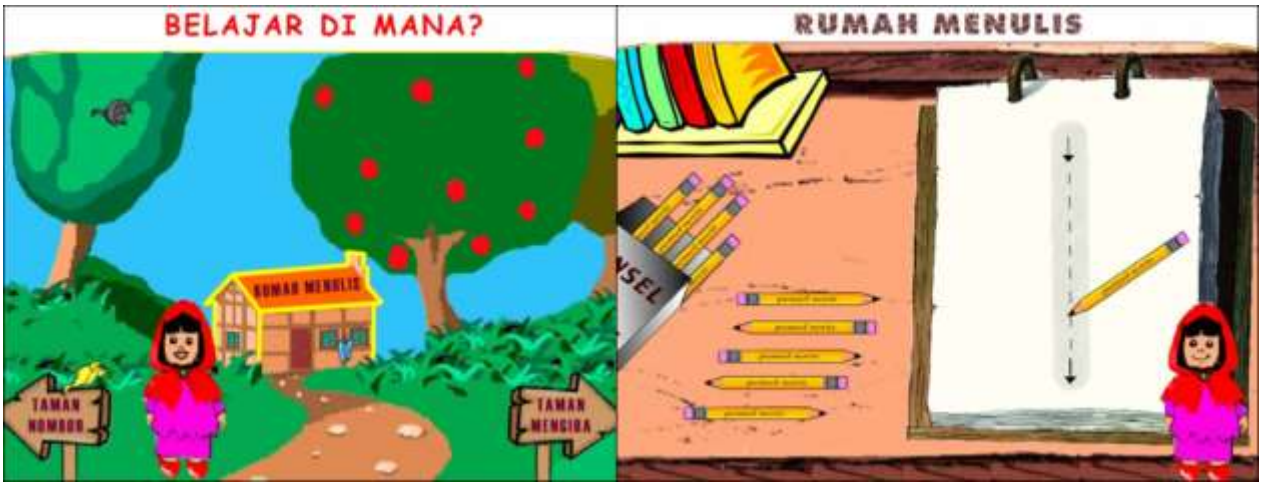

FIGURE 4. Interface of Basic Mathematics Preschool

Figure 4 shows the example of Basic Mathematics Preschool's interfaces that used multimedia elements which are graphics and animations extensively with character and color to generate and produce interface that suitable for the children. User could also choose background music, sound and voice based on their preferences and suitability.

2.3 Game-Based Courseware

Game has been used in online and offline lesson as to create an interesting element in the environment. Ron Fry (2004) state in his book that, "Learning should not be painful and certainly doesn't have to be boring, though it's far too often both" (p. xiv).

Many studies had been done on the adaptation of game-activity in education. Yien, Hung, Hwang & Lin (2011) concluded that "computer game-based learning can improve the learning achievement and learning attributes of student." Moreover, according to Lee & Hammer (2011), game covers the cognitive and emotional needs of children. In other word, game activity make the learning process more fun therefore children become eager to spend more time on learning.

Problem-solving skills can be developed through game-based activity and turned negative emotion experience do to failure into positive emotion (Walsh, 2012). In game, children treat failure as a motivation to keep trying and once they succeeded in completing the task, the

negative feeling turned into satisfaction. According to Emelia & Wan Fatimah (2010), games form a powerful education environment by generating active engagement and fun in learning.

There are few type of game and each present different affordance as an education tool. A research had been done by Alex Frazer, David Argles and Gary Wills from University of Southampton. They concluded in their study that "different gaming genres do indeed offer different affordances that might be useful in educational context." Figure 5 shows their finding. Therefore, in utilizing game in learning environment, it is important to consider the differences between the types of game in order to increase the effectiveness of using game activity as a learning tool.

	First-Person Shooter			RPG/Adventure			Puzzle			Strategy		
	1	2	3	1	2	3	1	2	3	1	2	3
Conversation	X	X	X									
New knowledge	X	X	X	X	X	X			X	X	X	X
World creation	X	X						X				
World exploration	X	X	X	X	X	X					X	X
Useful feedback		X	X	X		X				X	X	X
Balance difficulty						X				X		
Clear goals		X	X		X	X	X	X	X			X
Contextualisation	X	X	X			X	X	X	X			X
Provoke curiosity	X			X	X	X						
Immersion	X	X	X	X	X	X	X	X	X			
Offer rewards	X	X	X	X	X	X			X	X	X	X
Unite resources				X	X	X				X	X	X
Blended support									X	X	X	
Full pedagogy												
Standards	X	X						X				

FIGURE 5. The affordances offered by different games' categories © 2008 IEEE

However, game-based activity in a courseware might not fully achieve the objective of learning itself. Noorizaimi (2005) list down some of reasons why a game-based activity fail to achieve the learning objective;

- too simplistic
- tasks are repetitive which eventually resulting boredom
- tasks are poorly design and do not support progressive understanding

- range of activity is limited and only concentrates on one skill
- the target audience feels like they being coerced into learning.

The above finding can be overcome by following certain guideline which has been proposed by many researchers. One of the guideline is Malone's Framework which is shown in Figure 6. Based on Malone's Framework, the features that should be employed in a game activity as to increase children's motivation would be challenge, fantasy and curiosity.

TABLE 7
Framework for a Theory of Intrinsically Motivating Instruction

I. Challenge
- A. Goal
  - 1. Personally meaningful goals
  - 2. Obvious or easily generated goals
  - 3. Performance feedback
- B. Uncertain outcome
  - 1. Variable difficulty level
    - a. determined automatically
    - b. chosen by learner
    - c. determined by opponent's skill
  - 2. Multiple level goals
    - a. score-keeping
    - b. speeded responses
  - 3. Hidden information
  - 4. Randomness
- C. Toys vs. tools
- D. Self-esteem

II. Fantasy
- A. Intrinsic and extrinsic fantasies
- B. Cognitive aspects of fantasies
- C. Emotional aspects of fantasies

III. Curiosity

Optimal level of informational complexity
- A. Sensory curiosity
  audio and visual effects
- B. Cognitive curiosity
  - 1. "Good form" in knowledge structures
    - a. complete
    - b. consistent
    - c. parsimonious
  - 2. Informative feedback
    - a. surprising
    - b. constructive

FIGURE 6. Malone's Framework

2.4 Courseware Personalization

Human are born differently. Different people have different level of knowledge understanding. Some people can digest a topic just by looking at one page of note, while others require multiple pages before they can grasp the idea. Therefore, many researches had been in order to find the way to customize a learning process or learning tools to suit different needs of different people.

