

**RULE BASED ADAPTIVE EMOTIONAL SOLVING WEB TUTORING  
(AESWT) FOR KINDERGARDEN SCHOOL ON LEARNING  
MATHEMATICS**

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**(AESWT) FOR KINDERGARDEN SCHOOL ON LEARNING MATHEMATICS**

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## ABSTRACT

Rule Based Adaptive Emotional Solving Web Tutoring (AESWT) was developed to help the kindergarten student to solve their emotion problem when using web tutoring on mathematics. This AESWT focuses on kids because nowadays we can see that the kids are more exposed and also as the higher percentage of users which use modern technology such as computer and smartphone. In addition, most of the tutoring for kids are using online. Therefore, systems that can resolve emotion problems among kindergarten students need to be developed in order to reduce that problem. The objective of the Adaptive Emotional Solving Web Tutoring (AESWT) system to be created is to apply adaptive presentation techniques for web tutoring. Second, developing a prototype for adaptive emotional solving. Lastly, test the functionality of the prototype. This Adaptive Emotional Solving Web Tutoring (AESWT) will adapt in web tutoring mathematics. This AESWT function when received information about the emotional status of kindergarten students and it has the ability to change the Graphical User Interface based on emotion. In order to do that, this AESWT will use the rule-based technique to match human emotions with the right solutions. Besides that, this project uses Macromedia Dreamweaver CS8 to develop Adaptive Emotional Solving Web Tutoring (AESWT). This AESWT has three target emotions to solve: sad, happy, and angry. In addition, Adaptive Emotional Solving Web Tutoring (AESWT) will automatically help kids to solve their emotion easily during using a web tutoring on mathematics. The results for this prototype show that it can be a functionality when it can change the interface to become more interesting and can be accepted by kindergarten kids. As the conclusion, AESWT system can make kids feel comfortable and easily to solve emotional problems.

## ABSTRAK

Tutoran web Adaptif berasaskan penyelesaian emosi (TAPE) telah dibangunkan untuk membantu pelajar tadika menyelesaikan masalah emosi mereka apabila menggunakan laman web matematik. TAPE memberi tumpuan pada kanak-kanak kerana pada masa ini kita dapat lihat bahawa kanak-kanak telah banyak didedahkan dan juga menunjukkan peratusan yang tinggi sebagai pengguna yang menggunakan teknologi moden seperti komputer dan telefon pintar. Di samping itu, kebanyakan pendidikan untuk kanak-kanak juga menggunakan internet . Oleh itu, sistem yang boleh menyelesaikan masalah-masalah emosi di kalangan kanak-kanak perlu dibangunkan dalam usaha untuk mengurangkan masalah itu. Objektif TAPE yang akan diwujudkan adalah memohon teknik persembahan penyesuaian untuk tunjuk ajar web. Kedua, membangunkan prototaip untuk menyelesaikan emosi penyesuaian. Akhir sekali, menguji fungsi prototaip. TAPE akan menyesuaikan diri dalam web tutor matematik. TAPE berfungsi apabila menerima maklumat tentang status emosi pelajar tadika dan ia mempunyai keupayaan untuk menukar laman web berdasarkan emosi yang ditunjukkan. Dalam usaha demikian, TAPE ini akan menggunakan teknik berasaskan peraturan untuk dipadankan dengan emosi manusia dengan memberikan penyelesaian yang bersesuaian. Selain itu, projek ini menggunakan Macromedia Dreamweaver CS8 untuk membangunkan TAPE. TAPE ini, mempunyai tiga sasaran emosi untuk diselesaikan iaitu sedih, gembira dan marah. Disamping itu, TAPE akan berfungsi secara automatik akan membantu kanak-kanak menyelesaikan emosi mereka dengan mudah semasa menggunakan tutor web pada matematik. Tambahan pula, keputusan menunjukkan 70% peratus pelajar menyukai sistem ini. Sebagai kesimpulan, sistem TAPE boleh membuat kanak-kanak berasa selesa dan mudah untuk menyelesaikan masalah emosi.

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## **LIST OF ABBREVIATIONS**

AESWT: Adaptive Emotional Solving Web Tutoring

RAD: Rapid Application Development

SDLC: Software Development Life Cycle



## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 INTRODUCTION**

Human emotion is one of the important topics in psychological area and most important features in human development. When the human condition is unstable or in a prolonged state of uncontrolled emotion it might result in adverse effects towards the human. Thus, human emotions are one of the best ways to express the feelings of humans. In addition, human emotion can be divided into two categories which is positive and negative emotion. Then, positive and negative emotions are influenced by the environment and the activities carried out by humans.

Positive emotions showed that people in good condition but negative emotions show otherwise. So, negative emotion is something that should be treating because it can cause harm to human life. As we can see nowadays, they are lots of research done to control or solve the problem of human emotion. Based on this observation, Adaptive Emotional Solving Web Tutoring (AESWT) for kindergarten school web tutoring on mathematic was develop to help kids in order to solve they emotion problem. It is an adaptive web tutoring that available for kindergarten kids. This adaptive system is providing to solve the emotion of kids when using internet by giving a good solution. However, EST only gives a solution for sad, angry and happy expression. For example,



when user is in sad condition, it would provide music as a therapy. Besides that, according to Moore “listening to music can make you feel better when you're sad, help you dance around the house when you're happy, and make you cry when you really need a good cry (2011).

## **1.2 PROBLEM STATEMENT**

Nowadays, most of the web-based are not provide Adaptive Emotional Solving for internet user. Therefore, nobody knows when user experiencing emotional distress. In addition, users are not very comfortable with the website they visit which has many instructions to be followed and websites look very messy then it will make the internet users feel bored and depressed.

Besides that, is very hard to find the best way to solve the expression from the user. This is because different person have different way to solve the problem. Sometime, the solution that recommended to the internet users is not satisfactory and unable to solve the problem of user emotion. In fact, makes users feel resentful and they will be more emotionally disturbed than before. For example when users are in angry expression then the system has given them a sad song, and then it makes the user feel sad. Lastly, that most of the Adaptive Emotional Solving have limitation because it's does not provide many solutions for emotional problems and only a few emotions are choose to be solved.

### **1.3 OBJECTIVES**

There are three objective of this research are:

- i. To apply adaptive presentation technique for web tutoring.
- ii. To develop prototype for adaptive emotional solving.
- iii. To test the functionality of the prototype.

### **1.4 SCOPE**

There are fourth scopes on this research. First, the emotion expression will be collected and solve from 10 kindergarten students from different gender. Second, principle of human computer interaction for children is applying in this AESWT project to identify what kind of interface suitable to solve the expression emotion of children and make them friendly with that tools. In addition, use a rule based technique also apply in this system to match the emotion of kids with suitable solution for them. Third, the target emotional categories that will be solved using this AESWT are happy, sad and angry/stress. Fourth, software which used for develop AESWT are Macromedia CS8. This Macromedia CS8 is using for designing the interface according to solve the emotion problem. In addition, the hardware used for this project is laptop.

## 1.5 THESIS ORGANIZATION

This research consist of five chapter. Chapter 1 discusses about introduction to system. This chapter is described about overall of Rule Based Adaptive Emotional Solving Web Tutoring (AESWT) that will be done. Its include introduction of the AESWT, problem statement, objectives, scope, and thesis organization. Chapter 2 discusses about the literature review which related in this project. This chapter also mention about technique that compatible to this project. Chapter 3 is methodology that supposed to discuss on the approach to build the system. The information that mention in this chapter is introduction of methodology and software used.

Chapter 4 involves design and implementation that discuss about develop the framework and model through flow work. Then include researched which have planning of data analysis. Chapter 5 involves result and discussion that elaborate about the result from data analysis that have been done. The element should be included in this chapter are result analysis, the problem arise, and solution taken. Chapter 6 involves the conclusion that conclude or summaries overall about this project starting from chapter 1 until the last chapter.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

Nowadays, in the modern world and modern sophisticated there are many studies done to create software that will help human to solve their problems in the superlative method. One of the software is Adaptive Emotional Solving Web Tutoring (AESWT) which is can benefit the internet user by give the solution for their emotion whether bad or good emotion. Based on science daily articles, emotion in its most general definition is a neural impulse that moves an organism to action, prompting automatic reactive behavior that has been adapted through evolution as a survival mechanism to meet a survival need. Besides that, according to Linda Davidoff she has defines emotion as a feeling that is expressed through physiological functions such as facial expressions, faster heartbeat, and behaviors such as aggression, crying, or covering the face with hands.

As we all know, the emotion play an extremely important role in human life. This is because without human illustration feeling by face expression, the others not know what actually they want to delivered. This can affect the human activities such as misunderstanding and hurt feeling. Thus, emotion is important because it can help act as information, essential for making good decisions, communicate, and enjoyment. Emotion as information which is given human knows about anger, fear, sadness, happiness, jealousy, and grief. Then, its act as good decision making by combining emotion with head and heart together are necessary for making better choices.

Besides that, emotion can help human communication with surrounding because all human beings are share the same emotional language such as an angry face is described angry by someone in London and in Siberia. Lastly, emotion plays an enjoyment feeling because feeling help us recognized truth, appreciate beauty and give us the experience of joy. (Jaktraks, 2012)

Here there is some briefly explanation how does the Adaptive Emotional Solving Web Tutoring (AESWT) works. Firstly, this project are involves only the user which interact with web based. The face expressions of the user are recognizing by other system. After that, the result of emotion of user from that system will appear at the screen. Then, the AESWT will provide a solution link at the below image based on that user expression. Then, user can click the link to know what the best solution for their emotion. This AESWT only can solve three emotion of user which is sadness, happiness and angry. Each emotion that shows from user would have indicated more than one solution because each person has a different way to appease their feelings.

As a conclusion, the AESWT is the systems that can help the kids feel comfortable to interact with web based. Besides that, this system can change the emotional of the user by the solution given it will make the kids feel better than before.

## **2.2 Information of Adaptive Emotional Solving Web Tutoring (AESWT)**

Emotional design has become a powerful tool in creating exceptional user experiences for websites. Besides that, provide the emotion solving tool, will assist humans in solving emotional problems that they face when interacting with computers. In addition, Adaptive Emotional Solving Web Tutoring (AESWT) can be used as a means of prevent bad things happening when kids uncontrolled their emotions. For

example, people will take the easy way out by committing suicide when they do not know the best way to solve the problem. Thus, this system can help the kids or guide them to solve their emotion.

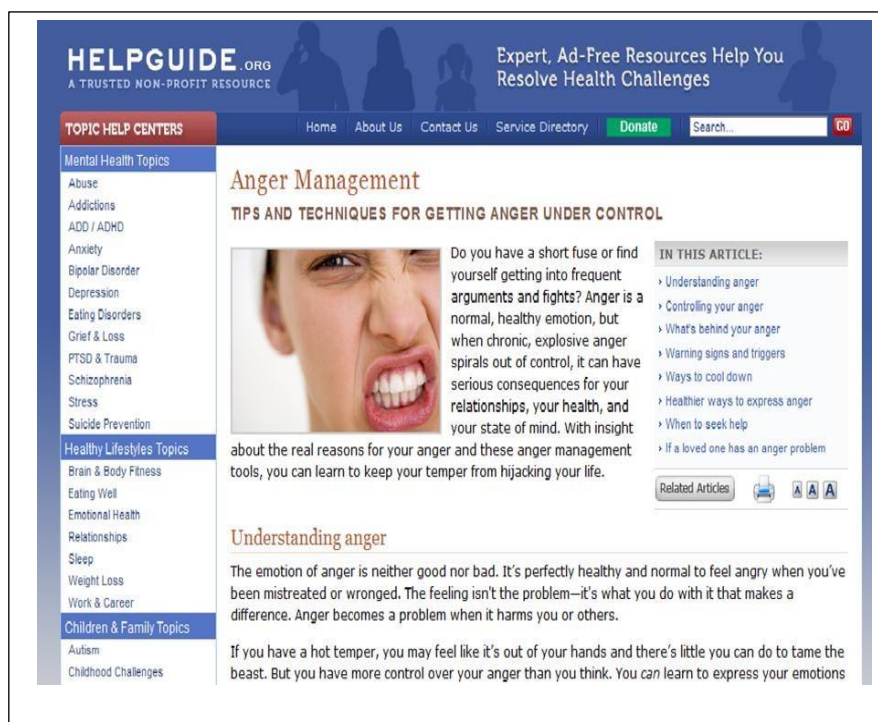
Refer to this website <http://www.healthguidance.org/entry/5440/1/What-Are-The-Benefits-of-Controlling-Your-Emotions.html> October 17, 2012 8.00pm (Online), the author is Abbas Abedi talk about the definition of emotion and effect of emotion. The admin state that emotions are the language of everyone's mental and emotional state of being. They are normally tied to person's social and physical sensory feelings. Emotions are the type of feelings used to react to fear, joy, love, sadness, hate, disgust, and pleasure. However, there are times when people need to control or suppress their emotions to prevent violence or other negative behaviors.

