

# **THE PLANNING AND DESIGN OF A MULTIMEDIA COURSEWARE ON UNIMAS ONLINE LEARNING SYSTEM**

**STEPHEN TING PING LIK**

This project is submitted in partial fulfilment of the requirements for a  
Bachelor of Science with Honours  
(Computer Science)

Faculty of Cognitive Sciences and Human Development  
UNIVERSITI MALAYSIA SARAWAK  
(2009)

BORANG PENGESAHAN STATUS TESIS

**Gred:**

JUDUL : \_\_\_\_\_  
\_\_\_\_\_

SESI PENGAJIAN : \_\_\_\_\_

Saya \_\_\_\_\_  
(HURUF BESAR)

mengaku membenarkan tesis \* ini disimpan di Pusat Khidmat Maklumat Akademik,  
Universiti Malaysia Sarawak dengan syarat-syarat kegunaan seperti berikut:

1. Tesis adalah hakmilik Universiti Malaysia Sarawak.
2. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat pendigitan untuk membangunkan Pangkalan Data Kandungan Tempatan.
4. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.

\*\* sila tandakan ( ✓ )

☐

SULIT

(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan seperti termaktub di dalam AKTA RAHSIA RASMI 1972)

☐

TERHAD

(Mengandungi maklumat Terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

☐

TIDAK TERHAD

\_\_\_\_\_  
(TANDATANGAN PENULIS)

\_\_\_\_\_  
(TANDATANGAN PENYELIA)

Alamat Tetap:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Tarikh : \_\_\_\_\_

Tarikh: \_\_\_\_\_

Catatan:

\* Tesis dimaksudkan sebagai tesis bagi Ijazah Doktor Falsafah, Sarjana dan Sarjana Muda

\*Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh tesis ini perlu dikelaskan sebagai TERHAD.

### **Statement of Originality**

The work described in this Final Year Project, entitled  
**“The Planning and Design of a Multimedia Courseware on UNIMAS  
Online Learning System”**  
is to the best of the author’s knowledge that of the author except  
where due reference is made.

\_\_\_\_\_  
\_\_\_\_\_

(Date submitted)

(Student’s signature)  
STEPHEN TING PING

LIK

15824

The project entitled ‘The Planning and Design of a Multimedia Courseware on UNIMAS Online Learning System’ was prepared by Stephen Ting Ping Lik and submitted to the Faculty of Cognitive Sciences and Human Development in partial fulfillment of the requirements for a Bachelor of Science with Honours (Computer Science)

Received for examination by:

-----  
(Assoc. Prof. Dr. Chen Chwen Jen)

Date:

-----

<b>Grade</b>
--------------

## **ACKNOWLEDGEMENTS**

I wish to express my sincere gratitude and appreciation to my supervisor, Assoc. Prof. Dr. Chen Chwen Jen for her opportune guidance and firm support throughout the completion of my final year project.

My special thanks to the CALM staff (Sh Norizan Bt Wan Zain, Maclean Patrick Sibat, Pauline Beremas George Gerrie, Ahmad Zikrilah B. Abdullah) who have helped much in the production process of Mastering Morpheus.

I would like to express my appreciation to my team members, Chieng King Seng and Wong Sheng Tung for their constructive comments and cooperation in designing and developing the multimedia courseware.

I would like to convey my deepest gratitude to my beloved family for their endless support and continuous affectionate encouragement during the completion of my undergraduate studies.

Last but not least, to all the individuals who have, in one way or another, assisted me in the accomplishment of this project, I am forever grateful to your kindness and efforts. Thank you all.

## TABLE OF CONTENTS

Acknowledgements	Page iv
Table of Contents	v
List of Tables	viii
List of Figures	ix
Abstract	xi
<i>Abstrak</i>	xii
<b>CHAPTER 1 - INTRODUCTION</b>	
1.0 Overview	1
1.1 Background of Study	1
1.2 Problem	4
1.3 Purpose of the Project	5
1.3.1 Aim	5
1.3.2 Specific Objectives	5
1.4 Scope of the Project	6
1.5 Significance of the Project	6
<b>CHAPTER 2 - LITERATURE REVIEW</b>	
2.0 Overview	7
2.1 What Is Multimedia?	7
2.1.1 Advantages of Using Multimedia Courseware	8
2.2 Model for Design and Development	10
2.2.1 Standards, Ongoing Evaluation and Project Management	12
2.2.2 Planning Phase	13
2.2.3 Design Phase	14
2.3 Methodologies for Facilitating Learning	16
2.3.1 Tutorial	16
2.3.2 Simulation	18
2.3.3 Demonstration	20

