

**E-LEARNING
MATHEMATICS SUBJECT FOR UPSR**

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E-Learning mathematics subject for UPSR / Mohd Yusof
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ABSTRACT

'E-Learning - Mathematics Subject for UPSR' is e-Learning software that builds for students and teachers for UPSR. Users can interact and navigate with the project. Its also attract student to learning Mathematics. This project is to be an alternative reference material for student and teachers. The project will developed follow the current syllabus for UPSR. There is eight capture cover in this project. This project only contains the Mathematics UPSR lesson and it is standalone application. This project built because teachers have problem to attract student to learn and score the mathematic subject and they don't have any interesting matters that can be used for teaching. Student don't have many option for their reference unless the exercise books and text books and the current software are not enough interactive and can't interact student to use them. Waterfall methodology is use for project methodology. Educational systems in Malaysia provide good advantage for business rules. This project will give alternative to educational environment and because of that, the quality of educational system in this country will be decrease.

ABSTRAK

'E-Learning - Mathematics Subject for UPSR' adalah satu perisian e-Pembelajaran yang dibangunkan untuk murid-murid serta guru-guru UPSR. Pengguna dapat melakukan interaksi dan navigasi dengan perisian ini. Ia juga dibangunkan untuk menarik minat murid-murid untuk mempelajari matematik. Projek ini dapat dijadikan sumber rujukan murid-murid dan guru-guru. Ianya dibangunkan mengikut silibus terkini matapelajaran UPSR. Lapan topik terangkum dalam projek ini. Projek yang dibangunkan hanya mengandungi pelajaran matematik untuk UPSR serta ianya adalah satu aplikasi yang tidak bergantung kepada rangkaian serta perisian lain. Projek ini dibangunkan kerana guru-guru menghadapi masalah untuk menarik minat murid-muridnya mempelajari matematik dan guru-guru sendiri tidak mempunyai cukup bahan untuk mengajar. Pelajar pula tidak mempunyai banyak bahan rujukan dan hanya bergantung kepada buku latihan dan teks untuk belajar. Perisian yang ada sekarang juga tidak cukup interaktif untuk menarik murid-murid mnggunakannya. Metodologi Air Terjun (Waterfall Model) digunakan untuk membangunkan projek ini. Projek ini mengambil kelebihan dalam sistem pendidikan di Malaysia untuk kajian perniagaan. Denan adanya projek, ia akan dapat memberi kelainan di dalam bidang pendidikan dan seterusnya meningkatkan lagi kualiti sistem pendidikan negara.

CHAPTER I

INTRODUCTION

1.1 Preamble/Overview

The developing of Information Technology today is faster and can't turn down anymore. Integrations of Information Technology in globalizations, trading, commerce, banking and also educational have to be more important, and the uses of computers for carried out the data communication already widespread. This situation cause the Information System is built, repaired and upgraded time to time for increase their capability, usability and adapted to nowadays environment. This situation is following of people needs that want the new information faster and reliable.

The 'E-Learning - Mathematics Subject for UPSR' is an application that built for primary school student for their Mathematic subject. This application is following the e-Learning concept which the user can interact and navigate with this system. The application is used by UPSR candidates and Mathematics' subject teachers.

The project is developing to take good opportunity to enhance the e-Learning application in Malaysia. Following by research in case study, there is a few numbers of e-Learning applications which it is built in Malaysia. Not enough for that case, we can saw

very few suppliers sold this kind of e-Learning application. By the way, it was easy to introduce people to use this application by the widespread publicity.

1.2 Problem statements

Through the research that has been doing before, the problems that identify with current situation are:

1. Teacher have problem to attract student to learn and score the mathematic subject.
- ii. Teachers don't have any interesting matters that can be used for teaching.
- iii. Student don't have many option for their reference unless the exercise books and text books.
- iv. The existing e-Learning software today are not enough interactive and can't interact student to use them.
- v. The existing e-Learning software today is under control of Ministry of Educational Malaysia. So, it's difficult to find it at market.

1.3 Objectives

Following are the objectives for the project:-

1. Developed an interactive application that allowing users to interact and navigatè with the application.
- ii. Attract student to learning Mathematics.

