

**E-LEARNING MODULE FOR PRINCIPLE OF ELECTRIC AND  
ELECTRONIC**


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“I confess this report is all my own work except the certain passage that I have clarified  
each of their sources”

Signature :  .....

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Date : 28/3/05 .....

I would like to dedicate my final year project and this thesis to my parents, supervisor En. Nurulfajar, fiancée and friends who had without any hesitation and as they are filled with precious knowledge, spirit and application oriented elements and to be used throughout my whole duration of study. May god bless you all.

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## ABSTRACT

The difficulties inherent to mobilizing an already active workforce for face –to-face learning are intimidating, deterring and costly. Thus, the possibility of delivering such crucial training remotely seems quite appealing, and the most effective methodology for administering remote training today is e-learning. E-learning is essentially the facilitation of teaching and learning via the use of some electronic medium. To compare e-learning with other content delivery mechanisms, this project will be focus on the educational potential of e-learning in the developing world. In this project, the Principles of Electrical and Electronics Subject has been choosed as the module for the e-learning system. The subject was selected since this subject is important and fundamental to the first year Electronic Engineering Student. This E-learning module will be designed with in build mechanism that “move” the learner progressively along the learning path. This module will contents a full syllabus that designed and encoded using a multimedia software tools for teaching and learning presentation which helps student in learning. This module created by using the Macromedia Flash, Macromedia AuthorWare, Macromedia Freehand and Macromedia DreamWeaver which helps in creates an interactive segment in the e-learning module.

## ABSTRAK

Kesukaran yang terdapat dalam memobilisasikan kaedah pembelajaran pada masa ini adalah kerana ia sukar di kemaskini, selalu berubah –ubah dan kos yang mahal. Dengan ini, cara yang terbaik dan paling berkesan pada masa ini untuk menyampaikan sesuatu pembelajaran secara lebih terperinci dan tersusun adalah melalui e-learning. E-learning adalah kemudahan pembelajaran dan pengajaran yang penting dimana ia menggunakan medium elektronik untuk disampaikan pada pengguna. Jika dibandingkan E-learning dengan mekanisme penyampaian yang lain, projek ini akan menumpukan kepada kemampuan peningkatan pembelajaran yang sejajar dengan kemajuan dunia. Dalam projek ini, Prinsip Elektrik dan elektronik telah dipilih sebagai modul bagi pembinaan sistem E-learning. Matapelajaran ini telah dipilih kerana ia penting dan merupakan matapelajaran asas bagi semua pelajar tahun satu Kejuruteraan Elektronik. Sistem E-learning ini akan dibina mengikut rekabentuk yang mesra pengguna di mana ia akan “bergerak” bersama pengguna sepanjang proses perjalanan pembelajaran itu berlaku. Modul ini merangkumi sukatan pelajaran yang telah direka dan di susun menggunakan perisian multimedia untuk pengajaran dan pembelajaran bagi membantu pelajar dalam proses belajar. Modul ini dibina menggunakan perisian Macromedia Flash, Macromedia AuthorWare, Macromedia Freehand dan Macromedia DreamWeaver di mana perisian- perisian ini akan membantu dalam membina segmen-segmen interaktif dalam sistem E-learning .

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.0 Project Introduction**

The world has undergone a transition from the industrial Age to the Information Age to the present Knowledge Age. In the Knowledge Age, where in the economy knowledge-based, continuous learning is will decide the success or failure of every organisation and individual. It is this aspect of the new economy that has brought e-learning to the forefront.

The definition of E-learning is, a range of activities, from effective use of digital resources and learning technologies in the classroom, through to a personal learning experience enabled through to a personal learning experience enabled through individual access at home or elsewhere. Besides that other resources defined e-learning as education created and delivery by using technologies related to computer, the internet and telephony, in combination or in isolation. [2].

E-Learning involves the use of some form of electronic media to enhance the learning process. Sometimes people will confuse with distance learning with face-to-face- communication. Individuals in the most remote localities re accessing the Internet, researching ideas, and inseminating perspectives and that time Learning is truly the solution to empower the people of the developing world's learning has gained immerse popularity over the last decade. With new models and emerging strategies, e-learning is also undergoing a revolution.

## **1.1 Project Objectives**

The main objectives of this project is to fulfilled the requirement for the bachelor of Engineering (Industrial Electronics) course. On the other hand, the objectives of this project are:

- 1.1.1 To generate an interactive multimedia application by using texts, and graphics.
- 1.1.2 To create a website using the software based on the syllabus.
- 1.1.3 To develop learning through the e-learning module which can increased the user's knowledge
- 1.1.4 To deliver a different environment to study in an exciting, challenging and enjoyable manner.
- 1.1.5 To improve student's academics performance and skills in the subject matter.
- 1.1.6 To enhance information sharing among the students and teacher.