Adomavicius & Tuzhilin (n.d) concluded that, "personalization tailors certain offerings (e.g., content, services, product recommendations, communications, and e-commerce interactions) by providers (e.g., e-commerce Web sites) to the customers of these offerings (e.g., customers, visitors, users, etc.) based on the knowledge about them with certain goal(s) in mind." Related to this project, it can be conclude that personalization is the alteration or modification of any related aspect of a courseware that are displayed to a user in order to match the user's needs and wants based on the courseware's objectives. According to Sinikka and Bragge (2008), personalization goes by other terms such as customization, mass-customization, individualization, segmentation, targeting, profiling, and also one-to-one marketing.

Many others researched on the level of effectiveness of adapting personalization in learning. According to Zhou and Rechert (2008), "personalization has proven to be of significant value to education system, which provides learning contents tailored to the knowledge, interest and other characteristics of the learners." The main purpose of education courseware is to provide the most relevant and suitable information, in the right form to the right user which make personalization essential for the acceptance of the courseware.

Figure 7 below is the snapshot of CaraSholat.com which is a website that provides videos of steps in solat and the guidance for the steps in form of text.

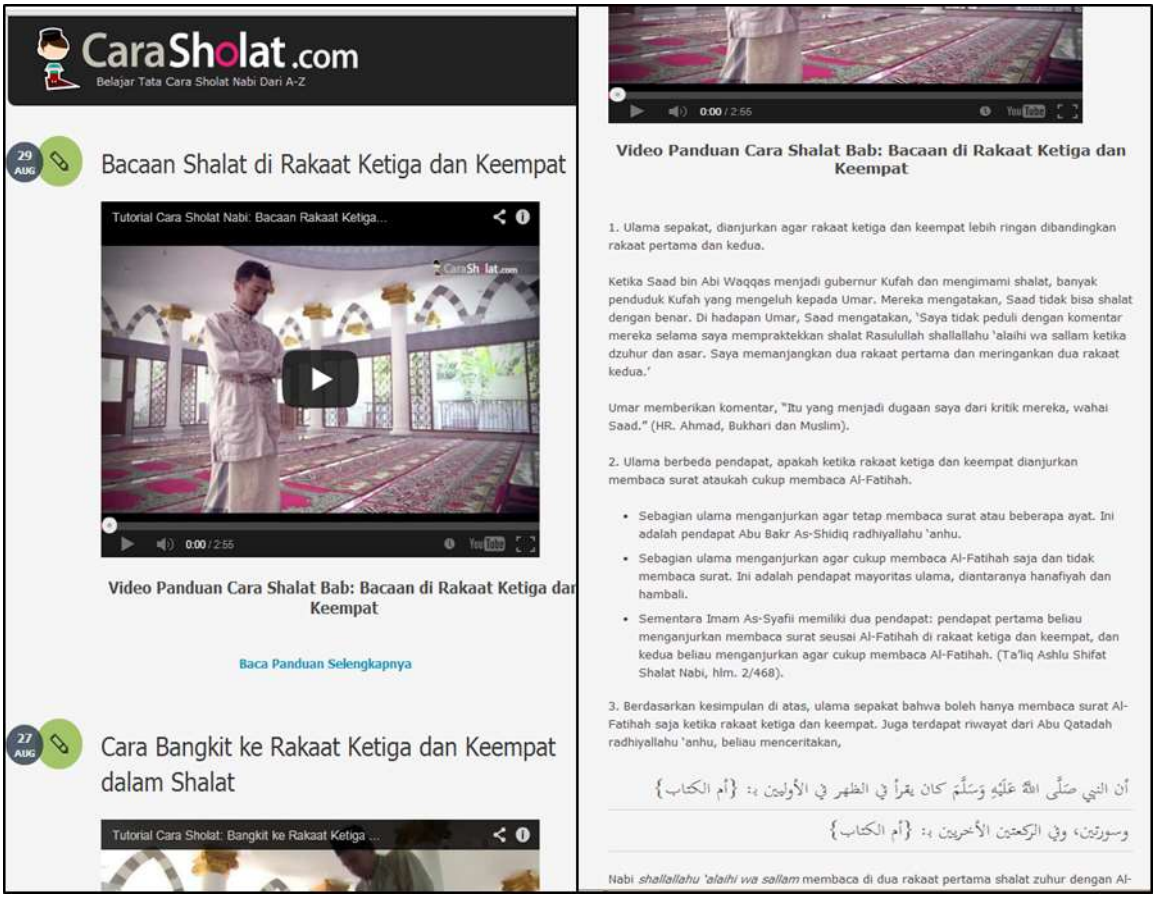

FIGURE 7. Snapshot of CaraSholat.com

The use of video to demonstrate steps in solat can provide high impact to the user including children however many characteristic of this website make it less friendly to children. It does not guide the user through the selection of the videos which is a problem if it is browsed by children without any guidance from adult. The explanation of each step is good however it might not attract children to read it because the sentences are long and in small font. Thus this website is a good example to shows the significant of personalization in courseware especially for children.

2.4.1 Drivers of Personalization

There are many studies focus on the concept of personalization in information technology. Based on research by Treiblmaier, Madberger, Knotzer & Pollach (2004) and Instone (2005),

personalization can be constructed based on user involvement and/or system driven. User involvement means that users need to provide certain information or personal preferences which will be used as guideline when the system provide personalization information.

According to Luna, Garrogos & Rossi (2010), user-related information can be classified as:

- User-specific characteristic (age, gender, or country)
- Domain-related information, for instance, preference or interest can be derive from user browsing history
- Information related to the user context (gps, Wi-Fi, etc.)

There are few ways to specify personalization requirement include: cookies, profile-based personalization, personal tools, opportunistic links and recommendation system. However, the most common approach would be data collection from user anticipation (Nancy, Shen & Shervin, 2007). Most system, application, or website required user registration. Through the registration, the courseware or other information system identify the user and make necessary adjustment of the environment and information displayed to the identified user.

As for system driven, the personalization is determined by the user behavioral or example, in e-commerce, it use the user's browse history as to display recommended product or information which might be similar to user's preferences.

2.4.2 Objects of Personalization

Another important element in personalization would be the object of personalization for example content, functionality, user interface or channel of information (Sunikka & Bragge, 2008). However, the direction of personalization should be determined before any object or elements in a system could be customized. The direction of the personalization is whether to focus on individual or groups of individual. A group preference could be based on demographic such as age and gender. However, for a courseware, the level of education seems to be most important reference point. Courseware personalization can also be based on location. Zhou and Rechert (2008) introduce the process of personalization for location-based e-learning. Their system tailored learning content according to the location of the learners.

2.4.3 Samples of Personalization Application and System

2.4.3.1 SIT UPS Mobile Application

Based on figure 8, the application guides users on how to be able to achieve a certain number of sit ups. The guidance is a set of sit ups that should be complete everyday which is based on users chosen goal and their gender.

1) User will set his or her goal i.e. how many sit ups that he or she will definitenly able to do in a row.

2) The user select the gender because the exersice customize based on user gender.

3) Finally, the application shows the sets of sit ups specified for the user based on her/his goal and gender.