While, refer to this website <http://www.collect-emotional-feedback-on-your-live-website> (Online), this author said, state about emotions become increasingly important on the web nowadays. While good usability has become a common standard, the user experience of a website has turned into a major distinguishing factor. People no longer want to solve boring tasks on your site, they want to be entertained and experience pleasure while finding answers to their questions (Sabina, 2012).

## 2.3 RELATED WORKS

There are many systems that develop using web base application which have using different types of technology and methodology. Usually, all the systems that have been developed have their own strength and weaknesses.

### 2.3.1 HELPGUIDE



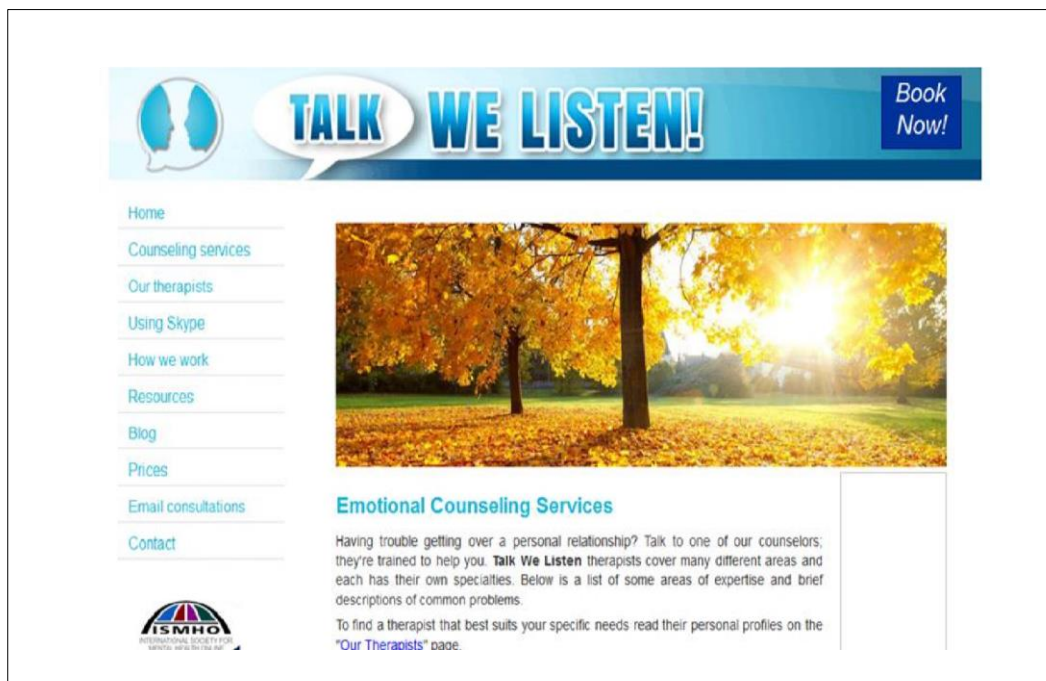
**FIGURE 2.1:** TALK WE LISTEN website

Helpline.org is a web base application that allows anyone to go through this website especially for those which have emotion problem. This website provide the guideline which help the person to control and manage they emotion problem such as stress, depression, anger and so on.

As with others website, Helpguide website also have advantage and disadvantage. The advantage of Helpguide website is there have lot of text information about manage and control people emotion. This website also have a good design of graphical user interface (GUI). This is because this website have properly structure which can avoid from user misunderstanding. Besides that, Helpguide website also uses of blue color for the each interfaces that can cause users feel comfortable and calmness.

Then, the disadvantage of this website is too much word in one section that makes the page a little bit crowded. Because of that problem, this website interface is not really interactive and make user bored.

### 2.3.2 TALK WE LISTEN



**FIGURE 2.2:** TALK WE LISTEN website



The TALK WE LISTEN website is an online service that using web base application. This system has been developed in order to ease the people to get a therapy due to their emotion problem using online which is fast and not taking too much time. There are many type of counseling service provided in this website such as anger, depression, disclaimer, phobia and so on.

There are several advantages of this website which provided online application that ease people to get counseling services from therapist without wasting too much time and money. Besides that, provide you with the opportunity to receive counseling from professional psychologists.

This website also have some disadvantage .Firstly, there is too much information that put together in one page and make hard for people to use the website. In addition, interface of this system also not well organized in term of colors, font size and many more.

### 2.3.3 EMOTIONAL PROBLEM SOLVING



**FIGURE 2.3:** EMOTIONAL PROBLEM SOLVING website

Emotional problem solving is web base application technology that solve emotional problem. This website provides information about emotional category and way to solve it. Emotional problem solving website has given a tips to avoid people from get an emotion problem in daily life.

There are several advantage of this website. This website is simple and anyone can access in this website without register their information. Besides that, emotional problem solving website also can attract people to access it because they are not have too much word which can avoid people from feel bored and confusing.

However there are several weaknesses that had been found in this system. First, this system icon are not well organized such tab, menu bar and so on. Seconds, the home page of this website have not look like a properly structure and a lot of empty space.

### 2.3.4 COMPARISON AND DISCUSSION

There is briefly discussion about three website that have been choosing. This three existing system which are HELPGUIDE, TALK WE LISTEN and Emotional Problem Solving. This existing system would become guideline and references in order to develop Adaptive Emotional Solving Web Tutoring (AESWT) each of system that has been chooses there are some weaknesses in term of user interface and function.

Then, in order to develop Adaptive Emotional Solving Web Tutoring (AESWT) successfully and meet requirement the feature of the system must have good characteristic in term of performance and fulfilled the user needs. Thus, Adaptive Emotional Solving Web Tutoring (AESWT) will be developed with the superlative and can overcome the weakness or enhance the existing system. After that, AESWT will provides good system interfaces and design properly to make sure it will look more interactive in term of criteria need for graphical user interfaces (GUI).

In addition, AESWT also provide picture which related to emotion problem which can attract people to use this system. Besides that, AESWT also put a sound or music to make the people enjoy and relaxes. Besides that, AESWT avoids to use a lot of word for every page this is because to make sure the user not feel messy and crowded. This can make user ease to handle the system without any instruction given. Lastly, AESWT will use rules based technique for develop system as a function to identify which solution are suitable due to emotional respond from user.

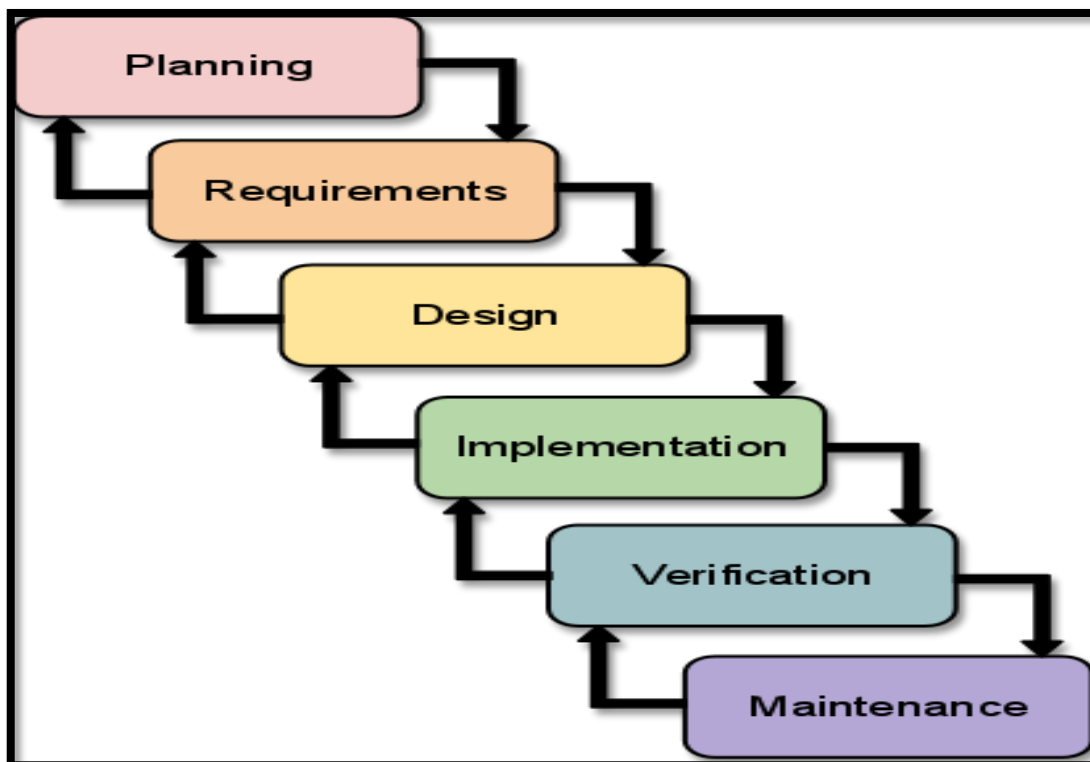
In conclusion, in order to develop an efficient and systematic system all aspect must satisfy. The AESWT system also need to fulfilled user requirement and help them to use this system properly.

## **2.4 METHODOLOGY**

Methodology is act as a guideline to help the developer to develop a system or use in an organization. Emotion Solving Tools are no exception to use a methodology as a guideline. There are several kinds of methodologies such as SDLC waterfall, Rapid Application Development (RAD) and lastly maybe by using agile methodology.

### **2.4.1 SDLC Waterfall Model**

The waterfall model is a popular version of the systems development life cycle model for software engineering. Often considered the classic approach to the systems development life cycle, the waterfall model describes a development method that is linear and sequential. Waterfall development has distinct goals for each phase of development. Imagine a waterfall on the cliff of a steep mountain. Once the water has flowed over the edge of the cliff and has begun its journey down the side of the mountain, it cannot turn back. It is the same with waterfall development. Once a phase of development is completed, the development proceeds to the next phase and there is no turning back.



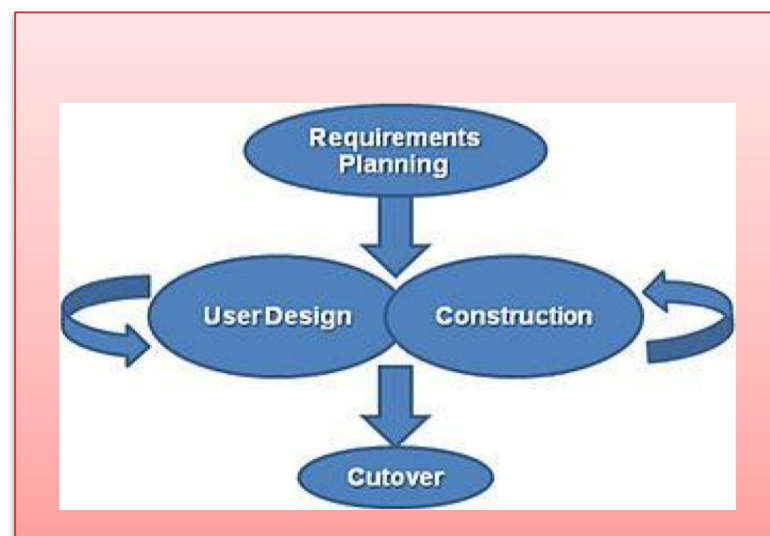
**Figure 2.4:** Waterfall Model (SDLC)

The advantage of waterfall development is that it allows for departmentalization and managerial control. A schedule can be set with deadlines for each stage of development and a product can proceed through the development process like a car in a carwash, and theoretically, be delivered on time. Development moves from concept, through design, implementation, testing, installation, troubleshooting, and ends up at operation and maintenance. Each phase of development proceeds in strict order, without any overlapping or iterative steps.

The disadvantage of waterfall development is that it does not allow for much reflection or revision. Once an application is in the testing stage, it is very difficult to go back and change something that was not well-thought out in the concept stage.

## 2.4.2 RAPID APPLICATION DEVELOPMENT (RAD)

Rapid application development (RAD) is a system development methodology that employs joint application design to obtain user input, prototyping, CASE technology, application generators, and similar tools to expedite the design process.



