Al-Quran Recitation (Tajweed Simulation)

"e-Tajweed System"

By
Nurarina Binti Mohd Said

Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information System)

SEPTEMBER 2012

UniversitiTeknologi PETRONAS
Bandar Seri Iskandar,
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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
Computer and Information Science Programme
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Approved by,

_____

(Mr. Faizal Bin Ahmad Fadzil)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
SEPTEMBER 2012

CERTIFICATION OF ORIGINALITY

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

_____

(Nurarina Binti Mohd Said)
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ABSTRACT

Al-Quran is the most important book in Muslim's life as it gives knowledge in many areas for the use of their daily life. Therefore, it is needed to be read properly so the meaning of the reading is correct. The main purpose of this project is to classify the Tajweed based on letters and signs by defining their shape and location. Images are used as samples to be processed for the use of classification. In an addition, this project was developed parallel to the technology advancement which the interactivity in learning is very important and it influences the understanding of the readers. In order to have a system which has an ability to learn interactively, this project was focused on the implementation of the web-based system. This research has led to the development of e-Tajweed that could monitor individual recitation through internet as well as to the development of practicality of it. As we can see, people nowadays are facing behavioral changes where they want to have a better life especially in the hereafter. They realize it's all started from the young education. With the target person are children from primary school, the scope covered for this project is by blending the best approach to be incorporated in order to create rich learning environments that are able to attract children to learn Tajweed and also be able to remember what have been learnt. The methodology used for designing and developing this websites is Rapid Application Development (RAD) which consists of four core phases; planning, analysis, design and development and also implementation. Apart from that, the author also included the results and findings from the survey carried out. Furthermore, the demand for this application in the future will be covered based on the objectives of this project where it enables children to learn Tajweed at home. This will promote independent learning environment where the children could learn Tajweed by themselves or together with their parents or siblings. The active interaction between children and this application will make the learning process more appealing and fun.

ACKNOWLEDGEMENT

Alhamdulillah, I bid for granting me the strength and perseverance necessary to complete this project. I have learnt so many things from scratch until the completion of my own system which has been fruitful to many learning curves thus far.

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I would also like to take this opportunity to thank my family especially my mother for always being there for me. She is the one who was helping me throughout the survey by giving me the opportunity to interview her and her colleagues at Sekolah Rendah Agama Jalan Kebun, Klang. The warmth of love given has always ensures a high morale confidence and perseverance in completing this project for me. My family has giving me a great deal of encouragement, advices and support which have led me to the completion of my current project today.

Last but not least, thanks to my colleagues for the continuous support and guidance, and also to UTP; especially to the CIS Department for their patience and opportunities to allow my project to reach greater heights than it can actually be. Alhamdulillah again and may prayers be with all of you.

Thank you.

TABLE OF CONTENT

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

1.1 Background of Study

Tajweed is the rules of reading Al-Quran together with the proper pronunciation of the Quranic letters. Learning Tajweed requires a two-ways communication between the learner and teacher. e-Tajweed is a web-based application that can facilitate Muslims to learn and understand the importance of Tajweed easily and help Muslims to practically practice it in their daily life. Literally, Tajweed means improvement and perfection. The term is technically used to refer to the science concerned with the correct recitation and pronunciation of the Quranic words and verses through the organs of speech such below:

- The vowel movements (Harakat)
- Prescribed point of exit (Makhraj) - where the sound of each letter should come from.
- The manner of articulation (Sifa) – the characteristics of the letters and recitation.

Figure 1.1 : Allah Ta'ala says in the Noble Quran (Al-Muzammil 73 : 4)

"And recite the Quran with Tarteel (in a slow pleasant tone and style)"

Since the Quran emphatically command us to recite the Quran with Tarteel, we need to recite it with Tajweed. Tajweed is not like all other subject which we are able to separate from Quran but instead Tajweed and Quran work hand in hand.

The Prophet S.A.W has said : ***"The Quran will either testify in you favor or against you"***.

Hence, if we fail to observe the requirements of the noble Quran during our recitation, the Quran will testify against us. If we are unacquainted with these prerequisites, we are compelled to acquire the laws of Tajweed. Due to the vastness of the Arabic language, any small mistake in pronunciation of a letter or word might changes the meaning of that word. For example, the word "Qalb" (with q) means heart, if we read "Kalb" (with k) it will mean a dog.

Developing a web-based training or simulation is becoming a *Fardhu Kifayah* to all Muslims. Children nowadays are adventurous, always keen on new technology to be their platform in learning or playing. Computers have been used for decades to teach children on variety of knowledge such as Science and Mathematics. The integration of media such as text, sound, animation, graphic and video is being used widely in education to help the student learn more interactively. Besides that, multimedia also cans stimulus interest of the student in learning. Therefore, by using the teaching theory in the multimedia presentation, it would help teacher to teach their student learn Tajweed in new ways and also can interact student in learning.

1.2 Problem Statement

Children at young age are easily got bored with just reading books especially in learning Tajweed. According to F.Barakatullah (2006), Tajweed cannot merely be learnt from books because the movements of mouth as well as the sounds are important to make the Al-Quran recitation correct. Currently, Tajweed are being taught at school or special classes. Learning is done on one-to-one or small group basis with religious teacher attending to each of the students.

Learning Tajweed in Malaysia most often are conducted in classes through a face-to-face approach and testes through pencil-and-paper approach. Face-to-face

approach is no doubt, the best teaching method, however the class size hinder the interaction requires between student and teacher. Meanwhile, pencil-and paper evaluation does not provide an instant feedback which is very useful in teaching and learning setting. Therefore, this research is conducted in order to try to lessen the interaction and feedback gap and also to contribute to the *Islamic Ummah*. This new perspective of learning Tajweed is hoped to be able to groom Muslims into proficient Al-Quran reciter.

According to research done by Mustapha Kamil Che' Pa (2001), many students have problems in pronunciation, and the rules of reading or Tajweed. They have less understanding on how to pronounce the letters and understand the rules stated. Therefore, bad reading will affect to the incorrect meaning given thus; it will give false understanding on the knowledge given by the Al-Quran.