## CHAPTER 3 - METHODOLOGY

3.0	Overview	21
3.1	Instructional Planning of the Multimedia Courseware	21
3.1.1	Define the Scope	22
3.1.2	Identify Characteristics of Learners	22
3.1.3	Establish Constraints	22
3.1.4	Produce a Planning Document	22
3.1.5	Produce a Style Manual	23
3.1.5.1	Look and Feel	23
3.1.5.2	Style Convention	23
3.1.6	Determine and Collect Resources	24
3.1.6.1	Subject Matter Resources	24
3.1.6.2	Instructional Design Resources	24
3.1.7	Conduct Initial Brainstorming	24
3.1.8	Define Look and Feel	25
3.2	Instructional Design of the Multimedia Courseware	25
3.2.1	Develop Initial Content Ideas	25
3.2.1.1	Brainstorming	26
3.2.1.2	Elimination of Some Initial Ideas	26
3.2.2	Task and Concept Analyses	28
3.2.2.1	Task Analysis	28
3.2.2.2	Concept Analysis	28
3.2.3	Preliminary Programme Description	29
3.2.3.1	Identifying Types of Learning	29
3.2.3.2	Choosing a Methodology	29
3.2.4	Create Flowchart and Storyboard	30
3.2.4.1	Flowchart	30
3.2.4.2	Storyboard	33
3.2.5	Prepare Scripts	39
3.3	Features of the Multimedia Courseware	40
3.3.1	Introduction of the Programme	40
3.3.2	Learner Control of the Programme	41
3.3.3	Presentation of Information	42
3.3.4	Providing Help	44
3.3.5	Terminating a Programme	44

## **CHAPTER 4 - RESULTS AND DISCUSSION**

4.0	Overview	45
4.1	Overview of the Courseware	45
4.1.1	Introduction	49
4.1.2	Content	50
4.1.3	Help	55
4.1.4	Ending	56

## **CHAPTER 5 - CONCLUSION, LIMITATIONS AND RECOMMENDATIONS**

5.0	Overview	58
5.1	Conclusion	58
5.2	Limitations of the Project	60
5.3	Recommendations for Future Works	60

<b>REFERENCES</b>	62
-------------------	----



## LIST OF TABLES

<b>Table 3.1</b>	
List of Content Ideas from a Brainstorming Session about Utilising the Morpheus System	26
<b>Table 3.2</b>	
List of Ideas to Facilitate Learning, from a Brainstorming Session about Utilising the Morpheus System	27
<b>Table 4.1</b>	
Summary Table of the Comments and the Corresponding Revisions	47

## LIST OF FIGURES

<b>Figure 2.1</b> 'Model for Design and Development'	11
<b>Figure 2.2</b> Common Structure and Sequence of a Tutorial Programme	17
<b>Figure 3.1</b> Level-1 Flowchart of the Multimedia Courseware	31
<b>Figure 3.2</b> Level-2 Flowchart of the Multimedia Courseware- Selection of Menu Option	32
<b>Figure 3.3</b> Storyboard Design of the Title Page	34
<b>Figure 3.4</b> Storyboard Design of the Main Page	35
<b>Figure 3.5</b> Storyboard Design of the 'Login' Page	36
<b>Figure 3.6</b> Storyboard Design of the Help Page	37
<b>Figure 3.7</b> Storyboard Design of the Exit Page	38
<b>Figure 3.8</b> Storyboard Design of the About Page	39
<b>Figure 4.1</b> Title Page of the Courseware	49
<b>Figure 4.2</b> 'Introduction' Page of the Courseware	50
<b>Figure 4.3</b> 'What is Online Learning?' Page of the Courseware	51
<b>Figure 4.4</b> 'About Mastering Morpheus' Page of the Courseware	52

<b>Figure 4.5</b> 'Login' Page of the Courseware	53
<b>Figure 4.6</b> 'Demonstration' Page of the Courseware	54
<b>Figure 4.7</b> 'Help' Page of the Courseware	55
<b>Figure 4.8</b> 'Exit' page of the Courseware	56
<b>Figure 4.9</b> 'About' Page of the Courseware	57

