IMPLEMENTATION OF DIGITAL STORYTELLING TO INCREASE LEARNABILITY AMONG PRIMARY STUDENTS

LIM WEI WEN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS TESIS*

JUDUL: IMPLEMENTATION OF DIGITAL STORYTELLING TO INCREASE LEARNABILITY AMONG PRIMARY STUDENTS

SESI PENGAJIAN: 2010/2011

Saya LIM WEI WEN

mengaku membenarkan tesis (PSM/Sarjana/Doktor Falsafah) ini disimpan di Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. ** 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	

(TANDATANGAN PENULIS)

Alamat tetap: 401, Block A15,
Section 2, Wangsa Maju, 53300,
Kuala Lumpur.

Tarikh: 1 Julai 2011

(TANDATANGAN PENYELIA)

Madam Syariffanor binti Hisham
Nama Penyelia

Tarikh: 5 Julai 2011

CATATAN: * Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda (PSM)
** Jika Tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

IMPLEMENTATION OF DIGITAL STORYTELLING TO INCREASE LEARNABILITY AMONG PRIMARY STUDENTS

LIM WEI WEN

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
2011

DECLARATION

I hereby declare that this project report entitled

IMPLEMENTATION OF DIGITAL STORYTELLING TO INCREASE LEARNABILITY AMONG PRIMARY STUDENTS

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

STUDENT : _____ Date : 1 July 2011

(LIM WEI WEN)

SUPERVISOR : _____ Date : 5 Julai 2011

(MADAM SYARIFFANOR BT HISHAM)

ACKNOWLEDGEMETS

The success of this project depends largely on the encouragement and guidelines of many others. I take this opportunity to express my gratitude to the people who have been instrumental in the successful completion of this project.

I would like to show my greatest appreciation to Madam Syariffanor Hisham. I can't say thank you enough for her tremendous support and guidance. Without her encouragement, this project would not have materialized.

I would like to thank my beloved parents who constantly give me their support, care, and motivation throughout this project.

To my dearest friends who have been a great source of support and help, thank you. Your motivation and assistance during my time in need is highly valued and appreciated.

I would also like to thank my faculty for providing all the necessities required for this project. A special thanks to the university and faculty staffs who have been remarkably selfless and helpful.

ABSTRACT

Since the invention of television in the 20th century, the communication of information has been permanently changed. People have since got accustomed to convey information visually with words a secondary adjunct, and become less patient, particularly the new generation. The current teaching-learning process in primary education is mostly based on "chalk and talk", where teachers face challenges to attract and retain students' attention and interest in class using this conventional teaching practice. Thus, it is essential to explore alternative methods on how to engage students in the teaching-learning process. Storytelling is a simple but powerful method to explain complex matters. People tend to pay much more attention for what is told when the information is put into an interesting or exciting story. Stories have been told as far as time allows us to remember. In the middle ages stories were told orally by wandering bards and minstrels. In the 1980s new technologies like film, radio and television offered a new way of telling stories. Digital Storytelling is the practice of combining narrative with digital content, including images, sound, and video, to create a short movie, typically with a strong emotional component. The purpose of this research is to study the effectiveness of implementing Digital Storytelling in primary level education to increase the learnability of students, using the Multimedia Production Process as the research methodology. This project is expected to contribute in terms of increasing student's engagement, attention, and memory recall in a particular subject during the teaching-learning process.