- iii. The application is to be an alternative reference material for student and it will reduce the student's depended on text book.
- iv. The application is to be an alternative teaching material for teachers that teach mathematic for UPSR.

1.4 Scopes

Project scope gives an important role for preparing limitation of the developed project. Following are the scopes for the project:-

- 1. Application will developed follow the current syllabus of Ministry of Educational Malaysia and Malaysian Examination Council for UPSR.
- ii. The syllabus that related with this application is Number, Add, Minus, Multiply, Divide, Percent, Decimal and Average only.
- iii. This application contains the Mathematics UPSR lesson only.
- iv. This application is standalone application. It not depends to other support software and hardware.

1.5 Contributions

The project is expected to give lot of advantage and interest in educational environment. The interactive application not only have interact student to learn Mathematics but it also can give teachers new teaching materials. It's also provided current syllabus of Mathematic UPSR.

With developed of this application, parents also can encourage their children to learn Mathematics at home. Parents who not be able to send their children to tuition and additional classes also can prepare learning material that easy to used and cheapest compare to others.

Students also can reduce relies on text book and reference book. The application expected can attracts student to learn mathematics well and result in mathematic subject will be excellent. Therefore, this developed of this application not only encourage spirit of learning mathematics between students but also it can stable the educational system in this country.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

E-Learning can be defined as software that related by the educational process worldwide, referring to smart learning and information delivered with related technologies. In a broader sense, the term characterizes not only a technical development, but also to improve educational locally, regionally, and worldwide by using information and communication technology.

2.2 Fact and finding

The method of how the current project information is collected is very important to describe and decide. Uses of interview method will give an opportunity to exercise conceptual, quantitative and analytical reasoning skills to arrive at the best solution. But solid quantitative skills aren't the only thing looking for. There are interested in leadership experience, communication skills, creativity and flexibility, as well. The best surveys contained methodological questions and questions which were shaped and asked in a way that reflected a clear purpose.

Interview a few people whose is responsibility and involve in the project development. Many kind of the interview are informal ways. There has takes the informal ways because it is a good decision to collect more information and analysis the requirement.

Below, there have divides into four stages of the interview session. There are:-

i. Introduction

The common exchange of names, small talk, casual questions that are escorted to the place of the interview is first chance to impress. The purpose is to establish rapport and put both parties at ease. First, should have some small talk topics prepared.

ii. Broad Question and Answer

The interviewer will begin to ask questions about self task of works and other items that related with project. There have also been asked questions about the task in overall view, opinion and suggestion.

iii. Focus on the position

There have concentrates more on the details of the analysis phase. It will be able to discuss how experiences and qualifications fit the requirements of the project. There should ask pointed questions about the previous research.

iv. Conclusion

There will summarize what has been said and clarify any questions may have. This is when need to reiterate interest in this project development and stress again how are uniquely qualified for the scope of the project.

For this study, case study methodology is employed, which can afford the ability to study the phenomenon in-depth and describe the project in real world.

2.3 Conclusion

The literature study in previous system could give more references in system development process. All the advantages in the previous system can be implementing in the system development. The characteristic of the previous system such as interface and module flow should be improve and enhance from the previous system.

The main concept of the project is e-Learning application. Because of that, this project must have the user friendly interface with method that can allow users to navigate with system optimally. For example, this project should have attractive interface that can attract the users and avoid them to feel bored with the application. This project also should have the function that obeys the users to navigate the system with easy way.

CHAPTER III

PROJECT PLANNING AND METHODOLOGY

3.1 Introduction

This project is applying the waterfall model in development and implementation process. Although there are many variations on the theme of the system development lifecycle, each approach has its own characteristics such as specific activities, techniques, outcomes are associated with each stage, and progression between stages is orderly and proceeds in a linear fashion.

In this application development, work completed in each stage is passed on and becomes the input basis for work at the next stage. At each point of transfer between stages it is possible that miss-communication may occur and therefore assumptions used for the work in a particular stage may be based on an incorrect understanding. There is little opportunity to back up and correct problems that are propagated this way.