FIGURE 8. Sit Ups Mobile Apps

2.4.3.2 Adaptive & Personalized E-Learning System

Another example is the system named APeLS as shown in figure 8. APeLS which stands for Adaptive & Personalized E-Learning System was proposed by Liu and Yang (2005) through their paper entitles "QoL Guaranteed Adaptation and Personalization in E-Learning Systems".

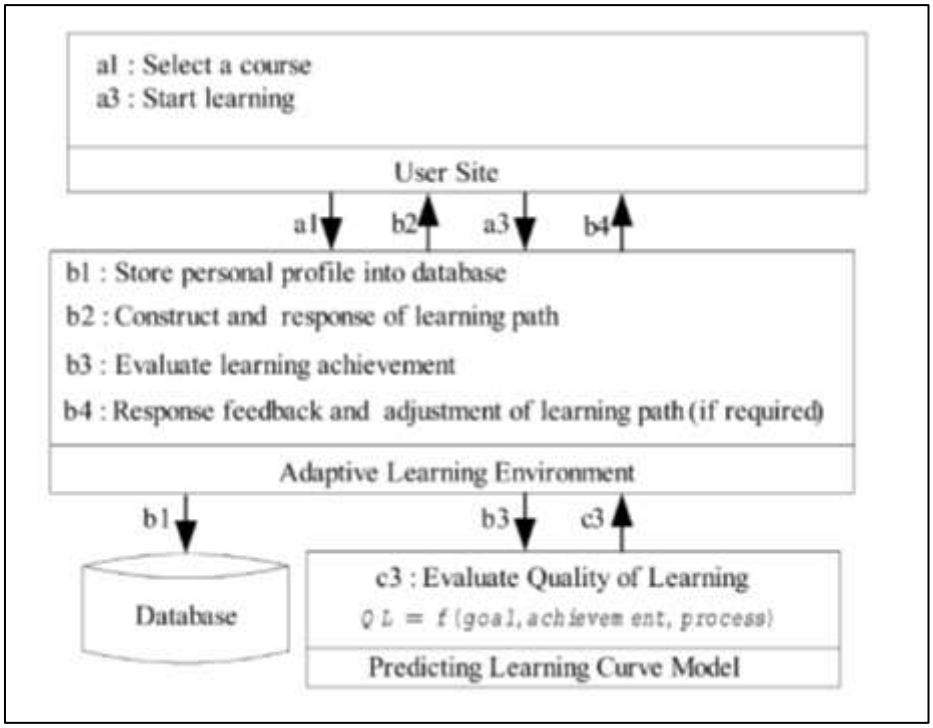

FIGURE 9. System architecture of APeLS © 2005 IEEE

APeLS is used to adjust the learning path by evaluating user's learning achievement. Based on figure 9, the system requires user's information and later gathers more information regarding user ability through small intelligence test. All data is stored in the database. APeLS will develop a proper learning plan to the specific user based on all the information that had been gathered.

2.5 Conclusion

In summary, courseware has been proven to be effective in supporting learning especially if it includes multimedia elements which could attract children's interest. Moreover, a right type of game-activity will also able to capture their attention and increase their motivation to learn.

Therefore, this project will use multimedia elements to deliver the information; video and audio will be used to demonstrate the steps in solat. That will allow the learner to learn-by-viewing and learn-by-coaching; which are two effective methods in developing practical skill (Hick, 1997).

This courseware also incorporates text and sound to teach the compulsory prayer. This is actually the challenging part for the children as they need to memorize the Arabic prayer which they do not understand[4]. The two channels (text and sound) create more cognitive paths allowing the quicker retrieval of information (prayer). However, there are a few stages in learning the prayers. Usually, the younger children (5 to 7 years old) can only memorize the prayer but do not able to read the text. This courseware will not cover on how to read Arabic prayer. Hence, there will be two type of text; Arabic text and also the Romanization of it.

Besides that, personalization also becomes an important element in developing a courseware as it can help children that have different level of knowledge and capabilities. The content of the courseware should be customized to suit an individual or a group that share similar characteristic of preferences.

[4] Non-arabic speaker

CHAPTER 3

METHODOLOGY

3.1 Research Methodology

3.1.1 Interview

Interview with a teacher of a primary school had been conducted as to gather information regarding current formal solat education in school. Moreover, this interview is conducted to get the insight from as experience teacher regarding the psychology of education; the level of knowledge based on children's age and the type of activity that suit their level of knowledge. Moreover, it is also important to know what elements or features that the teacher thinks should be included in the courseware. This method is important as to gather the information needed for developing the module and activity of the courseware.

3.2 System Methodology

3.2.1 Rapid Application Development and Prototyping

Rapid Application Development (RAD) is a newer system development methodologies that adjust the SDLC (System Development Life Cycle) to get some part of the system developed quickly into the hands of the users. According to James Martin (1991), "Rapid Application Development (RAD) is a development life cycle designed to give much faster development and higher-quality results than those achieved with the traditional life cycle". There are three basic approaches of RAD categories: Phased Development; Prototyping; and Throwaway Prototyping.

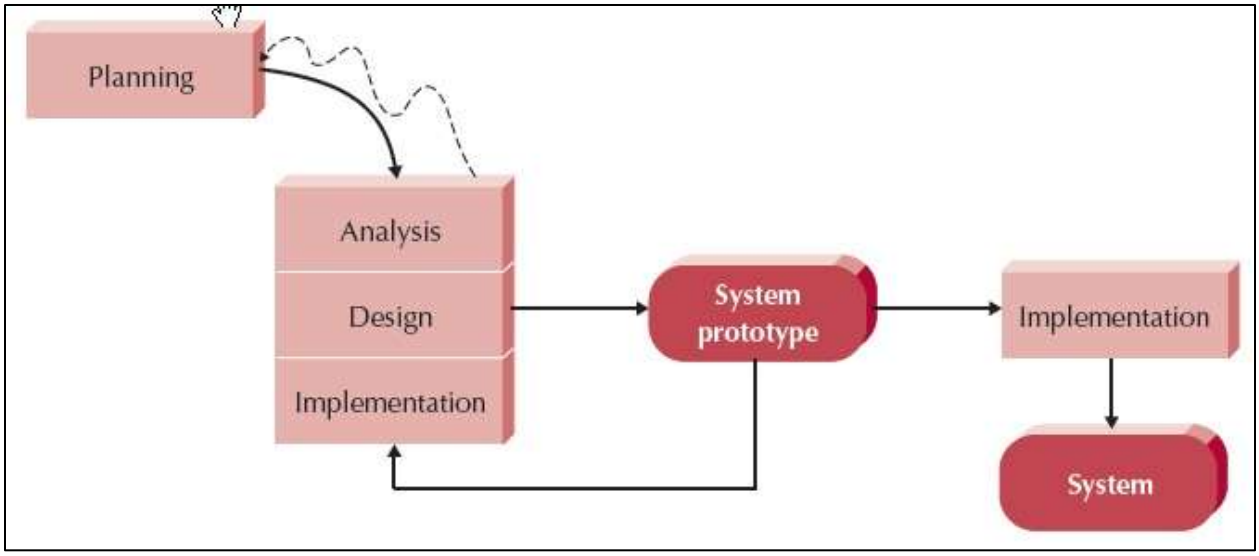

FIGURE 10. Prototyping-based Methodology © John Wiley & Sons

Figure 10 shows the model of prototyping-based methodology that will use in developing the courseware. Prototyping is an information-gathering technique and useful in seeking user reactions, suggestions, innovations, and revision plans. Based on users' responses and comments, several amendments of the system can be made and finally the real system that meets users' needs and satisfaction can be launched.

