

BORANG PENGESAHAN STATUS TESIS

JUDUL: VISUALEYES: AN INTERACTIVE LEARNING TOOL TO AMELIORATE 3D ANIMATION SKILLS REFINING AND PROMOTE SELF-LEARNING FOR NOVICE ANIMATORS.

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**VISUALEYES: AN INTERACTIVE LEARNING TOOL TO AMELIORATE
3D ANIMATION SKILLS REFINING AND PROMOTE SELF-LEARNING
FOR NOVICE ANIMATORS.**

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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2013

DECLARATION

I hereby declare that this project report entitled
**VISUALEYES: AN INTERACTIVE LEARNING TOOL TO AMELIORATE 3D
ANIMATION SKILLS REFINING AND PROMOTE SELF-LEARNING FOR
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DEDICATION

To my dearest and beloved family, lecturers and friends that have supported me.

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I would like to take this opportunity to convey my heartfelt appreciation to each and everyone who was involved in completing this final year project either directly or indirectly. I also appreciate those who have aided me through the difficult and crucial times. Producing this report has truly been as informative and remarkable experience for me. First of all, I would like to express my sincere gratitude to my supervisor, whom is also my lecturer, Dr. Syariffanor Binti Hisham, for her priceless assistance and guidance to complete my final year project. Her ideas, suggestions, advices and guidance have really helped me to improve and understand more on the objectives of this final year project. My appreciation also goes to all of my friends for their patience and assistance given in completing my final year project. Last but not least, I hope that this final year project can be beneficial to everyone in the future.

ABSTRACT

Majority of students taking up 3D animation courses are due to being inspired and amazed by the beautiful and realistic graphics that have been and can be produced in 3D animation. However, there are cases where there are students giving up half-way through the course. Based on these cases, there are actually several reasons why those situations happened such as lack exposure to the world of 3D animation, daunting tools and techniques, lacking of information to develop animation techniques and skills. To overcome these problems, students would normally look for tutorials in the form of books, videos and online resources. Most tutorial sources may be helpful to some but takes up alot of time to understand the steps and procedures from those tutorials. Furthermore, it may not be effective and even demotivate students to learn due to reasons such as unclear descriptions, lack of reference image or examples, lengthy video and confusing instructions. In fact, there are not many alternative resources in learning 3D animation. Therefore, this project's purpose is to research and develop an alternative or method for novice animators to learn and educate themselves in 3D animation development. In this project, an interactive learning tool integrated with a 3D animation approach will be developed to help and encourage more students to take up and learn 3D animation easily and effectively. With the developed interactive learning tool, third year BITM students from UteM are given a chance to use the tool to be tested. From the results and analysis, a majority of students accepted and are satisfied with the interactive learning tool. This shows that the interactive learning tool has potential to be used as an alternative way for students and novice animators to learn and educate themselves effectively in 3D animation.