3.1.1 Importance of work planning

The work plan itself is a written statement which identifies the work which needs to be accomplished by an individual to successfully achieve the aims of work. It makes use of available expert knowledge and attempts to maximize the

quality of work which is done. Work planning is a structured process which helps individuals define the unique identities, distinctive purposes and critical relationships within their environments. Work planning assesses individual strengths and limitations and analyzes potential opportunities or threats within systemic relationships. Ultimately, planning clarifies purpose and determines direction.

The work planning process may be used in a variety of formats or plan designs ranging from short-term action plans to long-term positioning strategies. The plan delineates purposeful activity with objectives, practical steps or tasks, time frames and performance measures. All of these activities are designed to be accountable to objectives and declared goals.

3.2 Project Methodology

A methodology is a set of documented series of activities that need to be executed in order to complete a complex job. There are many types of methodology used in project development such as Waterfall Model, System Development Life Cycle (SDLC), Spiral Model, Prototyping Model, Formal Transformation Model and Rapid Application Development Model (RAD). The methods imply in each methodologies have its significances and have their own functionality and advantages.

For this project, the Waterfall Model will be implementing. The Waterfall model divides the project into well-defined sequential phase with intermediate milestones. Apart from this, waterfall is a system approach to problem solving and consists of several phases. This methodology consists of six main phases that are Requirement Phase,

Design Phase, Implementation Phase, Integration Phase, Evaluation Phase, and Maintenance Phase as state in **Figure 3.1**.

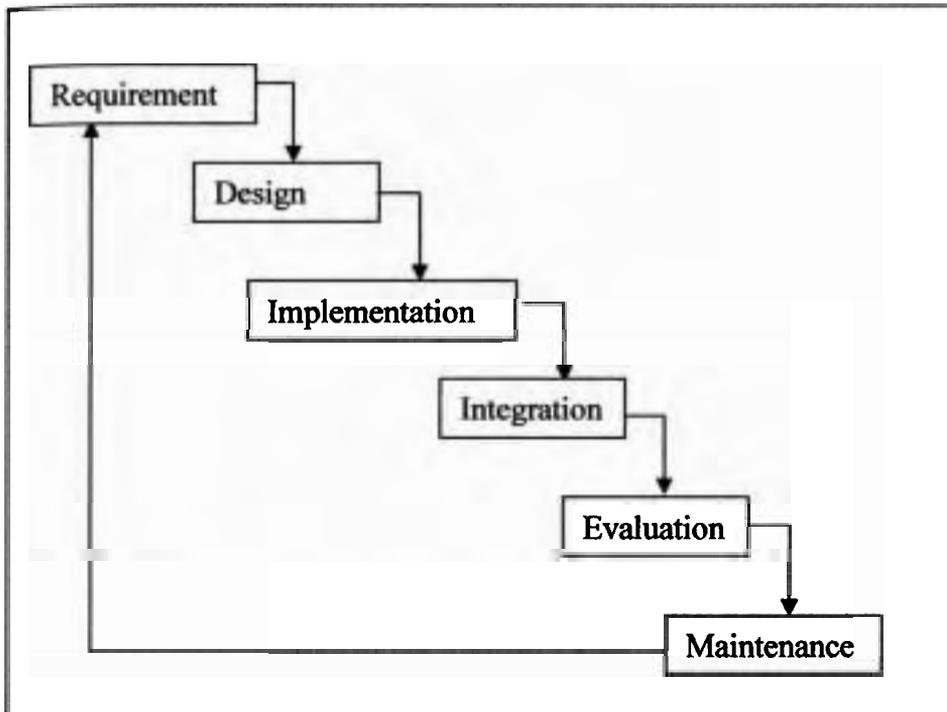


Figure 3.1: Waterfall Model Methodology

In this model, the stages of software development occur in a specific order, with each successive phase being completed before work begins on the next phase. All of this is to ensure the quality, reliability, and maintainability of the developed software. The progress of the project can be easily evaluated at the end of each phase and an assessment can be made to determine whether to proceed to next phase or adjustments need to be made.