## **ABSTRACT**

### **THE PLANNING AND DESIGN OF A MULTIMEDIA COURSEWARE ON UNIMAS ONLINE LEARNING SYSTEM**

Stephen Ting Ping Lik

With the emerging advances in technology, Universiti Malaysia Sarawak (UNIMAS) at present has deployed an online learning system known as Morpheus system to enable the integration of technology into the instructions that aim to enrich the teaching and learning efficiency. However, the current face-to-face training sessions on this online learning system for the UNIMAS academic staff poses some limitations. To overcome these limitations, this project was conducted to plan and design a multimedia courseware (known as 'Mastering Morpheus') as an avenue to guide these lecturers in learning the Morpheus system. The planning and design phases employed in this project were based on the 'Model for Design and Developmen' proposed by Alessi and Trollip (2001). According to the feedbacks and comments obtained from both instructional design and subject matter experts as well as three potential learners, some changes and the corresponding revisions had been made accordingly to further improve the completeness and quality of the courseware. In conclusion, the results of the evaluation indicated that the potential learners were generally satisfied with the overall presentation and quality of the courseware.

**Keywords:** Morpheus, online learning system, planning, design, multimedia courseware

## **ABSTRAK**

### **PERANCANGAN DAN REKA BENTUK BAHAN KURSUS MULTIMEDIA BAGI SISTEM PEMBELAJARAN DALAM TALIAN UNIMAS**

*Stephen Ting Ping Lik*

*Dengan perkembangan teknologi yang semakin canggih, Universiti Malaysia Sarawak (UNIMAS) telah menggunakan suatu sistem pembelajaran dalam talian yang dikenali sebagai sistem Morpheus untuk membolehkan implementasi teknologi dalam bidang pengajaran. Namun, sesi latihan secara bersemuka yang disediakan kepada staf akademik UNIMAS, khasnya golongan pensyarah mempunyai kelemahan. Sehubungan dengan itu, projek ini dilaksanakan bertujuan untuk merancang dan mereka bentuk satu bahan kursus multimedia sebagai suatu alternatif untuk membantu pensyarah dalam mempelajari sistem 'Morpheus'. Kaedah perancangan dan reka bentuk yang digunakan dalam projek ini adalah berlandaskan 'Model for Design and Development' yang dicadangkan oleh Alessi dan Trollip (2001). Berdasarkan komen dan cadangan daripada pelbagai pihak, pengubahsuaian telah dilakukan untuk meningkatkan kualiti bahan kursus bagi projek ini. Kesimpulannya, keputusan penilaian menunjukkan bahawa sampel pelajar sasaran berpuas hati dengan kualiti bahan kursus multimedia ini.*

*Kata kunci: Morpheus, sistem pembelajaran dalam talian, perancangan, reka bentuk, bahan kursus multimedia*

# **CHAPTER 1**

## **INTRODUCTION**

### **1.0 Overview**

This chapter discusses the background of the study, problem, aims and objectives of the project, scope of the project and also including the significance of the project. The background of the study focuses on computer-based instruction, the use of technology as a tool for teaching and learning and also the importance of multimedia in educational setting. Then, it is followed by problem section that highlights the predicaments arise which had accelerated the necessity to carry out this project. The objectives underlie this project are also explained together with the scope encompassed in this project. The significance of this project is also included.

### **1.1 Background of Study**

The rapid increase in technology has led to digital age. The first computer was built by Charles Babbage and it was introduced during the nineteenth century (Bitter & Pierson, 2002). The adoption of the integrated circuit in the year 1970 allowed

computers to be produced at a relatively low cost which enabled individuals to possess a personal computer similar to the ones we use today.

Technology today continues to advance, and in reality, it is a never-ending journey. These technology advancements, especially computer gradually play a vital role in each educator's and student's life and it became an item that society cannot live without, which is used both academically and socially. Naisbitt and Aburdene (1992) stated that "computers will strengthen the power of individuals" (p. 95). This technology device allows educators to have greater access to resources and content material such as multimedia software or product which can enhance their teaching delivery process so that learners can learn and understand in a better way. With this, computer-based instruction approach without doubt is a good alternative to deliver the lesson effectively.

This computer-based instruction approach in the classroom is found to enhance the learning as long as the text and visuals directly support each other (Slavin, 2006). Over the last few decades, computer-based technologies have provided new forms of access to knowledge and learning, and innovative didactic tools. Teaching and learning have changed as the use of technology becomes more prevalent. A number of forces have contributed to these changes, including the implementation of online leaning system in University Malaysia Sarawak (UNIMAS) such as Morpheus, is a successful programme of which many educators have benefited from it.