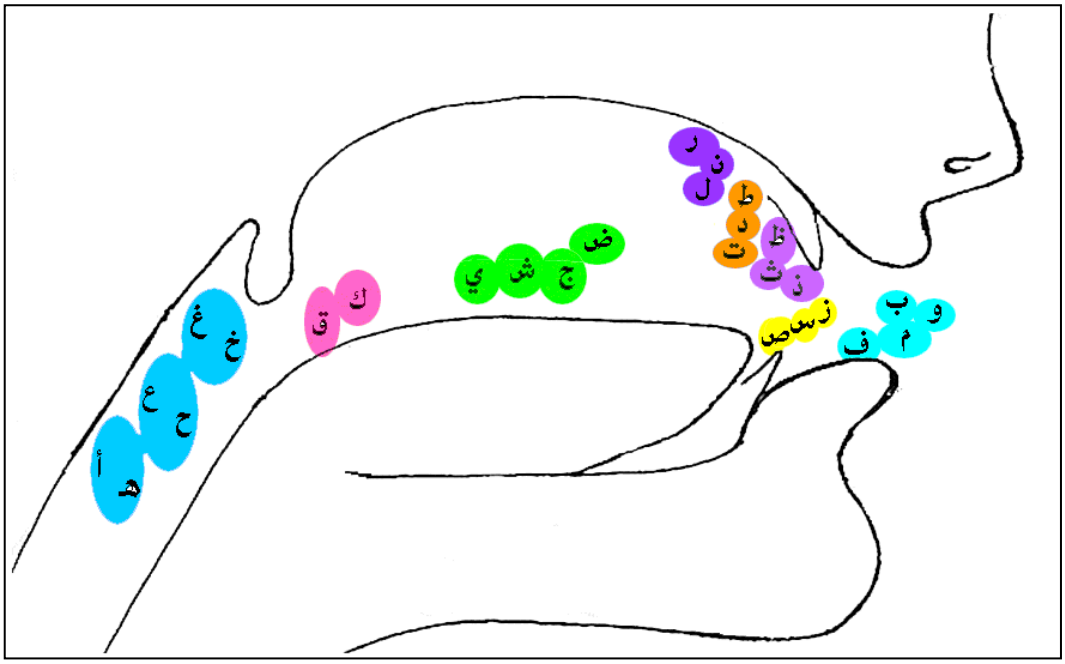

Figure 1.2 : The Articulation Points

Figure 1.2 shows the articulation points which are the position of the organs of speech in order to produce a letter so that it can be differentiated from others. This is equally so whether the letter is a consonant or a vowel.

There are many ways to learn Tajweed such as through radios, books or going to schools. By doing this, they can learn Tajweed for a better reading; however, this project is trying to enhance the way of learning in order to get better understanding of the Tajweed. Therefore, the learning can become more interesting as there are many sources to obtain knowledge and understanding for a better reading.

Information has becoming the most wanted in the new era. The information wanted does not only for the knowledge and improving skills but also for the use in daily life. Therefore, it is needed to have better tools to ensure people can obtain the information faster and in an order. One of the latest tools in getting the information is using technologies. Using technologies, they not only can gain the information but also can process the information faster. They can analyze and produce new information better and faster using technologies. Therefore, there are always new technologies being introduced to the public in order to do the task.

1.3 Objectives and Scope of Studies

The purpose of this study is to provide a more refreshing, more interesting and interactive way to learn and understand Tajweed. This application will focuses on blending the best approach to be incorporated in order to create rich learning environments that are able to attract learner to learn Tajweed and also able to remember what have been learnt. This application will be targeting on children in a range of 7 to 12 years old who already knew how to read Al-Quran but not proficient with the rules that is the Tajweed.

<u>The objectives/benefits of this application are :</u>

- Enables children to learn Tajweed at home. This will promote independent learning environment where the children could learn Tajweed by themselves or together with their parents or siblings.

- The use of such interesting approach such as interactive images and quizzes will make the Tajweed learning process more interesting.

- The active interaction between children and this application will make the learning process more appealing and fun.

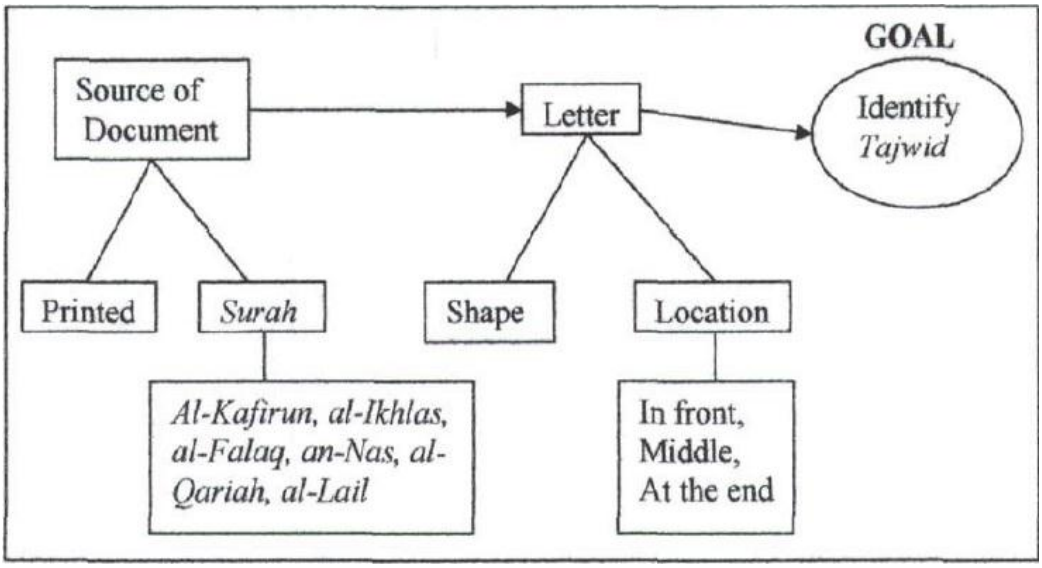

Figure 1.3 : Project Scope

Figure 1.3 illustrate the project scope where there are three main issues to be considered; source of document, Tajweed and letter itself.

The explanations are as follows :

1. Source of document
   - Printed document is being used in this project. This project focuses on the identifying Tajweed only in one word. All samples are taken from *surah Al-Kafirun, Al-Ikhlas, Al-Falaq, An-Nas, Al-Qariah* and *Al-Lail.*

2. Tajweed
   - There are many rules will be considered; *Makhraj*, *Mad Asli* and *Ikhfa' Haqiqi*.

3. Letter
    - In identifying the letters, their shape and location in the word must also be considered as their ligatures are different with single letter.

1.4 Relevancy and Feasibility

The implementation of this application is very relevant with the current situation for Muslims in Malaysia. With the robust development of technologies, we should grab this opportunity to attract learner, children especially because they are our next generation that will be a leader in the future. Active learning can be described as involving students in activities other than listening or reading. According to D. Schweitzer and W. Brown (2007), in his book entitled "*Interactive Visualization for the Active Learning Classroom*", engaging students in the learning process has been shown to be an effective means for education. Multimedia application can become the mean for active learning as it can engage children with learning.

Interactivity is another activity that can be held to increase students understanding. An interaction can be either with the instructor, peer students, or with technology (hardware or software). An interaction which is followed by a feedback will stimulate student's participation. Feedback will allow student to realize about the impact of their actions and furthermore about the topic being taught. This reaction will lead to new knowledge constructed. Active learning if we blend it together with multimedia elements will create an interesting application that will provide a rich learning activity environment that engages learners to keep on learning and support the various learning styles as suggested.

