BIOLOGY E-LEARNING SYSTEM (SPM STUDENT)

NARAYANI A/P KANESAN

TECHNICAL REPORT SUBMITTED IN FULFILMENT OF THE DEGREE OF BACHELOR OF COMPUTER SCIENCE (COMPUTER SYSTEM AND NETWORKING)

FACULTY OF COMPUTER SYSTEMS & SOFTWARE ENGINEERING UNIVERSITI MALAYSIA PAHANG

2015



UNIVERSITI MALAYSIA PAHANG				
BORANG PENGESAHAN STATUS TESIS				
JUDUL:				
SESI PENGAJIAN:				
SAYA(HURUF BESAR)				
Mengaku membenarkan tesis/laporan PSM ini disimpan di Perpustakaan Universiti Malaysia Pahang dengan syarat-syarat kegunaan seperti berikut:				
 Tesis/Laporan adalah hakmilik Universiti Malaysia Pahang. Perpustakaan Universiti Malaysia Pahang dibenarkan membuat salinan untuk tujuan pengajian sahaja. Perpustakaan dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institut pengajian tinggi. **Sila tandakan (√) 				
SULIT (Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972) *				
TERHAD (Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan) *				
TIDAK TERHAD				
Disahkan Oleh				
Alamat tetap: Penyelia Tarikh: Tarikh:				

*Sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh tesis/laporan ini perlu dikelaskan sebagai SULIT atau TERHAD

DECLARATION

I hereby declare that the work in this thesis is my own except for the quotations and summaries which have been duly acknowledged.

Date: 26th May 2015

NARAYANI A/P KANESAN CA11109

SUPERVISOR'S DECLARATION

"I hereby declare that I have read this report and in my opinion the report is sufficient in terms of scope and quality for the award of the Bachelor in Computer Science (Computer System and Networking)"

Signature :....

Supervisor : ABDULLAH BIN MAT SAFRI

Date :....

ACKNOWLEDGEMENT

There lot of the comments and suggestion is provided in completing this report. One of the most grateful pleasures of developing this system is acknowledging the hard work and effort between students and lecturers, and friends to friends. It is impossible to thank them adequately for all their help and support.

First, I would like to express my gratitude to the extraordinary efforts of Mr. Abdullah Bin Mat Safri my supervisor. I want to thank him for the guidelines in every aspect of the report. I sincerely appreciate his suggestions, comments, correction and also the constructive criticisms for improving this project. Thanks for being supportive, devoted time and energy to lead me to complete this Biology E-Learning system report.

Next, I want to give thanks to my parents. I wish to express my appreciation for their personal encouragement and understanding. Thanks for continually inspiring me to continue learning and assisting me all the way in my life and studies.

Last but not least, I would like to express my gratitude and appreciation to all my universitymates. Thanks for being cooperative in the group discussions and devoted time in complete of this project. I sincerely appreciated all for helping me to make my task manageable and lead me to contribute more effectively to the completeness of this project.

Thank You.

ABSTRACT

The E-learning system is an important field in the area of information communication technology for online learning. In Malaysia, the E-learning system is very popular. Traditional teaching method in secondary school causes some problems to student. Students have to bring a lot textbooks to school every day and sometime the weight goes up very heavy to carry every day. With the growing of Information and Communication Technology (ICT) in Malaysia, this situation should be changed. The Biology e-learning system can provide the solution for the above situation. There are three targeted users groups in this system which is admin, teacher and student. Firstly, admin are able to manage students and teachers record. Secondly, students are able to view their profile, update on their profile and view their result mark or study performance. They are also able to view extra notes, quiz and exercises from the system uploaded by their teachers. Thirdly, teachers are able to upload and view their student result and give comment according to their performance. Besides that, they are also able to upload extra notes, questions and exercises to the system according to subject of Biology. The entire user groups are able to take part in the interface discussion through forum especially student to student and student to teacher. Rapid Application Development (RAD) has been chosen as the methodology to develop this system which is planning, analysis design and development, testing and implementation. Adobe Dreamweaver CS5 will be used to develop this system. Security features like session registration will be implementing in this system, to make the system more secure. I believe at the end, this system could be suitable to implement in school if the SMK Sentul Convent are equipped with enough and suitable computer to run the system in order to increase the competitiveness of the school.

ABSTRAK

Sistem E-pembelajaran adalah satu bidang yang penting dalam bidang teknologi komunikasi maklumat untuk pembelajaran dalam talian. Di Malaysia, sistem E-pembelajaran adalah sangat popular. Kaedah pengajaran tradisional di sekolah menengah menyebabkan beberapa masalah kepada pelajar. Pelajar perlu membawa buku teks banyak ke sekolah setiap hari dan kadang-kadang berat buku naik sangat berat untuk membawa setiap hari. Dengan penanaman Teknologi Komunikasi dan Maklumat (ICT) di Malaysia, keadaan ini perlu berubah. Sistem e-pembelajaran Biologi boleh memberikan penyelesaian bagi situasi di atas. Terdapat pengguna yang disasarkan tiga kumpulan dalam sistem ini yang admin, guru dan pelajar. Pertama, admin, dapat menguruskan pelajar dan guru rekod. Kedua, pelajar dapat melihat profil mereka, mengemas kini pada profil mereka dan melihat tanda hasil atau prestasi pengajian. Mereka juga dapat melihat nota-nota tambahan, kuiz dan latihan daripada sistem yang dimuat naik oleh guru-guru mereka. Ketiga, guru-guru boleh memuat naik dan melihat hasil pelajar dan memberikan komen mengikut prestasi mereka. Selain itu, mereka juga boleh memuat naik nota-nota tambahan, soalan dan latihan kepada sistem mengikut subjek Biologi. Kumpulan-kumpulan pengguna keseluruhan boleh mengambil bahagian dalam perbincangan antara muka melalui forum terutamanya pelajar kepada pelajar dan pelajar dengan guru. Permohonan Pembangunan Rapid (RAD) telah dipilih sebagai kaedah untuk membangunkan sistem ini yang merancang, reka bentuk analisis dan pembangunan, pengujian dan pelaksanaan. Adobe Dreamweaver CS5 akan digunakan untuk membangunkan sistem ini. Ciri-ciri keselamatan seperti pendaftaran sesi akan melaksanakan dalam sistem ini, untuk membuat sistem yang lebih selamat. Saya percaya pada akhirnya, sistem ini boleh menjadi sesuai untuk melaksanakan di sekolah jika SMK Convent Sentul dilengkapi dengan komputer yang mencukupi dan sesuai untuk menjalankan sistem untuk meningkatkan daya saing sekolah.

TABLE OF CONTENT

CHAPTER

CONTENTS

PAGE

VERIFIED FORM	ii
DECLARATION	iii
SUPERVISOR DECLARATION	iv
ACKNOWLEGMENTS	V
ABSTRACT	vi
ABSTRAK	vii
CONTENTS	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
LIST OF APPENDIX	xvii
LIST OF ABBREVIATIONS	xviii

INTR	INTRODUCTION		
1.1	Background of Study	1	
1.2	Problem Statement	2	
1.3	Objective	2	
1.4	Scope of Work	2	

1.5	Thesi	s Organization	2
LIT	ERATUI	RE REVIEW	5
2.1	Introd	uction	5
2.2	Existi	ng System	6
	2.2.1	Manual E-Learning for biology	6
	2.2.2	E-Learning SMK Baling	7
	2.2.3	E-Learning SMK Baling	10
2.3	Progra	amming Tools	11
	2.3.1	РНР	11
	2.3.2	HTML	12
	2.3.3	Programming C	12
	2.3.4	Java Script	12
	2.3.5	Comparison between programming languages	13
2.4	Techni	que	14
	2.4.1	Mobile Application	14
	2.4.2	Web Application	15
	2.4.3	Comparison between web and mobile application	15
2.5	Databa	ase	16
	2.5.1	Structured Query language	16
	2.5.2	MySQL Database	16
	2.5.3	Microsoft SQL Server	17
	2.5.4	Comparison between MySQL and MS SQL Server	17
2.6	Web S	erver	18
	2.6.1	Apache	19

	2.6.2	Xampp	19
2.7	Softwa	are Development Methodology	19
	2.7.1	Waterfall Model	19
	2.7.2	Agile Model	22
	2.7.3	RAD Model	23
	2.7.4	Summary of Software Process Model	25

METHODOLOGY

27

3.1	Introduction		
3.2	Planning		
3.3	Analysis		
	3.3.1	Hardware requirement	30
	3.3.2	Software Requirement	31
3.4	Design	n and Development	32
	3.4.1	Sequence Diagram	32
	3.4.2	Data Dictionary	36
	3.4.3	Development	40
3.5	Testin	g	45
3.6	Impler	mentation	46
3.7	Summ	nary	46

IMPLEMENTATION 47

4.1	Introduction	2	17

4.2	2. Database Implementation		47
	4.2.1	Database and Server Connection	49
4.3	Sys Int	erface and Implementation	50
	4.3.1	Student Module	50
	4.3.2	Teacher	74
	4.3.3	Admin	85
4.4	Coding	Implementation	93

RESULT AND DISCUSSION

5.1	Introd	uction	94
5.2	Test R	lesult	94
	5.2.1	Student Module Test Check	95
	5.2.2	Teacher Module Test Check	96

5.2.3	Admin Module Test Check	97
0.2.0		21

5.3	Integration Testing	97
5.4	System Testing	98

5.5	Advan	ntage and Disadvantage	99
	5.5.1	Advantages	99
	5.5.2	Disadvantages	99

5.6	Project Limitation	100

5.7	Enhancement and Project Research	100

CONCLUSION

6.1 Conclusion 101

94

101

APPENDIX A

105

102

LIST OF TABLES

Table	Name	Page
2.1	Comparison of Existing System	10
2.2	Comparison between programming Languages	13
2.3	Difference between web application and mobile application	15
2.4	Difference between MYSQL and MS SQL server	17
2.5	Comparison between methods	25
3.1	Hardware to develop Biology E-Learning System	30
3.2	Software to E-Learning Biology system	31
3.3	Data Dictionary of E-Learning Biology System	36
5.1	Test check of student module in biology e-learning system	95
5.2	Test check of teacher module in biology e-learning system	96
5.3	Test check of admin module in biology e-learning system	97
5.4	Integration testing of whole biology e-learning system	97
5.5	Test check for the system testing of biology e-learning system	98

LIST OF FIGURES

Figures	ures Name			
2.1	E-Learning for Biology homepage	6		
2.2	E-Learning for Biology learning platforms	7		
2.3	E-Learning for Biology quiz	7		
2.4	Login page of E-Learning SMK Baling	8		
2.5	Homepage of E-Learning SMK Baling	8		
2.6	Download file for E-Learning SMK Baling	9		
2.7	Waterfall Model	20		
2.8	Agile methodology processes	23		
2.9	RAD Processes	24		
3.1	User hierarchy of E-learning Biology System	28		
3.2	Use-case diagram of E-learning Biology System	29		
3.3	Sequence diagram of SPM students use-case diagram	33		
3.4	Sequence diagram of SPM students use-case diagram	34		
3.5	Sequence diagram of teacher use-case	35		
3.6	Sequence diagram of administrator use-case	40		
3.7	UML class diagram of E-learning Biology system	41		
3.8	Main page of E-learning Biology system	42		
3.9	Main login page of biology e-learning system	43		
3.10	Student Registration page	44		
3.11	Validation for registration page	45		
4.1	Database of overall Biology e-learning system	48		

4.2	Database of student	48
4.3	Database of teacher	48
4.4	Database of admin	49
4.5	Connection of database to localhost	49
4.6	Database that disconnect to local host	50
4.7	Local host that connect with PHP	50
4.8	Student registration page	50
4.9	Validation of registration page	51
4.10	Validation for confirm password	51
4.11	Successful registration	52
4.12	Registration success message	52
4.13	Forget password page	53
4.14	Error page when enter wrong data	54
4.15	Enter data is correct	55
4.16	New password randomly generated	56
4.17	After registration user able to login	56
4.18	Main page of student module	57
4.19	Menu bar view	58
4.20	Interface to post question in discussion board	59
4.21	Interface to post question in discussion board after error page	60
4.22	Student view topic discussion	61
4.23	Student search file page	62
4.24	If the file not found	63
4.25	Search file found	64
4.26	Download files uploaded by the teacher	65
4.27	Student can view profile	66
4.28	Student can update their profile	67
4.29	Student can change password	68
4.30	Chapter notes provided in system	69
4.31	Chapter exercise for student	70
4.32	Display student score for exercise chapter one	71
4.33	Chapter two exercise for student	71
4.34	Chapter three exercise for student	72