ABSTRAK

Kebanyakan pelajar yang mempelajari animasi 3D adalah kerana diinspirasi oleh kecantikan dan tahap realistik grafik yang mampu serta telah dihasilkan dalam animasi 3D. Walaupun begitu, terdapat kes-kes dimana pelajar berputus asa dan berhenti mempelajari kursus animasi 3D. Berdasarkan kes-kes seperti ini, terdapat beberapa sebab kenapa situasi tersebut boleh berlaku contohnya seperti kekurangan pendedahan terhadap dunia animasi 3D, teknik dan perisian yang kompleks dan mengelirukan, kekurangan maklumat untuk memperbaiki teknik dan kebolehan animasi. Bagi menyelesaikan masalah tersebut, kebiasaannya pelajar akan mencari tutorial dalam bentuk buku, video dan juga sumber daripada internet. Kebanyakan sumber tutorial boleh membantu tetapi ia berkemungkinan akan memakan masa yang lama untuk memahami cara-cara dan langkah-langkah daripada tutorial tersebut. Malah, ia juga mungkin kurang berkesan dan menjejaskan motivasi pelajar untuk mempelajari animasi 3D akibat deskripsi yang kurang jelas, kekurangan sumber gambar atau contoh, video yang berlarutan serta arahan yang mengelirukan. Malah, sumber alternative yang lain untuk mempelajari animasi 3D amat jarang. Oleh itu, tujuan projek ini adalah untuk mengkaji dan membangunkan suatu alternative ataupun cara bagi pelajar animasi 3D untuk mempelajari dan mengajar diri mereka dalam animasi 3D. Dalam projek ini, suatu peralatan pembelajaran interaktif yang diintegrasikan dengan teknik animasi 3D akan dibangunkan untuk membantu dan menggalakkan lebih ramai pelajar untuk mempelajari animasi 3D dengan lebih senang dan efektif. Dengan adanya peralatan tersebut, pelajar 3BITM dari UTeM diberi peluang untuk menggunakan peralatan tersebut untuk diuji. Daripada analisis dan keputusan yang didapati, kebanyakan pelajar menerima dan berpuas hati dengan peralatan pembelajaran interaktif tersebut. Ini menunjukkan bahawa peralatan tersebut mempunyai potensi untuk digunakan sebagai cara alternative bagi pelajar animasi 3D untuk mempelajari dan mengajar diri mereka secara lebih efektif dalam animasi 3D.

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LIST OF ABBREVIATIONS

PSM	-	Projek Sarjana Muda
UTeM	-	Universiti teknikal Malaysia Melaka
3D	-	Three dimension/
FTMK	-	Fakulti Teknologi Maklumat dan Komunikasi
BITM	-	Bachelor of Computer Science (Interactive Media)
3BITM	-	Bachelor of Computer Science (Interactive Media) 3rd Year

CHAPTER 1

INTRODUCTION

1.0 Introduction

In this chapter of introduction, topics such as project background, problem statements, objectives, research questions and project significance will be stated, described and discussed. All these topics are meant to give a clear and detailed definition and explanation of the project initiation. An in-depth description of the background of the project will be explained to give an insight of how the project will run in order to solve problems of related field where in this case, 3D animation. This chapter will also discuss about the scope of the project to show the range of topics and other elements being covered throughout the whole process of the project.

1.1 Project Background

In the current field of multimedia, especially in the entertainment industry, utilisation of 3D animation has been increasing constantly at a rapid pace. 3D animation can be seen in a wide variety of multimedia such as movies, games and simulations. Out of many uses of 3D animation in multimedia, the current trend seems to apply 3D animation primarily in the entertainment industry. No doubt, with the advancement of technology in terms of graphic processing, quality films and games have been produced and the production has never stopped ever since. Having a wide variety of tools and technologies available nowadays, 3D animation production can be done with ease by anyone. This has led to an increment in the number of 3D animation courses in countless colleges and universities around the globe. With those colleges and universities, anyone can learn 3D animation with ease. However, that may not seem to be the case for some people.

To some, 3D animation seem to be a field that is very difficult and challenging to master. 3D animation is indeed difficult, challenging, tedious, time-consuming and may even be costly too. These matters can be a demotivating factor for beginners who are just starting out in the field of 3D animation. Besides that, many will also find that the process of developing 3D animation is not as easy as they imagined. In order to produce a good 3D animation, one has to understand many important topics, concepts and flow of 3D animation production. Basic fundamental topics such as modeling, texturing, rigging and animating are wide topics themselves with further subtopics involved. However, all these hurdles are stepping stones towards becoming a good 3D animator which many find hard to cope with.