According to Semple (2000), computer technologies are mind tools that can increase the cognitive abilities and thus will activate thinking which produces learning. As the learners use this programme, they are able to express their thinking and organize their knowledge in their own personal way. The utilisation of computer programmes in instruction allows better preparation of learners for their future

careers besides offering the chances for refining the critical thinking skills (Valois, 2000). Chorp (2002) states that instruction effectiveness and student learning will significantly be improved when judicious use of computer technology is integrated into the educational system.

Nowadays, the use of instructional multimedia in computer-based instruction has become increasingly prominent in schools and universities and this brings significant changes in the teaching strategies being employed by educators. The use of computer-based instructional method is beneficial as this mode of method integrates the multimedia tools into the teaching and learning processes that can stimulate the interest of the learners and hence generate the credibility (Brummelhuis, 1994). Fenrich (2004) says: “The inclusion of simulations, animation, discovery-learning techniques, video, active experimentation, numerous questions with detailed feedback, and photographs as instructional design strategies, practical hands-on skills can be taught effectively through multimedia technology.” (p.1)

At present, there is a need to develop a multimedia courseware for all the UNIMAS academic staff members, especially the lecturers who do not have the basic knowledge and skills in utilising the Morpheus System. However, in particular, this project merely focuses on the planning and design of a multimedia courseware on UNIMAS online learning system.



## 1.2 Problem

At present, UNIMAS practices ‘blended learning’. This blended learning involves the integration of technology into the current traditional mode of classroom delivery to enrich the teaching and learning processes. It does not take over the educator’s roles but instead provides them with supplementary tools that can enhance their teaching effectiveness. In addition, blended learning is also well suited for university students’ learning styles as it gives more responsibilities to them in managing their own learning.

UNIMAS employs blended learning in instruction through a mixture of face-to-face and online learning so that the instruction occurs both in the classroom and online. In order to promote and facilitate online learning, an online learning system known as Morpheus System has been deployed. Centre Applied Learning and Multimedia (CALM) is the entity in UNIMAS that responsible to provide training on how to utilise the Morpheus system for all the UNIMAS academic staff members, particularly the lecturers who do not know how to use the Morpheus system. In the past, the centre has conducted numerous face-to-face training sessions in order to accommodate this need. However, this mode of training poses some limitations.

First and foremost, it is always a problem to arrange for a date and time slot which is convenient for lecturers. Also, it is considered not cost effective to train each and every one of them as many training sessions need to be conducted to assist these lecturers in learning the basic skills and knowledge of using the Morpheus system. Williams (2000) notes it is impossible to have one-on-one educator-learner ratio in a regular educational setting.

Furthermore, delivery effectiveness varies among different instructors. This is due to the different demands by different lecturers which is caused by the differences in term of their computer literacy as well as their experiences in using Morpheus system. Moreover, the face-to-face training sessions undoubtedly are very dependent on instructor, number of attendance, venue and facilities available for the training.

Due to the limitations of face-to-face training, an alternative solution will be to develop a multimedia courseware that guides and assists these lecturers in self-learning the Morpheus system. If the lecturers can fully utilise this online learning system, surely they can enhance the teaching process and students' learning. In particular, this project emphasizes on the planning and design of a multimedia courseware on Morpheus system.

### **1.3 Purpose of Project**

#### **1.3.1 Aim**

Generally, the aim of this project is to plan and design a multimedia courseware to guide the UNIMAS staff members, particularly the lecturers in learning the Morpheus system.

#### **1.3.2 Specific Objectives**

The specific objectives of this project are to:

- i. identify the appropriate content for the multimedia courseware
- ii. design the overall interface for the multimedia courseware
- iii. design the flow of the content of the multimedia courseware
- iv. incorporate appropriate instructional methodologies into the multimedia courseware

#### **1.4 Scope of the Project**

Basically, this project only focuses on two preliminary phases of developing a multimedia courseware, which are the planning and design phases. These two phases are carried out based on the 'Model for Design and Development' proposed by Alessi and Trollip (2001). Besides, multimedia courseware is customised to the needs of UNIMAS lecturers in learning the Morpheus system. Demonstration of steps on how to perform a particular task in simulated environment, tutorial on presenting new information as well as activities are included in the courseware to effectively facilitate the learning process by the lecturers who do not know how to utilise the Morpheus system.

