

BORANG PENGESAHAN STATUS TESIS*

JUDUL: APPLYING INQUIRY BASED LEARNING ON HUMAN BIOLOGY
(BLOOD CIRCULATION)

SESI PENGAJIAN: 2 - 2007/2008

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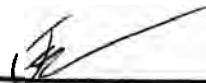
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**APPLYING INQUIRY BASED LEARNING ON HUMAN BIOLOGY
(BLOOD CIRCULATION)**

NORHASLINA BT. MOHAMED

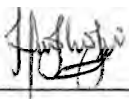
**This report is submitted in partial fulfilment of the requirements for the
Bachelor of Computer Science (Interactive Media)**


**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2008**

DECLARATION

I hereby declare that this project report entitled
**APPLYING INQUIRY BASED LEARNING ON HUMAN BIOLOGY
(BLOOD CIRCULATION)**

is written by me and is my own effort and that no part has been plagiarized
without citations.

STUDENT :  _____ Date: 20 JUN 2008
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SUPERVISOR :  _____ Date: 20 JUN 2008
(PN. FARAH NADIA BT AZMAN)

DEDICATIONS

In the Name of Allah, the Most Beneficent, the Most Merciful

Special Dedication Of This Grateful Feeling To My Family
(*Mohamed Bin Daud, , Che Anah Binti Che Ahmad and all my family*)

UTeM FICT's Lecturers, 3BITM Student

And all my friends..

Loving For Their Love, Support and Best Wishes

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ABSTRACT

Inquiry based learning courseware was developed specific all for the Form 5 students who take the Biology subject and especially for students who are taking Biology in Sijil Pelajaran Malaysia. This subject is selected because Biology is one of difficult subject that need to remember and understand by most of the students' base on the questionnaire that was distributed to students at the school. The topic that covers in developing this inquiry based learning technique is Blood Circulation System in the human biology. The application of inquiry based learning method is a new technique which to help deep students in their learning process which the student need to learn by themselves with manner of investigation and exploration. For this inquiry based learning, Seven's E concept is applying and Seven' E stand for Excite, Explain, Explore, Expand, Extend, Exchange and Examine. Each of the concept has different technique or learning but still discussing on the same topic. In addition, in this inquiry based learning courseware, the students can share the knowledge and information on the topic of Blood Circulation System in Human Biology from the source of internet which the student can link through from this courseware. Besides that, this inquiry based learning courseware provides some animation that shows the process of blood circulation in human body. This animation is provided to help the student understand better and the addition notes to explain the process that stated in this topic. Inquiry based learning is not a solution for students who have problems with Biology subject but it is a tool to help them to learn and understand in their learning by using this inquiry based learning method.

ABSTRAK

Pembelajaran secara penyiasatan adalah perisian pembelajaran yang dibangunkan khusus untuk pelajar Tingkatan 5 yang mengambil subjek Biologi yang mana akan menduduki peperiksaan Sijil Pelajaran Malaysia. Subjek ini dipilih kerana Biologi merupakan satu subjek yang susah untuk diingati dan difahami oleh sesetengah pelajar berdasarkan kajian dan pemerhatian yang dibuat di sekolah. Topik yang dibangunkan menggunakan teknik ini adalah topik Sistem Peredaran Darah dalam badan manusia. Kaedah penyiasatan yang diaplikasikan dalam pembelajaran ini adalah satu teknik baru bagi membantu pelajar dalam proses pembelajaran mereka iaitu pelajar perlu belajar sendiri dengan cara penyiasatan dan penjelajahan. Bagi pembelajaran secara penyiasatan ini, konsep *Seven' E* diaplikasikan dan *Seven' E* bermaksud *Excite, Explain, Explore, Expand, Extend, Exchange* dan *Examine*. Setiap satu konsep tersebut mempunyai penyampaian yang berbeza tetapi membincangkan topik yang sama. Di samping itu, di dalam perisian pembelajaran ini juga pelajar boleh berkongsi pengetahuan dan maklumat tentang topik Sistem Peredaran Darah dalam badan manusia dari sumber internet dan mereka boleh menghubungkannya melalui perisian ini. Di dalam perisian pembelajaran ini juga, terdapat sedikit animasi yang menunjukkan proses peredaran darah dalam badan manusia. Animasi ini adalah untuk memudahkan para pelajar memahami dengan lebih baik di samping nota – nota tambahan untuk menerangkan proses peredaran darah tersebut. Pembelajaran secara penyiasatan ini bukan satu kaedah penyelesaian untuk pelajar yang bermasalah dalam subjek Biologi tetapi sebagai alat untuk membantu mereka mempelajari dan memahami topik yang berkaitan dengan menggunakan kaedah penyiasatan ini.