With an abundance of 3D animation emerging on the “big-screen”, many are amazed by the amazing graphics and visuals of those movies. Some are even inspired to take up 3D animation courses. This leads to the increasing number of students in the field of 3D animation. Unfortunately, many students seem to stop exploring further or in-depth in order to improve their skills in 3D animation production. In fact, some even give up chasing their dreams in 3D

animation. There are a few main reasons that caused those problems. Firstly, students or novice animators are lacking in exposure to the world of 3D animation production. Secondly, 3D animation production tools can be very confusing at first use which may discourage beginners. Thirdly, sources for tutorial lessons and guidance are hard to find or may not be suitable to some.

Therefore, the purpose of this project is to develop an alternative way for novice animators to learn 3D animation whereby the ‘way’ in this project is an interactive learning tool to help and encourage more students to take up and learn 3D animation easily and effectively. In order to do that, there are several objectives that are needed to be completed. Firstly, to identify the causes of students not taking up or continue with learning 3D animation. Secondly, to investigate the effectiveness of current learning resources and tools available for 3D animation and other field. Thirdly, to develop a prototype of an interactive learning tool “VISUALEYES”.

1.2 Problem Statement

Majority of students taking up 3D animation are due to being inspired and amazed by the beautiful and realistic graphics that have been and can be produced in 3D animation. However, there are cases where there are students giving up half-way through the course. In fact, some even prefer to take up other courses without even considering 3D animation although they like it. Based on these cases, there are actually several reasons why those situations happened.

The reasons are:

- Students quitting 3D animation production or lose interest in it.
- Students lack exposure to the world of 3D animation production and the concept of animation.
- Lack of effective and quality 3D animation production tutorial resources.
- Lack of alternative learning resources.

First of all, students lack exposure to the world of 3D animation. The techniques and tools used can be daunting to most beginners who are taking their first step into 3D animation production. In terms of 3D development tools, one of the main problems is the interface. Having countless number of buttons, panels and toolbars, it will cause confusion to the user, especially beginners.

Besides that, students lack information on finding and discovering ways to develop their animation techniques and skills. In order to overcome these problems, students would normally look for tutorials in the form of books, videos and online resources. Most tutorial sources may be helpful to some but takes up a lot of time to understand the steps and procedures from those tutorials. Furthermore, it may not be effective and even demotivate students to learn due to reasons such as unclear descriptions, lack reference image or examples, lengthy video and confusing instructions.

There are also not many alternative learning resources besides current ones such as video tutorials and forums. For example, there are not many applications that apply 3D animation approach as a learning medium.

1.3 Objective

This project embarks on the following objectives:

- To identify the causes of students not taking up or continue with learning 3D animation.
- To investigate the effectiveness of current learning resources and tools available for 3D animation and other field.
- To develop a prototype of an interactive learning tool “VISUALEYES”.

1.4 Research Questions

Research questions are vital in giving value and meaning to the project by forming a path which directs the project towards a goal where in this case, a prototype “VISUALEYES” to assist students and novice animators in understanding and improving their skills in 3D animation production. The research questions for the project are:

- Why do students quit 3D animation after learning the basics of 3D animation production?
- What alternatives can be used to deliver knowledge in 3D animation?
- Does 3D animation approach in a learning tool helps in delivering knowledge in 3D animation production?

With the knowledge of why students quit and how the students improve their skills will give information on what the students need in a 3D animation learning resources or tools. On the other hand, with the data on what makes 3D animation learning tools effective and what other alternatives are available provides valuable information in developing the learning tool of the project.

1.5 Project Scope

The scope, in terms of the prototype “VISUALEYES”, the animation phase is selected out of the few main 3D animation production workflows such as modeling and rigging. However, to have a more focused scope, only the facial animation of a 3D character is chosen. There are several modules that need to be developed from the topic of facial animation. Divided into three modules:

- Emotion module
- Phoneme module
- Speech module

In terms of the user scope, this project focuses mainly on students/novice animators that have a basic knowledge on 3D animation or have taken 3D animation courses. Since the interactive learning tool is meant to improve and refine 3D animation skills, the user group chosen is very suitable and also beneficial for learning purposes.