4.35	View announcement send by teacher	73
4.36	Teacher registration page	74
4.37	Teacher main page after successful login	75
4.38	Teacher discussion board	76
4.39	Teacher view discussion board	77
4.40	Teacher view uploaded files	78
4.41	Teacher upload notes	79
4.42	Teacher profile view	80
4.43	Teacher edit profile	81
4.44	Teacher change password	82
4.45	View post announcement view	83
4.46	Admin post quiz page	84
4.47	Admin main page after successful login	85
4.48	Admin upload image page	86
4.49	Successful image upload	87
4.50	Teacher list waiting for approval	88
4.51	View teacher profile	89
4.52	Admin view profile	90
4.53	Admin update profile	91
4.54	Admin change password	92
4.55	Coding for teacher to delete student information	93
4.56	Teacher delete student profile	93

LIST OF APPENDIX

LIST	CONTENT	PAGE
А	Turnitin	105

ABBREVIATIONS

- UML Unified Modeling Language
- SPM Sijil Pelajaran Malaysia
- PHP Hypertext Pre-processor
- HTML Hypertext Mark-up Language
- **RDBMS** Relational Database Management System
- **OODBMS Object oriented Database Management System**
- DDML Data definition and Manipulation Language

CHAPTER 1

INTRODUCTION

1.1 Background of Study

E-Learning is a system is representing Biology E-learning system for SPM students of SMK Sentul Convent. Nowadays, there are a lot of online education systems in Malaysia. The main purpose of those systems is to provide a better and effective way to help students to get learning materials and information.

In this project, a web base learning management system also known as elearning management system will be developed for the secondary school. Purpose of this system is to enable teachers and students access the study materials at anytime and anywhere.

1.2 Problem Statement

- i. Current teaching method more individualistic (a teachers teaching method) and student find boring and less interactive.
- ii. Student spends a lot on buying study materials and extra classes like tuitions.
- iii. There is time limitation for the student to communicate with teacher.

1.3 Objective

Objectives of Biology E-Learning system are:

- i. To design and construct a database that supports the Biology E-Learning System.
- To gather and analyze the requirements for the e-learning system and provide a medium for discussion and communication between student and student or student and teacher.
- iii. To develop a web-based e-learning Biology system for secondary school.

1.4 Scope

The Biology E-Learning System project consists of three modules(SPM student module, Teacher module and administrator module) which are only for the SPM science stream students of SMK Sentul Convent whom taking biology subject.

Targeted user of this project output is admin, teacher and student of form five. Student from selected secondary school initially selected in order to improve the overall Biology e-learning system. Adobe Dreamweaver CS5 will be use as main tool to develop this Biology e-learning system for SMK Sentul Convent.

1.5 Thesis Organization

There are 6 chapters included in this thesis.

i. Chapter 1

This chapter is to introduce to the readers about the project that will be developed later. This chapter contains introduction, problem statement, objective, and scope and thesis organization.

ii. Chapter 2

This chapter explains about the reviews for the chosen project. This chapter is divided into two sub reviews that require students to study to get complete information about the project.

iii. Chapter 3

In this chapter the approach and framework for the project, method, technique or approach that will be and will be used while designing and implementing the project will be included in the content. Justification and of method on approach used and hardware and software necessary is stated here.

iv. Chapter 4

This chapter acts to document all processes that involve in the development of the project. Designed project development is explained here. The content of this project depends on the system. It contains information of database and tools used. Data in database is shown in this chapter.

v. Chapter 5

The purpose of this system is to explain about the results and data analysis that had been acquired. Result analysis, project limitation and suggestion and project enhancement are contents for the chapter.

vi. Chapter 6

This chapter explains briefly and summarizes the developed project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature review is a summary of the previous researches on all the related resources to a project. Resources are taken from books, internet, journal and online resources. In this chapter, a review of existing system is carried out. The literature reviews in this report are based on existing applications. Therefore, these reviews will be helpful in designing the methodology. Besides that, some of the techniques, methods, equipment and technologies from the reviews are very useful and can be applied into this project.

The main issues will be reviewed on this project is the end-users which are SPM students, teacher and admin. This research will help in understanding the system development for this project.

2.2 Existing System

E-Learning is the use of technology to enable people to learn anytime and anywhere. E-Learning can include training, the delivery of just-in-time information and guidance from experts. The target user for this E-Learning system is SPM biology student. Therefore the teacher will provide notes and learning materials to the student through the system. Student will be able to download the notes uploaded by the teacher. This system provides the student to communicate with teacher by messaging in discussion board. It also contains quiz which can help student to increase their knowledge.

In this section, the research on the existing website that has been developed in the internet will be discussed. This report will show two example of existing website that is related to the E-Learning. This report also will generally describe the E-Learning system. This research is mainly on how the existing system works.

2.2.1 E-Learning for biology

E-Learning for biology is a successful example of E-Learning system. It is a learning platform design specifically for biology in school of science, university, and in lifelong learning. The system has particular chapters then student can take the quiz to check their performance after reading the notes published in html form.



Figure 2.1: E-learning for Biology Homepage

It consists of 4 main chapters in biology. If user want to take the quiz, user needs to click on the map that written quiz.

r 1 Over	or 2 Chapter 3 Cha	phar 4
of Life Coolingy and I	Reducerally Animals Assessmy Collider Repr	aducture and Committee
	The Orig	gin of Life
	SOLAR	SYSTEMS
The sca solar sy	Bered elements condensed into clusters. This led t stem this process likely began about 5 billion year	o the formation of new stars and planets. In the case of our own
	1000	10000
	(# · C · C ·	
	1000	19999
		Our sun is a relatively small, cool star. It is being heated up by atomic fusion reactions.
	and a distance of the later	
The kine	tic energy released by the concentration of	ALL AND
element - sufficie - insuffic	s in the newly formed planets was: int to meit matter in the larger planets isent to start alongic fusion reactions.	
thus pla	anets could not become stars	

Figure 2.2: E-learning for Biology Learning Platforms



Figure 2.3: E-Learning for biology quiz

If the user click quiz in the main page, the quiz page will appear like above. After the user click submit, the answer will be submitted and the correct answer will be displayed in the box beside the answer.

2.2.2 E-Learning SMK Baling

The figure show the example login page of e-learning of SMK Baling

Jsername			
sagesblitz			
Password			
Remember	Me		
Log In			
Register Lost	your passy	word?	
Pack to a l		VIKB	

Figure 2.4: Login page of E-learning SMK Baling



If user is new to the website, users have to register first in order to use this system.

Figure 2.5: Homepage of E-learning SMK Baling

This system is developed for all type of Malaysia student, starts from UPSR to STPM. This site contains past year question from almost all the state in Malaysia.

🐺 Muat Tur Teda virus d	run Sekarang		3,733 muat turun		ih: roszelan sertai: 2 tahun y	ang lalu
会会会会 atings					Haritar Mepei Per	thed
				Upload to 4sl	hared	
	Jenis fait	File 2040 KP		-	Drewers	Mustanika
	Tolah dimuat naik-	2009-09-16			Diowse-	Muat halk ¥
	Terakhir dimuat turur	r 2010-04-04				
	Komen:	3		7		Alth Katuar Ma
				SHOO	T 5 AIR	PLANES
				C.C.C.	-	
				1.5		

Figure 2.6: Download file for E-learning SMK Baling

The main objective of E-Learning SMK Baling is to help student get past year question from all over Malaysia. Anyone can upload file and share their materials after they registered. It was created for all type of student starting from PMR, SPM and STPM. There is exercise post by the school teacher where anyone can download and do the exercise. The E-Learning SMK Baling looks more like; it is created for the school student of SMK Baling but can be access by anyone whom interested in getting information about result and past year. It acts more like a blog but it is a website.

2.2.3 Comparison of the Existing System

Adaptive E-learning system	Availability	Version or language available	Special feature provided
E-Learning for biology	For all user	English	User will be able to view notes and do quiz. It is more to overseas studies. Not dynamic and doesn't have download and upload function.
E-Learning SMK Baling	Registered user	English, Malay	Able to integrate to the entire user. Users are able to download and upload any learning materials they can share with. More to Malaysia school based web. Doesn't have quiz function.

Table 2.1: Comparison of the Existing System

2.3 Programming Tools

There are many tools can be used to create dynamic and interactive web pages. HTML, PHP and ASP.NET is the most popular programming tools for develop web pages.

2.3.1 PHP [1, 2]

PHP (PHP: Hypertext Pre-processor) is a widely-used Open Source generalpurpose scripting language that is especially suited for Web development and can be embedded into HTML. PHP is a very fast programming language, and very easily can be understand than other programming languages.

The PHP code is controlled by a web server which includes a PHP processor module, which also generates the output web page: PHP commands can be embedded directly into an HTML source document rather than calling an external file to process data. It has evolved to have a command-line interface usage and in mobile application which are standalone system.

PHP distinguish it from such client side JavaScript code that is executed on the server. If you have the same script on your server, the client will receive the results of running that script, with no way of determining what the underlying code. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve.

The best things in using PHP are that it is very easy for a newcomer, but offers advanced features for a professional programmer. Do not be afraid reading the long list of PHP's features. You can jump in, in a short time, and start writing simple scripts in a few hours.

2.3.2 HTML [2]

The most basic of all is HTML programming. HTML, which stands for Hypertext Mark-up Language, is the predominant mark-up language for web pages. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraph, lists, links, quotes and other items. It allows images and objects to be embedded and can be used to create interactive forms. It is written in the form of HTML elements consisting of "tags" surrounded by angle brackets within the web page content. It can embed scripts in languages such a JavaScript which affect the behaviour of HTML Webpages.

2.3.3 Programming C [3, 20]

Programming C is a general-purpose programming language. It has been closely associated with the UNIX operating system where it was developed, since both the system and most of the programs that run on it are written in C. C provides the fundamental control flow constructions required for well-structured programs: statement grouping, decision making (if-else), selecting one of a set of possible values (switch), looping with the termination test (while, do, break). It is widely used programming languages of all time and there are very few computer architectures for which a C compiler does not exist.

2.3.4 Java script [4]

JavaScript is an implementation of the ECMAScript language standard and is typically used to enable programmatic access to computational objects within a host environment. It can be characterized as a prototype-based object-oriented scripting language that is dynamic, weakly typed and has first-class functions. It is also considered a functional programming language like Scheme because it has closures and supports higher-order functions.

2.3.5 Comparison between Programming Languages

Comparison	HTML	РНР	Programming	JavaScript
between			С	
Programming				
Languages				
Features	High	Recognized	Higher security	High security
Security	security	safety	level	
		performance		
Platform	Multiplatfo	Multiplatform	Multiplatform	Multiplatform
incompatibility	rm			
Operating	Higher	High	Low	Higher
efficiency				

 Table 2.2: Comparisons between Programming Languages

After compare with four best programming language, I choose HTML and PHP to do my project. This is because the HTML and PHP language have high security and have multiple platforms. The HTML languages also have high efficient operating system. If we come all of four programming the best choice is HTML and PHP.

2.4 Technique

System can be developed by using different technique. Technique that I have study is mobile application and web application.

2.4.1 Mobile Application

Mobile applications are speedily developing division of the worldwide mobile market. It is application that runs on mobile devices. Many mobile applications such as SMS/MMS music player are preinstall on mobile device.

They have emphasized about the graphical user interface (GUI) because it is playing an important part in development of application. Developers must be able to discover the pros and cons of the design. The usability of the mobile environment is important to improve the Development. The appearance of the buttons in screen playing particular attention in attracting customer to satisfied in using the application [6].