**Figure 2.5:** Rapid Application Development (RAD)

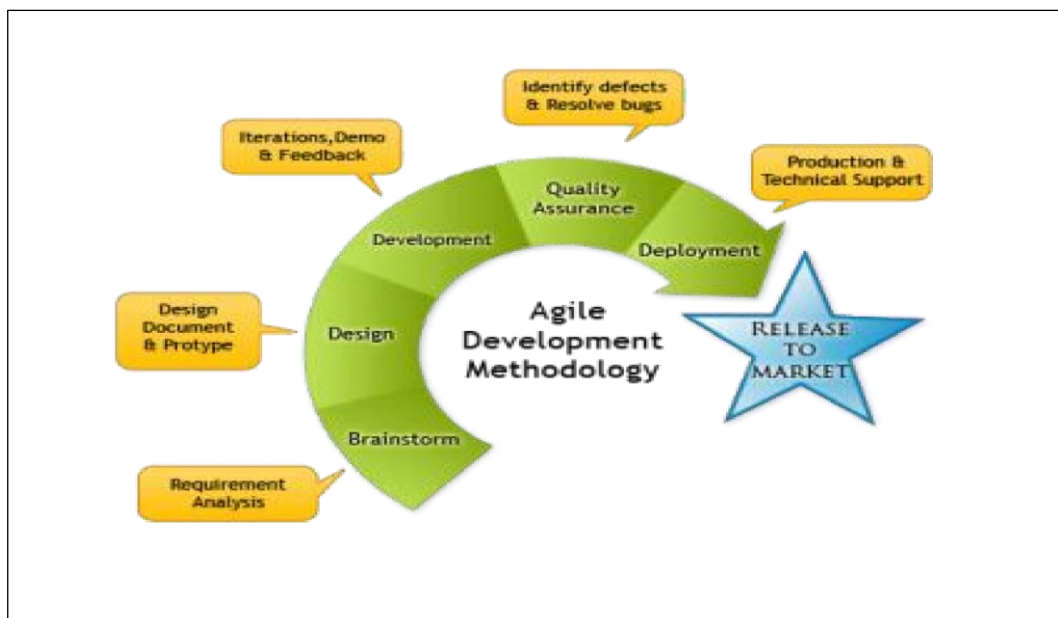
Rapid application development promotes fast, efficient, accurate program or system development and delivery. Besides that, the time required to develop the software is drastically reduced due to a reduced requirement analysis business requirements documentation and software requirement specification and planning stage. In addition, all the software prototypes produced can be kept in a repository for future use. The reusability of the components also enhances the speediness of the process of software development. Lastly, using RAD make easier for a project manager to be accurate in

estimating project costs which of course means that project cost controls are easier to implement and manage as well.

Then, the weakness of RAD is this method may not be useful for large, unique or highly complex projects. Besides that, it is reduced scalability occurs because a RAD developed application starts as a prototype and evolves into a finished application.

### 2.4.3 Agile

In software application development, agile software development (ASD) is a methodology for the creative process that anticipates the need for flexibility and applies a level of pragmatism into the delivery of the finished product. Agile software development focuses on keeping code simple, testing often, and delivering functional bits of the application as soon as they are ready. The goal of ASD is to build upon small client approved parts as the project progresses, as opposed to delivering one large application at the end of the project.



**Figure 2.6:** Agile Methodology

The advantage of agile methodology is has an adaptive team which is able to respond to the changing requirements. Besides that, the team does not have to invest time and effort and finally find that by the time they delivered the product, the requirement of the customer has changed. Lastly, the end result is the high quality software in least possible time duration and satisfied customer.

The disadvantage of agile methodologies is project can easily get taken off track if the customer representative is not clear what final outcome that they want. Besides that, in case of some software deliverables, especially the large ones because it is difficult to assess the effort required at the beginning of the software development life cycle. Lastly, only senior programmers are capable of taking the kind of decisions required during the development process. Hence it has no place for newbie programmers, unless combined with experienced resources.

#### **2.4.4 Comparison and Discussion**

There are three methodologies that have discuss which may include in develop of Emotion Solving Tools. There is SDLC Waterfall, Rapid Application Development (RAD) and Agile. Based on the discussion, the most suitable methodologies that should be used are Rapid Application Development because is faster and not take a long time to complete the project. Besides that, using RAD can minima cost of project and it also have short development cycle compare to other two methodologies.



## **2.5 TECHNIQUE USED**

Technique is a way of carrying out a particular task, especially the execution or performance of an artistic work or a scientific procedure. There are lot of technique will be applied in an application or system including for this Emotion Solving Tool. This Emotion Solving Tool might implement any kind of technique such as rule-based expert system, fuzzy logic and

### **2.5.1 Rule-Based Expert System**

A rule-based system is a set of "if-then" statements that uses a set of assertions, to which rules on how to act upon those assertions are created. In software development, rule-based systems can be used to create software that will provide an answer to a problem in place of a human expert. This type of system may also be called an expert system. Rule-based systems are also used in artificial intelligent programming and systems.

The rule-based system can be divided into two types which is backward and forward chaining. The backward chaining is refers to a scenario where the artificial intelligent has been provided with a specific goal and must "work backwards" to figure out how to achieve the set goal. To do this, the artificial intelligent would look back through the rule-based system to find actions in the "then" rules. Whereas, forward chaining is refers to a scenario where the artificial intelligent has been provided with a specific problem must "work forwards" to figure out how to solve the set problem. To do this, the artificial intelligent would look back through the rule-based system to find the "if" rules and determine which rules to use.

There are some of the advantages of rule-based expert system. Firstly, rules based is efficiency because can increase throughput and decrease personnel costs. Although

expert systems are expensive to build and maintain, they are inexpensive to operate. Development and maintenance costs can be spread over many users. The overall cost can be quite reasonable when compared to expensive and scarce human experts. Secondly, rule based is consistency which is similar transactions handled in the same way. The system will make comparable recommendations for like situations. Lastly, expert system is consistency of decision making.

However, rule-based also has disadvantage such as expert systems cannot respond creatively to unusual situations, must be explicitly updated and currently dependent on symbolic input. Besides that, expert systems are not good at recognizing when no answer exists or when the problem is outside their area of expertise.

### **2.5.2 Fuzzy Logic**

Fuzzy logic began with the 1965 proposal of fuzzy set theory by Lotfi Zadeh. Fuzzy logic has been applied to many fields, from control theory to artificial intelligence.

Fuzzy logic is a form of many-valued logic or probabilistic logic it deals with reasoning that is approximate rather than fixed and exact. In contrast with traditional logic they can have varying values, where binary sets have two-valued logic, true or false, fuzzy logic variables may have a truth value that ranges in degree between 0 and 1. Fuzzy logic has been extended to handle the concept of partial truth, where the truth value may range between completely true and completely false. Furthermore, when linguistic variables are used, these degrees may be managed by specific functions.

Furthermore, there are some advantages of using fuzzy logic techniques to develop a system. Firstly, allows for rapid prototyping because the system designer doesn't need to know everything about the system before starting. Secondly, cheaper because fuzzy are

easier to design and easily modified. Lastly, simplify knowledge acquisition and representation.

However, the fuzzy logic also has some weakness. These fuzzy logic methods are suitable only for trivial problems which do not require high accuracy. Practical implementations of the fuzzy control, therefore, refer to highly damped low-level systems. Besides that, fuzzy systems are understandable only for simple problems.

### **2.5.3 Artificial neural networks**

An Artificial Neural Network, often just called a neural network, is a mathematical model inspired by biological neural networks. A neural network consists of an interconnected group of artificial neurons, and it processes information using a connectionist approach to computation. In most cases a neural network is an adaptive system that changes its structure during a learning phase. Neural networks are used to model complex relationships between inputs and outputs or to find patterns in data.

Neural networks offer a number of advantages, including requiring less formal statistical training, ability to implicitly detect complex nonlinear relationships between dependent and independent variables, ability to detect all possible interactions between predictor variables, and the availability of multiple training algorithms.

Then, disadvantages of neural network include its "black box" nature, greater computational burden, proneness to over fitting, and the empirical nature of model development.

#### **2.5.4 Comparison and Discussion**

There are three techniques that might be used in order to develop AESWT project. These three techniques which are Rule Based Expert System, Fuzzy Logic and Artificial Neural Network have been discussed. Based on the discussion, the most suitable techniques that will be implemented to this EST project is Rule Based Expert System. This is because rule based expert system is using “IF-THEN” rules that can detect which solution are suitable for user based on their emotion. Besides that, by using rule base can minimize the cost of project.

## **2.6 Tool for Development**

There are many tools that has been use to develop a system or application. Tools are device that can be used to produce something for a specific purpose. Software development tool can be divides into some categorized such as development tools, programming tools, database tools, simulation tools, and performance analysis tools, debugging tools; application builds tools and many more.

### **2.6.1 Development Tool**

Development tool is a program or application that software developers use to create, debug, maintain, or otherwise support other programs and application. There a lot of development tool has been produce in some companies such as visual basic, Macromedia Dreamweaver, Delphi and many more.

#### **2.6.1.1 Visual Basic**

Visual Basic was developed in March 6, 1998 by Alan Cooper also known as Father of visual basic. Visual basic is a high level programming language which evolved from the earlier Disk Operating System (DOS) version called Basic. Basic means Beginners All-purpose Symbolic Instruction Code. It is a very easy programming language to learn. The code looks a lot like English Language. In addition, people prefer to use Microsoft

Visual Basic today, as it is a well-developed programming language and supporting resources are available everywhere. Now, there are many versions of VB exist in the market, the most popular one and still widely used by many VB programmers is none other than Visual Basic 6. We also have VB.net, VB2005, VB2008 and the latest VB2010. Both Vb2008 and VB2010 are fully object oriented programming (OOP) language.

### **2.6.1.2 Advantage and Disadvantage**

The advantage of using visual basic is the structure of the Basic programming language is very simple, particularly as to the executable code. Besides that, the Visual basic is Integrate Drive Electronic (IDE) has been highly optimized to support rapid application development (RAD). It is particularly easy to develop graphical user interfaces and to connect them to handler functions provided by the application. In addition, visual basic is very user friendly where it has interactive development environment and primarily integrated. This development tool also provides the comprehensive interactive and contact sensitive online help system where all information required is provided. However, visual basic has disadvantage where it is a proprietary programming language written by Microsoft, so programs written in Visual basic cannot, easily, be transferred to other operating systems. Then, the visual basic support OOP concepts, but not support fully. Lastly, deployment of this development is time consuming as all the components must be registered in the Windows registry.

### **2.6.1.3 Macromedia Dreamweaver**

Macromedia Dreamweaver, now known as Adobe Dreamweaver is software used for web development. It is a WYSIWYG web design and development tool. WYSIWYG stands for What You See Is What You Get, and it allows the less technical people to write web pages without needing to know coding or HTML. In addition, Adobe Dreamweaver is available for both Mac and Windows operating systems. Dreamweaver, also build standard based website with confident and design directly in code while develop pages with content management system.

### **2.6.1.4 Advantage and Disadvantage**

There are many advantages with using Dreamweaver for designing and maintaining web sites. Firstly, building and editing web sites is fast. A user may start with one of many supplied css templates and quickly modify it for their purposes. The GUI interface allows for simultaneous designing and coding. The user can see what their html looks like immediately after writing the code. Secondly, Dreamweaver has split view interface allows the user to quickly build a page in the html in the coding view the design view and then refine.

Dreamweaver, also, code that needs to be modified may be located quickly by selecting the corresponding element in the design pane. The code pane automatically scrolls to the html for the selected element and highlights the code. The ability to work form one interface also speeds up web development. However, Dreamweaver has a steep learning curve. It is a complex program that is difficult to master. In the time it takes to learn Dreamweaver, an individual could be productively hand coding web pages. Besides that, although for the most part, Dreamweaver generates efficient html code, the code usually needs to be touched up by hand after making several subsequent changes in the

design view. Finally, the user must switch between code views and various design views in order to optimize table construction.

#### **2.6.1.5 Delphi**

Delphi was introduced by Niklaus Wirth in 1968 and it is used for Microsoft Windows application. Delphi is a high level development tool where it compiled strongly typed language that support structured and objects oriented design. The language for Delphi is based on Object Pascal. Delphi is the first programming language that has been used to shatter the barrier between high level where it is easy to use rapid application development environments and low bits and bytes power tools. Delphi allows the developer to design the entire interfaces. Visually, and quickly implement and even driven code with the click of the mouse.

#### **2.6.1.6 Advantage and Disadvantage**

Delphi is a powerful tool and easy to use for generating standalone graphical user interface (GUI) programs. This tool has a structured programming language and syntax is clear, so easy to read, studied and understood. Then, this tool also support additional component that is very much on the Internet, even for a freeware category with the same quality or better than commercial components. Delphi is well structure and also provides the native access to the high performance where powerful and secure databases application is easy to create. Besides that, Delphi also has some weakness which is not easy to find free installer of Delphi and only support window and GNU and Linux.

#### **2.6.1.7 Conclusion and Discussion**

There are three development tools that will be used in order to develop AESWT project. This three development tool which is Visual Basic, Macromedia Dreamweaver, and Delphi has been discussed. Based on the discussion, the most suitable tool that will be used to develop this AESWT is Macromedia Dreamweaver CS8. This is because Macromedia Dreamweaver CS8 is a basic and simple development tools which suitable for AESWT.



