

# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

Learning is a process of gaining knowledge, skills, experience or values by studying, experience or training (APTL, 2002). It should be like part of a human life. No matter in what subjects, everyone should require a minimum learning process to get know about the subjects. Learning process might vary from one person to another, depending on their learning style.

Learning styles are the ways of learning or how people concentrate, process and memorize new information (Cuesta, 2003). There are several types of learning styles, including visual learning, auditory learning, read-write learning and kinesthetic learning (LdPride; William, 2004). Visual learners learn best when information is presented visually and in a written language, picture or designs format. Auditory learners learn best when information is presented auditory in an oral language format. Read-write learners learn best when notes are taken and kinesthetic learners learned best when learner physically involved in an activity (DVC, 2000; William, 2004).

With the widespread use of computers for the past few years, integration of learning process and ICT gave a big impact to education system and students respectively. Students could learn more easily through any combination of learning styles in e-learning that included hearing, seeing, writing, reading and illustration. This can enable students of the next generation should be ready to compete in global and challenging world.

Electronic learning or e-learning is another way of teaching and learning. E-learning is a mode of knowledge production and circulation wherein information technologies plays a decisive role (Polsani, 2002). E-Learning is an instruction delivered via all electronic media including the Internet, intranets, extranets, satellite broadcasts, audio/video tape, interactive TV, and CD-ROM (Thavamalar, 2001). E-learning gives a more flexible, focused curriculum (Toni, 2005). In order to implement a successful e-learning exercise, e-learning should meet a list of desired attributes, including developing content, storing and managing content, packaging content, student support and assessment (Thavamalar, 2001). Because of that, ICT practitioners have come out with a new concept that can integrate in e-learning. It is called Learning Objects.

Learning Objects has become a popular topic in recent years. This new approach for developing reusable learning content had been increasingly gaining attention among educational technology and computer science researchers (Mohan, 2004). Learning Objects is developed in smaller manageable chunks and designed specially for flexibility and re-use, which is then stored in database and tagged for easy searches. The basic idea behind this new approach is that a small component can be reuse in different instructional contexts, and to make e-learning system more reusable, interoperable, durable and accessible (Frosch, 2004). All these features are going to make the learning system becomes more independent and intelligent.

This project title is “Using Learning Objects Technology In Learning Styles Of Higher Education Students” and it is called LOOOP. Learning Objects is the fundamental idea in developing the Learning Objects system for this project and object-oriented programming is the domain of the system. LOOOP is developed to support learners learning in a new learning environment, where traditional learning style is transformed to digital environment is based on Learning Objects approach. In addition, LOOOP is also

developed to overcome the identified expectations of e-learning to meet the desired attributes of e-learning.

### **1.1 Problem Statements**

Nowadays, in this information technology age, E-learning plays an important role in learning. Although this is happening, based on the survey collected, most of the learners prefer to learn in a traditional learning style rather than a digital environment because of the lack of learning aid software found in the market. Lack of functions like jotting down notes and information finding in the e-learning system to support learning is also one of the reasons for learners not to study in a digital environment. Although learners can have information finding from the Internet, but they need to print out the information in hardcopy or save in softcopy and bring along the information whenever they need it. Besides, some of the e-learning courses found did not meet with the required attributes of e-learning, like developing content, storing and managing content, packaging content, student support and assessment (Thavamalar, 2001). Although this problem can be overcome with Learning Objects approach, some of the contents are fixed and can only be modified by the moderators. Besides, lack of discussion and information sharing within learners can also be an important issue in gaining new knowledge.

### **1.2 Project Significance**

Learning Objects has become a popular topic in recent years. Developing the Learning Objects enables the learning contents to be reuse, durable, interoperable and accessible. Generally, Learning Objects which is developed in small units and self-contained is save in a Learning Objects repository. Any of Learning Objects in difference context is able to save in a same repository and it can be retrieved independently in study,

sharing and easier to manage. With an online Learning Objects repository, the Learning Objects that has been modified on one computer can be retrieved on another computer. This has increased the accessibility of the information needed and learners do not need to always bring along the hardcopy or softcopy. Thus, Learning Objects can be modified from time to time to ensure the content of Learning Objects is always up to date. Besides developing the initial Learning Objects in this project, the system can be an alternative for learners who wish to use it in study and change from traditional learning style to digital environment where the system enables learners to jot down notes, modify the contents and make information searching. Furthermore, the system can be a place for learners to share their learning contents or notes and can also be a place for discussion among learners.

### **1.3 Project Objectives**

There are four project objectives. The objectives are as follow:

1. To provide an alternative system in support learning

LOOOP can be a system that can transform traditional learning style from using books or notes to an interactive learning environment.