The mobile telecommunication industry has been a highly competitive. Developing mobile application is not that easy because of the specific constraints of mobile environment. The constraints that mention before are limited capabilities and rapid evolution of terminal devices, various standards, protocols and network technologies, operate on a variety of different platforms, specific need of mobile terminal users and strict time to market requirements [5]. It is more concern on physical characteristics such as size, weight, display size, data input mechanism and expandability. There also technical characteristics including processing power, memory space, battery capabilities and the operating system.

2.4.2 Web Application

A web application is an application that is invoked with a web browser over the Internet. It uses a web browser as a client. Web application development requires agility, the use of standard components, interoperability and close attention to user needs.

Web-based applications are easy to use and can be implemented without interrupting your existing work process. Whether you need a content managed solution or e-commerce systems, we can develop a customized web application that fulfils your business requirements [10].

2.4.3 Comparison between web application and mobile application

A mobile application is software written for mobile devices that performs a specific task, such as game, calendar and music player. While, a web application is one in which all or some parts of the software are downloaded from the web each time it is run. The advantage of web application is lower costs; updates also can be made easily and so on. Everybody can have this application because can access to this application if there is internet. But mobile application is not like that because only certain people can have the application depends on their type of mobile. On the other hand, mobile application can reach user earlier than web application.

Features	Web Application	Mobile Application
Operating system	Windows, Linux	Symbian, Android,
		Windows mobile, Mac OS,
		Blackbery
Device used	Computer	Mobile
Screen size	Bigger	Smaller
Capability of information	All information included	Limited information

Table 2.3: Comparison between web application and mobile application

2.5 Database [11, 12]

A database is a prepared compilation of records or data that is stored in a computer system. Besides storing data, a database should be able to offer a way for other computer programs to update desired pieces of data. In order to have a highly efficient database system, it needs to be incorporated with a program that manages the queries and information stored on the system. This is usually referred to as DBMS or a Database Management System. There are several common types of databases. Each type of database has its own data model. They are the Flat Model, Hierarchical Model, Relational Model and Network Model.

2.5.1 Structured Query Language (SQL)

The Structured Query Language (SQL) is a relational database language. It is a medium which is used to communicate with DBMS. SQL commands consist of English like statements which are used to query, insert, update and delete data. It makes SQL easier to learn and understand [13]. Commercial database management system allows SQL to be used in two distinct ways. First, SQL commands can be typed at the command line directly. The DBMS interprets and processes the SQL command immediately and result rows that are retrieved are displayed. This method of processing is called interactive SQL. The second method is called programmatic SQL [14].

2.5.2 MySQL Database

MySQL is a relational database management system (RDBMS) based on SQL. It was released in January 1998. MySQL is now one component of parent company MySQL AB's product line of database servers and development tools. Many Internet start-ups became interested in the original open source version of MySQL as an alternative to the proprietary database systems from Oracle, IBM, and Informix. MySQL is currently available under two different licensing agreements which is, free of charge under the GNU General Public License (GPL) open source system or through subscription to MySQL Network for business applications [15].

2.5.3 Microsoft SQL Server [16, 17]

Microsoft SQL Server is an application used to create computer databases for the Microsoft Windows family of server operating systems. It provides an environment used to generate databases that can be accessed from workstations, the web, or other media such as a personal digital assistant (PDA) [16]. Its primary query language is Transact-SQL. Transact-SQL is an implementation of the ANSI/ISO standard Structured Query Language (SQL) used by both Microsoft and Sybase [16].

2.5.4 Comparison between MySQL and MS SQL Server

	MySQL	Microsoft SQL Server
Developer	MySQL AB	Microsoft Corp.
Open-source vs.	MySQL is an extensible,	Limited to a Sybase-derived engine.
Proprietary	open storage database	SQL Server is known to work better
•	engine, offering multiple	with other Microsoft products.
	variations such as	-
	Berkeley DB, InnoDB,	
	Heap and MyISAM.	
Licensing	MySQL is an open-	The best way to obtain a
	source system under the	developer's license is to buy a
	GNU General Public	license for the Microsoft Developer
	License. Developers can	or Microsoft Visual Studio suite.
	use it at no cost as long as	Both provide a free SQL Server
	the associated projects are	license for development use.
	also open-source.	
Technical Differences	Doesn't offer full support	Considered a complete relational
	for foreign keys.	database.
Performance	Uses little disk space,	Complexity and the hogging of
	memory and CPU.	resources in the way of storage and
	Therefore, it gives a good	memory, which leads to poorer
	performance.	performance.

Table 2.4: Difference between MySQL and MS SQL Server

Security	MySQL uses security	Has adequate security mechanisms
	based on Access Control	by default bearing user to follow
	Lists (ACLs) for all	the directions and keep the software
	connections, queries, and	updated with security patches.
	other operations that	
	users can attempt to	
	perform.	
Recovery	Power outrage could	SQL Server keeps track of the
	result in the corruption	process, even if the system
	and loss of critical data.	unexpectedly shuts down.

I prefer to choose MySQL as database compares Microsoft SQL Server. MySQL use little disk space, memory, and CPU. Therefore it gives a good performance compare Microsoft SQL Server which have complexity performance.

2.6 Web server

Web servers are computers that deliver (serves up) web pages. Every web server has an IP address and possibly a domain name. Any computer can be turned into a Web server by installing server software and connecting the machine to the Internet. There are many Web server software applications, including public domain software from NCSA, Apache and commercial packages from Microsoft, Netscape and others [18].
2.6.1 Apache

Apache is a software foundation that develops and provides open source software that is meant to run web servers. Their primary product is HTTP server which is the most popular HTTP server in use today. Apache is totally free of charge [19].

2.6.2 XAMPP

XAMPP is a free and open source cross-platform web server solution stack package. It consisting mainly of the Apache HTTP Server, MySQL database and interprets for scripts written in the PHP and programming languages. XAMPP is an easy to install Apache distribution containing MySQL, PHP [18].

2.7 Software Development Methodology

A software development methodology in software engineering is a framework that used to structure, plan and control the process of developing an information system. There is various software development approaches defined and designed which are used during the development process of software, these approaches are also referred as "Software Development Process Models". Each process model follows a particular life cycle in order to ensure success in process of software development. There are many claims about one development model is better than the others [20]. In this review there are three well known software process model to discuss and compare which are Waterfall Model, Rational Unified Model and Agile Model. However the discussion is limited to the important characteristic of the process model.

2.7.1 Waterfall Model

The Waterfall is one of the well-known examples of a software engineering methodology. It composed into the stages of system requirements, software requirements, preliminary and detailed design, implementation, testing, operations, and maintenance [17].



Figure 2.7: Waterfall Model

Figure 2.11 depict the phases in the traditional Waterfall model [18]. All these phases are cascaded to each other so that second phase is started as and when defined set of goals are achieved for first phase. Following are the stages involved in Waterfall model.

- i. Requirement Analysis: All possible requirements of the system to be developed are captured in this phase. Requirements are set of functionalities and constraints that the end-user (who will be using the system) expects from the system.
- ii. Software Design: Before a starting for actual coding, it is highly important to understand what we are going to create and what it should look like. The requirement specifications from first phase are studied in this phase and system design is prepared.
- iii. Implementation and Unit Testing: On receiving system design documents, the work is divided in modules/units and actual coding is started. The system is first developed in small programs called units, which are integrated in the next phase.
 Each unit is developed and tested for its functionality. Unit testing mainly verifies if the modules/units meet their specifications.

- iv. Integration and System Testing: As specified above, the system is first divided in units which are developed and tested for their functionalities. These units are integrated into a complete system during Integration phase and tested to check if all modules/units coordinate between each other and the system as a whole behaves as per the specifications.
- v. Operations and Maintenance: Generally, problems with the system developed, which are not found during the development life cycle come up after its practical use starts, so the issues related to the system are solved after deployment of the system. Not all the problems come in picture directly but they arise time to time and needs to be solved. Hence this process is referred as Maintenance.

The waterfall model, as described above, offers numerous advantages for software developers. Following are the advantages of Waterfall model [18]:

- i. The staged development cycle enforces discipline: Every phase has a defined start and end point, and progress can be conclusively identified through the use of milestones by both vendor and client. The emphasis on requirements and design before writing a single line of code ensures minimal wastage of time and effort and reduces the risk of schedule slippage, or of customer expectations not being met.
- ii. Help improves quality: Getting the requirements and design out of the way first also improves quality. It is much easier to catch and correct possible flaws at the design stage rather than at the testing stage.
- iii. Aid efficient knowledge transfer: Because the first two phases end in the production of a formal specification, the waterfall model can aid efficient knowledge transfer when team members are dispersed in different locations.
- iv. Easy to understand process: The stages in waterfall model are much easier to understand. This will help the company to reduce cost as their staff does not require additional training just to understand the process flow.

2.7.2 Agile Model [18, 19]

Most promote development iterations, teamwork, collaboration, and process adaptability throughout the life-cycle of the project. There are many specific agile development methodologies for example Scrum, XP and Crystal Orange. Agile methods break tasks into small increments with minimal planning, and don't directly involve long-term planning. Iterations are short time frames that typically last from one to four weeks. The term "agile" leads to a development process that is more responsive to customer needs compared traditional methods.

- i. Reduce the cost of change. In agile, multiple iterations may be required to release a product or new features. Each interaction is worked on by a team through a full software development cycle, including planning, requirements analysis, design, coding, unit testing, and acceptance testing.
- ii. Emphasis on coding. Agile argue that the only truly important product of the system development process is code. Coding can be drawing diagrams that will generate code, scripting a web-based system or coding a program that needs to be compiled.
- iii. Emphasis on testing. Testing is one of the core roots of agile development. Both acceptance tests and unit tests are used. Unit test should be automated tests that test the code. The programmer will try to write as many tests he or she can think of that might break the code he or she is writing; if all tests run successfully then the coding is complete.
- iv. Listening to customer needs. Communication between the customer and programmer need to be established. The programmer has to try to understand the business problem, and to give the customer feedback about his or her problem, to improve the customer's own understanding of his or her problem.
- v. Software Architecture Design is optional. Some of the agile methodology did not emphasis on design. Extreme Programming (XP) for example, believe that from the point of view of simplicity, one could say that system development doesn't need more than coding, testing and listening. If those activities are performed well, the result should always be a system that works.



Figure 2.8: Agile methodology processes.

2.7.3 RAD (Rapid Application Development) [19, 7]

RAD was a response to non-agile processes developed in the 1970s, such as the Waterfall model. The problem with previous methodologies was that applications took so long to build that requirements had changed before the system was complete, often resulting in unusable systems. Starting with the ideas of Barry Boehm and Scott Shultz, James Martin developed the Rapid Application Development approach during the 1980s at IBM and finally formalised it by publishing a book in 1991.



Figure 2.9: RAD process.

Figure 2.13 depict the phases in the RAD. All these phases are cascaded to each other so that second phase is started as and when defined set of goals are achieved for first phase. Following are the stages involved in RAD model.

- i. Analysis: The Requirements Planning stage consists of a review of the areas immediately associated with the proposed system. This review produces a broad definition of the system requirements in terms of the functions the system will support. The deliverables from the Requirements Planning stage include an outline system area model (entity and process models) of the area under study, a definition of the system's scope, and a cost justification for the new system
- **ii.** Design: The User Design stage consists of a detailed analysis of the business activities related to the proposed system. Key users, meeting in workshops, decompose business functions and define entity types associated with the system. They complete the analysis by creating action diagrams defining the interactions between processes and data. Following the analysis, the design of the system is outlined. System procedures are designed, and preliminary layouts of screens are developed. Prototypes of critical procedures are built and reviewed. A plan for implementing the system is prepared [7].

- iii. Construction: In the Construction stage, a small team of developers, working directly with users, finalizes the design and builds the system. The software construction process consists of a series of "design-and-build" steps in which the users have the opportunity to fine-tune the requirements and review the resulting software implementation. This stage also includes preparing for the cutover to production. In addition to the tested software, Construction stage deliverables include documentation and instructions necessary to operate the new application, and routines and procedures needed to put the system into operation [7].
- iv. Testing: The testing provide, independent information about the quality of software and risk of its failure to users [7].
- v. Deployment: The deployment stage involves implementing the new system and managing the change from the old system environment to the new one. This may include implementing bridges between existing and new systems, converting data, and training users. User acceptance is the end point of the implementation stage [7].