3.2.2 Methodology Justification

RAD provides faster delivery times because of the faster development life cycle. Moreover, this method leads to a better overall quality of the system (courseware) by meeting the user's requirements hence; provide a considerable reduction in errors due to the use of prototyping. Early detection of errors would prevent any extra effort, time and cost. RAD also provide greater user satisfaction by involving active participation of the system's developer and end users in all stages of analysis and development of the application which make this method ideal for this project.

3.3 Project Activities

Table 1 shows the overall project activities that had been done and will be done based on the system development stages. It also states the deliverables for respective task that had been done.

TABLE 1. Overall project activities

SDLC	RAD Phase	Activities
Planning	Requirement Planning	Identify project concept & scope • Project proposal
		Identify task • Gantt Chart
Analysis		Gather data • Literature review • Interview
		Develop preliminary design • Interface • Activity diagram • Storyboard
Design	User Design	Develop detail-level design
Development	Construction of Prototype	Convert the design into a functional prototype • Develop website • Insert video and quiz/game application
		Conduct system and acceptance tests on target user • Observe user
Testing		Receive suggestion or improvement from user • Conduct survey
Implementation	Cutover	Implement of the final system; launch website

3.4 Key Milestone & Gantt Chart

Figure 11 and figure 12 show the key milestone and Gantt chart of the project. Key milestone represent important task and deliverables for the project and Gantt chart indicate the progress and timeline of the project.

FIGURE 11. FYP 1 Key Milestone & Gantt chart

FIGURE 12. FYP 2 Key Milestones & Gantt chart

3.5 Tools

Table 2 below shows the tools that have been used to develop the web-based courseware which covers equipment, hardware and software.

Hardware

- Computer
- Camcorder
- Tripod

Software

- Windows Movie Maker 6.0
- Audio editing software
- Software to create/program game/quiz such as Flash
- Web programming language such as HTML, CSS, JavaScript.

CHAPTER 4

RESULT & DISCUSSION

4.1 Discussion and Result of Literature Review

Based on the literature review that had been done, this courseware will use multimedia elements which are; text, audio, images, video, and interactivity which is shown in table 2.

TABLE 2. Multimedia elements

Text	Display both Arabic sentences and its Romanization of the prayer Label and explanation text should be in short sentence and big font
Images	Emphasizes certain steps in solat i.e. position of hands and legs Use real images
Video	Edited video that shows the transition of steps in solat
Audio	Original audio incorporate with the video
Interactivity	Personalization of modules and tutorial

However, the main key deliverables of this courseware is the personalization as to suit the target user which is the children. Table 3 shows the summary of the personalization' drivers and objects for this courseware.

TABLE 3. Personalization elements

Drivers of personalization	Object of personalization
Gender	Video displayed either feat male or female model based on user's gender
Time	Video of solat is displayed based on the time user log in and the prayer time e.g. 1.00 pm -3.59pm : Zohor prayer
Age	The tutorial quiz/game is different for each group of user

4.2 Result of Interview

The interview was conducted with Ustazah Nafisah on 16 May 2013 for the purpose of gathering insight from an experience teacher of a pre-school.

Data gathered during the interview:

- common approach that the teacher use to teach solat at school
- how much that the children will learn about solat in year 1, year 2, year 3 and year 4
- the suitable activity in term of question for quiz and game that suitable for them

According to Ustazah Nafisah, teachers use both methods, either they teach the prayers in solat first and then teach the physical steps in solat or vice versa or both at the same time. All three methods are known teaching technique in pedagogy and can be used to teach solat. Therefore, according to her opinion, video that also include the audio of prayers can be used to teach solat to the children.

Ustazah Nafisah also said that the primary school student already start to learn all steps and compulsory prayer in solat since year 1. However, the new curriculum syllabus by Ministry of Malaysia Education takes the learning approach step-by-step.

TABLE 4. Short summary of Islamic Education Syllabus in Pre- and Primary School

Year	Age	Syllabus
Pre-School	6 years old	The syllabus emphasizes on the step of solat but does not focus on the compulsory prayer in solat.
1	7 years old	Wuduk
2	8 years old	The syllabus affirms their knowledge on the steps of solat and also the compulsory prayer in solat. The students are required to know how to read the Arabic prayer, know the meaning of the prayer and memorize the prayer.
3	9 years old	The syllabus include doa Qunut, which is needed to be recited in Subuh prayer The students are required to know how to read the Arabic sentence, know the meaning and memorize doa Qunut.

Table 4 shows the short summary of Islamic education syllabus on Ibadah for pre- and primary school student. Firstly, the children start to learn the step mostly by comprehending how it should be done and in year 1 they should already know all the steps in solat. The student starts to learn all the compulsory and additional solat's prayers in year 2 and 3 i.e. surah Fatihah, Tahyatul Akhir and etc. Therefore, by year 4, according to the syllabus, the student should be able to perform solat independently.