## 2.7 CONCLUSION

As conclusion this chapter discusses about the literature review that related and suitable for Adaptive Emotional Solving Web Tutoring project using web based. Besides that, this chapter also includes the description about information of this system, methodology use, techniques used and the tool of development. The AESWT will use Rapid Application Development (RAD). While, for techniques, the AESWT will use rules based technique because this technique are suitable with EST. Then, in order to develop the system Macromedia Dreamweaver CS8 are chosen as development tool because it easier to understand and learn it. Then, the next chapter will discuss about the methodology used for developing the system or application. Based on this chapter the development of the project will be run smooth and properly.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter would discuss about methodology which being used for develop of Adaptive Emotional Solving Web Tutoring (AESWT) for kindergarten school on learning mathematics. Methodology is generally for solving a problem, with specific components such as phases, tasks, methods, techniques and tools. Methodology also is the way how the data being collected, analyzed, designing user interfaces and implementing system based on the guidelines from collected data. Then, methodologies are concerned with the process of creating system but it is more focus on organizational aspect rather than technical side.

The benefit of using methodology is it helps to produce a better quality of system and documentation. Besides that, methodologies also ensure requirements met completely and also help project management. In addition, software development also describe as a process of inventing, improving, and selecting among alternative solution, and then describing computer programs that meet users requirements within the constraints of the environment and based on relevant criteria. A good software design is one that describes a system which can meet all its requirements.

In conclusion, the Emotional Solving Tool system will use a Rapid Application Development (RAD) as a software methodology to make sure that system will be referred in order to complete and develops this system.

### **3.2 SOFTWARE METHODOLOGY PROCESS**

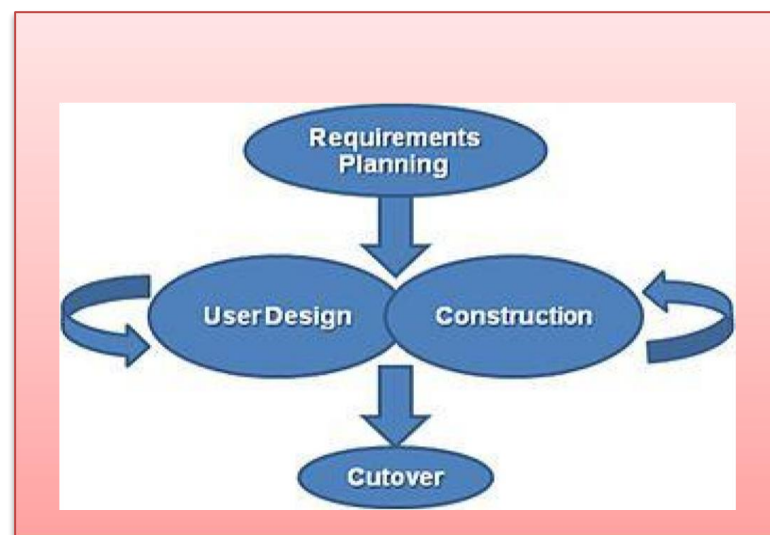
System development methodology is a framework that is used to structure, strategy, and control the process of developing an information system. Methodology is also define as a guidelines that should be to follow in order to develops a complete system which include the starting process until the end of the process. This Adaptive Emotional Solving Web Tutoring (AESWT) system will implement Rapid Application Development (RAD) methodology into the system.

Rapid application development (RAD) model is a linear sequential software development process that has much faster development and higher-quality results than those achieved with the traditional software development life-cycle. Besides that, in this process required minimum planning and the development are achieved by using component based construction approach. After that, the lack of extensive research and pre-planning allows the software to be written very fast and make it easier to alteration the requirements if needed.

In addition, there are some advantages of using Rapid Application Development (RAD) method compare the others existing method. This is because RAD makes the development process to be a more credible one by facilitating a scope for the customer to actively provide inputs and feedback in the development process. This may also prove feasible from the point of view of a developer. Then, RAD also increased speed

of development and increased quality. The speed increases can be achieved using a variety of methods including, rapid prototyping, virtualization of system related routines, the use of CASE tools and other techniques. Quality, as defined by RAD, is both the degree to which a delivered application meets the needs of users as well as the degree to which a delivered system has low maintenance costs. RAD increases quality through the involvement of the user in the analysis and design stages.

### 3.2.1 Rapid Application Development (RAD)



**Figure 3.1:** Rapid Application Development (RAD) model

The Rapid Application Development models have four phase which are requirement planning, user design, construction phase and cutover phase. Each phase in RAD have they own activities to carried out to make sure the system comprehensive and fulfill the requirements. The detailed about the activities for each phase as shown below:

Requirement planning is a first phase in Rapid Application Development (RAD). In this phase, several activities will carry out to identify the function of the system to be developed. Therefore, the research should be done to improve the knowledge about the system requirement.

Then, second phase is user design or also known as Functional Design Stage where consist of design flow and activities of the system. Therefore, in this phase should include the diagram such as flow chart of the system and interface design to make it clear.

Third phase is construction or Development Stage which need to complete the construction of the physical system. This process to make sure the system can work properly with function.

Final phase is cutover where involved testing and training activities. Besides that, the system will deliver to the user and developer can see the respond toward the system.

RAD (rapid application development) is a concept that products can be developed faster and of higher quality through:

- Gathering requirements using workshops or focus groups
- Prototyping and early, reiterative user testing of designs
- The re-use of software components
- A rigidly paced schedule that defers design improvements to the next product version
- Less formality in reviews and other team communication.

### **3.3 REQUIREMENT PLANNING PHASE**

Requirement planning phase is about beginner process of the development project. Then, in this phase is start by process getting detail information about emotional which is to identify the main objectives, scope, and problem statements. Actually, all the information have been collected based on several processes research books had used as reference and also search for suitable technique to develop the system. Besides that, by doing lot research can gain knowledge and idea about physiology in order to solve the emotion problem of human. After that, the all requirements obtained will be revising by supervisor in order to improve that requirements planning which has been identified.

#### **3.3.1 Gantt chart**

The Gantt chart below is illustrating the project process where it shows the start and finish date of each task. This Gantt chart as a guideline for finish the project according to the given time frame. Therefore, each task have state the duration to complete it to avoid from over the time. Besides that, this Gantt chart also show the time of whole project complete.

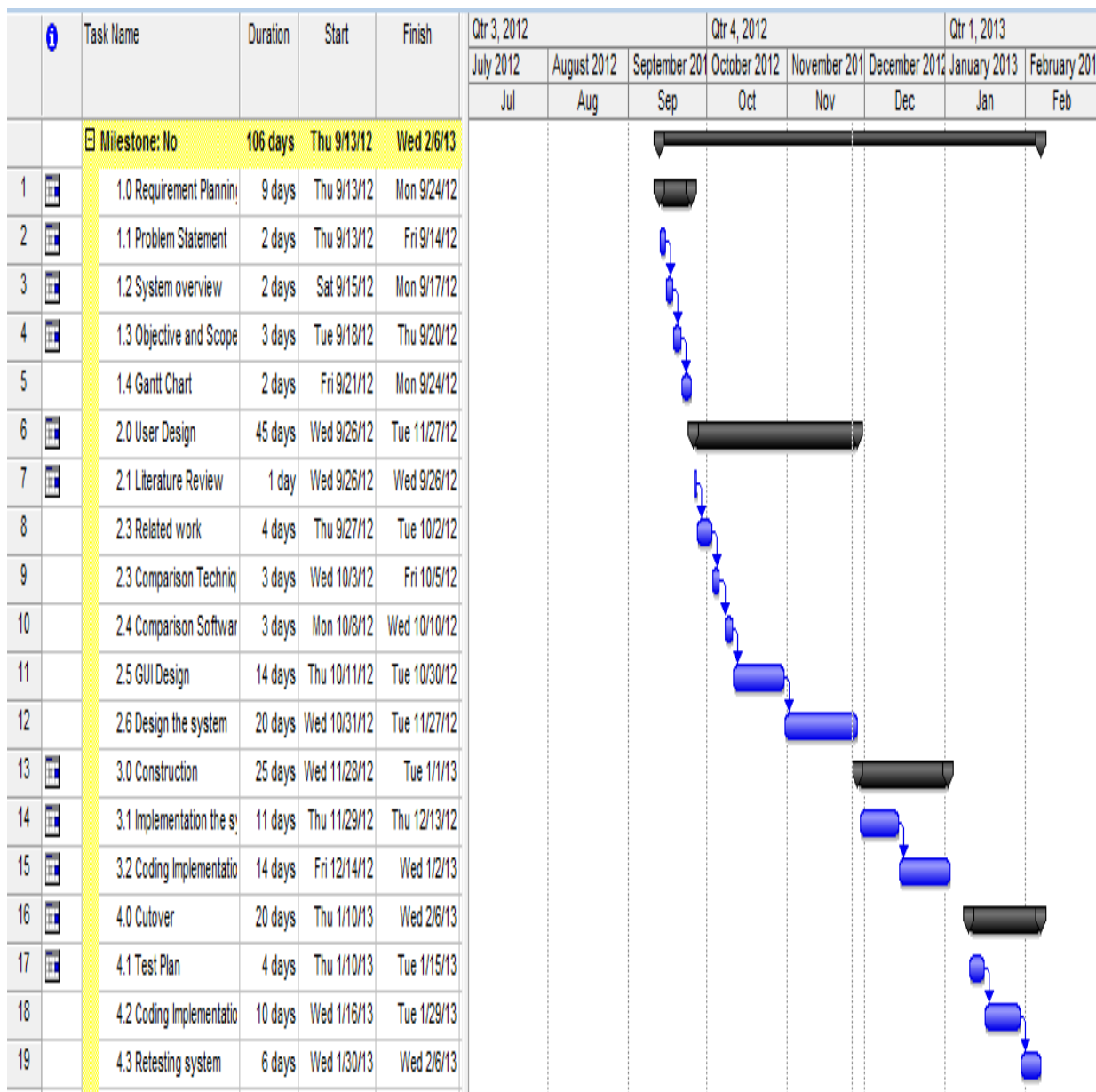


Figure 3.2: Gantt chart

### 3.4 USER DESIGN PHASE

This phase is a second phase in Rapid Application Development (RAD). In this phase all the necessary inputs, output, interface and process that are define and identified. On this phase, all process in this system will describe in detail and illustrate into flows chart diagram and layouts for important part of the system. Besides that, the algorithm for this system also has been created to know how the algorithm function in this Emotional Solving Tool (EST) system.

This algorithm will used to identify which solutions are suitable for emotion that express from user. The algorithm is important to make sure the Adaptive Emotional Solving Web Tutoring (AESWT) system working properly by show the right interfaces which matching with user emotion. In this algorithm, it describe that when user choose sad emotion then the system will provide the sad module. After that, when user choose happy mood then the system will provide the happy module as solution. Lastly, when user choose happy mood then the system will give angry module to make user feel better.

#### 3.4.1 Process of AESWT

##### 3.4.1.1 Adaptive Emotional Solving Web Tutoring (AESWT) Process

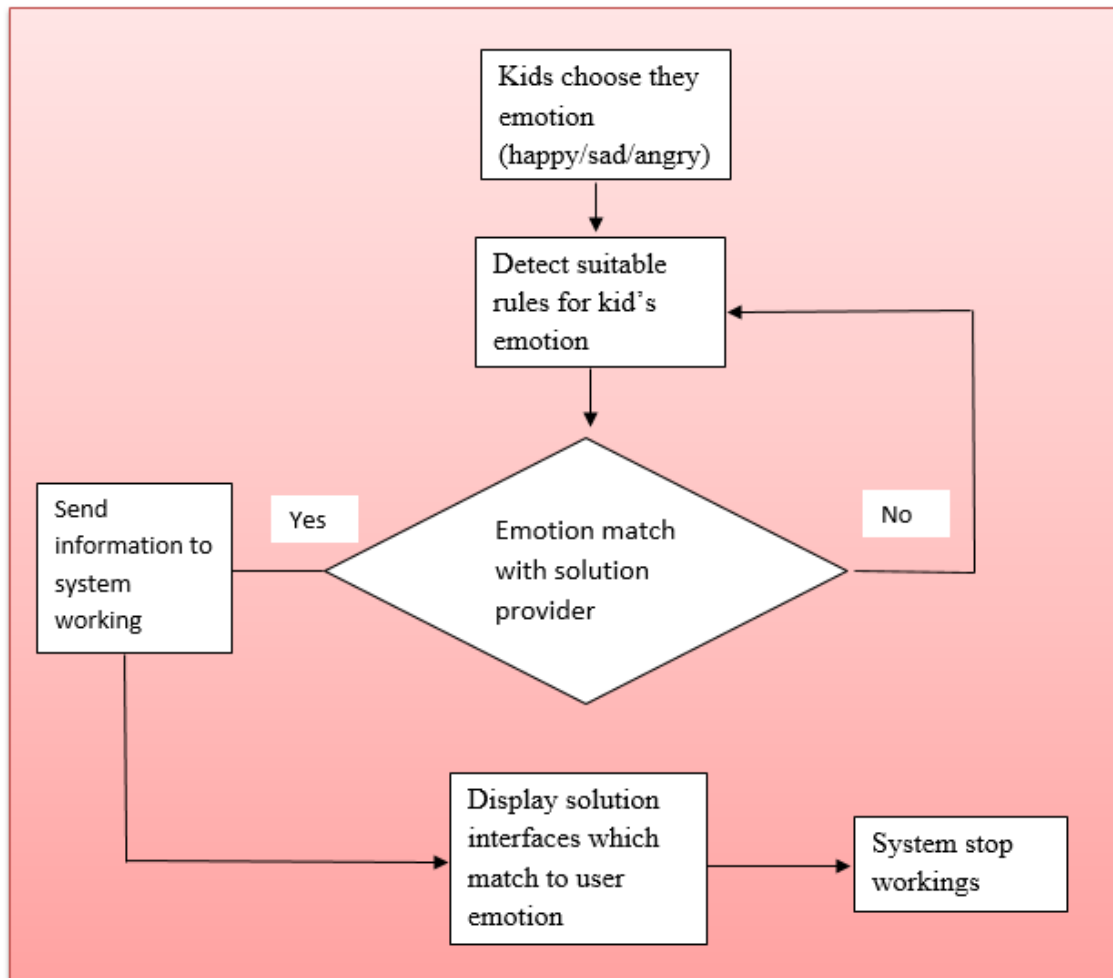
Adaptive Emotional Solving Web Tutoring (AESWT) needs to create a process to make sure the system can be executed properly by follow the flow.