2.7.4 Summary of Software Process Model

This section provides the brief comparison between Software Process Model. That studied in this project. However the comparison is not done in deep manner, rather the compare about the usage and common characteristic. Table 2.5 shows the comparison.

No	Characteristic	Waterfall	Agile	RAD
1.	Flow	Sequential and back step	Light/Small	Small
		between stage	Iteration	
2.	Easiness	Easy to understand	Easy to	Easy and clear to
		process	understand &	understand.
			emphasis on	
			teamwork	
3.	Requirement	Did not specify any	Based on user	Promotes strong
	& result	method	story and CRC	collaborative
			card. Architecture	atmosphere and

 Table 2.5: Comparison between methods

			is optional.	dynamic
				gathering of
				requirements
4.	Flexibility	It is not flexible enough	Fast development	Fast development
		to cater variable user	incremental	incremental
		requirement	process	process.
5.	Documentation	Emphasis of complete	Do not emphasis	Do not emphasis
		documentation on every	on documentation	on
		stage		documentation.
6.	Suggestion of	Suitable for project where	Suitable for huge	Suitable for
	usage	requirement is very well	project with huge	Project that have
		known and do not change	staff and deal with	to be developed
		frequently.	high risk issues.	in short time
				provided a strong
				cohesive team.

The main advantage is the backward scalability in Agile. Under waterfall approach we cannot change the decisions and implementations that we had made under the previous stages. If we want to make changes under waterfall we will have to build the entire project from the scratch once again. The flexibility to error check under any part of the development stage makes Agile more bug free and less erroneous as compared to Waterfall which can only test bugs at the end of the development module. **CHAPTER 3**

METHODOLOGY

3.1 Introduction

This chapter discusses the framework and approach taken to develop the system. It consists of type of methods and techniques from the analysis stage to the implementation stage of the system. It also discusses on the justification on method chosen, approach taken and the software that are used.

Biology e-learning system for SMK Sentul Convent is developed base on software Rapid Application Development (RAD). RAD is process used by the system analyst or system developer to develop this e-learning system which is planning, analysis, design and development, testing and implementation.

3.2 Planning

In this system, there have three type of user they are SPM Student, Teacher and Administrator. SPM Student and Teacher need to register as a member in order to log into system and access all the learning material and available function respectively.

Registered students are able to update their profile, post message, access the learning materials, take quiz or do exercises, download notes provided.

For teacher, they will be able to update their profile, upload learning materials, questions, replies the student message and view the student's profile.

Lastly, administrator is responsible to maintain and monitor activities by the Biology E-Learning System. Figure 3.1 shows the user hierarchy for this project and Figure 3.2 shows the use-case diagram for this system.



Figure 3.1: User hierarchy of Biology E-learning system

Figure 3.1 showing the user hierarchy for biology e-learning system that contain of three modules. It has two registered users which is student and teacher. The student and teacher need to register in order to use this system. Administrator is the one control the teacher registration. He/she approve or reject the teacher.



Figure 3.2: Use-case diagram of Biology E-learning system

Figure 3.2 is the use case diagram of biology e-learning system. It shows clearly what the teacher, student and administrator able to do in this system. According to the figure above, student can register, login, update or view profile, download notes, view learning material, post message, take quiz and do the exercise provided in the system.

3.3 Analysis

The requirement needed in assisting the development of for Biology E-Learning system is shown below. The requirements are divided into hardware requirement and software requirement.

3.3.1 Hardware Requirement

Hardware requirement are hardware needed in aiding the development of this project.

HARDWARE	DESCRIPTION
Graphic Display	Monitor
Data Storage	Hard disk and External Disk
Use to read or write CD	CD R/RW Drive and CD-R/DVD-R
Project document printout	Printer and A4 Size paper
CPU	Intel Centrino Duo, 1.50 GHz, 2.00 GB of
	RAM
Data transfer or backup	Pen drive and External hard disk

Table 3.1: Hardware to develop Biology E-Learning System

3.3.2 Software Requirement

Software requirement are software needed in aiding the development of this project.

Software Computer	Version	Purpose
Microsoft Windows 7	Home Premium	Operating system to done
Ultimate		the project
Microsoft Visual Studio	2010	Project development
2008		
Xampp Server	2012	To build database
Microsoft Office Word	2007	Project documentation
Microsoft Power Point	2007	Project presentation
Rational Rose 2002	9.0.0.0	To create graphical
Enterprise Edition		representation
Mozilla Firefox	24.0	Information searching
Google Chrome	28.0.1500.72	Information searching
McAfee	13.5	Protection from virus
Nero	6.0	To burn project
		documentation
WinRar	12.0	File compressor
Dreamweaver	6.0	A software development
		kit that enables developers
		to create web application

Table 3.2: Software to Biology E-Learning system

3.4 Design and Development

Design phase is an important phase where a system is developed based on planning and requirement that has been discussed in previous chapters. System interface attracts customer and makes user interaction easier for customers. System coding plays a very important role in this implementation phase, where it is used to run the functions in this website. Developer has to that the website meet its requirement and objective and also to void system errors.

System design explains about the system design, database design techniques, user interface design, technique and related algorithm in detail that are applied for developing the Biology E-Learning System. This chapter also includes the Unified Modeling Language (UML) concepts such as sequence diagram, data dictionary and class diagram on the system development model used.

3.4.1 Sequence Diagram

Sequence diagram illustrates the object that participate in a use-case and the messages that pass between them over time for one use case. Sequence diagram depicts traces of messages passed between class instances.

In this report, the sequence diagram will focus on all three modules which consist of SPM Student use-case, Teacher use-case and Administrator use-case.

In SPM Student use-case (refer Figure 3.3), student who is a first time user need to register as a member before they can login into the Biology E-Learning System. Only the student whom registers will be able to access into the system. After register, they need to key in their user name and password to log into the system. Inside the system, students will be able to access learning materials, and take the quizzes or exercises provided in the system. Student can change their password, update profile, post question in discussion board, view message sent by teacher, download notes and search files in this system.

For the Teacher use-case (refer Figure 3.4), the teacher need to register for the first time in Biology E-Learning System but the registration will only be successful after the teacher have been approved by the administrator. Once the teacher has been approved by the admin, the teacher will be able to login into the system. In the system, the teacher can upload notes, past year questions, reply student question, post message and view student's profile.

In Administrator use-case (refer Figure 3.5), the admin need to login into the system and perform maintenance and monitoring activities. As for maintenance purposes, administrator has the privileges to accept or reject teacher's approval to avoid wrong information provided to the student. The administrator can view teacher profile, update and change password in admin profile.



Figure 3.3: Sequence diagram of SPM student use-case



Figure 3.4: Sequence diagram of teacher use-case



Figure 3.5: Sequence diagram of administrator use-case

3.4.2 Data Dictionary

Data dictionary is the central storehouse of information regarding the existing data in the system. A data dictionary contains a list of all the attributes, the number of fields, the names and types of each field. Table 4.1 shows the data dictionary for the Biology E-Learning System.

Table Name	Field Name	Data Type	Field Size	Key Type
		Data T/PC		
admin	adminID	Varchar	10	
	Name	Varchar	30	
	Password	Varchar	10	
	ContactNumber	Varchar	10	
	Email	Varchar	40	
	Picture	Varchar	100	
studentinfo	Name	Varchar	30	
	IC_No	Varchar	12	
	Gender	Varchar	6	
	ContactNumber	Varchar	10	
	Email	Varchar	40	
	Username	Varchar	20	Primary
	Password	Varchar	20	
	ConfirmPassword	Varchar	20	
teacherinfo	TeacherID	Varchar	5	Primary
	Name	Varchar	30	
	IC_No	Varchar	12	
	Gender	Varchar	6	
	ContactNumber	Varchar	10	

Table 3.3: Data dictionary of Biology E-learning system

	Email	Varchar	40	
	Password	Varchar	20	
	ConfirmPassword	Varchar	20	
	Approval	Varchar	10	
announcement	ID	Int	11	Primary
	Торіс	Varchar	50	
	Message	text		
	Name	Varchar	30	
	Date	Varchar	10	
discussion	ID	Int	11	Primary
	Message	text		
	Username	Varchar	20	
	Date	Varchar	10	
easv	easvID	Int	11	Primary
	Ouestion	longtext		
	riahtAns	text		
	wrongAns1	text		
	wrongAns2	text		
	wrongAns3	text		
	rAnswer	text		
medium	mediumID	Int	11	Primary
	Question	longtext		
	rightAns	tevt		
	wrongApe1	tevt		
	wrongAps2	tavt		
	wrongAnsz	lext		

	wrongAns3	text		
	rAnswer	text		
hard	hardID	Int	11	Primary
	Question	longtext		
	rightAns	text		
	wrongAns1	text		
	wrongAns2	text		
	wrongAns3	text		
	rAnswer	text		
exerciseone	EOneID	Int	11	Primary
	question	mediumtext		
	rightAns	text		
	wrongAns1	text		
	wrongAns2	text		
	wrongAns3	text		
	rAnswer	text		
exercisetwo	ETwoID	Int	11	Primary
	question	mediumtext		
	rightAns	text		
	wrongAns1	text		
	wrongAns2	text		
	wrongAns3	text		
	rAnswer	text		
exercisethree	EThreeID	Int	11	Primary
	question	mediumtext		
			1	

	rightAns	text		
	wrongAns1	text		
	wrongAns2	text		
	wrongAns3	text		
	rAnswer	text		
upload	id	Int	11	Primary
	name	Varchar	30	
	type	Varchar	30	
	size	Int	11	
	content	longhloh		
	TeacherID	Varchar	20	
	Data	Varchar	10	
	Username	Varchar	20	1
quizscores	Username	varchar	20	
	Score	Int	11	
	Date	Varchar	10	
scores	scoreID	Varchar	20	Primary
	Username	Varchar	20	
	Score	Int	11	
	taken	Int	11	
	Date	Varchar	10	
images	image_Id	Varchar	100	Primary
	adminID	Varchar	20	

3.4.3 Development

Development means turning the system specification into a functional system by development tools. In this phase, all three modules stated in design phase will be coded by using Adobe Dreamweaver CS5. Xampp 1.73 used as database to integrate with the system so that the system may retrieve and update data to the database.

	ALLYING BIQFOGY IS	
Some FUN Notes	WELCOME TO THE BIOLOGY WEBSITE	
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet.		STUDENT
# Blood functions as a transport system and a		TEACHER
defence system against diseases.		ADMIN
# Oxygen is transported to all body cells in the form of oxyhaemoglobin .	Student Login	
#Carbon dioxide is transported in the form of bicarbonate ions in	Username :	
carbaminohaemoglobin in erythrocytes.	Password :	
# Humans have a closed and double circulatory system.	New User? Register Now	
# Fish have a single and closed circulatory	Forgot your password? Click here	
system, whereas <i>insects</i> have an open circulatory system.	"We learn more by looking for the answer to a question ar than we do from learning the answer itself"	nd not finding it
Copyright	© 2015. All rights reserved. BIOLOGY LEARNING SYSTEM.	

Phase 1- Interface Design

Figure 3.6: Student main login page

Figure 3.6 is the screenshot of student login page. This is the homepage for student module.

	ALL LOUGH LICE AND	
Some FUN Notes	BIOLOGY WEBSITE	
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet.		STUDENT
# Blood functions as a		TEACHER
defence system against diseases.		ADMIN
# Oxygen is transported to all body cells in the form of oxyhaemoglobin.	Teacher Login	
# Carbon dioxide is transported in the form of	Teacher ID:	
bicarbonate ions in blood plasma and	Password :	
carbaminohaemoglobin in erythrocytes.	Login	
# Humans have a closed and double circulatory system.	New User? Register Now Forgot your password? Click here	
# Fish have a single and closed circulatory system, whereas insects have an open circulatory system.	"Education is an admirable thing, but it is well to remember from ti that nothing that is worth knowing can be taught"	me to time
Copyright	©2015. All rights reserved. BIOLOGY LEARNING SYSTEM.	