3.2.1 Requirement Phase

Requirement Phase is the first step in Waterfall Model. The objective of this phase is to identify the needs and requirements from the users on how the system needs to be. Functional requirements are specifically defined and delineate the requirements in terms of data, system performance, security, and maintainability requirements for the system. Besides, in this stage also includes a detail study of the business needs of the organisation. All requirements are defined in depth as sufficient for systems design to proceed. This is the phase where the developers need feedbacks from the users or clients.

3.2.2 Design Phase

System design phase consists of logical design and physical design. System design is based on the requirements that have been identified during the analysis requirement phase. Activity-activity in design phase includes system design, input design, output design and interface design.

i. **Logical design**

The system could be implemented on any hardware and systems software requirements. The idea is to make sure that the system functions are intended and can be fulfilled. Logical design concentrates on the business requirements of the system.

ii. **Physical design**

In physical design, the logical design is turned into physical, or technical, specifications. The diagrams that map the original flow

and processing of data in a system must be converted into a structured systems design that can then be broken down into smaller and smaller units for conversion to instructions written in a programming language. The various parts of the system are designed to perform the physical operations necessary to facilitate data capture, processing, and information output.

During physical design, the things that need to be decided are programming languages used to write computer instructions, and which hardware and platform, operating system, and environment the system will be implemented in. These decisions will influence in deciding the hardware and software plans initiated at the end of the analysis phase. The final product of the design phase is the physical system specifications in a form.

3.2.3 Implementation Phase

The physical system specifications are handed over to programmers for the first part of the Implementation Phase. This phase is the creation of the system in the authoring or software program. During implementation, the designs are translated into code. Computer programs may be written using a conventional programming language or an application generator. Implementation includes coding and testing.

3.2.4 Integration Phase

After implementation, application software is installed, or loaded, on existing or new hardware and made operational in a production environment. This phase represent the process of installing the project into real environment. The integration work is necessary to evaluate how the system copes with the real time environment.

3.2.5 Evaluation Phase

During evaluation, the system is tested as a whole and each separate module are combined together and tested as a complete system. The system needs to be tested to ensure that interfaces between modules work (integration testing), and that the system does what the user requires (acceptance/beta testing).

3.2.6 Maintenance Phase

Maintenance is a final phase of waterfall methodology. Any developed system will need maintenance or upgrading to ensure it usability. Thus, in this phase the system will be undergo a maintenance phase. The installed package was adjusted to cope with on-going changes in content and environment. In maintenance, developers have to make the changes when users want extra things added or existing things changed over time. These are necessary to keep the system running and useful.

3.3 Project Schedule and Milestones

Project schedule is implementing by Gantt chart. This is because the Gantt chart is simple and easy to construct. The Gantt chart for this project is Gantt chart for PSM I on **APPENDIX 1.1** and PSM II on **APPENDIX 1.2**.

3.4 Conclusion

This chapter is focused on the methodology that used to develop the project. The entire problems have been analyzed in all phases of the methodology as the main method of solution. The right methodological approach has played an important role to achieve the project aims and objective. A good project planning can avoid the wasted effort and time.

CHAPTER IV

ANALYSIS

4.1 Introduction

In most traditional software development life cycles, analyses are focus on gathering system requirements. A business rules approach is a different way of thinking about the analysis process. Rather than focusing on system requirements, the analysis process is refocused on business rules. Instead of asking users what they want their system to do, they are asked about how their business or organization works.

4.2 Analysis of Current System

In the business study, this project has provides the documentation of business approach. Based on the previous e-Learning applications, there are provide the business approach concept. For instance, the first study case is about the previous applications. The project must interesting application for UPSR student. In this situation, the user can decide to get one application that good and able to fulfills their need, not a bored application.

This project has taken the opportunity from the educational system in Malaysia to get the market. This project was easy to publish at school and educational institution. This project could have profit from this situation because this application is a necessity for student and teachers in Malaysia.

