4.0 System Analysis

This chapter is the initial stage of the V-Shaped model and are also known as the requirements stage. During this stage, steps are taken to initialize the major tasks and areas to be covered. Section 4.1 describes the fact finding techniques for this system. Section 4.2 describes the requirement specifications which are functional requirements and non functional requirements.

4.1 Fact Finding Techniques

Effective and appropriate techniques must be carried out in order to define and elicit user requirement effectively. There are many information and requirements needed before the development of a system can be started. This information can be obtained from a variety of sources. Each source usually yields a different search method in retrieving the information. The techniques used to obtain the needed information are printed resources, internet research and interviews.

4.1.1 Printed Resources

Information gathering is done using materials such as journals, magazines, books, dictionary and encyclopedia. These printed resources provide enormous data and information regarding the problem domain. It will provide a better understanding on the capabilities, feasibility and the possibilities on how the system should be designed.
For example, a research article by Thorpe and Borden (1985) discussed the visual, auditory and kinesthetic importance when learning the sound to symbol relationship used to teach reading and spelling. By conducting a thorough reading on the articles, a solid understanding of the environment can be formed thus enabling content to be design with ease.

4.1.2 Internet Research

Internet has been the main resource to gather information and materials regarding dyslexia. The gathered information and materials are very important later in literature review.

For example, there are many online forums which can be accessed to gain information regarding dyslexia. Web forum such as www.dyslexiatalk.com, www.dyslexia-parent.com and www.beingdyslexic.co.uk are some of the best resources for dyslexia information. Discussion can be established with professional and experienced individual in the field.

Schenck.org (www.schenck.org) is a website regarding a private school designed to teach dyslexic students with learning disabilities. The Schenck School, founded by David Schenck in Atlanta, bases their reading instruction on the Orton-Gillingham Approach. The multisensory approach has given the students skills to improve their reading and writing. From the review, multisensory has been found to be a mandatory approach to be included in the system.
4.1.3 Interview

While gathering the requirements for this research, interview sessions have been conducted with Puan Sariah, the President of Dyslexia Association, Malaysia. We have been discussing the overall perception about dyslexia and its learning methods. These interviews are very crucial in obtaining full information and requirements needed for the development of the multimedia software.

Based on discussions with the President of Dyslexia Association, there is no fixed syllabus for dyslexic student. The teaching is basically focused on individual disabilities and awareness.

The syllabus of the multimedia learning is very important in order to develop a successful learning system. Another interview session has been conducted with Puan Alinah, a Special Education Teacher with 6 years of experience in the field. Based on the discussions, preschool syllabus is taken as the base syllabus for the dyslexic students. The preschool syllabus will then be enhanced and adjusted accordingly to suit the needs of the dyslexic students. Further explanation will be discussed in the Content Design section.
4.2 Requirement Specification

Software system requirement are often classified as functional and non-functional requirements. These are also known as domain requirements.

4.2.1 Functional Requirements

The functional requirements for e-Dyslexic are as follows:

4.2.1.1 Registration

- Registration is mandatory for both teacher and students in order to be able to use the system. Users will be provided with user name and password upon completing the registration.

- Student registrations are to be done by the teacher assuming that preschool students are not old enough to key in their registration information properly.

4.2.1.2 Log In

- Teacher and students have to key in their user name and password to log in to the system. Failed to supply the correct login will result in error.

4.2.1.3 Teacher Menu

Teacher acts as an Administer of the system. Below are what type of functionality can a teacher perform:
• **Add students to the system.** Teachers are required to register each student under his or her supervision. Teacher need to supply the student name, user name (used for login), age, gender, remarks and password (used for login). Teacher need to provide student with their login information (user name and password).

• **Remove student from the system.** Teacher can remove student if the student is no longer active or absent. The student’s data will not be removed.

• **View students' scores.** Teacher can view students’ current exercise score and quiz score.

• **Access student’s remarks.** Teacher can refer to the student remarks section to view students’ disability type. This will provide teachers with information to help them approach students more accurately.

• **Monitor student's performances.** Teacher can monitor students performances based on their monthly quiz scores. Teacher can find out which sections the student needs to improve on.

• **Generate performance graph.** Teacher can generate performance graph based on the students monthly quiz scores.
• **Access and print students’ performance report.** Teacher can make analysis based on students’ performance and print it in a report format.

• **Master Reset.** Teacher can reset student’s data so that the student can go through the quiz cycle again.

### 4.2.1.4 Student Menu

• **Access Lesson page.** Students can access the lesson sections and learn the dyslexic preschool basic lessons in both format: continuous or interactive play. With continuous lesson, students will learn according to system generated pace while in interactive format students can learn in their own pace.

• **Access Exercise page.** This is where the students will develop and improve their skill. They can access the exercise page anytime. Current exercise score can be accessed by both teacher and student.

• **Access Quiz page.** Student can only take 3 quizzes per one learning cycle. Teacher need to monitor and decide when is the appropriate time for students to take their quiz.

• **Access Bonus page.** Student can access the bonus page once they score an average of 70 marks for all three levels of quizzes on each lesson. Bonus page will have interactive games for them to play.
• **View current scores.** The students can view their current scores from the main menu. Current score is the current exercise score.

4.2.2 **Non Functional Requirements**

The non functional requirements for e-Dyslexic are as follows:

4.2.2.1 **User Friendly**

The system will have an attractive and easy-to-use interface, so that users will not be confused or frustrated when using the system. The navigational systems are not too complex and are easy for children to understand.

4.2.2.2 **Flexibility**

The system should have the capability to take advantage of new technologies and resources. The system should be able to be implemented in the changing environment.

4.2.2.3 **Reliability**

Reliability is the extent to which a system can be expected to perform its intended function with required precision and accuracy. Thus, the system should be reliable in performing its functions and operation to the users. This also will convince the user that the system will make the correct respond and provide error handling ability.
4.2.2.4 Usability

Usability places the user in control. The application system must be easy to use. They can enhance and support rather than limit or restrict business process. Users are able to understand the navigation option to choose the sections that they're interested. The interaction modes must defined not to forces a user into unnecessary action and provide flexible interaction for different users for instance via mouse movement and keyboard command.

4.2.2.5 Efficiency

This is one of the most important requirements of the system, where it should provide a good response time to all user requests. The system should not cause any delay in processing the user request or even in the midst of retrieving information.

4.2.2.6 Attractive and Interactive Interface

The interface design will be colorful and cartoonist due to the main users are children under 7 years old (pre-school). Music and sound effects will be added to the system to enhance the learning environment. Some animated characters will be accompanying students throughout the process.
4.2.2.7 Maintainability and Expandability

Maintainability maybe defined qualitatively as the ease with which software can be understood, corrected, adapted or enhanced. Expandability is the degree to which architectures, data or procedural design can be extended. This system can be expanded in the future.

4.2.2.8 Security

The system should be equipped with sufficient security. Each access by the user should be authenticated and validated by the system. The system should not show any potential of information leakage.