Figure 3.7: Teacher login page

Figure 3.7 is the screenshot of teacher login page. This is the homepage for teacher module.

	IN BILLE	
Some FUN Notes	WELCOME TO	от
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet.	2	STUDENT
#Blood functions as a	No.	TEACHER
transport system and a defence system against diseases.	admin	ADMIN
# Oxygen is transported to all body cells in the form of oxyhaemoglobin.		
# Carbon dioxide is	Admin ID :	
transported in the form of		
bicarbonate ions in	Password :	
carbaminohaemoglobin	1.000	
in erythrocytes.	Login	
# Humans have a closed and double circulatory system.	"The man who does not read good books has no advantage over the cannot read them."	e man who
# Fish have a single and closed circulatory system, whereas insects have an open circulatory system.		
Copyright ©	2015. All rights reserved. BIOLOGY LEARNING SYSTEM.	

Figure 3.8: Main login page of admin

Figure 3.8 shows the homepage of admin in the biology e-learning system

Phase 2 – Database Design

Database provides a framework that eliminates data redundancy, supports real time and dynamic environment. Database Management System (DBMS) is a collection of tools, features and interfaces that enable users to add, update, delete, manage access and analyze the contents of a database. The UML class diagram is used to illustrate the database design for the Biology E-Learning System, the relationship between users are determined and normalized accordingly.



Figure 3.9: UML class diagram of Biology E-learning system

This figures continuation is at next page so its figure number will be written together with the second figure.



Figure 3.10: UML class diagram of Biology E-learning system

3.5 Testing

After finishing each phase, the system is tested over and over again to find out any error which may cause the system fail to function perfectly. All the coding and interface will be tested so that the system may function perfectly. Any bug discovers in this phase is debugged and tested again to full fill the system requirement. The test procedure shown in figure 3.11



Figure 3.11: Phase of interface and database

3.6 Implementation

System development and implementation phase includes the development or construction of the system, testing, and installation. This phase is implementing the system development into real system. It will be done by implementing the code for the user interface, databases, organization structure, functionality and web security.

3.7 Summary

The conclusions emanating from the findings of this deliberation are suggestive of the fact that Rapid Application Development has brought about a new dimension in the software system development. The main points to be noted include the following:

- i. RAD has successfully achieved the objective of reducing costs on project whilst not compromising on quality by effective reducing the project time-frame and the number of people involved in such project.
- ii. It has also been successful in encouraging the involvement of customers in the entire process of its development lifecycle. This proves advantages in many respects but most importantly this improves the development process by ensuring full acceptance from the customer whilst the system is still being created.
- iii. RAD has also demonstrated strength in being able to speed up the development process by appropriately fusing its methodology, people, management and high tech computer aided tools.
- iv. RAD has also proven to have challenges. Amongst these challenges are the fact that it tends to learn too much on emphasizing more on delivery deadline and then compromising on other features that could have been added if there was not deadline set.

CHAPTER 4

IMPLEMENTATION

4.1 Introduction

This chapter is devoted to the implementation of database, interface and coding into the system.

4.2 Database Implementation

The e-learning Biology system for SMK Sentul Convent needed database to store the student record and study needed database to store the student record and study material for student. It is using pHp MyAdmin as the database management system. There are one database is uses in this system which are name biology sql which is shown from figure 4.1 until figure 4.4.

phpMuAdmin	- Server 12/1011 - Bintatase failing		
23984	🖗 Structure 📄 SQL 🧠 Search 📋 Query 🔛 Export 🔜 Import	🌶 Operations 🐮 Privileges 👌	Routines 🛞 Events 🔻 More
(Recent tables)	Table . Action Ro	ows @ Type Collation Siz	e Overhead
Service and the second	📋 admin 👔 Broans 📈 Structure 💘 Search 🙀 Innet 👹 Empty 🥥 Drop	⇒ knoD8 latin1_exedish_ci ≥	418 -
- biology	💼 🔄 anexescencent 🔄 Brown 🎉 Sturtum 💘 Search 🙀 Intert 👹 Erich 🥥 Dop	-i hered B latert swedish zi 🛛 14	- 418
Nes	🔋 discussion 🔠 Brone 📈 Sturtum 💘 Search 🕌 Inset 👹 Empty 🤤 Drop	4 intoD8 latin1_swedsh_ci 14	- 61
+- amouncement	😳 ausy 🔄 Bonne (e Statter i g Santh Belinat (g Ernte i Dop	4 indians taint suedeb ci 20	428 -
decusion	😸 exerciseone 🔠 Brokke 🖉 Shurbun ke Search 🙀 Inset 👹 Empty 🤤 Dop	-17 InnoOS latin1_seedsh_ci 18	r10 -
eaty	📋 wertinettene 🔄 Bronne 🖉 Stortere je Search 🙀 innet 👹 Errety 🥥 Dep	⇒ intol6 latr1_seedsh_p ⇒	- 818
evertiseone	👩 exercisetes 🔠 Stores 🖗 Stores 🖗 Search 🙀 Inset 👹 Empty 😝 Dop	4 hnol8 latint_evendeb_ci 14	128 · · ·
enercisettree	🔄 Ben Dittere je Sturtum it Search je Innet 👹 Erspt 🕥 Drop	⇒ insite tant_seeish_s ≈	K58 -
- fiet	📋 hard 🔄 Brooms 🖗 Stucture 💘 Search 🙀 Inset 👹 Empty 😝 Drop	⇒ innoD8 latin1_swedish_ci ⇒	13 -
- tart	😑 imagen	4 innole latest seedships 14	128 -
mages	📋 learning 🔄 Broose (v) Structure int Search (v) Inited (v) Empty 🥥 Drop	⇒ knoCB laint_swedsh_s = 20	128 -
learing	😳 medium 🔄 Bronne (e Statter ig Seath Seithnet @Erut) @Dop	≪ kendΩB tatel_swedsh_ci ⇒	128
neoun autoroma	📋 quizzcoves 🔄 Bronse 💥 Sturture 💘 Search 🙀 Inset 👹 Empty 🥥 Dop	-40 knots late1_seedsh_c =	- 60
-Treb	innel Bonne & Startum & Search fei meet @Erente @Dep	≠ InnoD6 latin1_swedish_co ⇒	428 -
SCORE	😑 scores 🔛 Brows 🖗 Sturture 💘 Search 🙀 Inset 👹 Empty 🥥 Drop	-4 involl6 latin1_evendsh_pi 24	- 40
	🔄 studeelielo 🔄 Bronn y Stuttum is Search Billinent Millinet (Dop	< Innote tatint eventsh to 19	128 -
leachesnic	Bosta y Statum e Seatt \$2 mot # Enut @ Dag	-1 involte latin1_swedeth_0 = 14	108
e bloes	inter a state in Stat	→ innol@ later1_swedsh_ci 1.4	rca -
cácal	18 tables Sum	417 inno Bi latini swedish ci 1.7	43 4.8
j information_schema j library	1_ © Deck Al With selected •		
j minproject j mjod	🔒 Pint view 🜉 Data Dictionary		
per set	• I Course table		

Figure 4.1: Database of overall Biology e-learning system

			ine seco					
SELECT * FROM studentin LIMIT 0 , 30	lo ⁻							
						- Profilery	[loine][Edt][Edt][Edt][Edt][Edt][Edt][Edt][Edt	gtain SQL 11 Create PHP Code 11 Re
Show - Start mar	0 100	niber of ma	- 10 IF	anders weev 100 mes				
				www.endocodill				
+ Options								
Options	IC_No	Gender	ContactNumber	Email	Username	Password	ConfirmPassaurut	
+ Options Name	IC_No 910420104324	Gender	ContactNordier	Email	Username	Password	ConfirmPassword	

Figure 4.2: Database of student

SELECT FROM	* teacherinfo' 2 _ 30								
							Profiling [him	1158111	Explain SQL] [Create PHP Code] [P
1000	Fred and Th	1		Table and the					
Show	: Start row 0	Number of 19	Nes: 30	Headers e	very 100 spec				
Show Options	: Start row 0	Number of 10	945 <u>30</u>	Headers e	very 100 rows	1			
Show Options Teacher(D	2 Start row D	Number of ro	Gender	Headers e	ernall	Password	ConfirmPassword	Approval	
Show Optors TeacherID C1234	s Start row 0 Nome Pri Zala bi Tajuddin	Number of rt IC_No 870909654321	Gender female	Headers e ContactNumber 0164401462	ernall zała@gruai.com	Password sagesbitz	ConfirmPassword sagestiftz	Approval	
Show Optors TeachertD C1234 A1212	s Start row 0 Name Pri Zaila bt Tajuddin Alimed Salith Hadi	Number of ro IC_No 870909664321 573433500000	Gender female Male	Headers e ContactNumber 0164401452 0173850450	Email Zala@grail.com Sumse@yahoo.com	Password sagesbitz andasd	ConfirmPassword sagesbitz andasd	Approval approved approved	

Figure 4.3: Database of teacher

Showing rows 0 - 0 (1 total. Query took 0.0100 sec)	
SELECT * FROM admin LIMIT 0 , 30	
	Profiling [Inline] [Edit] [Explain SQL] [Create PHP Code] [Refresh
Show : Start row 0 Number of rows 30 Headers every 100	mas
Options	
dmin/D Name Password ContactNumber Email Picture	
dmin Ahmed admin1234 0173890450 sunrise@yahoo.com admin.jpg	

Figure 4.4: Database of admin

4.2.1 Database and server connection

The Biology e-learning system needs a server to host and link to the database. It using Apache Server as local host and using PHP and MySQL code to connect the system with server and database as shown in figure 4.5 until 4.7

```
<?php
//learning.php script for connecting the database
Shostname_biology = "localhost";
Susername_biology = "root";
Spassword_biology = "biology";
if(!($db = mysql_connect($hostname_biology,$username_biology,$password_biology))
{
    die("Error connecting to mysql");|
}
else
{
    if(!(mysql_select_db("$database_biology", $db)))
    {
        die("Error connecting to db");
    }
?>
```



```
K?
function dbconnect()
{
    require("Connections/learning.php");
    global Shostname_biology = "localhost", Susername_biology = "root", Spassword_biology = '', Sdatabase_biology = "biology";
    mysql_connect(Shostname_biology,Susername_biology,Spassword_biology);
    @mysql_select_db(Sdatabase_biology) or die ("Unable to select database !");
}
function query_db(Squery)
{
    dbconnect();
    return @mysql_query(Squery);
}
```



```
k?php
session_start();
include("Connections/learning.php");
?>
<html>
<head>
<script>
```



4.3 System Interface and Implementation

In this section, all screenshots of student, teacher, and admin modules will be shown.

4.3.1 Student Module

In this report, starting from figure 4.8 until figure 4.35, it's all about student module. The explanations of screenshot have been explained below the screenshot.

	<u>a kandi</u>	NG RFO	
	合	E E	
	STUDENT	REGISTERAT	ION
Name			(max 30)
IC Number			(only integer) eg: 870908105125
Gender	Male	© Female	
Contact Number			(only integer) eg: Tel = 0123356779
Email			(eg: abc@yahoo.com)
Username			(min 6,max 15)
Password			(min 6, max 15)
Confirm Password			(min 6, max 15)

Figure 4.8: Student registrations page

Figure 4.8 shows the registration page of student. The student needs to fill up all the textboxes in order to register successfully.

		FEATION
Name		(max 30)
IC Number	IC Number is required.	(only integor) og: 870908105125
Gender	⊛ Male ◎ F	emale
Contact Number	Contact Number is required	(only integer) eg: Tel = 0123356779
Email	Email is required.	(eg: abc@yahoo.com)
Username	Username is required.	(min 6,max 15)
Password	Password is required.	(min 6, max 15)
Confirm Password	Confirm Password is require	(min 6, max 15)
Copyright	Register	Back

Figure 4.9: Validation for registration page

Figure 4.9 is the screenshot of error message shown in the system if the user forgets to key in any one of the field or all.