ABSTRAK

Sejak penciptaan televisyen pada abad ke-20, cara penyampaian maklumat telahpun berubah. Masyarakat zaman kini lebih cenderung kepada penyampaian maklumat secara visual, di mana penggunaan teks hanyalah sebagai tambahan. Secara umumnya, proses pengajaran dan pembelajaran pada peringkat sekolah rendah adalah berdasarkan kaedah traditional "*chalk and talk*". Justeru, para guru sekarang menghadapi cabaran untuk menarik dan mengekalkan perhatian pelajar-pelajar di dalam kelas dengan cara pengajaran traditional ini. Maka, adalah penting untuk mencari kaedah pengajaran alternatif lain yang lebih berkesan. Kaedah bercerita adalah satu kaedah yang mudah namun berkesan untuk menjelaskan topik-topik yang kompleks. Masyarakat didapati lebih cenderung memberi perhatian kepada sesuatu maklumat apabila maklumat tersebut dijadikan sebuah cerita yang menarik. Kaedah bercerita telah lama dipraktikkan sejak zaman dulu lagi. Pada abad pertengahan, cerita disampaikan secara lisan oleh para pengembara. Pada tahun 1980-an pula, teknologi-teknologi baru seperti penghasilan filem, penciptaan radio dan televisyen telah mewujudkan satu cara penyampaian cerita yang baru. Penceritaan Secara Digital merupakan penggabungan antara kaedah penceritaan dan bahan-bahan digital seperti gambar, audio, dan video untuk menghasilkan filem-filem pendek. Kajian ini bertujuan untuk menguji keberkesanan perlaksanaan Penceritaan Secara Digital pada pendidikan berperingkat rendah untuk meningkatkan tahap pembelajaran para pelajar, dengan menggunakan Proses Produksi Multimedia. Projek ini dijangka akan memberi sumbangan dari segi peningkatan daya perhatian dan pemahaman para pelajar semasa proses pengajaran dan pembelajaran dijalankan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 Project Background

The teaching-learning process in primary education is mostly based on "chalk and talk". In this traditional education realm, the role of the teacher is to provide the content and information to the students based on the teacher's curriculum and other relevant information for the class, using materials such as textbooks. Teachers today face challenges to attract and retain students' attention and interest in class using this conventional teaching practice. Thus, it is important to explore additional methods on how to engage students in the teaching-learning process.

The purpose of this research is to study the effectiveness of implementing Digital Storytelling in primary level education to increase the learnability of students in the teaching-learning process. Storytelling has a long and rich history (Wetzel, 2000); it is known as "the original form of teaching" (Pederson, 1995). People tell and listen to stories because stories bring the vibrancy of lived experience to interpersonal dialogue. Teachers, religious leaders, politicians, comedians, and journalists routinely embed stories in their talks and writing to illustrate points and capture their audience's attention (Neal, 2001). To capture and maintain the learner's interest, a story's narrative must connect with the learner's emotions, and therefore, easy to recall (Sharda, 2010).

The topic chosen to be illustrated in the Digital Story is the "Blood Clotting Mechanism". Bleeding is definitely an unavoidable experience in life ever since young, therefore students can relate this emotionally to themselves. The Digital Story will be develop using video recording with the integration of 2D animation, and it is a medium targeted to communicate with children above 7 years old. The rationale of using Digital Storytelling in primary level education is to capture the attention and interest of students and to engage them with its rich multimedia elements. It also aims to improve their memory recall on the subject by using the storytelling technique that enables students to relate the subject to themselves emotionally. As an additional module, first-aid tips on how to stop bleeding faster and when to call for help will be included in this study.

1.2 Problem Statement

Ever since the invention of the television in the 20th century, the communication of information has been permanently changed. Back then, people used to want to listen—and to read. People delighted in words. They were major means of exchange. Written language and skilful orators were sources of pleasure (Hamlin, 1988). People were more patient in obtaining information. But ever since the television invades our lives, mass impart information visually, with words a secondary adjunct. People want immediate information and instant gratification, without much personal effort (Hamlin, 1988). The pace of life has speed up and everyone is used to keeping up with the fast pace. Thus, people have become less patient, especially the new generation.

Teachers today face challenges to attract and retain students' attention and interest in class using the conventional "chalk and talk" method. This is due to the massive change of information communication means since the invention of television, resulting in the demand for immediate information and instant fulfilment. Nowadays, the "chalk" element is more likely to be a whiteboard, flipchart or a PowerPoint computerised presentation. In such a lecture, students assume a purely passive role and

their concentration fades off swiftly. Teaching in classroom using chalk and talk is "one way flow" of information, and the material presented is only based on lecturer notes and textbooks. More emphasis has been given on theory without any practical and real life time situations.