#### **1.5 Significance of the Project**

The significance of the project is to plan and design a multimedia courseware. According to Alessi and Trollip (2001), a multimedia product is more likely to success if the proper groundworks during the planning and design phase are laid before starting the development of it. Therefore, well planning and design of the courseware are essential to form a good groundwork for the later stage of the courseware development as they can significantly affect the quality of the courseware produced by the developer.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Overview**

This chapter presents an overview of the literature related to this project. It provides the definitions of multimedia as well as the educational benefits of employing multimedia software in the instructions. Besides, previous research studies regarding the effectiveness of computer-based instruction in terms of information delivery are also being discussed. This chapter also briefly describes the “Model for design and development” which is proposed by Alessi and Trollip (2001). The following section reviews the numerous types of instructional methodologies and their advantages.

#### **2.1 What is Multimedia?**

The term “Multimedia” has been defined in a number of ways. Shuman (1998) defines multimedia as a computer-based interactive communication process that incorporates text, graphic, animation, sound and video elements. Besides, multimedia is a woven combination of different types of media elements such as graphic, text, animation, sound and video and uses the computer as a control and presentation

platform to enhance the learning environment (Kaur, 1996; Vaughan, 2001). Reddi (2003) describes multimedia as an integration of multiple media elements into one synergetic and symbiotic whole that brings more benefits for the end users than any one of the media elements can provide individually. According to Smaldino & Rusell (2005), multimedia refers to the concurrent usage of numerous kinds of media formats in a given presentation and self-study activity.

In general terms, courseware can be defined as any educational software available in digital format that is designed particularly for use with the computers in the classroom (Infoplease, 2008). Apart from that, multimedia courseware is the use of variety types of communications mediums within a computer programme such as audio, video, still graphics and voice-over narration in presenting the information as well as illustrating the ideas to the learners in order to facilitate their understanding (Hick, 1997).

### **2.1.1 Advantages of Using Multimedia Courseware**

Marshall (1995) believes that the use of multimedia materials can enhance the transmission of factual information and ideas to the learners. In the past, most of the traditional courseware materials like cassette tapes, charts and text books, have some limitations especially in the kind of information each of them can display or communicate. Nowadays, there is a widespread usage of multimedia applications in the educational context. For instance, multimedia courseware has a significant impact upon learners as it incorporates a wide variety of visual and audio data forms to facilitate the learning process.

Borysowich (2005) had carried out an analysis to examine the benefits of using multimedia courseware. The results have revealed that multimedia courseware is more beneficial than classroom-based instruction in terms of training availability,

quality of presentation, information transfer, time management, and also the adaptability for the learners to manage their learning process.

According to Hick (1997), the advantages of using multimedia courseware are: (a) interactive, (b) cost-effective, (c) improve learning, (d) practical, (c) consistent, (d) engaging, (e) modular, and (f) flexible. In addition to that, Williams (2000) has described some major benefits of employing multimedia courseware for instructional purposes:

(a) Match with the learning style

- There are different types of learners such as audio learners and visual learners. If the design of the courseware matches with the learner's learning style, no doubt, they can learn faster and better.

(b) Clarity

- A good use of media can explain the concepts, ideas and examples clearly to the learners. For instance, a book provides text and visual images to describe the concept of DNA. However, this concept will be clearer to learners if they can view the structure of DNA in flash or animation mode.

(c) Motivation

- Multimedia courseware can provide an interesting learning environment for learners. During the learning process, effective use of the courseware is essential as it can provide cues, guidance and reinforcement to the learners.

(d) Cost-effectiveness

- Many lecturers in universities use courseware to deliver the lesson. This is a cost-effective way to deliver the lesson in the labour intensive courses.