##### 3.4.1.2 AESWT Algorithm

```

IF Emotion is Happy
    THEN Happy solution interface
IF Emotion is Sad
    THEN Sad solution interfaces
IF Emotion is Angry
    THEN Angry solution interfaces
ELSE
    Default interfaces
  
```

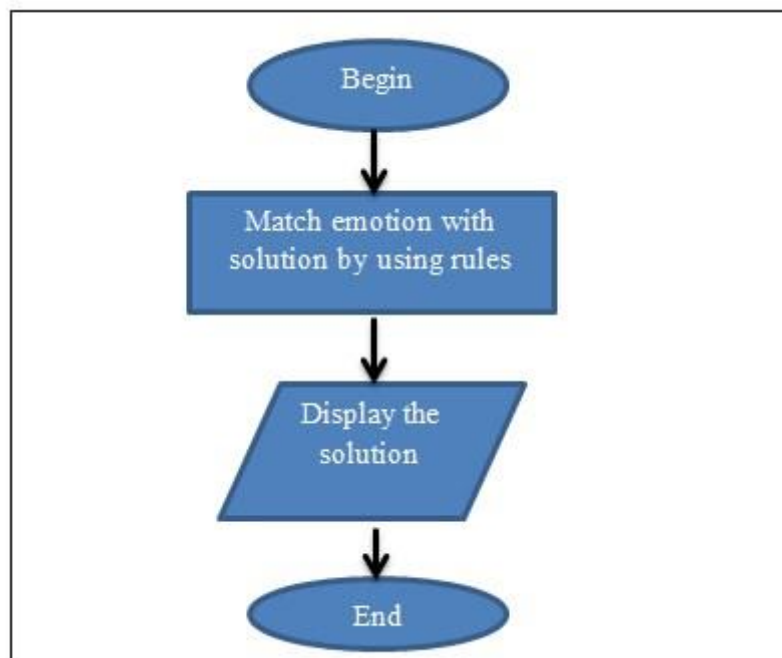




**Figure 3.4:** Processes Flow

The Adaptive Emotional Solving Web Tutoring (AESWT) system will get result from user emotion. After that, the rule will check the emotion from user whether it match or not with the solution provide in this system. If the rules are not match with the solution then system will check again until match. But, if the rule is matching then the system will show the interface which can solve the emotion that express from user.

### 3.4.1.3 Flow chart of AESWT system



**Figure 3.5:** Flow chart for Adaptive Emotional Solving Web Tutoring (AESWT)

## 3.5 CONSTRUCTION

The construction phase also known as development stage or implementation phase where testing phase involves directly. The process during the construction phase, a prototype is built using the software tools. The initial prototype consists of screens, forms, reports, and other elements of the user interfaces, and the underlying logic is added to the prototype only after the user interface is stabilized. In the Emotion Solving Tools system, prototype of interfaces is build according to the system requirement.

Besides that, AESWT system will be implemented on Microsoft Window operating systems. Then, it is required software of Macromedia Dreamweaver CS8 in order to develop the system. Actually Macromedia Dreamweaver CS8 acts as web application framework while Mozilla firefork used as web browser to access the system. Macromedia Dreamweaver CS8 is a good software tool for design, coding develops system web page. This is because Macromedia Dreamweaver CS8 is easy to handle and can fast learn for those are new with using this software.

### **3.6 CUTOVER**

The final phase in Rapid Application Developments is Cutover. This phase have similar to implementation which include a variety of activity. The cutover phase activities are including training the users, converting or installing the system, and completing the necessary documentation. In this phase, AESWT will deliver to internet user for testing and training them. A few of volunteer kindergarten kids are choosing to give them some explanations about the ways to use AESWT system.

### **3.7 PROJECT REQUIREMENT**

Adaptive Emotional Solving Web Tutoring has choose an appropriate software and hardware for developing this system. Hardware and software very important to ensure that flow for development of the system can be executed as well and able to function. All computer software needs certain hardware component to be present on a computer system. There are list of hardware and software that EST system has been specific to using during development process.

#### **3.7.1 Hardware Requirement**

Computer hardware is the collection of physical elements that comprise a computer system. Computer hardware refers to the physical parts or components of a computer. Table 3.1 is the computer software application that use during development process.

<b>Item</b>	<b>Minimum Requirement</b>	<b>Purpose</b>
Personal Laptop	ASUS K46C	<input type="checkbox"/> Prepare proposal and document. <input type="checkbox"/> Develop and design the EST system.
Printer	Hp	<input type="checkbox"/> Print proposal, document and related sources
USB Storage Device	Kingston 4GB	<input type="checkbox"/> Data transfer includes documentation as a backup.
Processor	AMD Turion 64	
RAM	6 GB	
CD-ROM	DVD-RW	
Hard Disk	80 GB	

**Table 3.1:** Hardware requirement for AESWT

### **3.7.2 Software Requirement**

Software is a general term for the various kind of programs used to operate computer and related devices. Software is often divided into application software and system software:

#### **Application software**

It is a defined subclass of computer software that employs the capabilities of a computer directly to a task that the user wishes to perform.

#### **System software**

It is a program that manages and supports the computer resources and operations of a computer system while it executes various tasks such as processing data and information, controlling hardware components, and allowing users to use application software.

Table 3.2 is the computer software application that use during development process.

Development Phase	Description	Types	Software Item	Version
Documentation	To create document about the development of AESWT system	Operating system that use throughout process of for developing system as well as preparation of document and presentation.  Tool (Documentation)	Microsoft office word Microsoft office Power Point	Version 2013
Project Management	Accomplish the system development  Platform developing the AESWT project. Include both interface and coding implementation.	Tool	Microsoft Project 2003 and Microsoft Visual Studio 2007	Version 2010

<b>Development Phase</b>	<b>Description</b>	<b>Types</b>	<b>Software Item</b>	<b>Version</b>
Configuration Management	Configure and manage for the system development	Methodologies	RAD	None
	Web browser to access the internet to find out information and view the develop project		Google chrome and Mozilla Firefox	None

**Table 3.2:** Software requirement for AESWT



### **3.8 Conclusion**

In conclusion, this chapter is about methodology and development tool that used to develop the Adaptive Emotional Solving Web Tutoring (AESWT) system. The AESWT system will use Rapid Application Development (RAD) as a software development method. It consists of four phase which are requirement planning phase, user design phase, construction phase and cutover phase. In order to develop this AESWT, it will used the Rapid Application Development (RAD) as software methodology process. This method consist of four phase which are requirement planning, user design, construction, and cutover. In the requirement planning phase, all the information about this AESWT would gathering. At user design phase where all draft of the prototype that are related with this system was created. Thirds, construction phase, the system will develop using Macromedia Dreamweaver CS8 and the all coding are put in this system to work properly and test functionality of the prototype. Last phase is cutover where give training to user in how to use this AESWT system and deliver to the kindergarten kids. In addition, it also includes hardware and software specification that use for the system development.

## **CHAPTER 4**

### **IMPLEMENTATION**

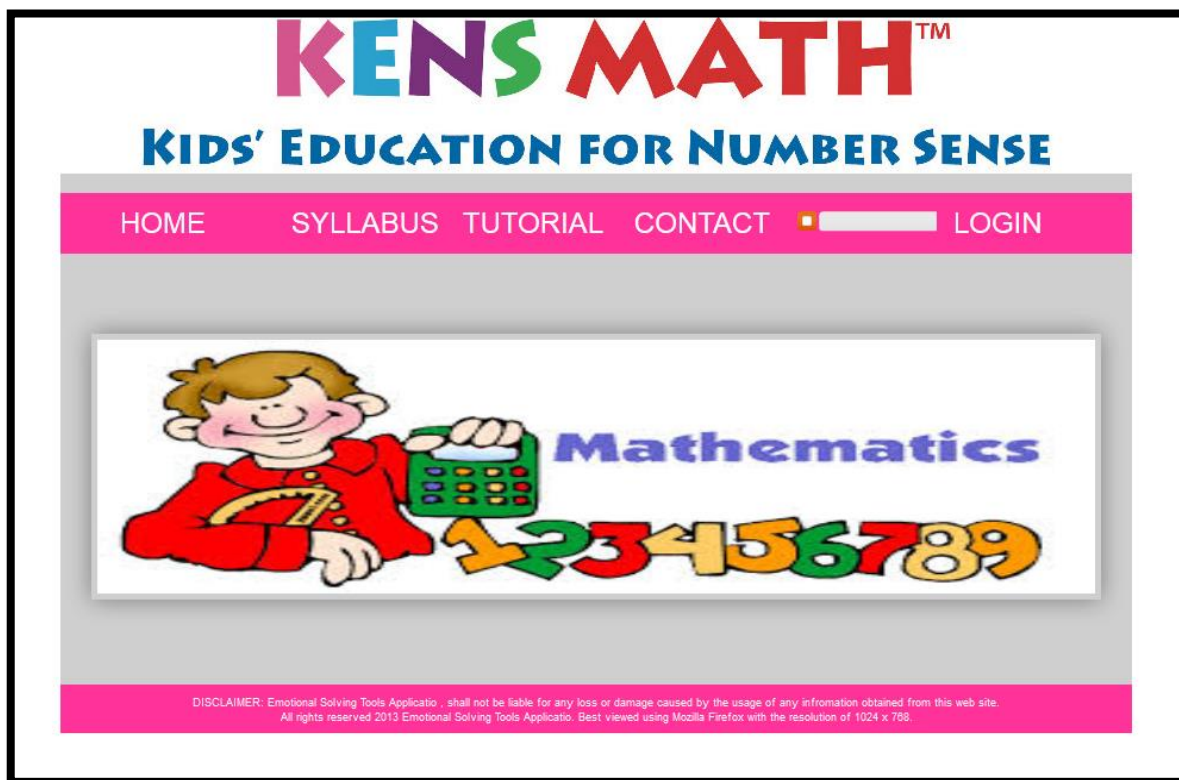
#### **4.1 Introduction**

This chapter will discuss about the implementation process of Emotional Solving Tools. The objectives of this chapter is to document the whole process in the project development for better future and improvement and enhancements. Mostly, this chapter briefly explains about the system interfaces and the rule base implementation.in order to fulfill the objectives of the system proposed. This chapter is most important phase since it is phase where the main part of the project is done.

#### **4.2 Interface Development**

Interface is a tool and concept that refers to a point of interaction between components, and is applicable at the level of both hardware and software. Interface development for this web-based application is very important in order to attract the user and for make sure the user feel friendly when using this application. Besides that, user will more understood the flow of the system and all it function. In addition, this section, also describe how the AESWT will work in a certain website. AESWT application will change the characteristic of website in term of background color, music and game as a solution for emotion problem. This process will be automatically changes after the user click at the pop-up.