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LIST OF ABBREVIATION

MS	--	Microsoft Suite
ADC	--	Analog-to-Digital Converter
SPM	--	Sijil Pelajaran Malaysia
MoE	--	Ministry of Education
ISD	--	Instructional System Design
JPEG	--	Joint Photographic Expert Group
PSM	--	Projek Sarjana Muda

CHAPTER I

INTRODUCTION

1.1 Project Background

Inquiry-based learning is a way of acquiring knowledge through the process of inquiry. In inquiry-based learning, students either ask their own questions or are posed a question by the teacher. In the former case the question concerns a topic the students wish to learn about, and in the latter case the question concerns a topic the teacher wishes students to learn about. Regardless of the source of the question, inquiry-based learning requires that students play a major role in answering the question. This can occur through designing and executing controlled experiments, making measurements and observations, or building and testing models.

In this way, students actively develop their understanding of science by combining scientific knowledge with reasoning and thinking skills. This project will be use by secondary school students which from form 4 and form 5. This project will distribute to make easier for student to learn about blood circulation in human biology. Students should have the opportunity to use scientific inquiry and develop the ability to think and act in ways associated with inquiry, including asking questions, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, constructing and analyzing alternative explanations, and communicating scientific arguments. This inquiry based learning involves seven modules which are excite, explore, explain, expand, extend, exchange, and examine. The elements that provide in this project are graphics and

simple animations to make it more attractive and enjoyable when use this courseware. Besides that, the interesting image or pictures will provide in this courseware to make the students more understand the given information.

1.2 Problem Statement

Human blood circulatory system is one of the sub topics that contain in the Biology subject for upper forms students especially Form Five. Circulatory system is a process that responsible for transmitting materials throughout the entire body. It transports nutrients, water, and oxygen to the billions of body cells and carries away wastes such as carbon dioxide that body cells produce. It is an amazing highway that travels through the entire body connecting all of the body cells. Human blood circulatory system is divided into three major parts that is the heart, the blood and vessels.

Currently, the textbooks, references book, pictures, a human model, transparency and slide presentation are some of the teaching methods that being used. The biology subject is the difficult subject for students to learn because the students need to understand and to remember the process, technique and formula that have in this subject. In general, the traditional approach to learning is focused on mastery of content, with less emphasis on the development of skills and the nurturing of inquiring attitudes. The current system of education is teacher centered, with the teacher focused on giving out information about "what is known." Students are the receivers of information, and the teacher is the distributor. Much of the assessment of the learner is focused on the importance of "one right answer."

At this moment, there are a few coursewares which are developed to solve this problem. Usually the coursewares that have been developed are to general and the information of the subject more similar to the textbooks and references book. The courseware that have before just teach the students in linear way, so student only get the information from that courseware without doing anything to that courseware. Besides that, there have no technique or process in the courseware which students

can learn or explore themselves. It can cause the student difficult to learn and to understand the process of blood circulatory.

Inquiry based learning will be developed to solve this problem which the students can learn the blood circulatory more easily than the courseware that have before. This is because this courseware project will give the students understood and make the experiments themselves about the process of blood circulatory in human biology. The contents of learning materials will be simplified for easy understanding and the presentation of these materials has to be interesting. The learning materials will be taught using multimedia elements such as graphic and simple animation. The overall functionality of the courseware has to be satisfying to the users.

1.3 Objective

The following are objectives for this project:

- a) To develop a human biology courseware for learning about blood circulation in details.
- b) To apply the inquiry base learning technique for developing the courseware to assist secondary school students in learning about blood circulation in human biology.
- c) To produce an interactive learning tool for exploration elements.

1.4 Scope

This project applies the education learning based project. The scope of this project is to teach the students about the blood circulation in human body easier and understand. The target users of this project are the secondary school students from form four and form five. This project provides the process of blood circulation in human body which includes elements of multimedia such as animations, and graphics. It can make the students interest to use process or technique of inquiry base learning. Besides that, this courseware is much more interactive and user friendly. This project will be developed only the 'proof-of-concept' level only.

1.5 Project Significant

This project will provide the significant for the users by using this inquiry based learning method which can help the students more understand in their learning. Besides that, the students can improve their learning skills be more exploration or investigation about the learning content. These inquiry standards specify the abilities students need in order to inquire and the knowledge that will help them understand inquiry as the way that knowledge is produced.