(e) Interactivity

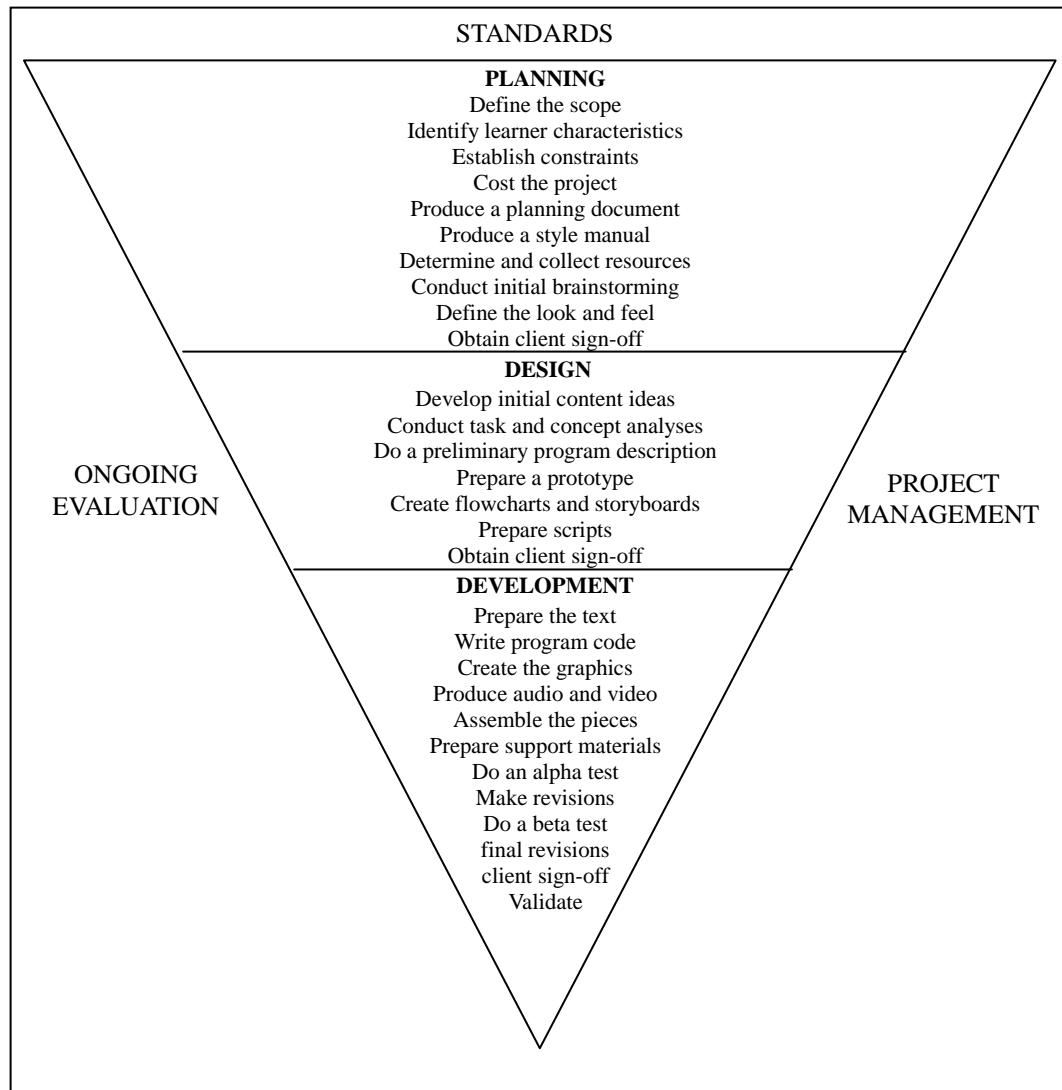
- A good multimedia courseware will provide suitable interactions for the learners. These interactions may be in the form of providing individualised learning pace, paths, practices and feedback. For example, students' interaction with the courseware is quite readily compared to the students in a classroom of forty as they can hardly have individual interactions with their teacher all the time.

(f) Non-threatening learning Environment

- Typically, learners do not want to be embarrassed during their learning process. Multimedia courseware is an alternative to overcome this kind of situation as it provides a non-threatening learning environment for the learners to explore, and practise their skills according to their own pace.

## **2.2 Model for Design and Development**

Alessi and Trollip (2001) proposed the 'Model for Design and Development' as illustrated in Figure 2.1, aims to guide the creation of a multimedia courseware. This model is modified from the Instructional System Design (ISD) approach and it is designed to be flexible as users can mold it to their own individual needs and styles of work as they gained experiences. Besides, it has three attributes and also three important phases. Each phase comprises a variety of issues and actions to be taken. These three attributes are standards, project management and ongoing evaluation whereas the three phases are the planning, design, and development phases. They are the principles that need to be aware of at all time and have to apply them throughout the whole process of design and development. The details for these attributes and the phases involved in this project are reviewed based on the points of views and model suggested by Alessi and Trollip (2001).



**Figure 2.1:** ‘Model for Design and Development’ (Adapted from Alessi & Trollip (2001))