4.3 Courseware Design

4.3.1 Activity Diagram

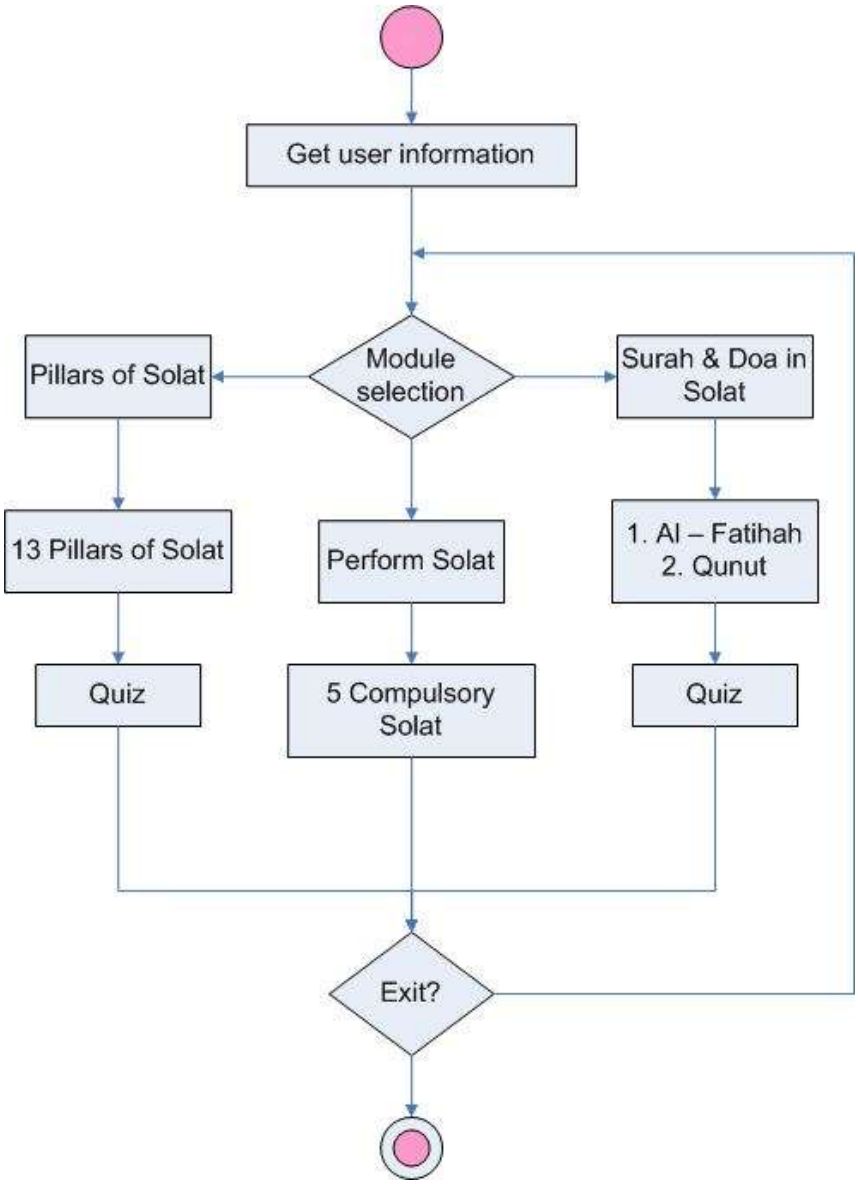

FIGURE 13. Activity Diagram

Figure 13 shows the courseware's activity diagram. Basically there will be three modules for tutorial, pillar of solat, performing solat and surah & doa in solat. The first module will focus on the action and recitation in each Pillars of Solat (Rukun Solat). The second module will display video of performing solat based on current prayer time and the third module focus on surah Al-Fatihah and Doa Qunut.

4.3.2 Storyboard

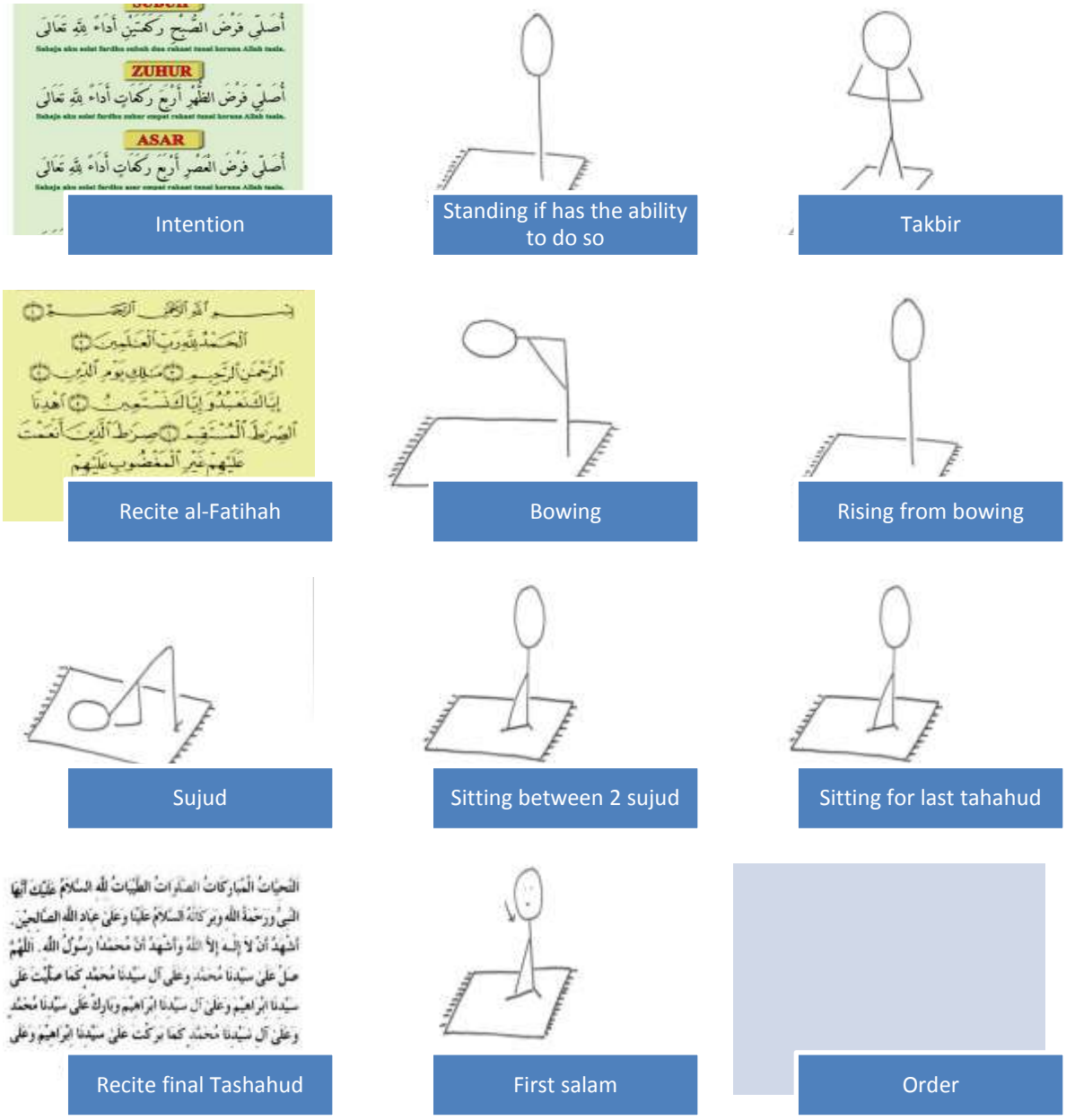

FIGURE 14. Storyboard for Pillar of Solat

Figure 14 shows the storyboard for the first module which is the Pillars of Solat. Those steps are repeated in the solat. The storyboard for the second module will consist of repeating step of the pillar and the recitation in each step.