2. To provide supportiveness for learners in information finding and recording.

In LOOOP, information searching agent act as a virtual instructor for students and Google.com would be the information storage center. Information searching agent searched the most related solution URL via Google.com when user keys in a problem. User could link to the page and save it as new learning contents.

3. To provide a communication tool.

LOOOP enable user to share the learning contents with friends through learning contents sharing function. This function also allowed instructors to share the new learning content notes if they use this system as a teaching material. Besides,

LOOOP also provide a communication tool that can communicate within LOOOP registered users.

4. To give immediate feedback promptly to learners who need information
- Google.com is known as one of the Internet leading search engine (THES, 2004). Once the Google.com server is not terminated or down, the server can work twenty-four hours a day and seven days a week. Information searching agent that act as a virtual instructor is able to give immediate feedback to user when they needed any information.

#### **1.4 Project Scopes**

The completion of this project not only need to meet and accomplished the objectives. Project scopes also need to meet and avoid the outcome of running out of topic. The main scope of this project is to develop an informational type of Learning Objects that provides information to learners. LOOOP is not only needed to present information to learners but is also needs to solve learners' problem. In addition, the system also needs to transform traditional learning styles to digital environment. For this purpose, the scopes included in this project are as follow:

1. Designing and implementing a Learning Objects repository for this project to save all the existing and new Learning Objects that can be modified, searched and reused in different context.
2. Developing an Information searching agent for information searching from the Internet or database, finding solution for problems from the Internet and enables saving of the information found as new Learning Objects.
3. Developing a set of features tool that enables user to perform traditional learning styles such as highlighting the important text and jotting down notes on Learning

Objects and enables user to navigate the learning content, shares the learning content with other user, media-playing on multimedia resources including sound, animation and video, as well as applying reader agent that could read the learning content.

4. Developing a communication tool for LOOOP registered users to communicate with each other and make discussion.

### **1.5 Intended Audiences**

LOOOP end users are learners who wish to use this system as additional learning material. Learners are able to create new learning contents, managing learning contents and also created learning contents from time to time. In addition, they may share their personal learning contents within LOOOP registered users and performed information searching from the Internet or from sharable learning contents. Besides, LOOOP also provides a communication tool within LOOOP registered users to communicate within each other.

### **1.6 Methodology**

Before software is fully developed, there are a series of predictable steps that can help in creating a high-quality result. The steps are clearly described with Linear Sequential Model. Linear sequential model is sometimes known as classic life cycle or waterfall model. This model had been selected as LOOOP project because it follows a few simple and clear steps in its software development life cycle. This model suggests a systematic, sequential approach to software development that begin at the system level and progresses through analysis, design, coding, testing, and support.

Besides, the investigation techniques used in this project were case study and survey. A case study was performed on the previous study of related topics from articles, journals, books and conference papers. The related topics which included in the study were

Learning Objects approach, Learning Objects metadata, e-learning standards, object-oriented programming, learning styles and others. A survey was conducted on the students from Faculty of Computer Science and Information Technology, University of Malaya and Systematic College, Petaling Jaya Campus. The survey was done to collect information about the behavior of respondent on learning, the efficiency of currently used learning styles and material, the opinion of ideal learning aids software and others. Altogether, 80 people had given their respond to the survey.

### **1.7 Expected Output**

The output of this project is a client-server application that run on the client computer and retrieved its learning contents from server or from the client computer itself. The overall application contains two parts, including server-side and client-side. The purpose of server-side is performing data processing. For this purpose, an application that act as a socket is created and located on the server to retrieve and store the entire learning contents to the database on server.

At the client-side, a standalone executable application with an ActiveX control is developed. ActiveX control is the main part for the overall system. All the features are developed inside this control. The expected features included in the ActiveX control were Information searching agent, file sharing, sharable learning contents, media file playing, highlight text tool, reader agent and a communication tool. Besides, a dynamic link library (DLL) file was created for reusability and interoperability purpose. With this file, developers and moderators are able to connect to the learning contents from an external resource.

Thus, the project is also expected to develop Learning Objects that can be used with the system. The Learning Objects are enable to modify and to reuse. Besides, a Learning

Objects repository is also expected to be designed and implemented. The repository is designed as database and the Learning Objects are tagged by the fieldname for easy search.