Stories have been used as educational medium since prehistoric times as they encapsulate four crucial aspects of human communication: information, knowledge, context, and emotions (Norman, 1993). Embedding stories as digital media, also known as Digital Storytelling, is therefore essential for effective learning. Thus, this research studies the effectiveness of implementing Digital Storytelling as an additional teaching-learning method to enhance the conventional "chalk and talk" method.

1.3 Objective

- To study the effectiveness of Digital Storytelling in the teaching-learning process of primary students.
- To implement Digital Storytelling to increase students' attention and engagement in a particular subject.
- To evaluate the effectiveness of using the storytelling technique to increase students' memory recall on a particular subject.

1.4 Scope

The modules of this project includes video recording of a host who explains the "Blood Clotting Mechanism", the 2D animation that illustrate the host's explanation, and the first-aid tips to children on how to stop bleeding faster. The target users of this project are children above 7 years old. The reason for this age limitation is due the topic

of "Blood Clotting Mechanism" requires audience to have necessary English Language proficiency and basic Science knowledge, which generally begins at primary level at the age of 7.

1.5 Project Significance

This project study the effectiveness of applying Digital Storytelling in primary level education as an additional teaching-learning method to the conventional teaching process. It serves as a precedent to further explore additional teaching-learning methods and means of information communication among primary students. This project is beneficial to both teachers and students at the primary level. Significance to students is portrayed by the implementation of Digital Storytelling to increase their learnability and memory recall of a certain subject; while the significance to teachers is depicted in the exploration of additional teaching methods to better capture their student's attention in class.

1.6 Summary

This study focuses on the effectiveness of implementing Digital Storytelling as a teaching-learning method in addition to the conventional teaching process. The development of the Digital Story will compose of video recording concurrent with 2D animation illustration, and the topic chosen to be illustrated is the "Blood Clotting Mechanism". By the end of this project, the developer is expected to successfully explore an additional teaching-learning method by implementing Digital Storytelling, which at the same time acts as an alternative medium for information conveying among primary students. In the next chapter, the literature review will be discussed and a methodology will be selected for the development of this study.

CHAPTER II

LITERATURE REVIEW & PROJECT METHODOLOGY

2.1 Introduction

The literature review is discussed in this chapter. The area of discussion includes published information by accredited scholars and researchers in a particular subject area and sometimes within a certain time period. It determines what has already been done in the field, provides the necessary insight to develop a logical framework into which the topic being researched fits and also presents the rationale for the hypotheses being investigated and the justification of the significance of the study (Duck, 2010).

A literature review can also identify potentially useful methodological strategies and facilitate the interpretation of the results (Duck, 2010). The project methodology discusses the usage of all available approaches, techniques and tools in achieving predetermined objectives.

2.2 Domain

The domain of this project is Digital Storytelling. Digital Storytelling is the practice of combining narrative with digital content, including images, sound, and video,

to create a short movie, typically with a strong emotional component. Digital stories can be instructional, persuasive, historical, or reflective. The resources available to incorporate into a digital story are virtually limitless, giving the storyteller enormous creative latitude. Some learning theorists believe that as a pedagogical technique, storytelling can be effectively applied to nearly any subject.

2.3 Existing System

There are four related existing systems being compared in this section, namely the Animated Interactive Fiction (AIF-system), CONFUCIUS, Slowmation, and Expressive Talking Heads (ETHs) Narrator.

2.3.1 Animated Interactive Fiction (AIF-system) : Storytelling by a Conversational Virtual Actor

According to Piesk, J., and Trogemann, G. (1997), The AIF-system works with a conversational cactus (illustrated in Figure 2.1), who tells "Alice's Adventures in Wonderland". The 3D-character has been designed for live performances in German youth television. The story has been rewritten as an interactive dialogue script by the authors focusing on representing nonlinear narrative structures' in the hypertextual structure of the dialogue script. The AIF-system focuses on the conjunction of verbal natural languages with nonverbal behaviour in the context of storytelling using an autonomous 3D character. The intermediate textual representation is enacted by the 3D-character using both verbal-vocal and nonverbal-non-vocal natural language. The spoken language output is produced by a voice synthesizer, while the nonverbal behaviour comprises lip-movements, facial expressions, gesture and body posture. The 3D-character used in the prototype system has 36 motion effectors (e.g. head up, mouth open, left arm up, etc.) that are controlled by the animation data.