4.2.1 Problem Analysis

There are three targets which it is in the research case study to provide the project implementation. There are:-

i. **Current Application**

Several applications already built nowadays. Many of this application is not enough interact the student and students are bored to used this application. In additional, the system which publish now are very few and difficult to find. Many of the e-Learning software are under control of Ministry of Educational Malaysia. So, few of types of e-learning application was found at the market. Trough the research that has been made, there is only one company that sells the interactive application software in Malacca. The company is Lyaz Enterprise that operated in Inkubator K-Ekonomi, Ayer Keroh. Some company is sell the e-Learning software too, but the software is coming from others country like Singapore, Britain and USA. This software are must know as foreign software that not follow the syllabus of Ministry of Education and Malaysian Examination Council.

ii. **Student**

Many of the student nowadays not interested to learn mathematics because there is not a good and interesting reference for they to learn the

mathematic more enjoyable. They always use books that display static text and nothing interactive with them. Application that are nowadays too can't interact these student because there is not enough interactive and enjoyable.

iii. Teachers

Teachers are one of the group targets in this research. Teachers today don't have any additional reference and material that can be used for helping their teaching process in school. In Malaysia, the implemented of computers or laptop uses in class for learning process is needed teachers to get software for the material of teaching in their classes. Teacher too have problem to interact their student to learning.

After identify the entire problem, some solutions have been creating with the application that will develop:-

- 1. Create an interactive application that will attract student and teachers to use it as learning material in the school.**
- ii. Create an application that not only as the reference but as it also can be an instructor to the students. Application that has animations and graphic will be an instructor for people and student.**
- iii. Create an application that able to become reference that different with others books and notes. Its will follow current syllabus of curriculum.**
- iv. Create an application that interactive and interact users.**

4.3 Analysis of To Be System

The project that develops must have tools and support. This part will analyze the tool and requirement for develop the project.

4.3.1 Software Requirement

There have listed the requirement and specification of software components and languages which have been used this application development. Analysis for function and definition for used software have list on **Table 4.1**.

Table 4.1: Software requirement and description

Name	Function / Definition
Macromedia Director MX	Design And Built Application Macromedia Director MX can create movie in *.exe file. This software use to develop major of project.
Macromedia Flash MX	Design And Built Animation Macromedia Flash MX can create animation for interactive learning. By using Macromedia Flash MX, learning process will be arrange properly.
SWiSH max	Design And Built Animation SWiSH max can create animation for interactive learning. By using SWiSH max, learning process will be arranged properly.

Adobe Photoshop 7.0	Design Interfaces And Images For System Adobe Photoshop 7.0 is the graphic software that can use for create graphic image. This software is use to build the system interfaces.
Paint	Design Interfaces And Images For System Paint is graphic software that prepare by Windows. Paint is used to edit picture and graphic for this project.
Microsoft Visual Basic 6.0	Programming Tools Microsoft Visual Basic 6.0 is a programming tool that used for build the Examination Questions part in this project.
Microsoft Project Pro 2002	Tasks Schedule And Chart Microsoft Project Pro 2002 used to create chart for project scheduling. Gantt chart will be creating here.

4.3.2 Hardware Requirement

There have listed the requirement and specification of hardware components which have been used in this project development. **Table 4.2** shows the hardware that used and its description. Other hardware that used as additional can be refer in **Table 4.3**

Table 4.2: Hardware and description

Suggested Configuration	Minimum Configuration
P4 1.6 GHz Upwards	P-III and above
5 GB HDD Free Space	1 GB HDD Free Space
256 MBRAM	128 MB RAM
52x CR-ROM Drive	Any CD-ROM

Table 4.3: Other computer accessories and description

Name	Functions
Printer	Print documentation
Scanner	Scan pictures
USB Drive	Temporary storage
Camera Digital	Capture images
CD Writer	Project / System delivery medium

4.4 Conclusion

Analysis phase is using for study the existing systems and how to build the systems. Analysis include analyze the target user, problem face by targeted users and tools that uses in developing project. From the analysis phase, the tools and support to develop the system is identify for the next action.

CHAPTER V

DESIGN

5.1 Introduction

After doing the analysis phase, the design phase will be performed. The data that collected before will be used for solve the software design. Design phase is really needed in development of an application. It was one interaction between user and application that will develop. This phase will involve the program design and interface design.