## **1.8 Project Schedule**

Having a simple methodology to follow in this project development is not enough to complete LOOOP sufficiently. In order to build a complex system, many software engineering tasks occurred in parallel, and the results of work performed during one task might had a profound effect on work to be conducted in another task. These interdependencies were very difficult to understand without a schedule. It was also virtually impossible to assess progress on a moderate or large software project without detailed schedule. To achieve this milestone, a work list and project schedules were planned and analyzed carefully based on the scope of the work.

After the entire task for LOOOP had been defined and determined, the next steps that had to be done was to determine the task logical dependencies. Most tasks were dependent on the start or completion of other tasks, and the task must precede another task unless it has completed the project. Determining the logical dependencies is allowed to determine the overall length of this project and credible estimates of the time required to complete this project.

By using a plan schedule that followed the task logical dependencies, LOOOP can be developed step-by-step and able to complete the milestone or objective on time. A Gantt chart was drawn after the logical dependencies had been defined. Table 1.1 showed the general task dependencies, figure 1.1 illustrated task logical dependencies diagram.



Table 1.1 General task dependencies

Task	Description	Dependencies
T1	Define title	-
T2	Plan and schedule	T1
T3	Literature review	T1
T4	Programming	T2
T5	Writing report	T3
T6	Testing	T4
T7	Binding book	T5
T8	Packaging	T6

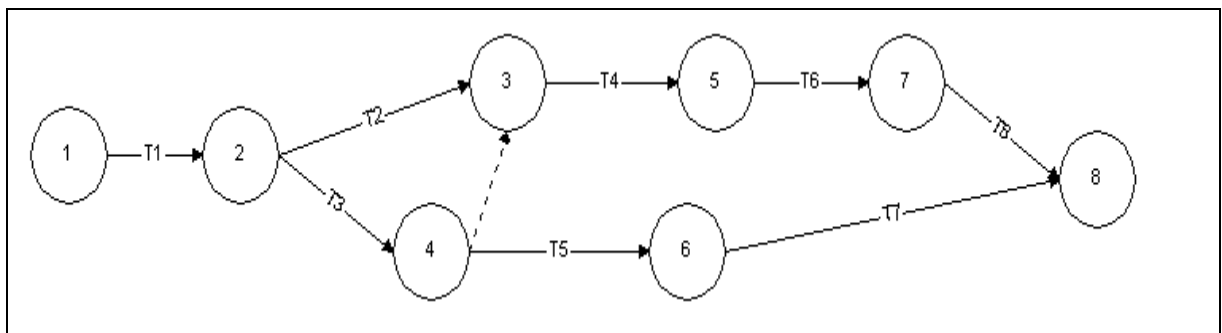


Figure 1.1 Task logical dependencies diagram

In this project, a timeline chart or a Gantt chart was generated. Figure 1.2 illustrated the LOOOP Gantt Chart that had been described. There were fifteen tasks within six groups of activities in system planning schedule. The six groups were system planning, system analysis, system design, system development, system testing and system finish.

In system planning activities, title review and understanding was important to have a better understanding. The understanding ensured project development was always in the project scope and on the way to achieve project objectives. In the system analysis activities, information collected on the data including the definition and the details of Learning Objects as well as some of the similar Learning Objects that had been developed by other instructional party. At this stage, a survey also had been conducted. After gathering the

information, some analyses were made on the information collected and survey conducted. The results were kept for references for system design level.

In system design activities, this activity was more focused on system architecture, system process flow and user interface design. Beside this, database used in the system was also designed at this level. ERD and DFD were also designed at this level to describe the data flow of the subsystem. These two diagrams were used for implement at the next level, system development.