CHAPTER 2
LITERATURE REVIEW

2.1 Web-based System

According to Samsudin (2006), web based means an application that is accessed with a web browser over a network such as the Internet or an intranet. The web-based system is also called the 'automated' system. The web-based provides a far more efficiency in processing any task domain especially for a system that involves a lot of data collections and retrievals (Bimbo, 2008). According to Bimbo (2008), web-based systems should meet its users' requirements and expectations. Thus, web-based applications should be developed on-top of a carefully studied business process of the organization in which the system will be deployed.

2.1.1 Existing websites available for Tajweed

There are many websites that offer Tajweed learning information. The author chooses three best websites as comparisons. There are :

i) About Tajweed.com webpage :
http://www.abouttajweed.com/muharram_1424.htm

Figure 2.1.1 : Homepage of Tajweed.com

ii) The Islamise.co.uk webpage :

http://www.islamise.co.uk/islam/islamic-lectures/

Figure 2.1.2 : Homepage of Islamise.co

iii) The Tajweed in English webpage :

http://www.tajweedinenglish.com/

Figure 2.1.3 : Homepage of Tajweed in English

Referring to the above websites, they are using many too many wording. Apart from that, the paragraphs and texts are small which make a little bit harder for user to read the content especially, user with poor vision.

According to Hammerich and Harrison (2002), credibility, clarity, conciseness and coherence of content in websites contribute to web ability to persuade a reader that has the right stuff. Credibility is the quality, capability or power to elicit belief is depend on the eye of the beholder. Clarity can be defined as ability to write and exit texts that are clear and easily readable by users. Example like keep paragraphs short and discuss only one topic per paragraph. Next is conciseness, concise means able to present topic in the most economical

manner possible, be brief but tough. Last is contents of website must be coherence, by minimizing users cognitive work, all parts of text must be connect together in clear and logical ways.

2.1.2 Multimedia Component

Attractiveness of a websites refers to degree, to which a user believes that the websites is aesthetically pleasing to the eye, Hammerich and Harrison (2002). Website that contain graphic rather that only words will be more attractive to user. Both references websites that author choose, content less graphic that will make user feel bored when their reading process. Research made by The Nielsen Company (2002) tells that average surfer on web is more likely to stay in site when it contains some graphic rather than if it does not.

Multimedia was best defined as the combination of various digital media types such as text, images, sound and video, into an integrated multi-sensory interactive application or presentation to convey a message or information to an audience. Multimedia is changing the way we communicate with each other. The way we send and receive messages is more effectively done and better comprehended.

The inclusion of media elements reinforces the message and the delivery, which leads to a better learning rate. The power of multimedia lies in the fact that it is multi-sensory, stimulating the many senses of the audience. It is also interactive, enabling the end-users of the application to control the content and flow of information (Vaughan, 1998). This has introduced important changes in our educational system and impact the way we communicate information to the learners (Neo & Neo, 2000). The evolution of multimedia has made it very possible for learners to become involved in their work. With multimedia technologies, they can create multimedia applications as part of their project requirements. This would make them active participants in their own learning process, instead of just being passive learners of the educational content.

2.2 Teaching Theory

Teaching is the work of a teacher to deliver knowledge or skill to the learner. To deliver a knowledge, or in teaching process, there have several teaching theory that create by philosophers to help the teachers give the knowledge to their students. According to Mathieu Deflem (1999), in teaching theory, a teacher should apply those theories and study about the theory deeply to instruct the techniques and tools of being theoretical and doing theory. The function of teaching theory is as guidelines to the teachers to teach their students. Teaching theories that have in the education area are Objectivism, Constructivism, Reflectivism and Behaviorism Teaching Theory. All these theories are different based on the concept and the characteristics of each theory. The creators of each teaching theory have their own opinion and justifications on the ways of delivering. Each theory can be applied in certain subject that suitable with the concept of theory. According to Kathleen (1963), theories die if they remain disconnected from practice.

2.2.1 Objectivism Teaching Theory

Knowledge obtained from objectivism is based on observation and experimentation. Objectivism Teaching Theory focuses teaching on facts and quantified data extracted from the observation and experimentation. Because the knowledge to be conveyed is facts and quantified data, the knowledge is known to be decontextualized and exists independently of the teacher or knower. Therefore, the knowledge can be learned, tested, and applied more or less independently of particular contexts. Due to the independency of knowledge from the knower, objectivism has become the most pragmatist and efficient teaching method. The decontextualization of know ledge from the knower is analogue to the separation of value from gold itself which has made trade in this world the most efficient. Objectivism teaching method can be used in teaching situations where the content is mostly consisted of the raw facts or concepts to the learner. This is especially true when the learner has mastered sufficient

prerequisite knowledge and the knowledge to be learned is auxiliary to the learner's major interests such as engineering students learn mathematics and multimedia students learn image editing. However, due to any observed facts are only an inaccurate approximation to real world; this teaching can lead to distorted learning outcome and practice.

2.2.2 Constructivism Teaching Theory

In contrast to Objectivism which adopts a quantitative learning process, Constructivism adopts a qualitative learning process. Rather than attempting to convey facts from direct observation and reporting of reality, Constructivism emphasizes humans or learner's constructions and interpretations of reality, this is known to be humanistic approach in teaching. Constructivism Teaching Theory is the most popular in teaching theory from the researcher reading. There have a lot of Constructivism founders. This theory replaced the truth of the concept of viability. The concept knowledge of Constructivism Teaching Theory is a kind of substance, which can be transferred from the head of the teacher to the head of the student directly. The teacher should choose students who must be treated as an intelligent, independently thinking individual in teaching them using this theory. This theory is suitable for science subject because it is based on human approval teaching and this theory also teach students construct their own understanding of the world they live and another meaning to generate sense of their own experience. Based on the Behaviorism Teaching Theory, it is interested in a student's behavior in relation to teaching while its opposite Constructivism is interested in the mutual process which affect the behavior of a student (Risku P. ,1996).

2.2.3 Reflectivism Teaching Theory

Reflectivism Teaching Theory is the combination of advantages both of two theories. The theories are Objectivism Teaching Theory and Constructivism Teaching theory. Reflectivism Teaching Theory goes further than Constructivism Teaching Theory, it believes that there are power structures that mould and

determine the construction and interpretation of knowledge. Particularly, the action research method has developed a systematic circle of structure based on the four activities of planning, acting, evaluating and reflecting. In implementation, this cyclic process is formulized as a four stage process: concrete experience, abstract conceptualization, active experiment, and reflective observation. This method combines the advantages of both the objectivism method and the Constructivism Teaching Theory method. It can be used for teaching for courses which train learners for practical skills, such as engineering, information technology.