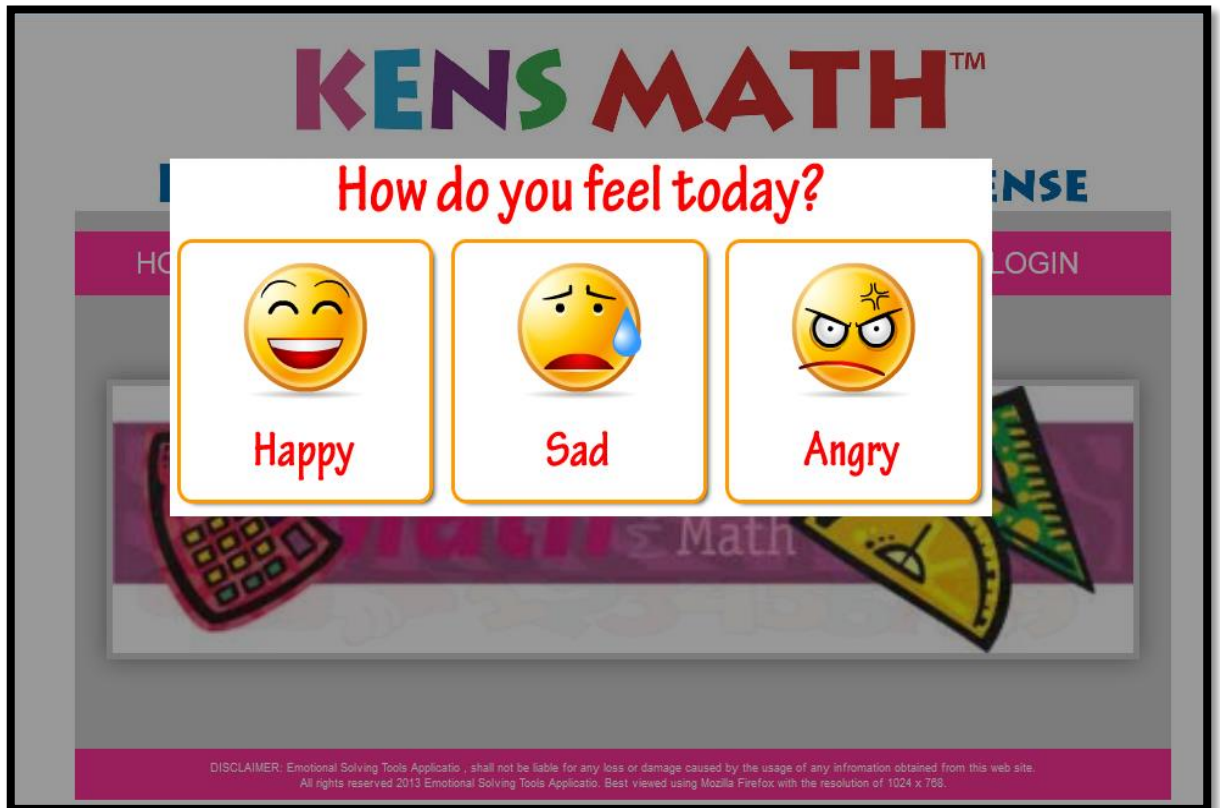
#### 4.2.1 The Main Interface



**Figure 4.1: Main Interface for AESWT**

This is the main interfaces of mathematic website for kindergarten students. In this interface contain the Adaptive Emotional Solving Web Tutoring (AESWT) that has been embed to give the solution for emotion problem of kindergarten students which visit this website.

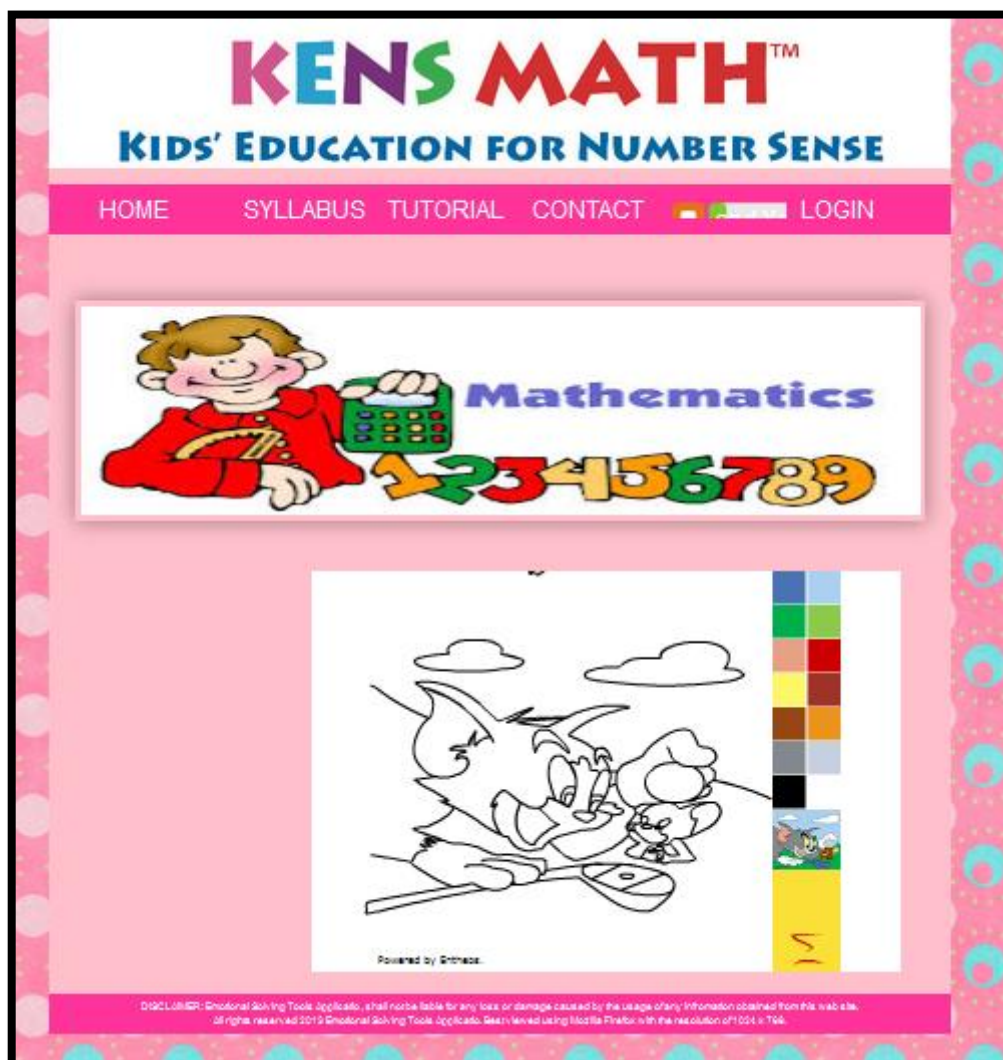
#### 4.2.2 The Pop-Up Interface



**Figure 4.2: Pop-Up Interface**

In this interface Pop-up will be appear after a few minutes. In this Pop-up it will ask the user about their emotion. Then, user need to click which emotion represent them at that time. After clicking the icon emotion, this system will provide proposed solutions to users depending on their emotions whether happy, sad or angry.

### 4.2.3 'Solution for Happy Emotion' Interface



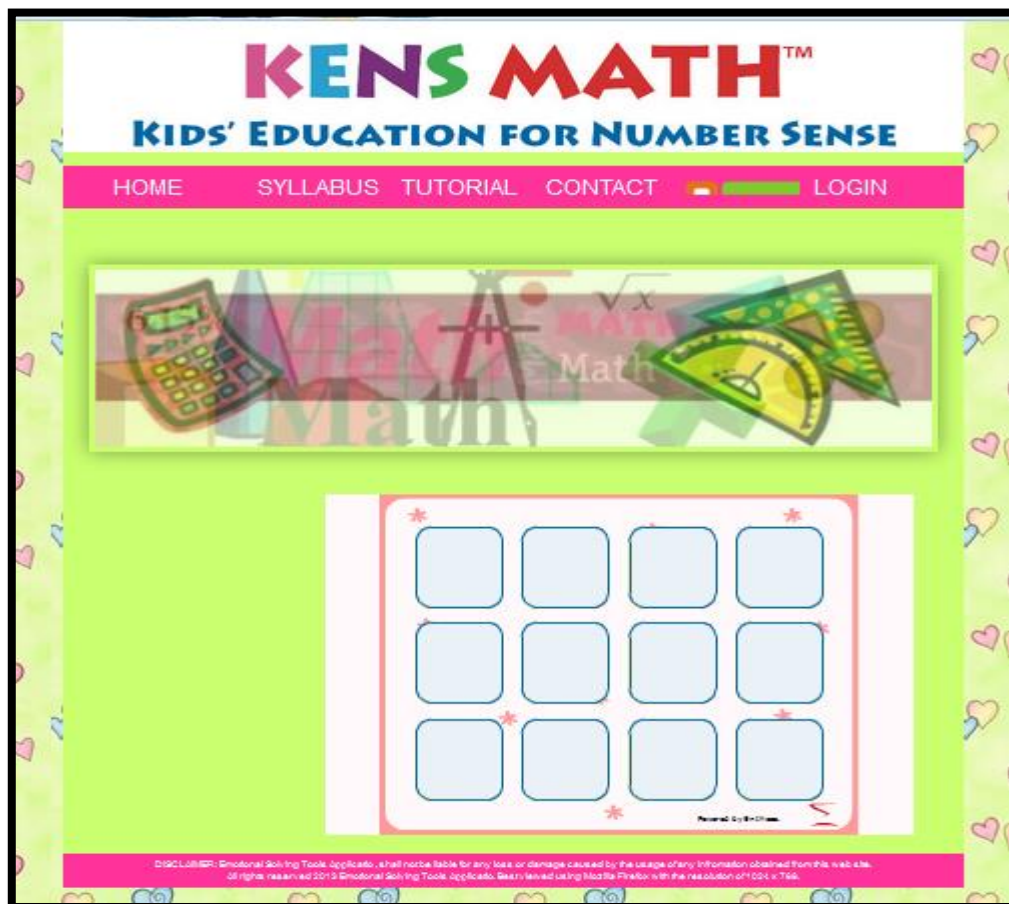
**Figure 4.3: Solution for Happy Emotion**

This solution interface shown for 'happy emotion'. This happens when the user clicks at the happy icon on the pop up. The explanation of the characteristic change in this interface is as shown in table 4.1:

Characteristic changes	Description
Background color	<p>Pink: In color psychology, pink is a sign of hope. It is a positive color inspiring warm and comforting feelings, a sense that everything will be okay. Thus, the pink color will be more suitable for people with happy emotion as this color can make a person have a positive mind and a sense of all things is fun.</p>
Music as therapy	<p>Children song Barney-If you happy and you know it</p> <p>This song represents a happy mood and encourage kids to engage in activities such as clapping hands together. This song is perfect for children because we know the children in a happy mood is very energetic and interesting to do the movement.</p>
Game	<p>Coloring game</p> <p>AESWT will provide the coloring game for kids who have happy emotion. Usually, kids are more interesting with coloring because at this age they are more attractive with things that have a variety of colors.</p>

**Table 4.1:** Explanation about Happy interfaces

#### 4.2.4 'Solution for Sad Emotion' Interface



**Figure 4.4:** Solution for Sad Emotion

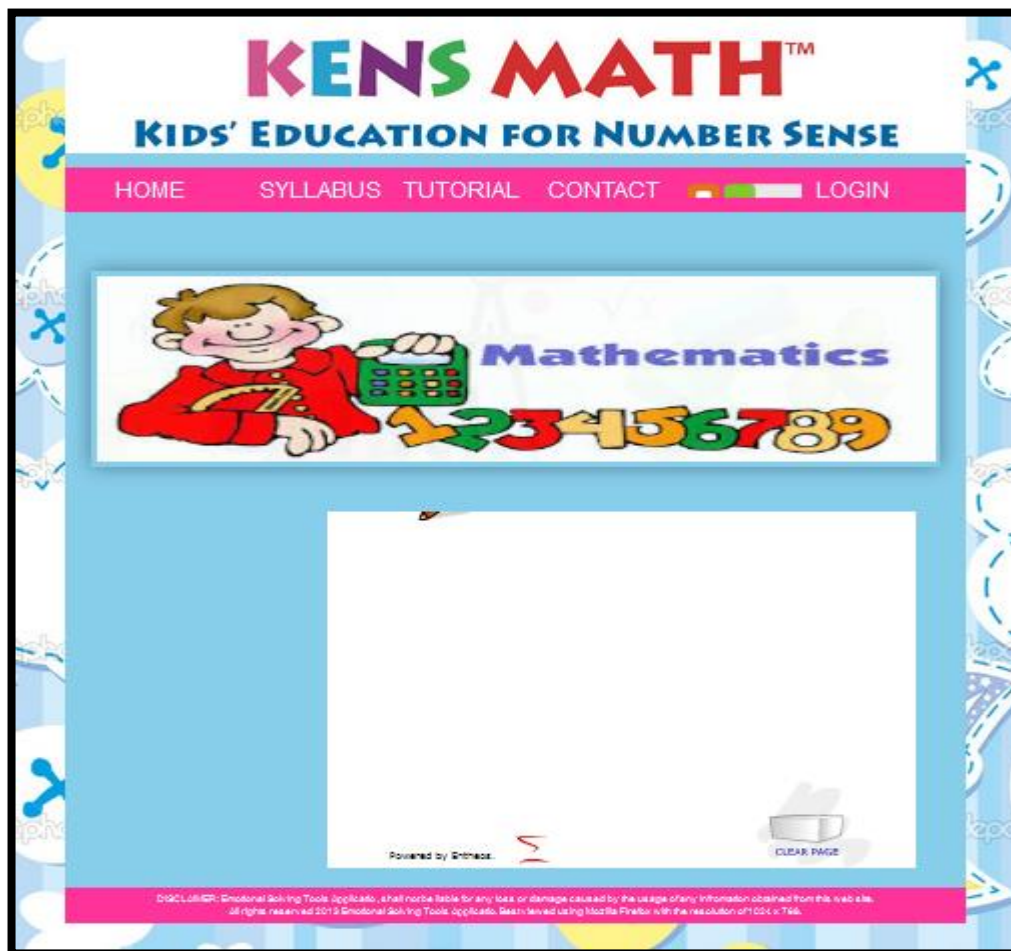
This solution interface shown for 'sad emotion'. This happens when the user clicks at the happy icon on the pop up. The explanation of the characteristic change in this interface is as shown in table 4.2:

Characteristic	Description
Background color	<p>Green: This color represent as the most common color in nature and is regarded as being a neutral factor. In psychology, it is a well-balanced color, good for speech development, good for contemplation, and a restful state. Besides that, green color is thought to relieve stress.</p>
Music as therapy	<p>Children song Barney-I love u</p> <p>This song highlights the value of love for children. Besides that, the slow rhythm of the song will be able to make children feel relaxed and increase self-esteem. This song is perfect for children who are in sadness.</p>
Game	<p>Matching fruits games</p> <p>For kids who have a sad emotion, this system will provide the matching fruits games to make kids enjoyable.</p>

**Table 4.2:** Explanation about Sad interfaces



#### 4.2.5 'Solution for Angry Emotion' Interface



**Figure 4.5:** Explanation about Angry interfaces

This solution interface shown for 'happy emotion'. This happen when the user click at the happy icon on the pop up. The explanation of the characteristic change in this interface as table 4.3:


Characteristic	Description
Background color	Blue: blue calms the mind and body, lowering blood pressure, heart rate and respiration and decreasing feelings of anxiety and aggression. Children who have trouble sleeping or are prone to tantrums and other behavioral problems may benefit from spending time in a blue environment. The physical effects of blue also cool the body, creating a refreshing oasis in hot, humid locations. Thus, blue color is suitable for solve the person who have angry emotion state.
Music as therapy	Bareny- Mr. Sun  This song give kids feel enjoy and reducing angry emotion.
Game	Drawing game  In this game, children can expression their feelings through drawing.

**Table 4.3:** Explanation about Angry interfaces

#### 4.2.6 Admin Login Interface

**KENS MATH™**  
KIDS' EDUCATION FOR NUMBER SENSE

HOME SYLLABUS TUTORIAL CONTACT  LOGIN



**LOGIN ADMINISTRATOR**

username	<input style="width: 90%;" type="text"/>
password	<input style="width: 90%;" type="password"/>
<input type="button" value="Login"/>	

DISCLAIMER: Emotional Solving Tools Appellate, shall not be liable for any loss or damage caused by the usage of any information obtained from this web site.  
All rights reserved 2019 Emotional Solving Tools Appellate. Been Invented Using Mozilla Firefox with the resolution of 1024 x 768.

**Figure 4.6: Admin Login Interface**

This is the login form for the admin to login to the system. Admin has to key in the username and password to proceed to the next page which is statistic interfaces. If admin key in the correct username and password, then it will proceed to the next page. If admin key in the wrong username and password, he has to key in again the correct username and password then he only can proceed to the next page.

#### 4.2.7 Admin Statistic Interface

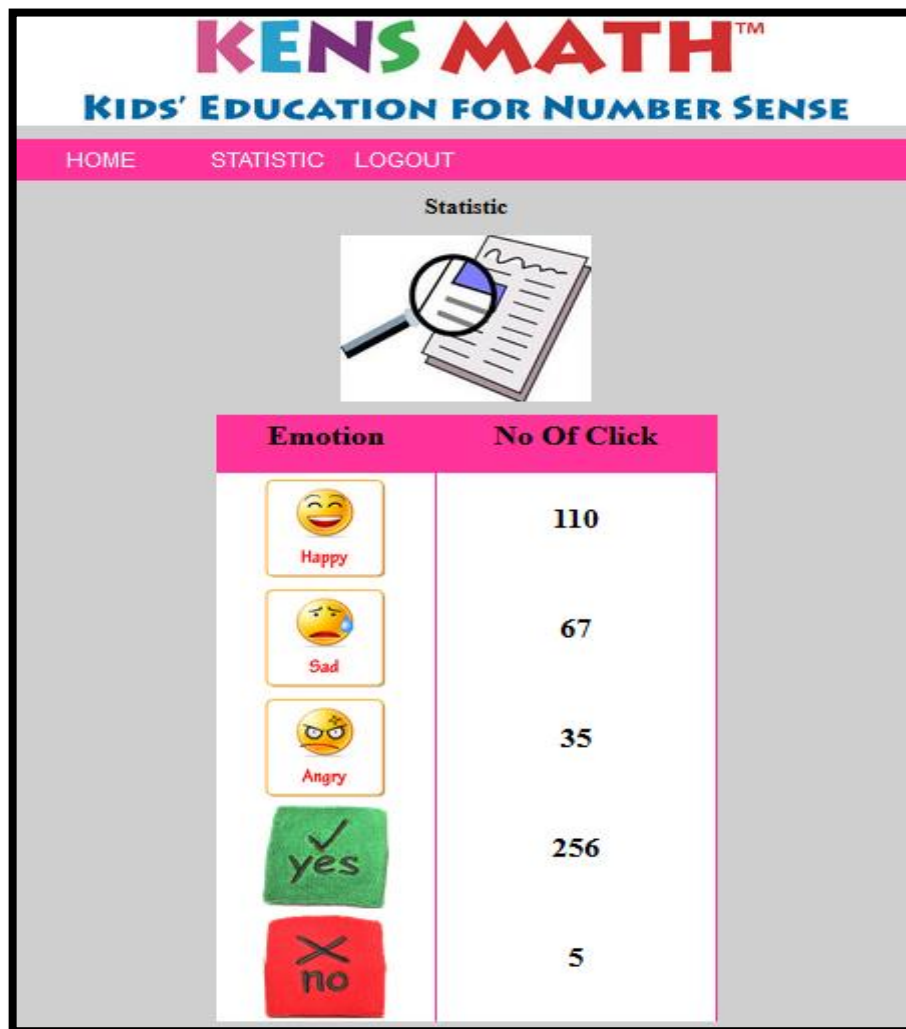


Figure 4.7: Admin Statistic Interface

This interface is shown the statistic number of user which choose happy, sad and angry emotion when using this application. Then, also shown the statistic feedback from the user whether they are happy or not.

#### **4.4 Conclusion**

This chapter will be discussed about the implementation phase which includes the system interfaces and rule-based. There is some description about the flow of the system interface and rule-based coding implementation.

## CHAPTER 5

### RESULT AND DISCUSSION

#### 5.1 Introduction

This chapter describes more about result and discussion on the Adaptive Emotional Solving Web Tutoring (AESWT) which is obtained from the implementation. The purpose of this chapter is to identify and discuss about the result by testing development. In this chapter, the discussion is divided into several sections. The first section is more on testing development. Second section is description on the constraints during the development process of Adaptive Emotional Solving Web Tutoring (AESWT). The third section is about suggestion and improvement for this system.

#### 5.2 Result analysis

This section describes about the analysis and testing from the implementation of the system by identifying and determines of the proposed project objectives. Adaptive Emotional Solving Web Tutoring (AESWT) has been developed based on three objectives. Therefore, this system has met all the objectives of this project which are:

- I. To apply adaptive presentation technique for web tutoring.
- II. To develop prototype for adaptive emotional solving.
- III. To test the functionality of the prototype.

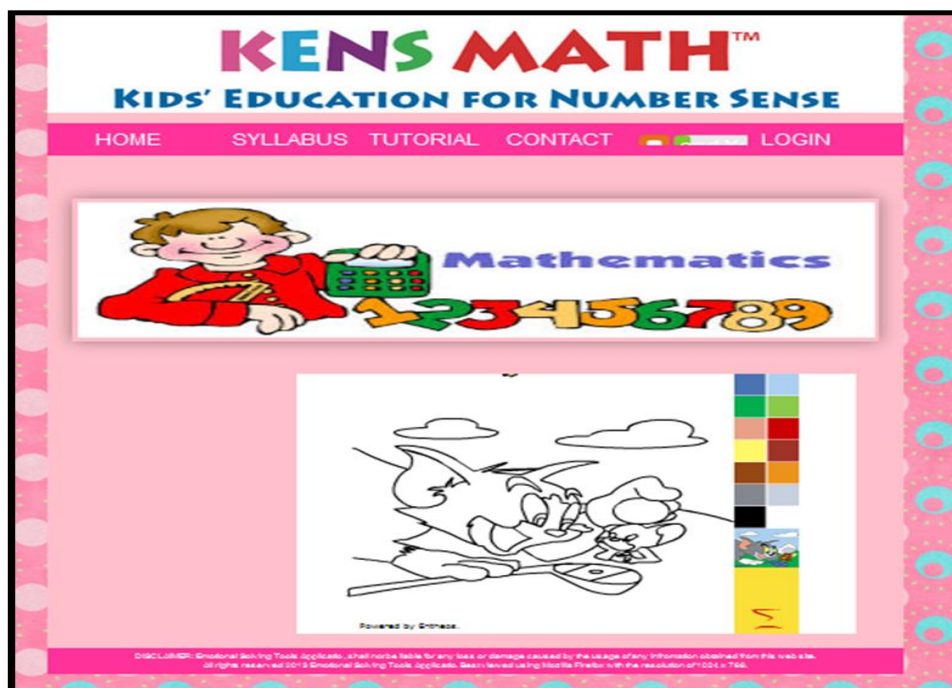
### 5.2.1 Objective Achievement

This section explains the achievement of the system objective after the development of Emotional Solving Tool.

#### I. To apply adaptive presentation technique for web tutoring.

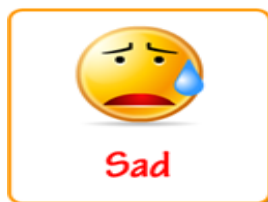
The objective to apply adaptive presentation technique using rule based technique for the Adaptive Emotional Solving Web Tutoring (AESWT) has met by the development of this system. This technique will help to match the best solution for emotion that express from kids.

Emotion type:



**Figure 5.1:** Solution for Happy Emotion

Emotion type:



**KENS MATH™**  
**KIDS' EDUCATION FOR NUMBER SENSE**

HOME SYLLABUS TUTORIAL CONTACT LOGIN

Math MATH Math

Math

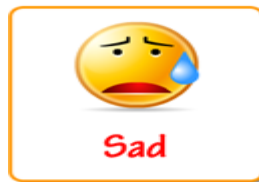
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DISCLAIMER: Emotional Solving Tools Application shall not be liable for any loss or damage caused by the usage of any information obtained from this web site. All rights reserved 2013 Emotional Solving Tools Application. Screen viewed using Mozilla Firefox with the resolution of 1024 x 768.

**Figure 5.3:** Solution for Sad Emotion



Emotion type:

A screenshot of the KENS MATH website. The header features the text "KENS MATH™" in large, colorful letters, followed by "KIDS' EDUCATION FOR NUMBER SENSE" in blue. A pink navigation bar contains the links "HOME", "SYLLABUS", "TUTORIAL", "CONTACT", and "LOGIN". The main content area has a blue background with a cartoon boy in a red jacket holding a calculator and the word "Mathematics" in blue. Below this is a large white rectangular area. At the bottom, there is a pink footer with a disclaimer and a "CLEAR PAGE" button.

**KENS MATH™**  
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HOME SYLLABUS TUTORIAL CONTACT LOGIN

Mathematics

1 2 3 4 5 6 7 8 9

Powered by Emaze.