Software design will involve module design that got in this application. The flows for the modules will be representing in design phase. It will represent with context diagram.

The interface design is the most important in the software development. It is important because it will attract peoples to use this system. The better design of interface will attract more people to use this application.

5.2 Preliminary/High-Level Design

This part will initial the design and analysis the data flow in this project. Data, design and system architecture will be cover in this part.

5.2.1 Raw input/data

This project contains the syllabus of Mathematic subject for UPSR. This application use numbers for most their operation. The raw of data that use for this application is:-

- i. Number
- ii. Add
- iii. Minus
- iv. Multiply
- v. Divide
- vi. Percent
- vii. Decimal
- viii. Average

5.2.2 System Architecture

This project divides for six modules that will operate all the functions in this application. These six modules are the '*Topik*', '*Kuiz*', '*Laman Pautan*',

'Panduan Pengguna', 'Keluar', and 'Set Soalan Latihan'. The flow of modules shows in **Figure 5.1**.

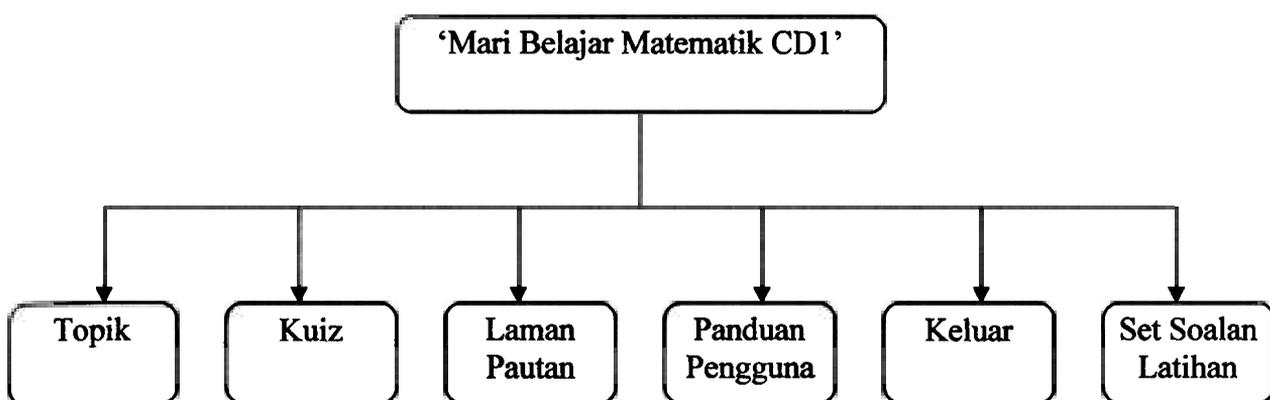


Figure 5.1: System's Modules

i. Topik

Topik's module designed for learning method in this system. It is an important module in this application. This module will contain topics such as:-

- a) *Nombor*
- b) *Penambahan*
- c) *Penolakan*
- d) *Pendaraban*
- e) *Pembahagian*
- f) *Peratus*
- g) *Purata*
- h) *Perpuluhan*

ii. Kuiz

Kuiz's module designed for user to test their knowledge in the learned syllabus. This module will contain quizzes in the topics such as in the *topik's* module.

iii. Laman Pautan

Laman Pautan's module designed for user to choose web-links that related with the UPSR Mathematics for their reference. This module will contain links such as:-

- a) Portal Pendidikan Utusan
<http://www.tutor.com.my/>
- b) Education segment e-Media NSTP
<http://www.emedia.com.my/Education/Didik/didikrevamp>
- c) Education segment Berita Harian
http://www.bharian.com.my/websekolah/Didik/formatmate_html
- d) Note and questions sets
<http://www.e-genius.com.my/>
- e) Note and questions sets
<http://www.geocities.com/CollegePark/Stadium/5052/MatematikUPSR.htm>
- f) Note and questions sets
<http://members.tripod.com/lintasan/topm.htm>
- g) Mathematics recreation web
<http://www.angelfire.com/ri/matematik/>