2.2.4 Behaviorism Teaching Theory

Behaviorism Teaching Theory assumes that a learner is essentially passive, responding to environmental stimuli. This theory believes that a learner starts out with a clean slate, and behavior is shaped by positive and negative reinforcement. Positive reinforcement or negative reinforcement may increases the possibility of an event happening again. Punishment, both positive and negative decreases the possibility of an event happening again.

2.3 Critical Analysis of Literature

Islam is the way of life. It is a religion that embraces every aspect in people's life (Hassan, 1924). In Islam, Allah has created certain rules and regulations; and the rules that are stated by Allah give benefits to Muslims in their daily life before and also after their death. Listening to the Quran being recited correctly is enough to soften even the hardest of hearts. Muslims and non-Muslims alike find it deeply moving experience even if they do not understand what is being said. Every single Muslims has to recite Quran in their prayers, but people do not realize that reciting the Quran correctly, observing the rules of recitation is not an advanced science for expert reciters alone, rather it is an obligation upon each and every one of us whenever we recite the Quran.

- Muhammad Bin Al-Jazaree the great Quran and Hadeeth scholar of the 9th century(Hijri) says in his famous poem detailing the rules of Tajweed : *"And applying Tajweed is an issue of absolute necessity, whoever does not apply Tajweed to the Quran, then a sinner is he".*

- Sheikh Zakariyya Al-Ansari (died in 926 H) said in the explanation of this verse in his book : Sharh Al-Muqaddimah Al-Jazariyya *"It is required to observe all of the Arabic rules in that which changes it and ruins the meaning. So he regarded it as an obligation to keep away from the major mistakes in reciting the Quran"*.
  - The scholars have divided the types of mistakes one might fall into when reciting the Quran into two types :
    - Clear mistakes : which usually change obvious things and changes the meaning.
    - Hidden mistakes : for which one may need to study Tajweed rules.

And the majority of scholars have agreed to apply the Tajweed rules of Quran, such that the clear mistakes are avoided is an individual obligation upon every Muslims who has memorized part of or all of the Quran. The clear mistakes must be avoided by all and to avoid them one must memorize and read attentively and have knowledge of some basic aspects of Tajweed. If a person falls into the clear mistakes, this is considered as a sin and Ibn Taymiyyah even regarded it as undesirable for a Student of Knowledge (i.e someone who knows Tajweed) to pray behind a person who makes clear mistakes in their prayer. As for the hidden mistakes, then the ruling on them is lighter and the recitation of a person falling into this type of mistake is regarded as lacking in completeness but prayer behind such a person is sound.

It is obligatory, according to the scholars of Tajweed, to observe its rule when reciting the Quran. Imam Ibn Al-Jazari, one of the earliest scholars of Tajweed, maintained in his Tuhfatul-Atfal, a famous beginner-style Tajweed manual that :

"It is incumbent to observe the rules of Tajweed; Those who fail to do so are incurring a sin because the Quran was revealed by Allah and transmitted to us with the rules of tajweed."

However, some scholars hold that it is recommended (mustahab) to follow the rules of Tajweed rather than being wajib (obligatory) as long as the words are pronounced correctly in terms of Arabic and no mistakes are involved of course. Nevertheless, it benefits a Muslim to try his best to perfect his recitation. Aishah (may Allah be pleased with her) narrated that the Prophet S.A.W said :

"The one who is proficient in the recitation of the Quran will be the honorable, obedient scribes (angles), and who is recites the Quran with difficulty and find it hard to recite will have a double reward." (Al-Bukhari and Muslim)

Tajweed is the manifestations of Allah's protection for the Quran from any kinds of corruption. Going through books of the Tajweed shows the extreme care given to the minute details of the pronunciation of the Quran. All of this is to ensure that the way The Quran is recited 14 centuries after the demise of the Prophet S.A.W is exactly the same as how the Prophet recited the Quran. Besides, the Isnad-based transmission of the Quran guarantees that the rules of Tajweed are fully put into practice in a way that ensures the highest quality and accuracy level when transmitting the Quran from one generation to another. Tajweed after all, is one of a group of science created initially to serve the Quran and to guard it from corruption such as the Qira'at (science of the recitation versions) and scripting of the Quran (Ar-Rasm Wad-Dabt).

2.4 Object Recognition

Recognition is the process that assigns a label to an object based on its descriptors (Gonzalez & Woods, 2001). In other word, the testing object is classified into a similar group and being labeled based on the information provided by its descriptors. According to Abdul Aziz (2004) the system developed must have the following characteristics :

1. The ability to extract relevant information from unnecessary background and details.
2. Make generalization from the knowledge generated by learning from training data and examples.
3. The capability to make classification from imperfect or noisy information.

The approaches in recognition are divided into two principal areas; decision-theoretic and structural. The methods based on decision-theoretic are matching represent each class by a prototype pattern vector, optimum statistical classifiers, and neural networks (Gonzalez & Woods, 2001). Meanwhile, in structural area, the approaches are matching shape numbers, string matching, syntactic recognition of strings and syntactic recognition of trees.

According to Abdul Aziz (2001), recognition can be categorized into two types which are supervised recognition and unsupervised recognition.

i) Supervised recognition

In supervised recognition, the real output is known. The actual output is obtained based on a priori knowledge about the patterns of input data (Luger,2002). One of the most popular approaches of this type of learning is Artificial Neural Network (ANN). Supervised recognition consists two phases; learning or training phase, and testing or validating phase.

a) Training or learning phase

While a set of training data are being input into the classifier, the internal properties of the classifier are also being adjusted. In Neural Network for example, the desired output is being compared with the actual output produced by the network. The error gradient is calculated to adjust the weight of each neuron in the network (Friedman & Kandel,1999).

b) Testing or validation phase

After several repetitive adjustment processes, the final internal properties will be used to test mutually exclusive testing data. The performance of the classifier is measured by the number of correct classification the classifier made.

ii) Unsupervised recognition

In unsupervised recognition, the characteristics and details of output are unknown. It is more difficult than the supervised recognition. According to Abdul Aziz (2004), it is suitable when a set of training pattern of unknown class is available.it will try to learn to categorize the patterns into finite and unknown numbers of output class. Most unsupervised recognition is based on clustering algorithm and operations.

By using the object recognition as a concept on this project, e-Tajweed can blend the best approach to be incorporated in order to create high rich learning environments among school children so they will memorize what they learn easily.