		FACT TO THE
Name	STUDENT REGISTERA	TION (max 30)
IC Number	910404085868	(only integer) eg: 870908105125
Gender	© Male ● Female	
Contact Number	0149057675	(only integer) eg: Tel = 0123356779
Email	narayani.kanesan@yahoo.com	(eg: abc@yahoo.com)
Username	narayani	(min 6,max 15)
Password		(min 6, max 15)
Confirm Passwor	d Confirm password must match wi	(min 6, max 15) ith above.
	Register Back	
Convrigh	t © 2015 All rights reserved BIOLOG	Y LEADNING SYSTEM



Figure 4.10 is the screenshot for the error message if the password and confirm password is not the same.

II II I	7 27	THEY DE	FACT IF TTY	
		X 1		
New		STUDENT REGISTERA	ION	
INAL	пе	INAKATANI	(max 30)	
IC	Number	910404085868	(only integer) eg: 870908105125	
Ger	ıder	Male Female		
Cor	ntact Number	0149057675	(only integer) eg: Tel = 0123356779	
Em	ail	narayani.kanesan@yahoo.com	(eg: abc@yahoo.com)	
Use	rname	narayani	(min 6,max 15)	
Pas	sword	•••••	(min 6, max 15)	
Cor	nfirm Password	•••••	(min 6, max 15)	
		Register Back		

Figure 4.11: The Page will look like this if all requirements fulfilled

Figure 4.11 is the successful registrations because all the textbox was filled in.



Figure 4.12: Registrations success message

Figure 4.12 is the message box will appear if the registration successfully inserted into the database.

	LARTING BROKOGY IN FUL
Some FUN Notes	FORGET PASSWORD?? NOT TO WORRY, YOU STILL CA
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet. # Blood functions as a	Forget Password?
transport system and a defence system against diseases.	
# Oxygen is transported to all body cells in the form of oxyhaemoglobin.	
# Carbon dioxide is transported in the form of bicarbonate ions in blood plasma and carbaminohaemoglobin in erythrocytes.	Username :
# Humans have a closed and double circulatory system.	IC Number : Submit Back
# Fish have a single and closed circulatory system, whereas insects have an open circulatory system.	Click submit to get a new password
Сору	rright © 2015. All rights reserved. BIOLOGY LEARNING SYSTEM.

Figure 4.13: Forgot password page

Figure 4.13 is the screenshot of forgot password page. Users have to key in their username and password to get a new password.

	LING BIOLOGY IF FUL
Some FUN Notes	FORGET PASSWORD?? NOT TO WORRY, YOU STILL CAN RET
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet	
	Forget Password?
# Blood functions as a transport system and a	
defence system against diseases.	
# Oxygen is transported to all body cells in the form of oxyhaemoglobin.	
# Carbon dioxide is	
transported in the form	
of bicarbonate ions in blood plasma and	Invalid Information
carbaminohaemoglobin in erythrocytes.	Username :
# Humans have a closed	IC Number :
and double circulatory system.	Submit Back
# Fish have a single and closed circulatory system, whereas insects have an open circulatory system.	Click submit to get a new password
Copyright @	2015. All rights reserved, BIOLOGY FARNING SYSTEM.

Figure 4.14: Error page if the data entered was wrong

Figure 4.14 shows the error page if the user enters invalid username or password in the textbox.
	LITTLE BROKOGT LT FU
Some FUN Notes	ORD?? NOT TO WORRY, YOU STILL CAN RETRIEVE IT !
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet.	Forget Password?
# Blood functions as a	
transport system and a defence system against diseases.	
# Oxygen is transported to all body cells in the form of oxyhaemoglobin.	
# Carbon dioxide is transported in the form of bicarbonate ions in blood plasma and	
carbaminohaemoglobin in erythrocytes.	Username : <mark>magarita</mark>
# Humans have a closed and double circulatory system.	IC Number : 2147483647 Submit Back
# Fish have a single and closed circulatory system, whereas insects have an open circulatory system.	Click submit to get a new password
Copyright	2015. All rights reserved. BIOLOGY LEARNING SYSTEM.

Figure 4.15: If the data entered was correct

Figure 4.15 shows the correct data being entered in the system. If the data entered same in the database the message below will be shown.



Figure 4.16: New password number generated randomly for user

Figure 4.16 is the message box shown if the user enters the correct username and ic number. The system will generate a random number for the user to use temporarily until they change their password in the profile.

	LUTING BIQTOGY IN FU	
Some FUN Notes	GY WEBSITE	
# There are 3 types of blood cells, namely erythrocyte, leucocyte and platelet.		STUDENT
# Blood functions as a		TEACHER
transport system and a defence system against diseases.		ADMIN
# Oxygen is transported to all body cells in the form of oxyhaemoglobin.	Student Login	
# Carbon dioxide is transported in the form of bicarbonate ions in	Username : magarita	
blood plasma and carbaminohaemoglobin	Password : •••••	
in erythrocytes.	Login	
# Humans have a closed and double circulatory system.	New User? Register Now	
# Fish have a single and closed circulatory	Forgot your password? Click here	
system, whereas insects have an open circulatory system.	"We learn more by looking for the answer to a question and not f than we do from learning the answer itself"	inding it
Copyright ©	2015. All rights reserved. BIOLOGY LEARNING SYSTEM.	

Figure 4.17: After the registrations success, user able to login

Figure 4.17 shows the user enters the correct data to login into the system.



Figure 4.18: Main page of student module after successful login

Figure 4.18 is the screenshot of main page in student module. The student can choose any of the function buttons at left hand side.



Figure 4.19: Menu bar view

Figure 4.19 shows the screenshot for the menu bar. If the user clicks on discussion menu, the discussion menu has 2 submenus. User able to choose any action he/she wanted to do.

	EARNING BIOLOGY IN FUR
NAME: MAGESWARY USERNAME: magarita LOGGED IN: 11/05/2015	DISCUSS NEW TOPIC?
HOME	
FILE SHARE PROFILE	Message
NOTES	Post Reset
MESSAGE QUIZ	
LOGOUT	
Сор	rright © 2015. All rights reserved. BIOLOGY LEARNING SYSTEM.

Figure 4.20: Interface for post question in discussion board

Figure 4.20 shows the discussion board. The student can post a new question in the system.





Figure 4.21 is the screenshot of error message shown if the student post an empty field. Then the student writes a question in the field to show the message successfully updated in the database.

NAME:	MAGESWARY	10			1	
USERN	Ame: maganta	1D 8	hiiiiiii	Abmed	magarita	29-04-2015
LOGGED) IN: 13/05/2015	9	h	iiii	magarita	29-04-2015
	HOME			F	leply	
	DISCUSSION					
	FILE SHARE					
	PROFILE					
	NOTES					
	EXERCISE					
	MESSAGE					
	QUIZ					
	LOGOUT					
	Cop	pyright © 2015. A	ll rights reserved.	BIOLOGY LEAR	VING SYSTEM.	



Figure 4.22 shows the topic post by the all students. The user able to click the reply button to reply or answer the question post by other students.



Figure 4.23: Student Search file page

Figure 4.23 is the screenshot of search file interface. The students can enter the file name they want to find in the system.





Figure 4.24 shows the message pop up if the filename entered by user not found in the database.



Figure 4.25: Design for the result of search file found

Figure 4.25 is the screenshot of the view file. If the file name entered by the user match with the file name in database, it will be shown as above.

	NAME: PN ZAILA BT					
	USERNAME: magarita		Filenam	e	Teacher ID	Date
	LOGGED IN: 11/05/2015		<u>quiz1.doc</u>		C1234	11-05-2015
Save As		-		X	Search Another File	9
🚱 🔍 🕊 Desktop 🕨		▼ 4	earch Desktop	٩		
Organize 🔻 New folder			i ti V	• 0		
★ Favorites Coding Coding System Folder	fskkp System Folder	Cor Syst	m puter tem Folder			
Downloads Recent Places	FYP2 REPORT File folder	Inte 188	tiport Online Exams ernet Shortcut bytes			
Wind Wind Ibraries Microsoft Word 97 - 2003 Docum J Music S7.5 KB Prictures Videos						
IN Computer ▲ Local Disk (C:)						
File name: quizI (1)				•		
Save as type: Microsoft Word 97 - 2003 Document				•		
Hide Folders			Save	ancel		
		Copyright © 2	015. All rights rese	rved. BIOL	OGY LEARNING SYST	EM.

Figure 4.26: Download files uploaded by the teacher

Figure 4.26 shows the message box appears if the user clicks the file name to download the file. The user can choose to save or open the file.

NAME:	PN ZAILA BT		BIQTOGY	
USERNA	AME: magarita		YOUR PROFILE	
LOGGED	IN: 11/05/2015	Name	Mageswary	
		IC Number	2147483647	
	HOME	Gender	Female	
	DISCUSSION	Contact Number	0122512337	
	FILE SHARE	Email	mag@yahoo.com	
	PROFILE	Password		
	NOTEC	Retype Password		
	NUTES	Exercise One		
	EXERCISE	Exercise Two		
	MESSAGE	Exercise Three		
	QUIZ	Quiz		
	LOGOUT			
	Сору	right © 2015. All rights reserve	ed. BIOLOGY LEARNING SYSTEM.	

Figure 4.27: Student can view their profile

Figure 4.27 shows the profile information of the student. It is only can be viewed. No changes able to made in this page.

			BIQÉOGY	
NAME: T/ USERN/	: PN ZAILA BT AJUDDIN AME: magarita		UPDATE YOUR PROFILE	
LOGGED	IN: 11/05/2015	Name IC Number	Mageswary 2147483647]
	DISCUSSION	Gender Contact Number	Female 0122512337 eg: Tel = 60123356779	(only integer)
	FILE SHARE PROFILE	Email	mag@yahoo.com abc@yahoo.com)	(eg:
	NOTES EXERCISE		Save	
	MESSAGE			
	QUI2 LOGOUT			
	Сору	right © 2015. All rights reserv	ed. BIOLOGY LEARNING SYSTEM.	

Figure 4.28: Student can update their profile

Figure 4.28 is the page for the user to edit their information. They only able to edit contact number and email because other information is standardize.

			BILLING	
NAME: T/ USERN/	PN ZAILA BT AJUDDIN AME: magarita	U	IPDATE YOUR PROFILE	
LOGGED	IN: 11/05/2015	New Password		(min 6, max 15)
	HOME	Re-type Password		(min 6, max 15)
	DISCUSSION		Save	
	FILE SHARE			
	PROFILE			
	NOTES			
	EXERCISE			
	MESSAGE			
	QUIZ			
	LOGOUT			
	Сор	yright © 2015. All rights reserved.	BIOLOGY LEARNING SYSTEM.	

Figure 4.29: Student can change password

Figure 4.29 shows the page for the user to change their password. User need to type the same password twice in order to save the password successfully.



Figure 4.30: Chapter notes provided in the system

Figure 4.30 shows the notes available in the system. This is the example notes of chapter 1. The system contains 3 chapters with short and easy to understand notes.

A A A A A A A A A A A A A A A A A A A	
Chapter One	
 What is the name of process responsible for the movement of reducing sugar molecules into the surrounding water? Diffusion Absorption Active transport Osmosis 	
 2 Which substance enters plant cells by active transport? > Nitrate ions > Carbon dioxide > Oxygen > Water 	
 Which processes can take place in a root hair when oxygen is not available? Diffusion and osmosis Active transport only Diffusion only Active transport and osmosis 	
 4 Osmosis is referred to diffusion of water glucose ions energy 	
 5 Which of the following is an example of diffusion in a plant? • Carbon dioxide from the air moving into a photosynthesis leaf • Ions moving into root hairs against a concentration gradient • Sugars in phloem moving from leaves to roots • Water in xylem moving from roots to leaves 	

Figure 4.31: Chapter exercise for student

Figure 4.31 is the screenshot for the exercise module in the system. Once the user click submits, marks will be evaluated and stored into the database.



Figure 4.32: Display student score for chapter one exercise

Figure 4.32 is the screenshot of marks shown to the student once they submit the exercise.