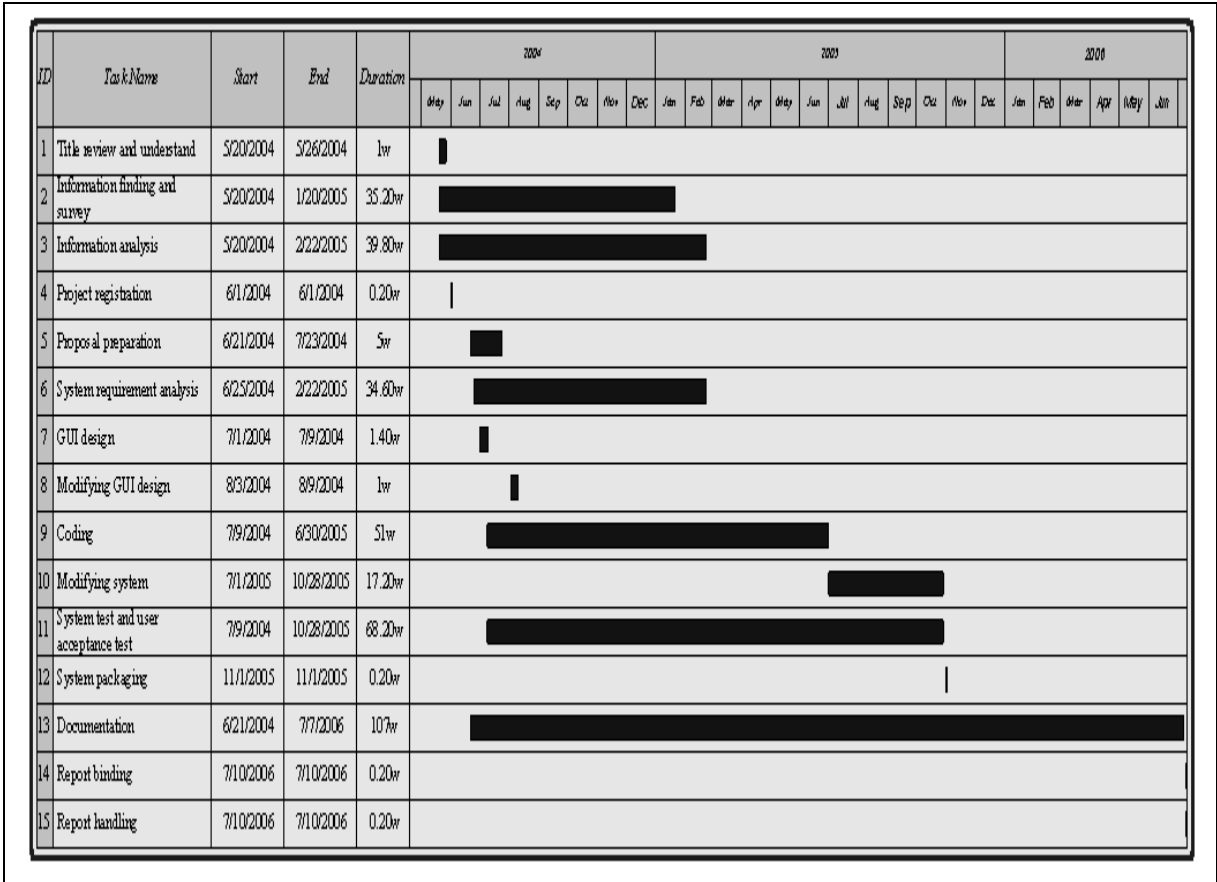


Figure 1.2 LOOOP Gantt Chart

System implementation or code generating level was an activity that translated what had been written or designed in the system design level into machine-readable form or reality. System testing was an activity where the system is tested by logical test, functional test and user acceptance testing.

Activity in system finish began only after the subsystem was fully accomplished. The activities included final testing and installer making.

## **1.9 Chapters Summary**

This report consisted of nine chapters.

### **1. Introduction**

This chapter gives an overview to this project. This chapter discuss about the problem statements, project significance, project objectives, project scopes, intended audiences, an overview of methodology use in this project, expected output and project schedule,

### **2. Review On Learning Objects**

This chapter discusses about the definitions, the features and other related information for Learning Objects. The reviews also included some projects that had been developed by other committee, universities and organizations.

### **3. Review On Learning Styles**

This chapter discusses about the definitions, types of learning styles as well as the relationship between learning styles and Learning Objects.

### **4. Methodology**

This chapter discusses about the software development life cycle model used to develop the system as well as the investigation techniques used on data collection.

### **5. System Analysis**

This chapter discusses about the analysis made on collected data, analysis on survey, the functional and non-functional requirements for this project, the expected system requirements to run the system as well as the application used to complete this project.

## 6. System Design

This chapter discusses about the designs of the systems including system architecture, process flow, entity relationship, data flow, database design and the system graphical user interface design.

## 7. System Implementation And Coding

This chapter gives an overview of the programming languages and technologies used on system implementation as well as the algorithm and coding for several important functions for the system.

## 8. System Testing And Evaluation

This chapter discusses about the testing performed to the system including the unit testing, integration testing, system testing as and also user acceptance test.

## 9. Conclusion

This chapter discusses about the project strength, project limitation and project enhancement.

### **1.10 Summary**

This chapter gives an overview to the project, including the problems statements, project significance, objectives, scopes, intended audience, expected outcome as well as project schedule. Problem statements regards to the issues raised in learning and education system. With the stated problem statements, project significance showed the important of this project to be created. After that, the objectives, scopes and intended audience were identified to ensure the project was developed following the right way for the right users. The expected outcome of the project has also been identified as a guideline to develop the system for this project. Project schedule was designed to ensure the completion of project met the milestone on time.