CHAPTER 3
RESEARCH METHODOLOGY

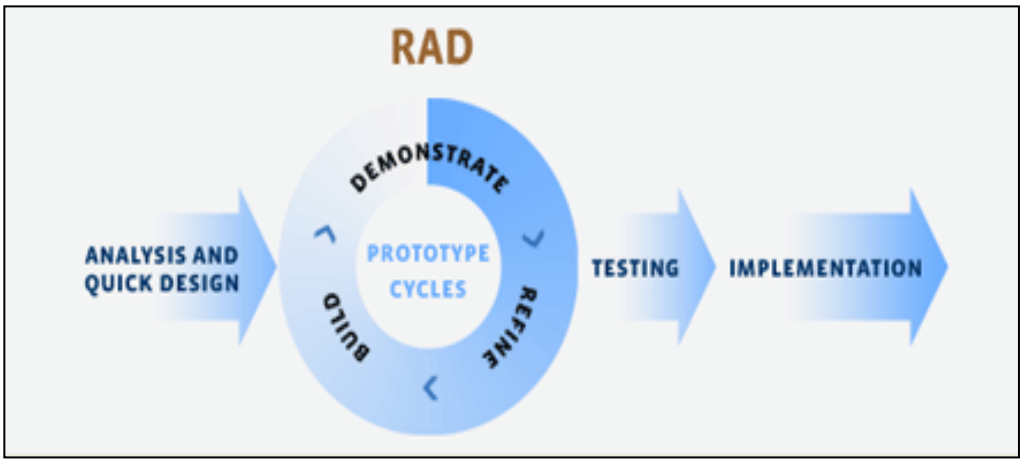

Figure 3.1: RAD Model

3.1 Rapid Application Development (RAD) Methodology

Rapid application development (RAD) is a development methodology that attempts to address weakness of structured design methodologies; waterfall and parallel development. Since author has limited time in developing this project, RAD is a best methodology to be used because RAD have ability to adjust system development life cycle (SDLC) phases to get some part of system been develop quickly (Dennis, Wixom and Tegarden., 2005). RAD involves iterative development, quick construction of prototypes by using techniques and computer tools such as CASE tools. CASE tools makes tasks are much faster to complete and alter, development information is centralized and information is illustrated through diagram, which typically is easier to understand. Example of CASE tools is functional modelling; activity diagram and use case diagram

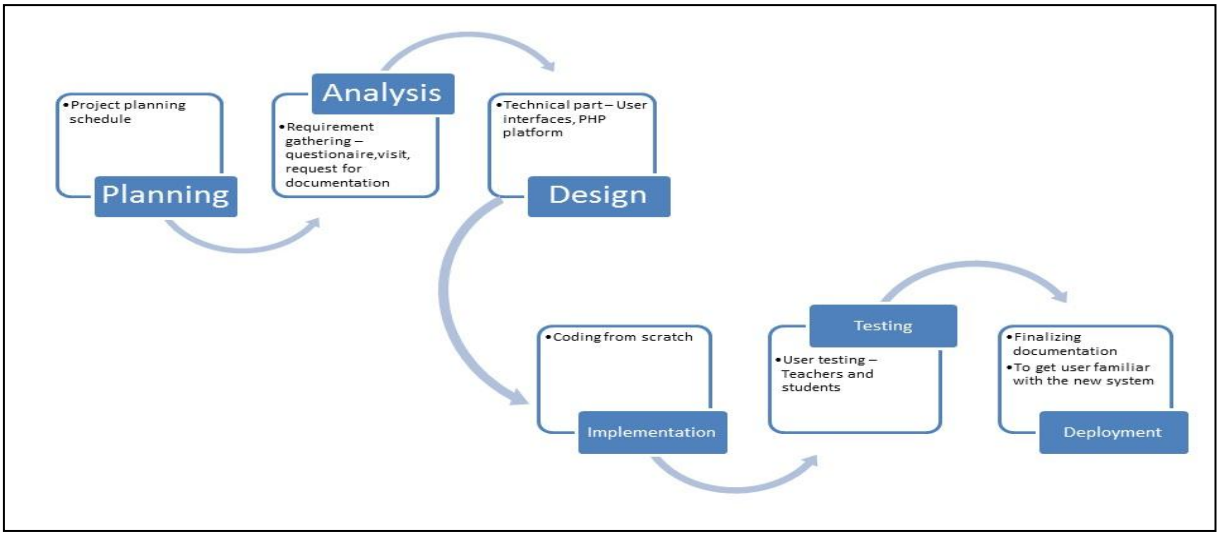

Figure 3.2: Project Development Details

This methodology is chosen because any modification to the application could be easily done, and less risk is incurred to develop the smaller system represented by the increments.

1. Planning & Requirements Gathering

Planning phase is the fundamental process of understanding why should this be build and determining how to build it. First thing to do in planning phase is defined the suitable topic that will be developed. After the topic has been approved, author will move on to gather data related to this topic that will be used in analysis phase. There are several techniques that been used to gather data, there are by reading article and journal, and requirement gathering by using questionnaires and observation techniques. Information about available development tools will be defined during this planning phase.

2. System Analysis

Data that has been collected during planning phase will be analyzed during this analysis phase. From questionnaires, author will come out with requirement

determination in order to determine knowledge level of user about Tajweed and their expectation. From observation, author will analyze others website content and functionality that will be used in design phase. The development tools to be used in developing this project also will be finalized.

3. System Design

The previous section discussed the requirement-gathering used to develop the author's project which is using questionnaires and observation techniques. Now, at design phase functional modeling like swim lane diagram and use case diagram will be developed. Swim lane diagram support the logical modeling of business process and workflows. Use cases are used to describe the basic functions of the information systems. Both diagrams will be used during development phase. During this phase, user interface also will be designed and determined. The content of application will be finalized. The design phase must be carefully developed to ensure this website will meet the requirement mentioned in the analysis phase.

4. Implementation

Application will be developed based on diagram and user interface that has been designed and determined. Coding will be generated in way to develop the application. After finishing with the development phase, this application will be tested and be delivered as a final product.

5. Testing

This is to make sure that the system produced is error free and in a high quality condition. The teachers and student will be using the system several times before it is released to them.

6. Deployment

In the deployment phase, it involves finalizing user documentation, finalizing the system set-up and conducting user training to get user familiar with the new system.

3.2 Project Tools

3.2.1 Hardware

Laptop and server.