Figure 2.1: Selected nonverbal behaviour of the conversational cactus telling the story of "Alice's Adventures in Wonderland"

2.3.2 CONFUCIUS: An Intelligent Multimedia storytelling interpretation and presentation system

Minhua, E. M., (2002) states that an intelligent multimedia storytelling interpretation and presentation system called CONFUCIUS, automatically generates 3D animation and speech from natural language. As illustrated in Figure 2.2, CONFUCIUS use natural language input including traditional typed text and a tailored menu that facilitates input of movie/drama scripts in a specific format to generate spoken language (dialogue), animation, and non-speech audio outputs. It gives the audience a richer perception than the usual linguistic narrative. Since all the output media are temporal, CONFUCIUS requires coordination and synchronization among these output modalities.

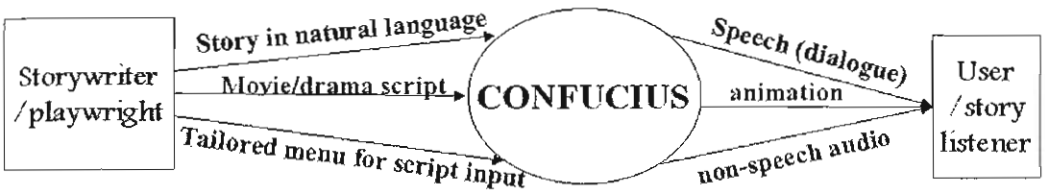
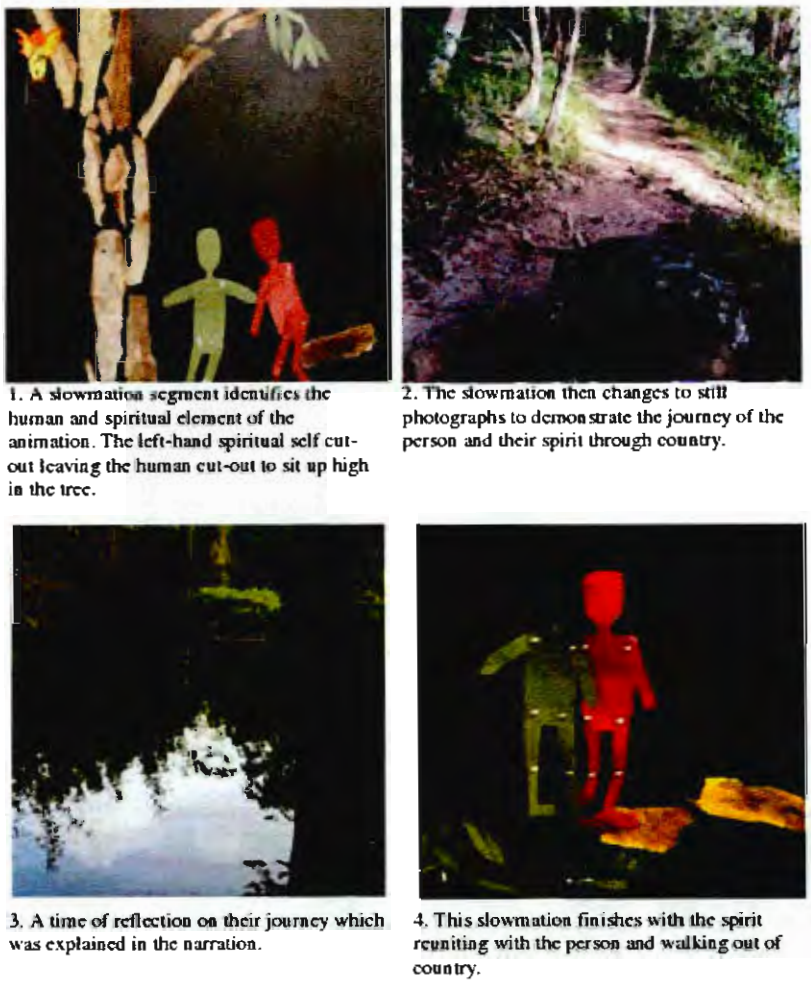