4.4 Prototype

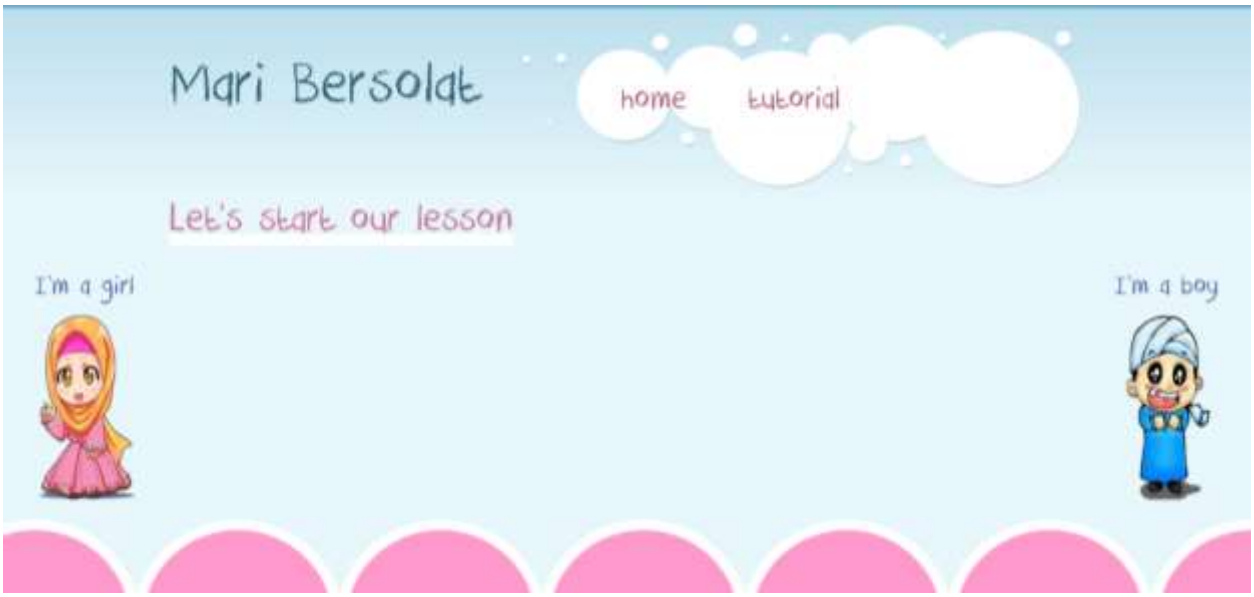

FIGURE 15. Tutorial start page

The courseware is called "Mari Bersolat" which is a phrase to invite the users to perform solat. Figure 15 shows the first page of the tutorial where the users choose their gender so then the system will display the video based on that. Therefore, a girl user will see videos portrayed by only girl and vice versa. Figure 16 shows the example of those video.

FIGURE 16. Example of videos

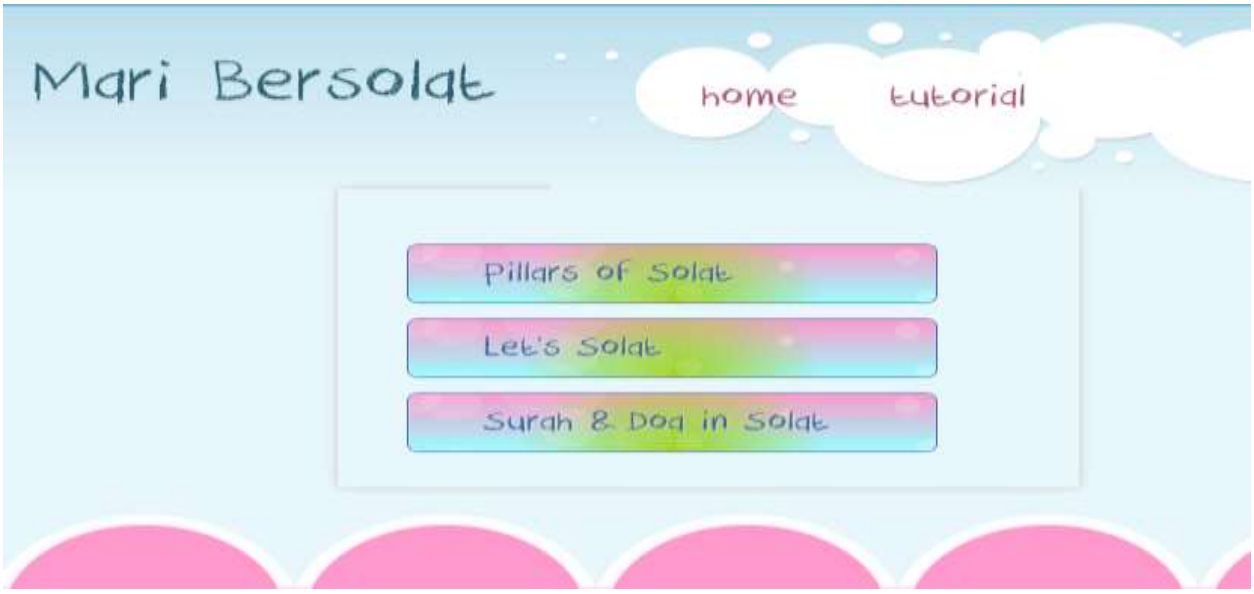

FIGURE 17. Module selection

Figure 17 shows the page where the user can choose between three modules and figure 18 below is the first page of the 1st module. The 1st module consist of all 13 Pillars of Solat (Rukun Solat)

FIGURE 18. 1st module

FIGURE 19. 2nd Module

Figure 19 shows the 2nd module which employs another driver of personalization; time. The video displayed in this module is based on the current prayer time as it seen in the figure 19 above; current time is 13:50 which is the time to perform Zuhur prayer.

FIGURE 20. Solat Zohor

Figure 20 is the second page of the 2nd module which consists of videos that show the performance of solat from the Intention until Salam.

FIGURE 21. 3rd Module

Figure 21 shows the 3rd module which focuses on individual surah and doa in solat. The selection of surah and doa is based on Islamic education syllabus of primary school. Figure 22 below is the page of Surah Al-Fatihah where the user can read and listen to the recitation sentence by sentence.