3.2.2 Software

Software used :

- Adobe Photoshop CS4
- Xampp 3.0.2
- Microsoft SQL Server.
- Joomla 2.5

3.2.3 Programming Languange:

- HTML
- PHP

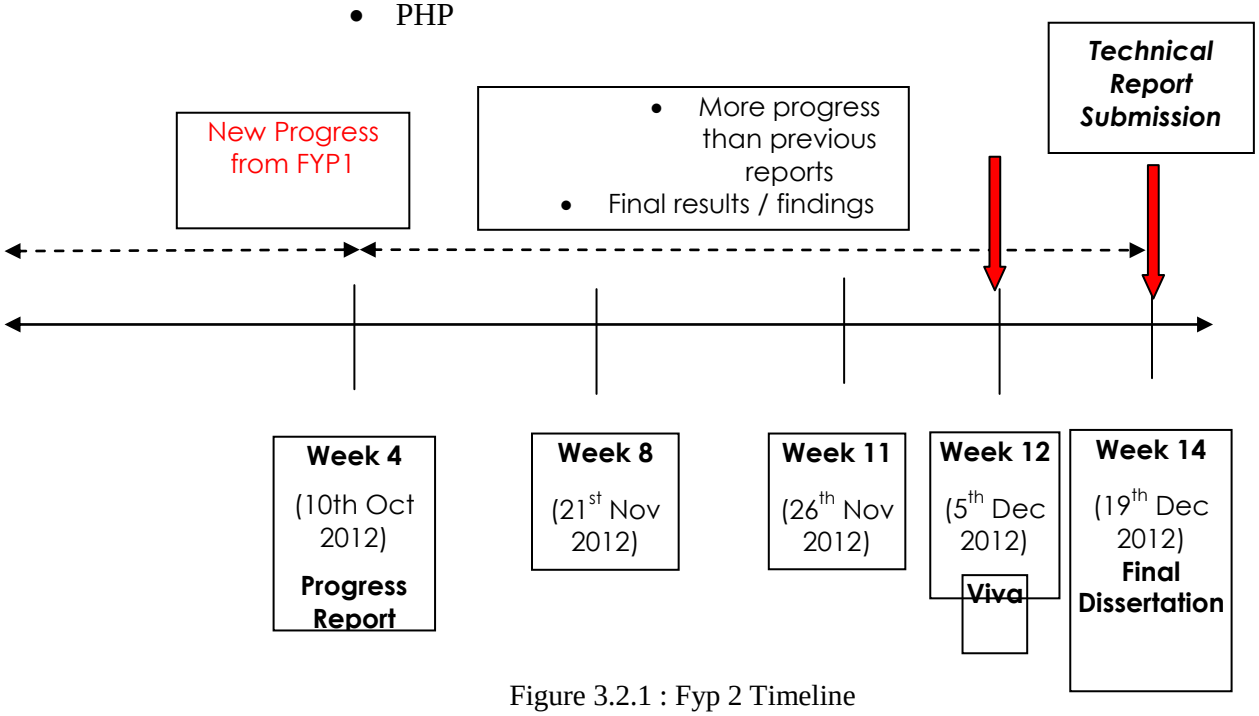

Figure 3.2.1 : Fyp 2 Timeline

CHAPTER 4
RESULT AND DISCUSSION

4.1 Interview

Several interviews have been conducted with a Headmistress from Sekolah Rendah Agama Jalan Kebun,Klang during the data collection phase. Generally, the interviews are carried out in order to understand the current problems faced by student and teachers at school. From the interviews, the author manages to collect problems faced by student and also teachers. Apart from that, the author has prepares few questions regarding the system:

Figure 4.1 : (LEFT) Ustazah Masamah, (RIGHT) Ustazah Zakiyah

Figure 4.1 shows the snapshot during author's interview session with Ustazah Masamah and Ustazah Zakiyah at Sekolah Rendah Agama Jalan Kebun, Klang.

Below are the questions that author had prepared for the interview :

1. What is a current approach used to teach Tajweed in school?
   The current approach is done mnually where the teachers usually prepare a set of ABM (Alat Bantuan Mengajar) or we can called it as teaching aids to help students understand better on the subject.Sometimes student easily got bored because the teaching aids is only using color papers and no innovations to attract student attentions.

2. What are the weaknesses that the school wants to improve? Time-saving, paperless, quick etc.
   Time consuming and waste of papers.

3. Who is the main user of the system? Or who has the access to this system?
   Teachers, students and parents.

4. Who is the third party involved in this system? E.g. caterers, banks.
   No third party involved.

5. Is there any requirement on the specific software to be used?
   It depends on the developer preferences.

4.2 Swim lane Diagram

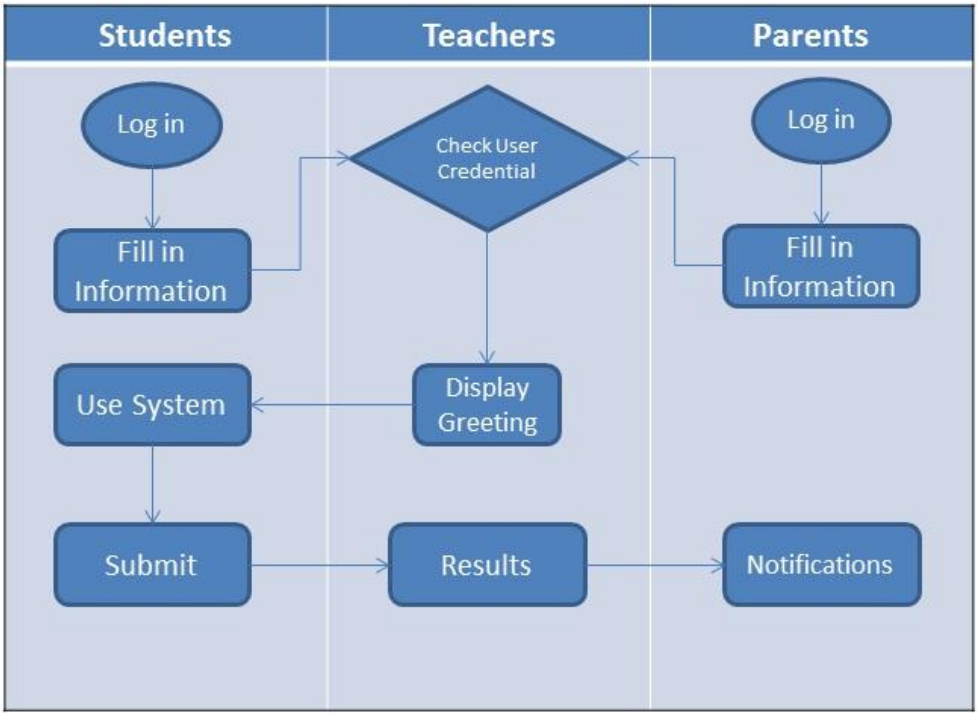

Figure 4.2 : Swimlane Diagram

Figure 4 shows the Swimlane diagram for the system. The requesters (students) need to log in and continue to fill in the required fields such as general information, subjects taken and level. After that, the students will submit the form to their teachers as an admin and get endorsement from them. Once the application was approved, students and parent can view the content of the application. Then, the student and parents will be notified whether their application is accepted or rejected. The time is saved a lot since they are communicating through emails and internet, which indicated the unlimited access as long as they are connected with the internet.