## **1.2 The Important Of Project**

E- Learning allows for efficient transfer of knowledge anywhere and anytime, regardless of subject matter. It opens up a world of learning unavailable in most corners of the world, while at the same time empowering learners with information technology awareness and skills crucial to succeed in today's global knowledge economy.

For the education factor in particular, the adoption of new and emerging technology by schools and classroom (including E-learning) offers tremendous potential for developing countries to introduce new teaching tools, expand educational opportunities and develop knowledge-economy skills increasingly demanded in the labour market. It is our argument that teachers constitute the right group to pioneer new technologies and e-learning in particular. With access, appropriate professional development and support, teachers who themselves have used technology to learn will be better able to help their students comprehend difficult to understand concepts, engage in new forms of learning. [1].

## **1.3 Project Scope**

The most recognizable and understandable component of e-learning is the learning content or courseware itself. Courseware may be presented in a format as simple as hypertext mark-up language (HTML) or as the complex as interactive, rich



multimedia that includes sound, animation or movie files. The scope of this project includes:

- 1.3.1 Studying the software's application such as Macromedia AuthorWare 5, Macromedia Freehand 10 and Macromedia DreamWeaver and Macromedia Flash in order to build a system that has graphical user interface.
- 1.3.2 This module created based on the Electrical and Electronics subject. The scope in the subject includes the concept of electricity, magnetisms and electromagnetism, construction and operation of transformers and capacitors, differentiate between the unit of power, work and energy and the application of electric generator such as dc generator and ac generator.(please refer table 1.1 for the related topics)

Table 1.1: List of topics

No	TOPICS
1	<p><b>ELECTRICITY</b></p> <ul style="list-style-type: none"> <li>• Introduction, static &amp; dynamic electricity, charge unit, electric charge, electrical base units, electric field, electric force, electric potential, electric flux &amp; electric flux density, electrostatic field, electrostatic force, potential difference, concept of emf &amp; potential difference, Coulomb's law &amp; Ampere's law</li> </ul>
2	<p><b>MAGNETISM AND ELECTROMAGNETISM</b></p> <ul style="list-style-type: none"> <li>• Introduction, magnetic units, poles of magnet, magnetic field, magnetic field around the conductor &amp; coil, magnetic flux &amp; magnetic flux density, relation between B &amp; H, Magnetic effect of electric current, current carrying conductor in magnetic field, force</li> </ul>

	between parallel conductors, Faraday's law, Lenz's law, Fleming's rule, comparison between electrical & magnetic quantities
3	<p><b>TRANSFORMER</b></p> <ul style="list-style-type: none"> <li>• Introduction, basic construction, operation, types of transformer, voltage relationship, voltage ratio, efficiency, transformer loss, ideal transformer</li> </ul>
4	<p><b>CAPACITORS</b></p> <ul style="list-style-type: none"> <li>• Introduction, symbols, construction, operation, capacity of the capacitor, types of capacitor, serial and parallel capacitors, dielectric strength, energy stored in capacitors, charging and discharging capacitors</li> </ul>
5	<p><b>ENERGY AND POWER</b></p> <ul style="list-style-type: none"> <li>• Introduction, definition, formulae, Unit, Power in serial and parallel circuit, Ratio of power in side component, Unit for HP (Horse Power) and Electrical energy</li> </ul>
6	<p><b>ELECTRIC GENERATOR</b></p> <ul style="list-style-type: none"> <li>• DC generator: Introduction, construction of the dc generator, operation, types of dc generator</li> <li>• AC generator: Introduction, construction of the ac generator, types of ac generator</li> </ul>
7	<p><b>CHARGE MOVEMENTS IN SOLID MATERIAL</b></p> <ul style="list-style-type: none"> <li>• Introduction, characteristics, resistance factor, conductor inside semi-conductor material, introduction of insulator, characteristics, bonds of semiconductor, effect of temperature on semiconductor, intrinsic and extrinsic semiconductors</li> </ul>

- 1.3.3 To test capability of the module to uploading into the CD-ROM and via the Internet.