Another significant that inquiry-based learning offer is the development of habits of mind that can last a lifetime and guide learning and creative thinking. Learning through inquiry continually provides students with the opportunity to make firsthand decisions. They can decide which questions to raise at various points, which ones to follow in depth and why, what science tools to use for various tasks, how to organize data, how to portray the patterns created by the data, and what conclusions to accept or reject as they work. Besides that, it is also of significance that students learn to develop their decision-making capacities in collaboration with their peers, and with a teacher's assistance.

1.6 Expected Output

The expected output for this courseware project is the inquiry-based learning methods provide concrete, active learning experiences; they also give students the opportunity to develop the initiative, problem solving, decision-making, and research skills needed to become life-long learners. When students are provided with appropriate experiences, they can use these skills and habits of mind to make their own knowledge bases. When students use inquiry to discover content, they not only learn a great variety of facts and concepts, but they also learn how these are related to each other.

1.7 Conclusion

For the conclusion, this courseware project can give more benefits to students in their learning by applying the inquiry based learning method than current courseware which not applying the method that can give easier for students to learn and more understand. This courseware project is generated based on the objective and scope that implement in this courseware project and can solve the problem that having before. The next chapter will discuss about literature review by make some research about the existing systems.

CHAPTER II

LITERATURE REVIEW & PROJECT METHODOLOGY

2.1 Introduction

This chapter discusses about the literature review and project methodology of the project. Literature review is a comprehensive survey of publications in a specific field of study or related to a particular line of research, usually in the form of a list of references or in depth review of key works. It also a process of searching, collecting, analyzing and drawing conclusion from all debates and issue raised in relevant body of literature. It describes all the analysis and findings which are related research, case study and other findings that are related to this project.

This chapter also explains the methodology to be used in the project development. Methodology is a set of method that defines the process and order how something is to be achieved. The project requirements such as software and hardware, for the project development are also determined. Besides that, the milestone and Gantt chart is created as a guideline to ensure the project can be finish according to the schedule and plan.

2.2 Domain

The domain for this project is learning content. Based on the domain that has been chosen, the topic for this project is related to the syllabus of Biology subject for students form 5 according to the Education of Ministry. This project will develop in learning content to help the students to learn about blood circulation in human biology based on inquiry process.

2.3 Existing System

i) Teaching Courseware

Nowadays, there is a lot of courseware that related to the biology subject. The students can learn this subject from this courseware. One of the courseware is teaching courseware that develops by Ministry of Education (MoE).