4.3 UML Diagram

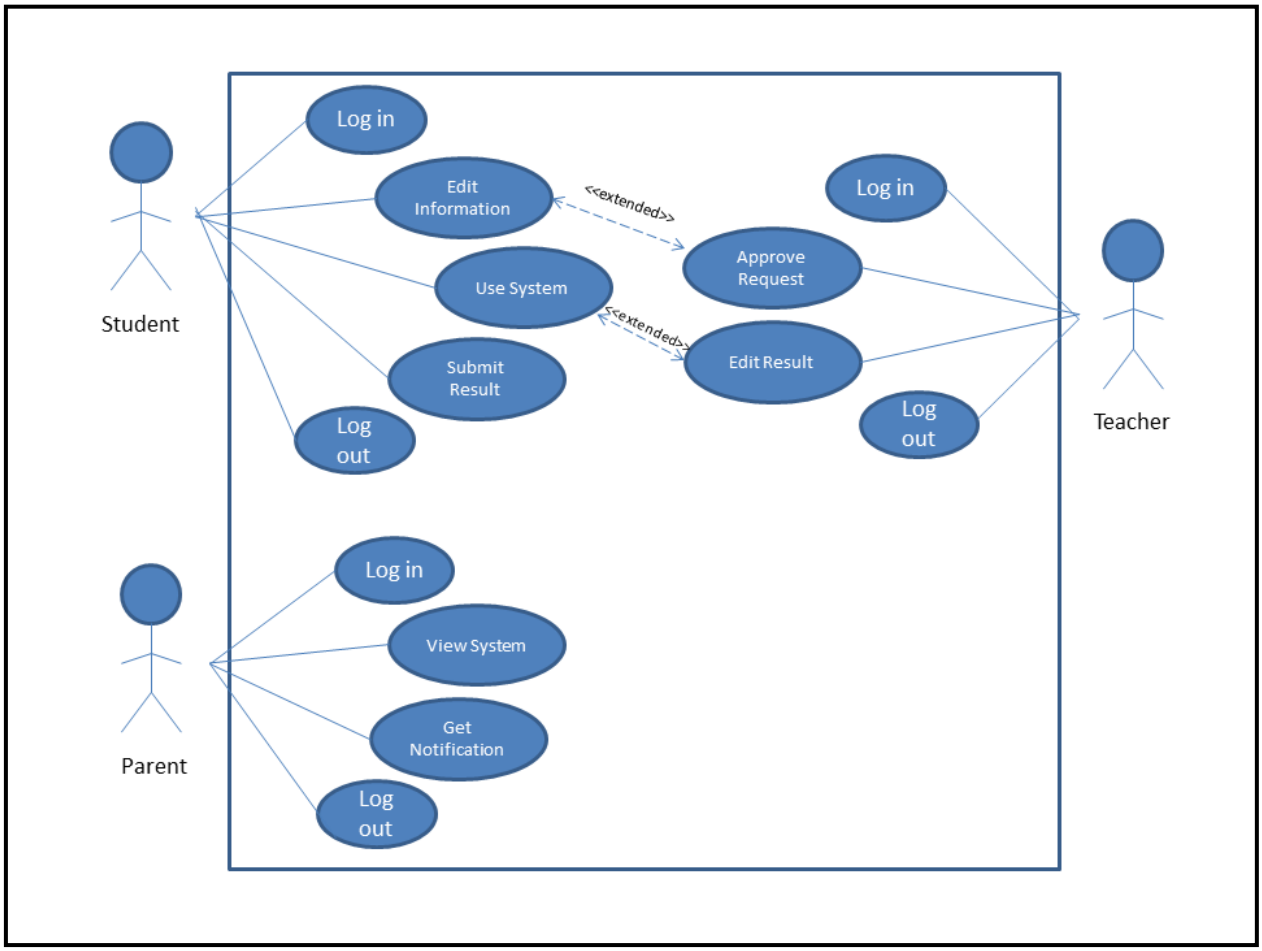

Figure 4.3: Use Case Diagram

Figure above shows the use case diagram for the system. It shows that the student and parent have the same level to view and use the system. Meanwhile for the teacher, as admin has the authority to edit and marks student result. Parents will be notified on the result of their children and this can be beneficial for them to monitor from far the progress of their children.