A A A A A A A A A A A A A A A A A A A
Chapter Two
 Organization of Skeletal Muscles Muscle Fibre Bundles Skeletal Muscles Cardiac Muscles Smooth Muscles
 2 The Adult Human Skeletal consists of 206 bones 158 bones 224 bones 315 bones
 3 What is Gaut? Gout is a joint inflammation (a kind of arthritis) caused by accumulation of uric acid. Gout is a type of bacteria Gout is caused by a chemical reaction in which crystals of uric acid Gout is a type enzyme
 4 What is Gaut? Gout is a joint inflammation (a kind of arthritis) caused by accumulation of uric acid. Gout is a type of bacteria Gout is caused by a chemical reaction in which crystals of uric acid is collected in the joints and concentrated Gout is a type enzyme
 5 Define sliding filament theory of muscle contraction. 6 Sliding Filament Theory of Muscle Contraction 7 Sliding of the thin filaments over the thick filament. 7 Filament theory which states that contraction of a muscle fiber takes place by the sliding 9 Mechanism of muscle contraction is best explained by the sliding filament

Figure 4.33: Chapter two exercise for student

Figure 4.33 is the screenshot of chapter exercise for chapter 2 in biology e-learning system.



Chapter Three

1 Cerebellum

- Evaluates the information and relays the need for coordinated movements back to the cerebrum
- Coordinating centre for body movements
- Then sends appropriate commands to the muscle
- It is responsible for many mental abilities

2 Whai is Medulla oblongata

- Regulates the internal body processes that do not requires conscious effort
- Reflex centre for vomiting, coughing, sneezing, hiccupping and swallowing.
- Important role in homeostatic regulation.
- Control centre of the endocrine system

3 What is The spinal cord and its function?

- Contain within the vertebral column
- In cross section, grey matter looks like a butterfly or the letter H
- Consist mainly of cell bodies of neurones
- Surrounded by white matter

4 Types of neurones

- Carry sensory information from receptor cell to the brain and spinal cord.
- carry information from the brain or spinal cord to the effectors, that is the muscle or gland cells
- onvey nerve impulses between the various parts of the brain and spinal cord, transmit nerve impulses
- Neurones afferent (sensory)

5 The transmission of information across synapses

- Synapse is the site where two neurons, or a neuron and a effector cell communicate.
- The transmission of information across a synapse involve the conversion of electrical
- The function of synapses include controlling and integrating the nerve impulses transmitted
- The effectors involved in involuntary action are smooth muscle and cardiac muscle

Figure 4.34: Chapter 3 exercise for student

Figure 4.34 is the screenshot of chapter exercise for chapter 3 in biology e-learning system.

	A H			
	ia k	NINE BIUL		
	T	な 公		
NAME: MAGESWARY		DISCUSSI	ON BOARD	
USERNAME: magarita	ID	Message	Username	Date
LOGGED IN: 13/05/2015	8	hiiiiiii Ahmed	magarita	29-04-2015
	9	hiiii	magarita	29-04-2015
	11	dddddd	PN ZAILA BT TAJUDDIN	29-04-2015
HOME	13	dddddddddddddddd	magarita	29-04-2015
	14	send me a paper	magarita	29-04-2015
DISCUSSION	15	dir	magarita	29-04-2015
	16	mm	magarita	29-04-2015
FILE SHARE	17	sdf	magarita	29-04-2015
	18	fggg	magarita	29-04-2015
PROFILE	19	99999	magarita	29-04-2015
PROFILE	20	hi guys	magarita	29-04-2015
NOTES		Re	ply	
EXERCISE				
MESSAGE				
QUIZ				
LOGOUT				
Copyrig	nt©2015.A	ui rights reserved. BIOLOGY LEARNI	NG STSTEM.	



Figure 4.35 is the screenshot of view message sent by the teachers.

4.3.2 Teacher Module

In this report, starting from figure 4.36 until figure 4.46, it's all about teacher module. The explanations of screenshot have been explained below the screenshot.

	TEACHE	R REGISTERA	TION
Teacher ID			(eg: .40000)
Name			(max 30)
IC Number			(only integer) eg: 870908105125
Gender	⊛ <mark>Male</mark>	© Female	
Contact Number			(only integer) eg: Tel = 0123356779
Email			(eg: abc@yahoo.com)
Password			(nån 6, max 15)
Confirm Password	R	egister Back	(min 6, max 15)
Copyright @	2015. All rights	reserved. BIOLOGY	LEARNING SYSTEM.

Figure 4.36: Teacher's registrations page.

Figure 4.36 shows the registration page of teacher. The teacher needs to fill up all the textboxes in order to register successfully. The validation is same as the student page as shown as above just now. The teacher needs to wait for the admin approval in order to use this system.



Figure 4.37: Teacher main page after successful login

Figure 4.37 shows the main page of the teacher module if the teacher successfully login into the system. The left hand side menu is the feature that teacher able to use.



Figure 4.38: Teacher discussion board

Figure 4.38 is the page for teacher to start a discussion if he/she wished to.



Figure 4.39: Teacher view discussion board

Figure 4.39 is the Q&A from student and teacher. The teacher able to delete the message if he/she feels the Q&A is not relevant.

	FARNING RIA	ÊOGYI	FIF
NAME: PN ZAILA BT TAJUDDIN			
TEACHER ID: C1234	File Name Lab-exercise-2.docx	C1234	Date 29-04-2015
LOGGED IN: 13/03/2013	05-chap-04.pptx	C1234	29-04-2015
HOME	Lab-exercise-2.docx	C1234	29-04-2015
DISCUSSION	File Name Lab	-exercise-2.docx 🔻	Delete
FILE SHARE			
PROFILE			
MESSAGE			
POST QUIZ			
LOGOUT			
Соруг	right © 2015. All rights reserved. BIOLOGY LI	EARNING SYSTEM.	

Figure 4.40: Teacher view uploaded files

Figure 4.40 shows the page for the teacher able to view or delete files so that the space can be occupied for other files



Figure 4.41: Teacher upload notes/learning materials page

Figure 4.41 shows the screenshot of upload notes. The teacher able to uploads notes below 1MB. This is because to avoid the database become heavy and work slow.



Figure 4.42: Teacher profile view

Figure 4.42 is the screenshot for teacher to view their profile. Changes cannot be made in this page.

			BIQÍOGY	
NAME: TA TEACH	PN ZAILA BT JUDDIN ER ID: C1234		UPDATE YOUR PROFIL	LE
LOGGED	IN: 13/05/2015	Name	Pn Zaila bt Tajuddin]
		IC Number	870908654321]
	HOME	Gender	female]
	DISCUSSION	Contact Number	0164401462	(only integer)
	FILE SHARE	Email	eg: Tel = 60123356779 zaila@amail.com	(eq: abc⊚yahoo.com)
	PROFILE		Save	
	MESSAGE			
	POST QUIZ			
	LOGOUT			
Copyright © 2015. All rights reserved. BIOLOGY LEARNING SYSTEM.				

Figure 4.43: Teacher edit profile

Figure 4.43 is the screenshot for the teacher to edit their information. The information will be updated once they click the save button.

	LAUTING BROT	OGY IN FUE
NAME: PN ZAILA BT TAJUDDIN TEACHER ID: C1234	CHANGE YO	UR PASSWORD
LOGGED IN: 13/05/2015	New Password	(min 6, max 15)
HONE	Re-type Password	(min 6, max 15)
HOME		Save
DISCUSSION		
FILE SHARE		
PROFILE		
MESSAGE		
POST QUIZ		
LOGOUT		
Сору	right© 2015. All rights reserved. BIOLOGY LEA	RNING SYSTEM.

Figure 4.44: Teacher change password

Figure 4.44 shows the page for the teacher to change their password. It works same as for the student module.

NAME: PN ZAILA BT TAJUDDIN TEACHER ID: C1234	POS Use the Announcement to	ST ANNONCEMENT
HOME	Topic	etc.) to all members.
DISCUSSION	Message	
PROFILE		
MESSAGE POST OUIZ		Post Reset
LOGOUT		
Соругі	ght© 2015. All rights reserved. Bl	OLOGY LEARNING SYSTEM.

Figure 4.45: Teacher Post Announcement view

Figure 4.45 is the screenshot of announcement. Teacher able to send message on (event, function, invites) using this system to students.

	EALVING	BIQTOGY IS FUL
NAME: PN ZAILA BT TAJUDDIN TEACHER ID: C1234 LOGGED IN: 13/05/2015	POST	EASY QUIZ QUESTION
HOME DISCUSSION FILE SHARE	Question	
PROFILE	Right Answer Wrong Answer	
POST QUIZ	Wrong Answer 2 Wrong Answer	
LOGOUT	Wrong Answer 3	Post Reset Vew

Figure 4.46: Teacher's post quiz page

Figure 4.46 is the screenshot of teacher post quiz question. Once the teachers enter post, the question will be saved into the database. This page interface is similar to medium and hard post quiz page.

4.3.3 Admin Module

In this report, starting from figure 4.47 until figure 4.54, it's all about admin module. The explanations of screenshot have been explained below the screenshot.



Figure 4.47: Admin main page after successful Login

Figure 4.47 is the main page of admin if the admin have successfully login. The menu bar at left hand side is the feature the admin can use in this system.



Figure 4.48: Admin upload image page

Figure 4.48 is the screenshot for the admin to upload his image in his profile.



Figure 4.49: Successful image upload

Figure 4.49: After the admin upload the image successfully. The image will automatically display in the sidebar as shown in figure 5.46.



Figure 4.50: Teacher list waiting for approval

Figure 4.50 is the list of teacher waiting for approval. The admin can accept or reject the teacher. If the admin reject the teacher, the teacher won't be able to use the system.





NamePn Zaila bt TajuddinIC Number870908654321GenderfemaleContact Number0164401462Emailzaila@gmail.comTeacher IDA1212NameAhmed Salih HadiIC Number573433500000GenderMaleContact Number0173890490Emailsunrise@yahoo.comTeacher IDK1234NameKAMALIC Number900105085868GenderMale
IC Number 870908654321 Gender female Contact Number 0164401462 Email zaila@gmail.com Teacher ID A1212 Name Ahmed Salih Hadi IC Number 573433500000 Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Gender female Contact Number 0164401462 Email zaila@gmail.com Teacher ID A1212 Name Ahmed Salih Hadi IC Number 573433500000 Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Contact Number 0164401462 Email zaila@gmail.com Teacher ID A1212 Name Ahmed Salih Hadi IC Number 573433500000 Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Email zaila@gmail.com Teacher ID A1212 Name Ahmed Salih Hadi IC Number 573433500000 Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Teacher IDA1212NameAhmed Salih HadiIC Number573433500000GenderMaleContact Number0173890490Emailsunrise@yahoo.comTeacher IDK1234NameKAMALIC Number900105085868GenderMaleContact Number0129057675Emailkamal@gmail.com
Teacher IDA1212NameAhmed Salih HadiIC Number573433500000GenderMaleContact Number0173890490Emailsunrise@yahoo.comTeacher IDK1234NameKAMALIC Number900105085868GenderMaleContact Number0129057675Emailkamal@gmail.com
Name Ahmed Salih Hadi IC Number 573433500000 Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
IC Number 573433500000 Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Gender Male Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Contact Number 0173890490 Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Email sunrise@yahoo.com Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Teacher ID K1234 Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Name KAMAL IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
IC Number 900105085868 Gender Male Contact Number 0129057675 Email kamal@gmail.com
Gender Male Contact Number 0129057675 Email kamal@gmail.com
Contact Number 0129057675 Email kamal@gmail.com
Email kamal@gmail.com
Delete (eg: 40000)

Figure 4.51: View teacher profile.

Figure 4.51 shows the screenshot of admin to delete teacher account. The password is encrypted when the admin view the teacher profile.

		BIQFOGY IN THE
NAME: AHMED TEACHER ID: admin		YOUR PROFILE
HOME	Admin ID	admin
TEACHER	Password	
PROFILE	Contact Numbe r Email	0173890490 sunrise@yahoo.com
Copyright © 2	015. All rights reserve	ed. BIOLOGY LEARNING SYSTEM.

Figure 4.52: Admin view profile.