#### **1.4 Problem Statement**

Nowadays, most of the student learns from books, notes and based on the lectures in the classroom. Sometimes, student did not attend the lectures and most of the syllabus is incomplete. Due to that, this e-learning module can enhance the structure of learning. This can lead to repetitive learning because it will not end when the classroom end. Furthermore, the student can continue access to personalized learning account for an entire year and allow reviewing and revising lesson unlimitedly. Besides, students no need to spend all the time in the library to search for information because, with e-learning module, they can surf through internet.

#### **1.5 Organization of Report**

This report is organized into several chapters. Each chapter contains subtopics to make an easy access among the user. Here are a brief contains about the chapter in this module.

- 1.5.1 In chapter 1 will give a brief idea about the Introduction of the nature of electricity and the production of electricity.
- 1.5.2 In chapter 2 it's contains about seven subtopics which explained a detail information about voltage, current and resistance, Static and dynamic electricity, Electric current and electric charge, Electric base Unit, Electric field, electric flux and electrostatic.

- 1.5.3 In chapter 3, user can get information about conductor, semiconductor and insulator, Intrinsic and Extrinsic material and the Diode characteristic.
- 1.5.4 Meanwhile in chapter 4 there are about 13 subtopics can be explore by the users. User can get information all about the magnetic field, flux, density and its effect. Besides that, user also can search about Faraday, Fleming and Lenz laws.
- 1.5.5 User can continue exploring this subject about the transformer in chapter 5. In this chapter user can know how the transformer operates and all which are related to the transformers.
- 1.5.6 In chapter 6, student can get information about capacitor. User can enhance information about the types of capacitor, how to connect the capacitor in a circuit and the impact of using the capacitor.
- 1.5.7 User can enhance information about Energy and power in Chapter 7. It is divided in 2 topics which are Unit of work energy and power and Heating effect of electric current.
- 1.5.8 The last chapter user can learn about Electric generator. In this chapter it will discuss about the DC and AC generator and the slip ring.

## **1.6 Conclusion**

As for the conclusion, in the first chapter is a briefly introduction about the E-learning concept. This chapter also explained about the important and the project scope of the module. In addition, any relevant topic about the syllabus also includes in this chapter. From here, reader can get an early idea about the project objectives

and how the organization works. Rather, E- learning will serve as a factor in motivating digitally illiterate individuals to pursue computer literacy education, while serving as a vehicle for deepening literacy skills. Without access to the internet, or intranet, there can be no E-learning.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 INTRODUCTION**

E-learning is a relatively new term in the world of computer-delivered training and education. E-learning encompasses any type of learning content that is delivered electronically. However, E-Learning can define as “Any learning, training or education that is facilitated by the use of well known and proven computer technologies, specifically networks based on Internet Technology” [1]. The use of Internet technologies means that learning contents is stored on a Web server and that learner’s access the content by using well known and widely used network technologies such as Web browsers and TCP-IP network protocol.

The notion of e-learning has evolved over the last decade. The phrase itself seems to have come from distance learning, a 1980’s term referring to delivering instruction over satellite. Originally used in higher education to define courses delivered over the Internet, e-learning has grown to include virtually any use of technology to deliver curriculum or instruction.[4].The term has come to mean any type of no classroom academic offering - including Internet, satellite,

videoconferencing or other virtual setting. Increasingly, these programs utilize a combination of technologies, although most preserve many of the same structures of traditional classroom courses with lectures, opportunities for interaction with professors, 'homework' assignments, and examinations and other methods to assess student learning" .[13].

## **2.1 E-Learning Defined**

E-learning can be classified based on the degree to which it differs from traditional learning strategies. Often it is only one component in a comprehensive learning system that may include such other methods as instructor led training, self-study, books, videos and so on.

The evolution of the learning system can be classified into 3 categories. The first categories it called Traditional system. This learning system begins in World War I and II. However, in early 50's an evolution started and it been called as the Big Transition. In this age, the computer based training had been introduced to the world. However, because of the fast changing in the education system, e-learning had taken over the learning system in the education world. (Please refer figure 2.1 for the evolution of education).

E-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance. It is based on three fundamental criteria:

- 2.1.1 E-Learning is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information. So important is this capability that it is fast becoming an absolute requirement of e-learning. As useful as CD-ROMs are for instruction and

information delivery, especially for rich media-based simulations, they lack the networkability that enables information and instruction to be distributed and updated instantly. So, while CD-ROMs are indeed technology-based learning systems, they should not be classified as e-learning.

- 2.1.2 It is delivered to the end user via a computer using standard internet technology.
- 2.1.3 It focuses on the broadest view of learning. Learning solutions that go beyond the traditional paradigm of training-learning is not limited to the delivery of instruction, characterized by computer-based training.