Figure 2.2: Multimodal I/O of CONFUCIUS

2.3.3 Slowmation: A simplified way of making animated stories

According to McKnight, A., Hoban, G., and Nielsen W. (2011), in Australia, teacher education courses are introducing subjects into courses to inform preservice teachers about Aboriginal ways of knowing in order to develop an awareness of Aboriginal cultures and practices. A "Slowmation" (abbreviated from "slow animation") is a narrated stop-motion animation created by preservice teachers that is played slowly at 2 photos per second to tell a story. It is a simplified way of creating an animation that engages preservice teachers in telling a story through making a sequence of five connected representations: notes from preparation or experiences; storyboard to plan the animation; making simple models; taking digital still photos of the models as they are moved manually; and finally constructing the animation. In previous studies, Slowmation has been used to enable preservice teachers to explain science concepts and this is the first study to use the process for storytelling. The narrated animation produced is a multimodal representation created by the preservice students to explain the story of their own "special place" using perspectives about Aboriginal ways of knowing that they have learned from the elective subject, as illustrated in Figure 2.3.



1. A slowmation segment identifies the human and spiritual element of the animation. The left-hand spiritual self cut-out leaving the human cut-out to sit up high in the tree.

2. The slowmation then changes to still photographs to demonstrate the journey of the person and their spirit through country.

3. A time of reflection on their journey which was explained in the narration.

4. This slowmation finishes with the spirit reuniting with the person and walking out of country.

Figure 2.3: Selection of photos from a Slowmation

2.3.4 Expressive Talking Heads (ETHs) Narrator

The presence of a synthetic Narrator is at the very heart of the storytelling experience. The virtual Narrator proposed here is capable of emotional expressions. The implemented environment integrates a talking head system, called ETHs (Expressive talking Heads), with a plot-based storytelling system LOGTELL. ETHs present an innovative system that combines facial animation with plot generation and visualization of interactive stories. In the environment, the talking head featured by ETHs works as a story Narrator, receiving markup-texts containing story fragments and producing, on the

fly, a facial animation that gives voice to this input text. The speech is automatically generated using text-to-speech (TtS) mechanisms. The Narrator facial animation controls, besides lip synchronization, the varying emotional expressions, as shown in Figure 2.4. These are obtained through the text markup parameters. Synchronized with the talking head narration output, a 3D module in the environment renders the story scenes (Rodrigues, P.S.L., 2005).