4.4 System Architecture

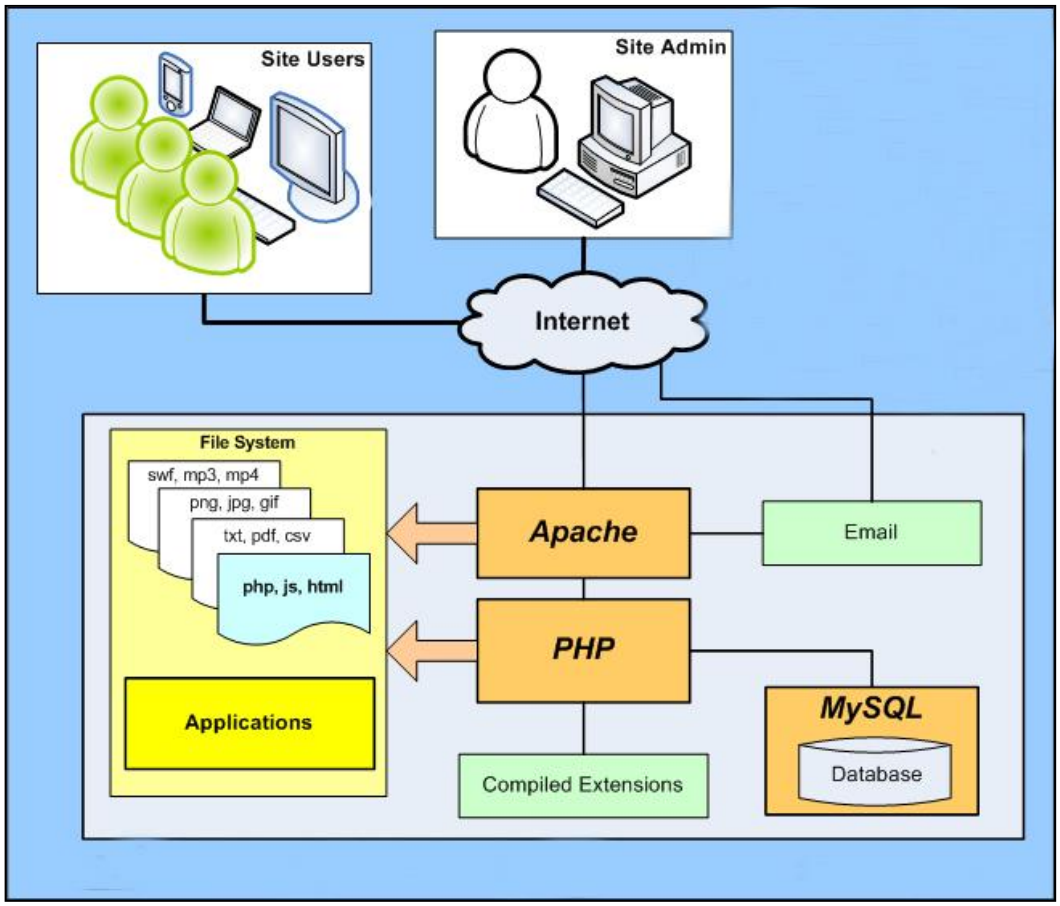

Figure 4.4 : System architecture for e-Tajweed website

An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structure of the system which comprises system components, the externally visible properties of those components, the relationships between them, and provides a plan from which products can be procured, and system developed that will work together to implement the overall system. The system architecture for e-Tajweed consists of three layers which are interface/presentation layer, application services layer and also database layer. The interface layer is the representation for user interacting with the system from the outer side. Meanwhile, the application layer consist all applications in the websites that enables user to communicating with the database and the e-Tajweed itself. Lastly, in database layer, it consist all student information that only can be access by the admin.

4.5 System Interface (Prototype)

Figure 4.5 : Log in page

For the testing phase, the author developed e-Tajweed by using Bahasa Malaysia in order to test whether student can understand on the system or not. Because it covers from various of ages, the author needs to use a simple language and hint for this project.

Before entering to this application, users need an approval from the admin. The user for this application is student, range form 7-12 years old and the admin will be their own teachers. After users got log into this application, they can use and play around with the function provided.

Users also can edit and update their profiles, and check the scores they had collected from activities which they had done in this application. From the results, teachers can monitor the imrpovement of student in learning Tajweed from time to time.

Figure 4.5.1 : e-Tajweed Homepage

Figure 4.5.2 : e-Tajweed main menu

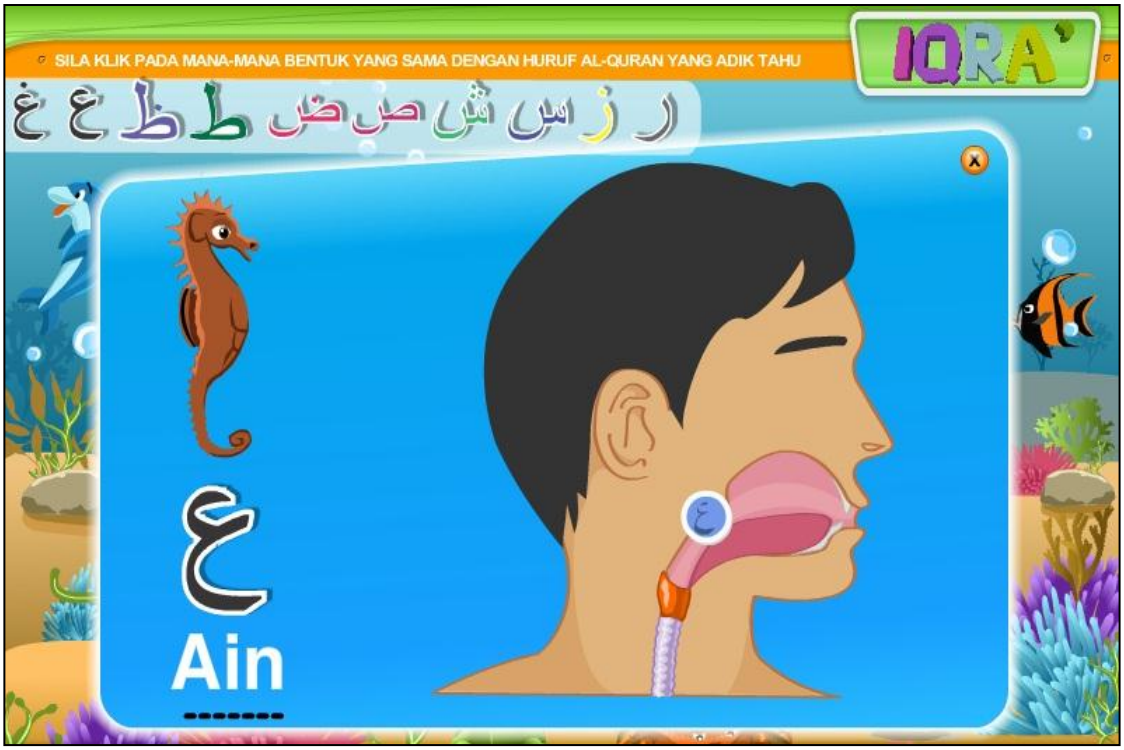

Figure 4.5.3 : Reading activities

e-Tajweed helps student to learn and have a better understanding on the Holy Quran rules. During the testing phase, students got a little assistance and they were all attracted to the application for its colorful interfaces and the various learning activity provided in the application.

The results showed that students can recognize *Arabic* letters but cannot pronounce it correctly base on its *Makhraj*. Students are engaged with the various activities presented in the application. This learning model can be applied to any learning situation as it able to attract and engaged learners to learn through the rich learning environment that it adopted.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

This project involves development of website that enhances the manual system of teaching Tajweed in schools. This will helps children in the early stage of their learning process. With the utilization of interactive image, this will create interesting leaning environment and at the same time, to create an exciting feeling in learning new things. This application will act as an essential tool in learning process. Besides that, the game approach in believe can increase effectiveness in delivering the information.

On the first semester of the project duration, the activities were focusing on analyzing and designing. Through researches that have been made, the author manages to gather all required data and make necessary analysis. Then, the designing process was performed to create effective learning tools for children. All the objectives of this final year project were met. On the following semester the project is continued into development, testing and implementation before deliver the system to the user.

The utilization of web base application and image editors technologies, create suitable learning theories and suitable types of game for teaching Tajweed are identified and applied in the development of this project. The application is almost successfully developed using Joomla 2.5 and Photoshop CS4 as the programming tools and photo editing. At the end of this project, usability testing is conducted and the results are discussed for future recommendation and enhancement.

5.2 RECOMMENDATION

The author expects the project can improve and ease all level of user starts from students, parents until teachers who will be using this system. This project is not only meant to improve the education system but to educate student in more interactive ways parallel with the advancements of technologies as well as promoting green computing and also the efficient working culture.

Some feedbacks and recommendations were obtained from the respondents who do the testing of this application. First, is to use animated picture to make it more attractive. Second, use multimedia elements such as the background sound that suitable for learning environment and provide a hint in a form of sound. Thus, in future the application will cover higher syllabus context for example, verbs vocabulary which suitable for Primary School children in learning Tajweed.

For the continuation of the project, the database should be created in order to store the player names and scores. In future, this element may become an important part in assessing and evaluating student's performance when the application is implemented in school.

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