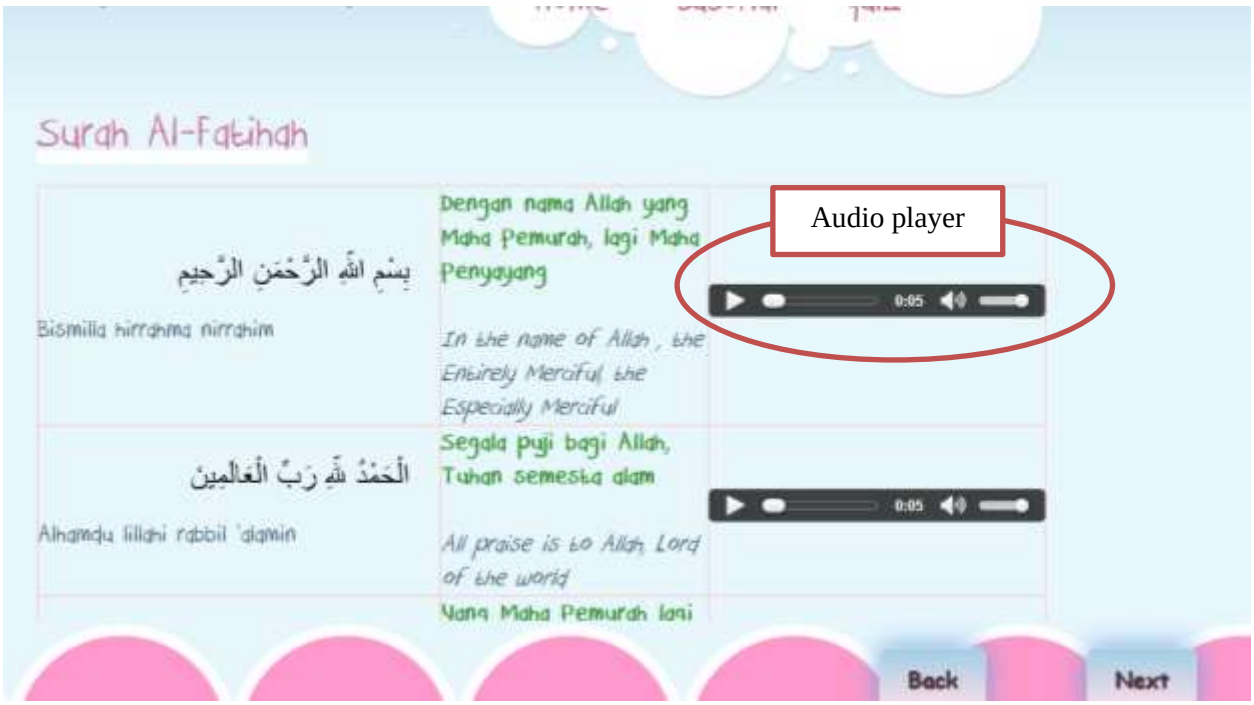

FIGURE 22. Surah Al-Fatihah

FIGURE 23. Start page for quiz

Figure 23 shows the first page of the quiz where the users need to choose their age so that the system will display the suitable quiz for them.

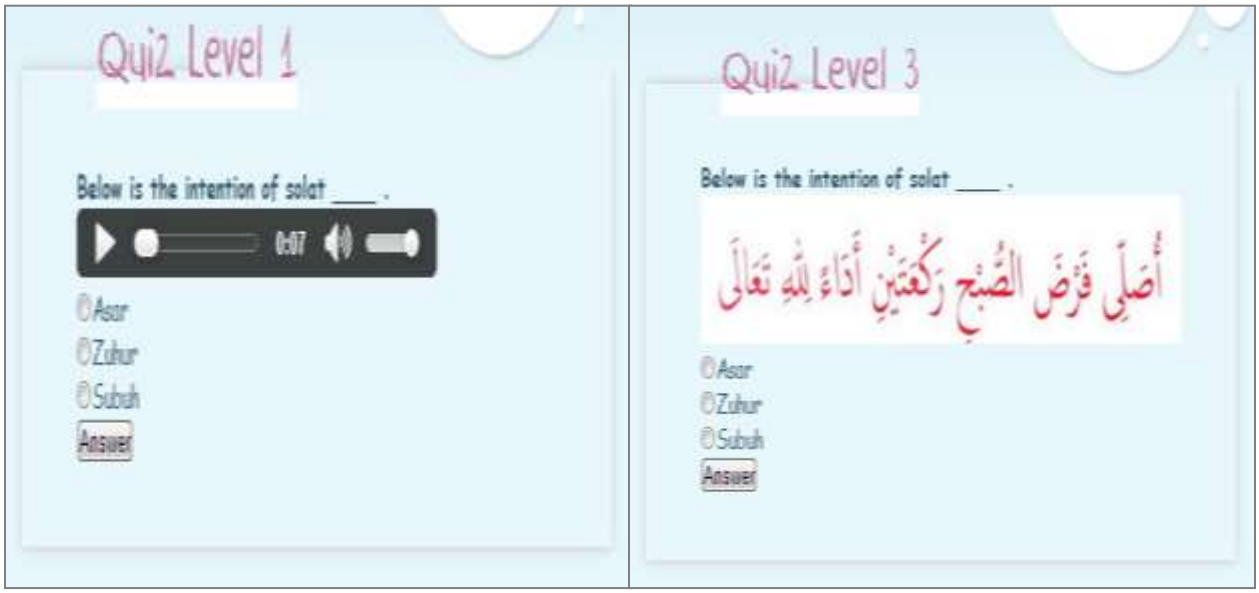

FIGURE 24. Quiz

Figure 24 shows the example of quiz level 1 and level 3. As mention previously in this report, the user should get the information based on their level of intelligent. Therefore, by using the primary school Islamic education syllabus as reference, different level of quiz is design for different group of children based on their age. In figure 24, both question ask the same thing but

in different way. The level 1 is for 7 years old children who mostly cannot read the Arabic sentence of the Niat therefore the question use audio to help them. As for level 3, they need to read the Arabic sentence in order to answer the question.

4.5 Usability Testing

User usability testing has been performed with the objective to determine whether the user can successfully use the courseware. This test measure how the interface of the developed prototype facilitates user in getting desired information.

This test has been performed among a few numbers of potential users on the test facilitator's laptop. At the end, each participant answered 15 closed-ended questions as shown in APPENDIX 1. The test facilitator observed and recorded the participants' behavior in the occasion where they seem to be confused, hesitated or frustrated.

4.5.1 System Usability Scale

The test result is analyzed with reference to System Usability Scale. Based on the system; the user need to response by indicating the degree of agreement using the scale of 5 for each question/statement.

The calculation is performed by sum up the score contribution from each statement/question which range from 0 to 4. SUS scores have a range of 0 to 100.

- Strongly disagree = 0
- Disagree = 1
- Neutral = 2
- Agree = 3
- Strongly agree = 4

Below is the calculation for the first participant:

1. It is easy to complete the task given.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

2. The font and size is easy to read.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

3. The colors are attractive and pleasing.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

4. The menu items are easy to find.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	2

5. I immediately understood the function of each menu item.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	1

6. The buttons are easy to find.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

7. I immediately understood the function of each button.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

8. I found navigating around the pages to be:

Very difficult	Difficult	Neutral	Easy	Very easy	4

9. I understand the purpose of this website.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	3

10. I understand the information in this website.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

11. The information is relevant to what I need.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

12. I like the presentation of the information.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

13. I do not need guidance in using this courseware.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

14. Overall, I like this courseware.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

15. I will use this courseware again.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	4

Total score = 50

SUS Score = (50/60) * 100 = 83%

4.5.2 Result of the Usability Test

TABLE 5. SUS Score

Participants	Age	Score
1	10	85%
2	10	95%
3	8	80%
4	8	83%

Table 5 is the summary of the SUS Score of each participant. Based on the score, it indicates that the participants were successfully used the courseware and the interface of the courseware manage to facilitate the user throughout their lesson.