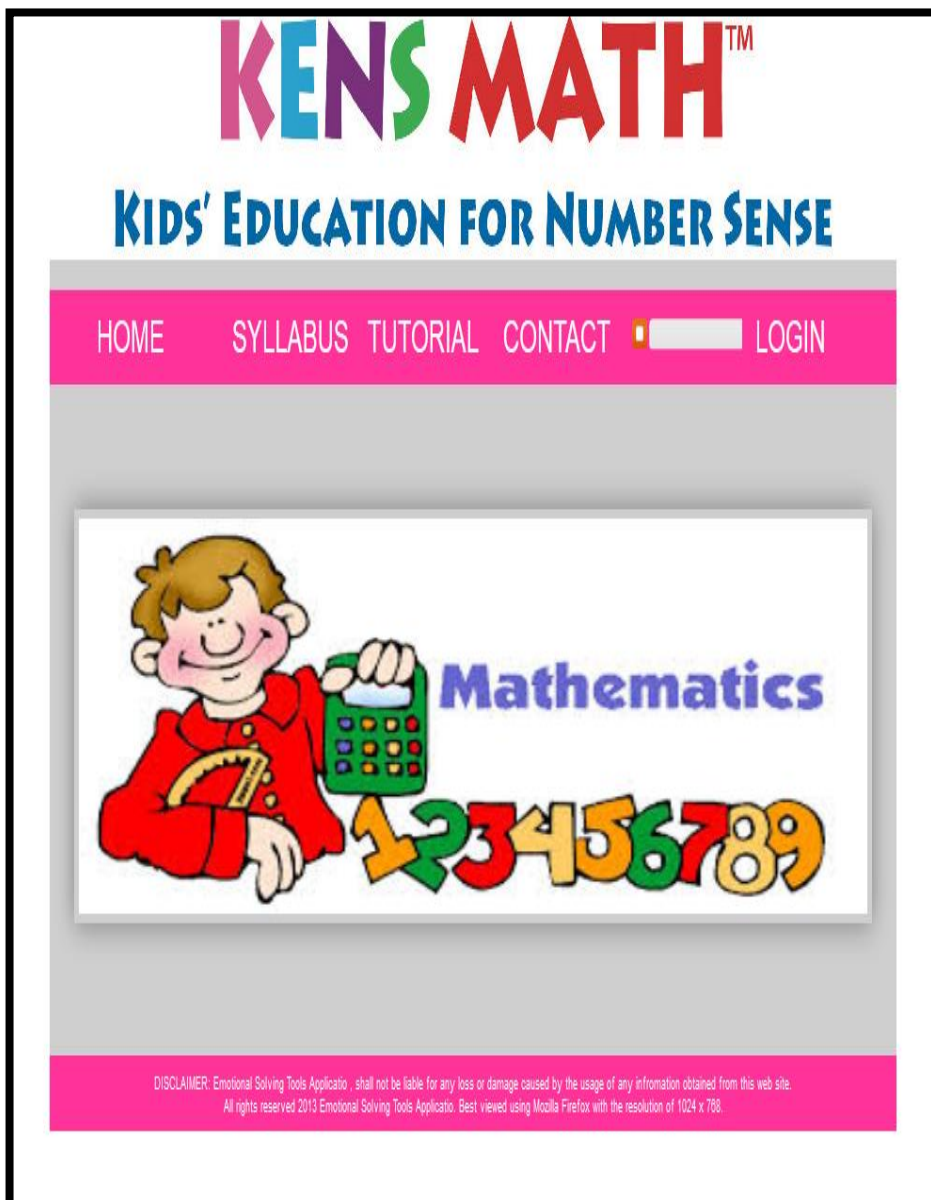
CLEAR PAGE

DISCLAIMER: Emotional Solving Tools Appellate, shall not be liable for any loss or damage caused by the usage of any information obtained from this web site. All rights reserved 2013 Emotional Solving Tools Appellate. Screen saved using Mozilla Firefox with the resolution of 1024 x 768.

Figure 5.3: Solution for Angry Emotion

## II. To develop prototype for adaptive emotional solving.

The objective to develop a prototype for recommended system has been met by the development of this system. This prototype have implement adaptive presentation technique.



**Figure 5.4:** Main Interfaces (Prototype)

### III. To test the functionality of the prototype

The objective to test the prototype functionality has been met by testing this system for kindergarten student.

#### Testing

The research have done the testing which includes alpha and beta testing. The Alpha testing which tested the functionality of this tool. The functionality test of the Rule Based Adaptive Emotional Solving Web Tutoring (AESWT) for kindergarten school on learning mathematic was pass because the interface of web tutoring on mathematic was changed when kindergarten student click on the emotion icon. Then, testing for beta state have been done to ten kindergarten kids and the result show they accepted the tutoring and find it interesting.

#### ALPHA

#### Unit Testing 1: Login for Admin

**Table 5.1 : Login for Admin Unit Testing**

No	Event	Value	Expected Result	Result
1	Verify login user after the correct input data is submit on login form	Username: admin Password: admin2013	Successful login to admin home page	Pass
2	Verify login user after the null value is submit on login form	Username: Password:	Message box displayed request user to input the empty field	Pass
3	Verify login user after the invalid value is submit on login form	Username: admin Password: password	Login fail and Message box appear.	Pass

## Unit Testing 2: Interfaces Change

**Table 5.2 : Interfaces Change Unit Testing**

No	Event	Value	Expected Result	Result
1	Interface change To Happy solution	Choose Happy icon	Interfaces successful Changes: <b>Color:</b> Pink <b>Music:</b> Children song Barney-If you happy and you know it <b>Game:</b> Coloring game	Pass
2	Interface change To Sad solution	Choose Sad icon	Interfaces successful Changes: <b>Color:</b> Green  <b>Music:</b> Children song Barney-I love u  <b>Game:</b> Matching fruits games.	Pass
3	Interface change To Angry solution	Choose Angry icon	Interfaces successful Changes: <b>Color:</b> Blue <b>Music:</b> Barenny- Mr. Sun  <b>Game:</b> Drawing game	Pass
4	Interface not change	-	Maintains page	Pass

## BETA

There is the finding after the development of Rule Based Adaptive Emotional Solving Web Tutoring (AESWT) for Kindergarten School on learning mathematic. Results for this prototype show that it can be a functionality when it can be change the interface to become more interesting and can be accepted by kindergarten kids.

### **5.3 Advantage and Disadvantage**

This section will describe the advantages and disadvantages of Adaptive Emotional Solving Web Tutoring (AESWT).

#### **5.3.1 Advantage**

There are advantage of Adaptive Emotional Solving Web Tutoring (AESWT):

- I. The Adaptive Emotional Solving Web Tutoring (AESWT) help the kids to solve they emotion problem when using web tutoring on mathematics. Thus, this system will avoid a kids feel stress and uncomfortable.
- II. This, Adaptive Emotional Solving Web Tutoring (AESWT) are automatically function after the kids click they emotion. In addition, this system provides three of solution for the user.
- III. The system is easy to use especially for kids who have less knowledge in computer field because no high skill needed to operate the system. Kids only need to choose what emotion they are and the system will give the solution.
- IV. This system also helps kindergarten student to get interested in study mathematics.

### 5.3.2 Disadvantage

There are disadvantage of Adaptive Emotional Solving Web Tutoring (AESWT):

- I. The AESWT only provides three type of emotional that it can be solved which is happy, sad and angry.
  
- II. This system is a web-based system, that's mean it only can used by user that have internet connection.

### 5.4 Project Constraint

The following are project constraint that effect the efficiency of the project implementation in order while complete this project.

#### **I. Technical Knowledge**

This application is developed by using PHP language and MySQL as database. For range of developing this adaptive system its might take time to build because developer not expert in PHP language and rule based function. Thus, to get more knowledge developer explore a tutorial, reading book and surf internet to get the information about the interface and coding.

#### **II. Experience**

Based on the experience during the development of this system, PHP is very sensitive code, if using the wrong JavaScript, the coding can be error or will came out undefined statement. In this kind of problem, need to refer to expert person on PHP and by referring source from internet.

## 5.5 Suggestion and Project Enhancement

The section describe on the suggestions and enhancement for this system. These suggestions and enhancement are for future enhancement to increase the effectiveness of this system. There are several suggestions and enhancement can be carried out for future enhancement of Adaptive Emotional Solving Web Tutoring (AESWT) which is as below:

- i. Develop the real AESWT that can be used in future as an adaptive system for solve the emotion problem among the internet user.
- ii. Increase the types of emotions that can be solved by AESWT system. Therefore, all emotion that express by user can be solved not only for sad, angry and happy emotion.
- iii. Develop a various solution to solve a user emotion. This is because each person has a different way to solve their emotional problems.

## **5.6 System Contribution**

The major contributions of this thesis are summarized as follows:

- I. Develop a system that have ability to solve the internet user emotion based on graphical user interface (GUI).
  
- II. Create interface and solution by refer psychology and human computer interaction technique information. This for make it the real solution which matching with user emotion.

## **5.7 Conclusion**

This chapter has discussed on the results and data analysis acquired as well as project limitation and suggestion for future development and enhancement. There are many feature could be include in AESWT. Through identifying those features correctly, AESWT will be very much improved and next to complete.



## **CHAPTER 6**

### **CONCLUSION**

Nowadays, most of the websites do not provide adaptive system which can solve human emotion. Therefore, a system that is able to solve the problem of human emotion is needed to develop as a function to help them performed well. Then based on this observation, Adaptive Emotional Solving Web Tutoring (AESWT) have been developed to solve the kid's emotion problem among kindergarten kids when using a mathematic tutoring website. AESWT is developed by do a research which related with psychology field to ensure that solution given to kids are absolutely correct and appropriate.

This project fulfils the objectives in develop prototype for adaptive emotional solving. And, it will help user in order to solve they emotion problem when kids using a mathematic tutoring website. As known from the literature review, most of the website does not provides a adaptive system which give a solution to solve emotion problem among kids. This is because no disclosure about the negative impact of uncontrolled emotion.

Adaptive Emotional Solving Web Tutoring (AESWT) is using Rapid Application Development as a method to develop this system. Rapid Application Development method consist of four phase which is requirement planning, user design,

construction and cutover. First phase which is requirement planning is phase where the all the information and requirement is gathering. Second, is user design phase is the detailed analysis about the flow and activities of the system. Third which is construction phase, where need to complete the construction of the physical system. This process to make sure the system can work properly with function. Lastly, is the cutover phase where involved testing and training activities. In addition, AESWT has been developed using Macromedia Dreamweaver for its interfaces design and function.

As a conclusion, hopefully Adaptive Emotional Solving Web Tutoring (AESWT) will help in order to resolve emotion problem among kids. In addition, in my opinion for future and further research create more the types of emotions that can be solved by AESWT system. Therefore, all emotion that express by kids can be solved not only for sad, angry and happy emotion.

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# APPENDIX A

Fakulti Sistem Komputer & Kejuruteraan Perisian  
Faculty of Computer Systems & Software Engineering

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RUJ. KAMI (OUR REF) :  
RUJ. TUAN (YOUR REF) : UMP.12.02/13.11/01/07 (16) 28 Februari 2013

**KEPADA SESIAPA YANG BERKENAAN**

Tuan/Puan,

**TAJUK : EMOTIONAL SOLVING TOOLS FOR INTERNET USER**  
**NAMA PELAJAR : NURFATIN BT NOHADIN (CB10009)**  
**TAHUN/PROGRAM : 3/IJAZAH SARJANA MUDA SAINS KOMPUTER (KEJRUTERAAN PERISIAN) DENGAN KEPUJIAN**

Adalah dengan hormatnya dimaklumkan bahawa pelajar di atas ialah pelajar berdaftar Fakulti Sistem Komputer & Kejuruteraan Perisian, Universiti Malaysia Pahang.

2. Sukacita kiranya pihak tuan/puan dapat memberikan kebenaran bertulis serta data dan maklumat yang berkaitan untuk pelajar menyiapkan projek berkenaan. Untuk makluman tuan/puan, projek ini ialah satu keperluan bagi kandungan kursus berkaitan.

Sekian, segala kerjasama dan perhatian tuan/puan didahului dengan ucapan ribuan terima kasih.

**"BERKHIDMAT UNTUK NEGARA"**

Saya yang menjalankan tugas,

**(DR. ADZHAR KAMALUDIN)**  
Timbalan Dekan (Akademik & Hal Ehwal Pembangunan Pelajar)  
Fakulti Sistem Komputer & Kejuruteraan Perisian  
Universiti Malaysia Pahang  
☎ 609-5492467 / 2147  
☎ 609-5492144  
CEE2013



May 25, 2013

**NurfatinBintiNohadin**

University Malaysia Pahang

LebuhrayaTunRazak, 26300 Gambang

Kuantan, Pahang DarulMakmur

Dear **En. KamarulArifin Bin Abd Rahman**:

Greetings!


I **NurfatinBintiNohadin** student of 3/1 year Bachelor's Degree of Computer Science (Software Engineering) student of University Malaysia Pahang undertaking a research entitled **RULES BASED ADAPTIVE EMOTIONAL SOLVING WEB TUTORING FOR KINDERGARDEN SCHOOL ON LEARNING MATHEMATICS.**

With your expertise, I am humbly asking your permission to validate the attached self-made solution for solve the kid emotion problem, for the study that related to emotional problem among kids. I am looking forward that my request would merit your positive response.

Thank you for your cooperation.

Respectfully Yours,  
**Nurfatin Binti Nohadin**  
Researcher

Validated by:

  
.....  
**En. Kamarul Arifin Bin AbdRahman,**  
University Malaysia Pahang,  
Psychological officer Career& Counseling

Date: 27/5/2013

## **APPENDIX B**

**TURNITIN DOCUMENT VIEWER**

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RULE BASED ADAPTIVE EMOTIONAL SOLVING WEB TUTORING  
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**Attention:**

The turn it in show that the 72 % are similarity. This is because 69% come from my previous thesis documents (PSM1).