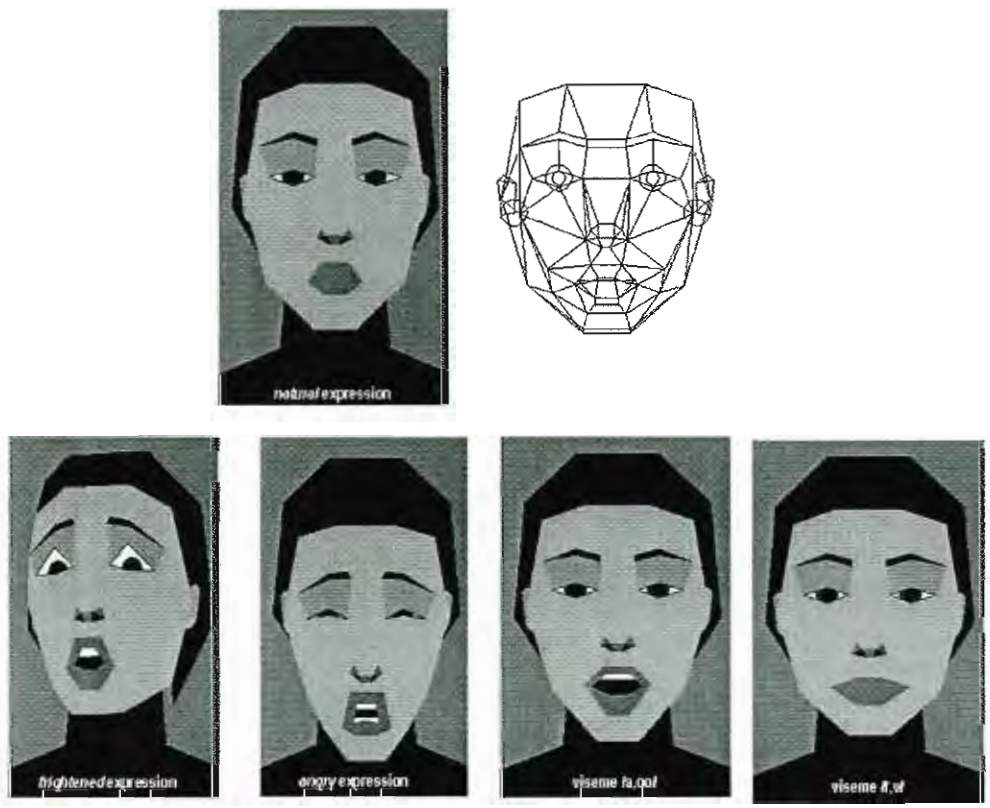


Figure 2.4: The ETHs facial expressions

2.3.5 Comparison of Existing System

Table 2.1: Comparison of existing systems

Digital Story	Storytelling Technique	Storyteller
Animated Interactive Fiction (AIF-system)	Conjunction of verbal natural languages with non-verbal behaviour in the context of storytelling using an autonomous 3D character.	Non-human 3D character
CONFUCIUS	Generates 3D animation and speech from natural language to tell a story.	Human 3D character
Slowmation	Narrated stop-motion animation played slowly at 2 photos per second to tell a story.	Non-human still photos
Expressive Talking Heads (ETHs) Narrator	A talking head with facial animation and speech works as a story narrator, combining plot generation and visualization of interactive stories.	Human talking head character

All the existing digital stories above use a computer-synthesized Narrator. Studies comparing the origin of a narrator's voice in multimedia learning environments have consistently shown than human voices produce greater learning gains and more positive attitudes toward a learning situation than a computer synthesized voices (Harrison, 2009). Therefore, in this project, a human narrator is used instead of a computer-synthesized Narrator.

Most of the digital stories above use one single narrator. According to Ryokai, K., Vaucelle, C., and Cassell, J. (2002), while parents and teachers may not always be available to listen to children's everyday stories, peers are available and can also offer scaffolding to their co-equal status partners. Neuman and Roskos (1991) observed children engaged in instructional conversation with their peers – designating, negotiating, and coaching each others' literacy activities. Therefore, besides a human narrator, I'll create a character as the narrator's "peer" so that children can relate better with the digital story.

2.4 Project Methodology

I have chosen the Multimedia Production Process as the project methodology. The Video Production Process outline is shown in Figure 2.5.

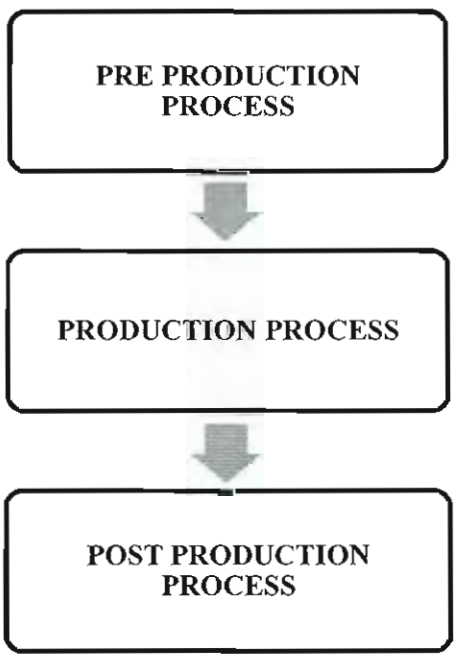


Figure 2.5: Multimedia Production Process