As for the behavioral observation, test facilitators stated that older participants are more confident using the courseware while younger participants seem hesitated to explore the courseware and required guidance from test facilitator.

CHAPTER 5

CONCLUSION & RECOMMENDATION

5.1 Conclusion

Courseware is an alternative for secondary learning platform to use at school or at. Based on the research; this project implements personalization in order to deliver the right and relevant learning content to the right learner.

In conclusion, this courseware will be able to meet its purpose as a teaching aid in the classroom for the younger children and a supplementary learning platform for those users who are able to learn independently. This courseware is design to help the children to perform solat besides the formal education that they receive at school and perhaps with this courseware, the possibility for them to be able to perform solat as early as possible will increase.

5.2 Suggested Future Work for Expansion and Improvement

In the future, this courseware should include more topics of Ibadah such as Wuduk, Solat Sunat and etc. in order to produce a comprehensive learning medium for Islamic Education. Hence, children will have full exposure of Ibadah in Islam and will be able to practice Ibadah in the right way.

In addition, voice recognition technology could also narrow the limitation of this courseware. User will be able to check their pronunciation with the implementation of that technology. Moreover, more research should be made in term of HCI (human computer interaction) as to increase the children's interest and motivation to use this courseware especially the younger children.

REFERENCES

Azilawatie, R., Fadhilah, A., Mat Atar, M.A., Mohd Suffian, M.D., Suhailan, Wan Malini, W.I. & Wan Mohd Rizlan 2010. *Development and innovation of multimedia courseware for teaching and learning of KAFA subjects*, 2010 2nd International Conference on Computer Technology and Development. University Sultan Zainal Abidin, Terengganu. Retrieved on February 15, 2013 from http://www.fit.unisza.edu.my/i-kafa/pdf/b.pdf

Adomavicious, G. and Tuzhilin, A. n.d., *Personalization technologies: A process-oriented perspective*, University of Minnesota, Minnesota. Retrieved on February 15, 2013 from http://misrc.umn.edu/workingpapers/fullpapers/2003/0322_053003.pdf

Aldo de Moor 2007. *A practical method for courseware evaluation*, 2nd International Conference on the Pragmatic Web. Retrieved on February 15, 2013 from http://dl.acm.org/citation.cfm?id=1324244

Argles, D., Frazer, D. and Wills, G. 2008. *The same, but different: The educational affordances of different gaming genres*. IEEE

Cairnoss. S. and Mannion, M., 2001. *Interactive multimedia and leaning: Realizing the benefits,* ISSN 1470-3297, Innovations in Education and Teaching International. Retrieved on February 15, 2013 from http://personal.tss.edu.hk/kem/msc/6025/5446424.pdf

Emelia, A. and Wan Fatimah, 2010. *Game-based learning courseware for children with learning disabilities*. Univesiti Teknologi PETRONAS

Esteban, R.L., Garrigos, I. and Gustavo, R, 2010. *Capturing and validating personalization requirements in web applications*. ISSN 978-1-4244-8797-4/10/ IEEE.

Fry, R. 2004. *Improve your memory*. Clifton Park, NY.

Hick, S. 1997. Benefits of interactive multimedia courseware. Trican Multimedia Solution Inc. <http://http-server.carleton.ca/~shick/mypage/benifit.html>

Hung, C.M., Hwang, G.J., Lin, Y.C. and Yien, J.M. 2011. *A game-based learning approach to improvising students' learning achievements in a nutrition course.* TOJET: The Turkish Online Journal of Education Technology – April 2011, Volume 10 Issue 2

Liu, H. and Yang, M. 2005. *QoL Guaranteed adaptation and personalization in e-learning system*, Education, IEEE Transactions on – Volume 48 , Issue: 4

McDevitt, T.M. and Ormrod, J.E. 2009. Chapter 7: Cognotive Development: Cognitive Process. Pearson. Retrieved on February 15, 2013 from http://wps.prenhall.com/chet_mcdevitt_childdevel_3/47/12219/3128111.cw/index.html

Noorizaimi Ibrahim 2005. *Kids edu (courseware).* Kolej University Teknikal Kebangsaan Malaysia.

Rechert, K. & Zhou, R. 2008. *Personalization for location-based E-Learning*. Univeristy of Freburg, Germany.

Ros Emilia Kartina, M. and Zurina, M. 2006. *Adaptive User Interface Design in multimedia courseware*. Universiti Kebangsaan Malaysia. ISSN 0-7803-9521-2/06 IEEE

Ros Emilia Kartina, M. and Zurina, M. 2005. *Multimedia design and development in mathematics learning courseware for preschool education*. Universiti Kebangsaan Malaysia. ISSN 0-7695-2505-0/05 IEEE

Sunikka, A. and Bragge, J. 2008. *What, who, and here: Insights into personalization*. Helsinki School of Economics. 1530-1605/0 IEEE

Walsh, K. 2012. The gamification of education and cognitive, social and emotional learning benefits. <www.emerginggetech.com/2012/06/the-gamification-of-education-and-cognitive-social-and emotional-learning-benefits/ >

APPENDIX 1: USABILITY TEST QUESTION

Usability Test - Web Based Solat Courseware for Children

Date:

The Web Based Solat Courseware usability test is intended to determine the extent of this courseware and its interface facilitates user throughout their lesson. This test is conducted with the potential user on the test facilitator's laptop. Test facilitator will help explain the questions below.

User's Background Question

1. Age

7 years old	8 years old	9 years old	10 years old

2. Gender

Boy	Girl

3. Can you read?

Yes	No

Usability Test Question

1. It is easy to complete the task given.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

2. The font and size is easy to read.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

3. The colors are attractive and pleasing.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

4. The menu items are easy to find.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

5. I immediately understood the function of each menu item.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

6. The buttons are easy to find.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

7. I immediately understood the function of each button.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

8. I found navigating around the pages to be:

Very difficult	Difficult	Neutral	Easy	Very easy

9. I understand the purpose of this website.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

10. I understand the information in this website.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

11. The information is relevant to what I need.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

12. I like the presentation of the information.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

13. I do not need guidance in using this courseware.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

14. Overall, I like this courseware.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

15. I will use this courseware again.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

APPENDIX 2: PICTURES DURING USABILITY TESTING