1.6 Project Framework

A framework is a conceptual structure or the backbone of the project which purpose is to serve as a guideline and the flow of the project. Please refer to Appendix A for further information on the project framework.

1.7 Project Significance

The success in fulfilling the objective of this project will bring beneficial significance to students and also the 3D animation industry. As this project identifies the causes of students not taking up or continue with learning 3D animation, the research findings of this identification will prove to be useful for not only students but also for many people such as tutors and lecturers. Knowing

the cause, methods of teaching and learning 3D animation can be changed or improved to facilitate the process of understanding 3D animation.

Self-teaching and self-learning requires a great deal of constant motivation and quality tutorial resources available. However, tutorial resources available currently are not as effective as they seem to be. They come in many different forms such as videos, application, documents and step-by-step guide. It cannot be denied that these tutorial resources are useful but the question is whether they are effective in teaching and educating the users. Therefore, this project aims to create a new form of interactive learning tool to further improve the process of learning 3D animation.

The interactive learning tool, “VISUALEYES”, consist elements of interaction, engagement, education and applies the 3D animation approach. These elements will bring a new form of learning especially for students. Using 3D models as an agent in the tool, it provides better interaction and also entertainment to the users. This will motivate users to use the tool continuously and with that, it makes the learning process more effective.

Therefore, this project will definitely boost the learning process of 3D animation which will bring benefits to any 3D animation enthusiasts especially beginners or novice animators who wish to learn more.

1.8 Summary

The existence of problems among students/novice animators in the field of 3D animation and the lack of tutorial resources available currently, action has to be taken to improve the acceptance of 3D animation production among students/novice animators. This is done in order to develop the creative industry in the country especially in the field of computer graphics. “VISUALEYES” will definitely bring great benefit to 3D animation practioners. With all the initiator topics discussed and explained, the project will move on to the next phase. In chapter 2, the literature review of the project will be shown.

CHAPTER 2

LITERATURE REVIEW

2.0 Literature Review

A literature review is a study, analysis, evaluation and the summary of scholarly materials which had been done by others. This chapter is separated into several sections which are area of study, current systems/tools/output of learning 3D animation and their comparison.

2.1 Area of Study

This project embarks on the exploration of two primary areas which are the area of “learning” and 3D animation. The area of “learning” seems to be a large area to be handled but in this case, the “learning” area is defined as the method, process and the form of learning undergone by novice animators in improving, enhancing, ameliorating and to explore further in the area of 3D

animation. In this project, a study is done with university students of UTeM to investigate their acceptance towards 3D animations and whether they would continue with it or to pursue another field of interest. The study includes questionnaires with questions regarding how the students learn 3D animation, what tools they use to learn and their opinion in learning 3D animation. This helps to understand more about the students learning process of gaining more 3D animation knowledge and also their style or preferences of learning 3D animation.

In order to understand more about ways and methods of learning 3D animation, there several areas that needed to be investigated for this project. Those areas include tutorial materials and resources, learning tools and reference books. Researching and understanding these areas will provide useful information to determine their vital points which will increase their effectiveness in teaching or giving information and knowledge to their users, in this case, the students.

In terms of 3D animation, this project requires the study of effective natural facial animation of characters where three modules are selected which are emotion, phoneme and speech. This study is important to create a smooth and natural character facial animation for the “VISUALEYES” prototype.

2.1.1 3D Animation in the current days

3D animation is a rather popular topic among three-dimensional graphics enthusiasts, 3D movie fans and mostly younger generations such as students. The growth of 3D animation has been a great improvement compared to the past. It is very easy to bump into computer generated stills and motion graphics in every nook and corner of the city such as advertisements and billboards. In fact, one of the most popular sources of 3D animation is in films. The usage of 3D animation in famous live-action films has been an ongoing process and it seems to be never-ending or stopping. 3D animations are great addition to films nowadays as it enhances