Figure 4.52 is the screenshot of admin profile. Admin can view his profile cannot make any changes in this page.
		UPDATE YOUR PROFI	E
the stand the	Admin ID	admin	(max 10)
Children a second data and	Name	Ahmed	(max 30)
NAME: AHMED TEACHER ID: admin	Contact Number	0173890490 eg: Tel = 60123356779	(only integer)
LOGGED IN: 26/05/2015	Email	sunrise@yahoo.com	(eg: abc⊚yahoo.com)
HOME		Save	
TEACHER			
PROFILE			
LOGOUT			
Соругі	ight © 2015. All rights reserve	ed. BIOLOGY LEARNING SYSTEM.	

Figure 4.53: Admin update profile.

Figure 4.53 shows the edit profile of admin. The admin can edit their profile in this page. They have authority to edit all the information in his profile.

	CH	ANGE YOUR PASSWO	ORD
	New Password		(min 6, max 15)
	Re-type Password		(min 6, max 15)
NAME: AHMED		Save	
TEACHER ID: admin			
LOGGED IN: 20/03/2013			
HOME			
TEACHER			
PROFILE			
LOGOUT			
C	opyright © 2015. All rights reserved.	BIOLOGY LEARNING SYSTEM.	

Figure 4.54: Admin change password.

Figure 4.54 shows the page for the admin to change their password. Admin need to type the same password twice in order to save the password successfully.

4.4 Coding Implementation

The Biology e-learning system used PHP and HTML coding to connect between interface and database of biology. The coding is used to make sure the entire button work properly in interface of Biology e-learning system without error.

```
    </select>
    </div>
    </label>

        <label>
        <input type="submit" name="button" id="button" value="Delete" />
        </label>
        </input type="submit" name="button" id="button" value="Delete" />
        </label>
    </form>
    </form>
    </forms
    </pre>
```

Figure 4.55: Coding for teacher to delete student information

Name	Sectores		
C Number	2247433547		
Geader	Male		
Contact Number	0109315050		
Zmai	and vineys as gyshoo oo in		
Diermanne	on geobline		
Name	Magazimary		
C Number	2247455547		
Geader	Female		
Contact Number	0122512537		
Email	maginy shoe com		
Ciername	ine garde		
Name	Ahmed		
IC Number	123456789123		
Geuder	Male		
Courses Number	0173590490		
Ena sú	summine Symboo com		
Ciername	stan1955		
Name			
IC Number	930420304324		
Geuder			
Contact Number			
Znanik			
Corpanie			
10.3	Number 910420104324 ¥		
Delete			



Figure 4.55 shows the screenshot of teacher view student's detail. Here, the teacher able to delete the student account.

CHAPTER 5

RESULT AND DISCUSSION

5.1 Introduction

In this chapter is discussed on the result output of the Biology e-learning system for SMK Sentul Convent. There are five main modules, every module is tested by using correct input and wrong outputs to make sure it come out with correct output. The testing part is to make sure the error handling the work. There are several advantage and disadvantage had been stated in this chapter. Finally, the enhancement and further research are stated in detailed.

5.2 Test Result

Unit testing is a testing module to identify and eliminate errors that could cause the program to terminate, and any logical errors that have been missed. It is used to test classes, components and other elements in the system environment. Besides, it also identifies and eliminates execution errors and bugs that could have been missed in the system environment. The testing for the Biology E-Learning System is just focused on the three modules; there are Student module, Teacher module, and admin module.

5.2.1 Student Module Test Check

Table 5.1 Student Module

TESTING ELEMENT / CRITERIA	SUCCESS	FAIL
 Click on register and check whether system directing to provide a register from page for user. 	/	
2. Click on forgot password and check whether system directing to provide a password page for user.	/	
3. After register, user signs in as member, user use username and password to login into the system.	/	
4. Check whether when student enter invalid format in register form message popped up.	/	
5. Check whether when student enter invalid data in forgot password form message popped up.	/	
 Check whether when student enter invalid data in login page message popped up. 	/	
7. Check whether when student post invalid format message in discussion board message popped up.	/	
8. Check whether when student enter invalid format in update profile form message popped up.	/	
9. Database connection	/	

5.2.2 Teacher Module Test Check

Table 5.2 shows the test check of teacher module in biology e-learning system. Table 5.2 shows the test check of teacher module in biology e-learning system.

Table 5.2: Teacher Module

TESTING ELEMENT / CRITERIA	SUCCESS	FAIL
1. Click on register and check whether system directing to provide a register from page for user.	/	
2. Click on forgot password and check whether system directing to provide a forgot password page for user.	/	
3. After register and approved by admin user sign in as teacher, user use Teacher ID and password to login into the system.	/	
4. Check whether when student enter invalid format in register form message popped up.	/	
5. Check whether when teacher enter invalid data in forgot password form message popped up.	/	
6. Check whether when teacher enter invalid data in login page message popped up.	/	
7. Check whether when teacher post invalid format message in discussion board , quiz and announcement message popped up.	/	
8. Check whether when student enter invalid format in update profile form message popped up.	/	
9. Database connection	/	

5.2.3 Admin Module Test Check

Table 5.3 shows the test check of admin module in biology e-learning system.

	TESTING ELEMENT / CRITERIA	SUCCESS	FAIL
1.	Admin use username and password to login into the system	/	
2.	Check whether when admin enter invalid format in update profile form message popped up.	/	

5.3 Integration Testing

Integration testing is to test how the constructed components work together. This is to ensure all applications are in good condition and working properly after being combined. The objective is to take unit tested components and build a system structure that has been dictated by design.

Table 5.4: Test Check for Integration Testing

TESTING ELEMENT / CRITERIA	SUCCESS	FAIL
 Test the inheritance of subclasses from super class a) Test whether the insert data of the student score is stored in the account of scores. 	/	
2. Test attributes to behaviora) Test the function ACCEPT button, function of REJECT button, function of DELETE button of UPDATE button and function of INSERT button.	/	
 3. Test whether module interactions work properly. a) Test whether admin, teacher, student module can communicate with each other. Teacher registration, admin acceptance, teacher upload, student download and discussion topics. 	/	

5.4 System Testing

System testing is a testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing is a series of different tests whose primary purpose is to fully exercise the web application system. The system testing in this report includes content testing, security testing, database testing and others.

Table 5.5: Test Check for System Testing

TESTING ELEMENT / CRITERIA	SUCCESS	FAIL
 Content Testing b) Test whether the teacher registrations insert in data and can only if the admin approve. 	/	
2. Database Testingb) Check the table record in the database, when update (insert, delete, modify) is performed at student site, teacher site and admin site.	/	
3. User Interface Testingb) Click the link button to the information that is intended. Check whether system is able to direct the correct URL and listing the correct information.	/	
 4. Security Testing a) Login using invalid username and password in student module b) Login using invalid username and password in teacher module c) Login to admin account using non admin module 		/ / /
5. Navigation Testinga) Test the entire link within Biology e-learning system and determine it is directed to the URL.	/	

5.5 Advantage and Disadvantage

5.5.1 Advantages Gained From Project Development

From the project development, there are several advantages and benefits gained. The advantages and benefits are:

- i. Learning problem solving skills in developing the project.
- ii. Learning to interact and communicate with supervisor, examiner, panels and lecturers.
- iii. Learning the importance of time management and project planning in order to make sure the project can run smoothly and produced on time.
- iv. Gained lots of skills and knowledge in developing a web system by using PHP, JAVA script and MySQL.
- v. Learn to communicate with different kind of people to ask information and suggestion in this project

5.5.2 Problem faced in Improving and Developing System

When improving and developing the Biology E-Learning System, there are several types of problems are occurred. These problems become a great challenge because it influences the process of system development.

- i. Problem faced in the planning phase The problem that encountered in the planning phase was lack of experience in dividing the modules and tasks. However, this problem has been solved after discussed with supervisor.
- ii. Problem faced in the design phase The problem faced was lack of exposure towards database management. For example, there were confusions to design the entity and attributes for each table in the database. More time was taken to do table for the quiz.

5.6 **Project Limitation**

There are some limitations discovered from this system:

- i. Time left for the quiz couldn't be displayed to the user.
- ii. Teacher could not post question which contains images.

5.7 Enhancement and further research

There are some future works suggested for Biology E-Learning System:

- i. Add a function for the post quiz question so that image kind of question will be available.
- ii. Add function to show time during the quiz attempt.

CHAPTER 6

CONCLUSION

6.1 Conclusion

In conclusion, since the Internet Communication Technology (ICT) in Malaysia is growing more and more advance from day to day, it is time for the SMK Sentul Convent to evolve from traditional to advance school. The e-learning system may help the SMK Sentul Convent school to evolve and be more compatible compared to other school in Malaysia.

In order to make the learning process become more efficiency, a forum is provided so that student and student or student and teacher may discuss problem and sharing knowledge among each other. This system has achieved the above objective which is providing a medium for discussion on study and management of student records. Since the objective achieved, means that the problem statement which is stated earlier has been solved.

Finally, this system could be suitable to implement in secondary school if the school are equipped with enough and suitable computers and network systems to run the system.

REFERENCES

- Vivek gite, Interesting php performance, retrieve on September 20, 2013. http://www.cyberciti.biz/tips/interesting-php-performance-related-articles-
- Wikipedia. (n.d.). Retrieved November 16, 2013, from "HTML 4.0 Specification". World Wide Web Consortium: http://en.wikipedia.org/wiki/HTML
- 3. Kernighan.B.W and Ritchie.D.M (1988), The C programming Language
- JavaScript, http://www.princeton.edu/~achaney/tmve/wiki100k/docs/JavaScript.html
- Jack T.Marchewka (2013). Information Technology Project Management. (2nd Edition). United States of America: John Wiley & Sons Inc.
- Roger S. Pressman (2012). Software Engineering: A Practitioner's Approach. (6th Edition). McGraw Hill.
- Shari Lawrence Pfleeger and Joanne M.Atlee (2006). Software Engineering Theory and Practice. (3rd Edition). United States of America. Pearson International Edition

- Thomas Connolly and Carolyn BEGG (2005). Database System: A Practical Approach to Design, Implementation, and Management Fourth Edition. United States of America. Addison Wesley.
- Elizabeth Naramore, Jason Gerner, Yann le Scouarnec, Jeremy stolz and Michael K.Glass (2006). Beginning PHP5, Apache, MySQL Web Development. Programmer to Programmer exercise.
- Techtarget.com,http://searchenterpriselinux.techtarget.com/sDefinition/0,,sid39_ gci516819,00
- 11. Functionx.com, http://www.functionx.com/sqlserver/Lesson01.htm
- 12. Dahlan, A. A., & Nishimura, T. (2008). Implementation of asynchronous predictive fetch to improve the performance of Ajax-enabled web applications. the 10th International Conference on Information Integration and Web-based Applications
- 13. Wikipedia. (n.d.). Retrieved October 6, 2013, from web application: http://en.wikipedia.org/wiki/Web_application_framework
- Ron Burback . Software Engineering Methodology: The WaterSluice. Stanford University. Dissertation for the degree of Doctor of Philosophy. 1998.
- Darius Damalakas. XP versus UP: A methodology comparison study work. Roskilde Business College .2004
- 16. Wikipedia. (n.d.). Retrieved October 6, 2013, from XAMPP: http://en.wikipedia.org/wiki/XAMPP
- 17. Timothy Hart, Open Source in Education, February 2004 http://portfolio.umaine.edu/~jmitchell/OpenSource/Assets/Open%20Source.pdf

- 18. Kernighan.B.W and Ritchie.D.M (1988), The C programming Language
- 19. Agile software development, Wikipedia. Retrieve October 3, 2013. From the http://en.wikipedia.org/wiki/Agile_software_development
- 20. The Java Programming Language: https://www.java.com/en/about/

APPENDIX A: Turnitin

preferences					
Criginality Report	Processed on: 10-May-2015 01:16 M/T ID: 542301596 Word Count: 15443 Submitted: 2	PSM2 By narayani kanesan	Similarity Index 41%	Similarity by Source Internet Sources: Publications: Student Papers:	22% 3% 40%