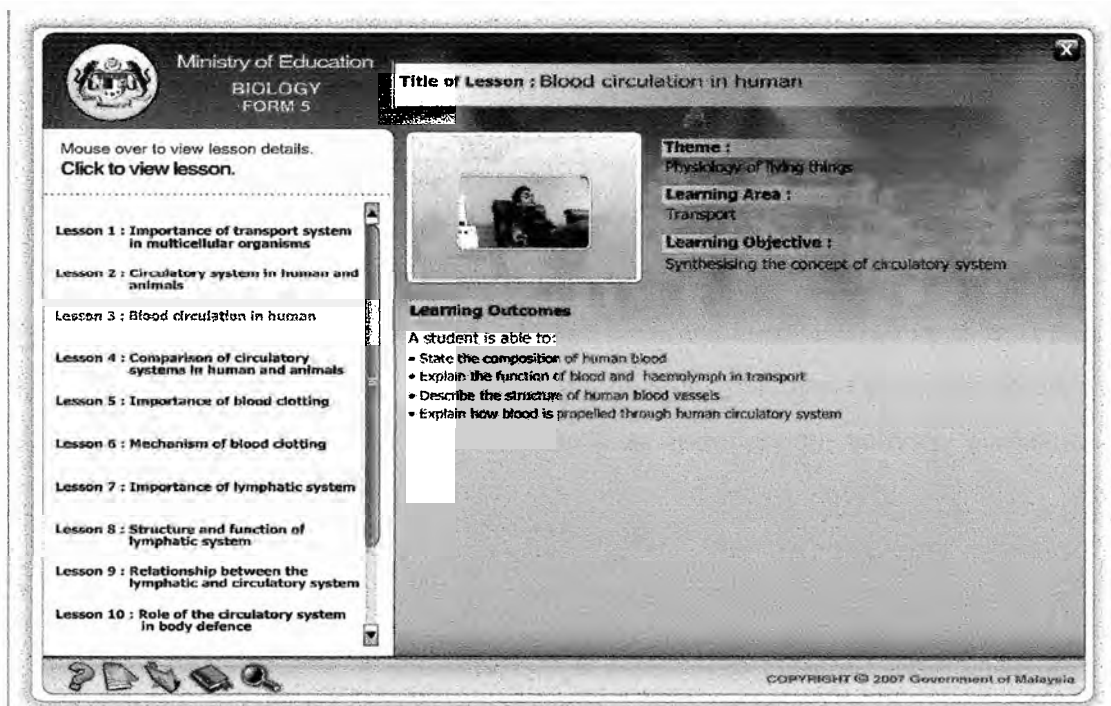


Figure 2.1: Main page of existing courseware

Figure 2.1 show the main page of the courseware of Biology subject which is learn by students form five. From this courseware there are a lot of topics that will be covered. These entire topics are the syllabus of the Biology subject. The users need to choose the topic that they want to learn. After the users choose the topic, the next page will be displayed as shown in Figure 2.2.

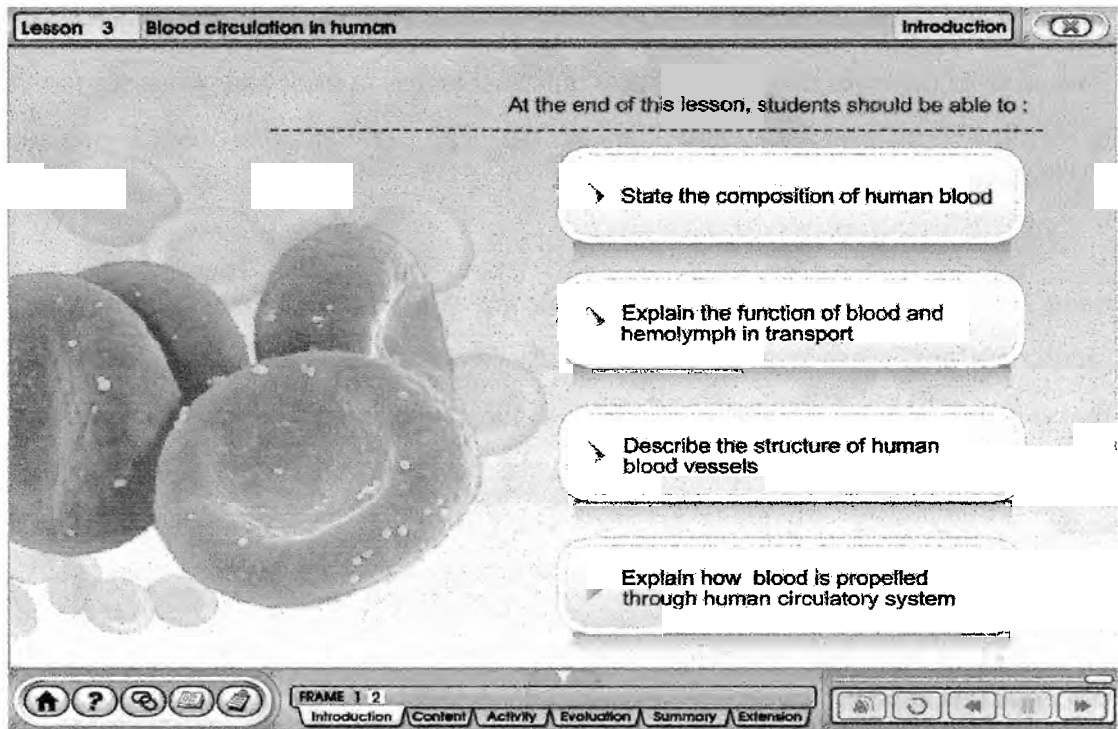


Figure 2.2: The content interface in existing courseware

From this figure, the users can learn the chosen topic. This page can be called the content page. In this page, it will show the in animated image and the information of the image. While the image is appeared, the narrator will read the information at the same time. After finish the process in this page, the users need to go to next page by choose the number that have in frame line. Besides that, there also have the other function or button for users to choose such as introduction, activity, evaluation, summary and extension.

ii) Inquiry Based Learning

The inquiry based learning is the technique on how the students learn in their education. According to Bruner, 1961, inquiry-based learning is an instructional method developed during the discovery learning movement of the 1960s. It was developed in response to a perceived failure of more traditional forms of instruction, where students were required simply to memorize fact laden instructional materials. Inquiry learning is a form of active learning, where progress is assessed by how well students develop experimental and analytical skills rather than how much knowledge they possess.

Inquiry-based learning projects are driven by students. Instructors' act more as coaches, guides, and facilitators who help learners arrive at their "true" questions- the things they really care about. When students choose the questions, they are motivated to learn and they develop a sense of ownership about the project.



Figure 2.3: Main page of inquiry based learning method