The elements of filmmaking

James Patrick Hilliard

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THE ELEMENTS OF FILMMAKING

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education:
Instructional Technology

by
James Patrick Hilliard
September 2006
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ABSTRACT

This project is an educational multimedia development project created to teach would-be learners of filmmaking about the various elements of the film making process. It consists of the construction of instructional media, such as a CD-ROM, which was created using Macromedia Flash 8 Professional in conjunction with other video editing programs. This media covers various elements of film making that cover the three phases of production and was tested by students and experts in the industry.

This process involved surveying people to determine learner needs and testing the final project to gather data regarding functionality and learner satisfaction. During alpha and beta testing stages the project was tested and user knowledge retention was measured. This was done by having participants complete instruments designed to test their knowledge of the subject matter contained in instructional media.

The results showed that users had a high remembrance rate of content that was contained in the instructional media. Also, there was a higher remembrance rate during the beta testing stage than during the alpha testing stage.
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DEDICATION

This is dedicated to me, all who believe in me, who care about me, and who contributed to my success. Thank you all. I hope this serves as an example to show that anyone can achieve their goals.
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CHAPTER ONE

BACKGROUND

Introduction

This chapter describes the rationale behind the development of this instructional media and explains the existing problem that it addresses, the purpose of the project, and its importance. There are some limitations to the content contained within this project, which are explained. Lastly, a list of definitions and terms are presented to help the learner understand the meaning of words referred to throughout this project.

Statement of the Problem

During prior experience when obtaining an undergraduate degree in Radio Television & Film many facets of filmmaking were learned. Much of this content seemed that it could be taught without lengthy schooling involved, which generally lasted two or more years. Once out of school it was realized that it would be nice to have an instructional media that students who had a desire to venture into film-making could utilize as a quick reference. However, there were not many available.
A lot of the content that was previously learned from the Radio TV Film degree had been forgotten. For example, when or how to set up backlighting on a set couldn’t be remembered. So it was decided that, as a master’s thesis project topic, development of an instructional media that those who are interested in filmmaking could explore on an as-needed basis or as a refresher course could be created.

The target audience was mainly adults who have had experience with film-making, as well as those who have had no experience with film-making.

Much of the content learned while obtaining this degree required the use of expensive equipment and studio time. Many people cannot afford to go to school, or go back to school for that matter. Therefore, there is a need for an instructional media that will allow would-be filmmakers the opportunity to learn much of the desired content about filmmaking without having to spend a lot of money and time at a film school.

Purpose of the Project

With today’s emerging technology the average novice can buy a camcorder for less than $300 and start making movies with it. Also, with the emerging usage of
computers and audio/video software, would-be film creators can virtually produce their own film within their home. Having a resource, such as an instructional media that teaches about filmmaking, will help filmmakers create quality home movies or professional independent films.

The purpose of this instructional media is to present ideas and concepts that are basically standards in the industry used in creating motion pictures. It addresses various stages of the production processes, as well as focuses on specific elements of the filmmaking process, such as lighting, story, camera shots, angles, and movement.

This instructional media will allow quick access to much needed material that filmmakers can turn to in order to refresh their memory and simply learn a new trick that they can use when creating their movies. They can learn about lighting, film shots, timelines, special effects, and many other elements of filmmaking that they might not know about.

Significance of the Project

This project is important in that it allows for would-be filmmakers to have with them an instructional media that can serve as a 24 hour film tutor. It can
provide explanations and examples, as well as help to give structure to a filmmaker's project.

A filmmaker may be in the middle of a project or be at a point that they can't move past without having much needed answers to important questions concerning their endeavor. Going to film school, calling a famous producer, or driving to the library to read a book may not be a feasible way to find immediate answers. In these situations, this media can be useful in answering these questions about particular film subjects. It brings most of the pertinent elements of filmmaking together into one educational resource.

Limitations

During the development of this project, a number of limitations were noted. In the examples given in this media the following limitations were:

1. Combinations or variations on film shots were not fully addressed. For example, a pan and a zoom occurring at the same time.

2. Different types of trucking or other motion filming are not fully explained by this project. For example, an example of a car on the back of
a truck and trailer with cameras attached to it was not addressed.

3. Video quality was limited to the capability of the computer and software used to edit the video footage.

4. Only common facets of filmmaking processes were mentioned in this project. Very little in-depth discussion of the content is found.

5. The media will only work on computers that have the Flash 8 plug-in installed on their computer Internet browsers.

Definition of Terms

The following terms are defined as they apply to the project:

Animation - computer animated or drawn footage.
Boom - an apparatus used to hold a microphone.
Broad - a type of light shines of a wide area.
Camera - a video movie capture unit used on movie sets.
Cast - the actors and actresses seen in a movie.
Continuity - the ability of footage to flow together.
Crane - a large apparatus used to maneuver a camera.
Crew - the members of a movie production team.
Director - the overseer of the movie creation process.
Dolly - an apparatus with wheels that a camera sits on.
Editing - the process of cutting and adding footage.
Ellipsoidal - a type of hard light.
Extras - people hired to play non-speaking roles.
Fresnel - a type of hard light.
Gaffer - the electrician of a lighting scheme.
Grip - a production assistant that works on a set.
Lapel - a type of microphone that clips to the collar.
Leko - a type of hard light.
Matte - a one-color screen that is used as a back drop.
Mixing - the process of merging various sounds.
Perspective - the angle or viewpoint of the cameraman.
Plot - the part of a story that is seen in a film.
Principal - the primary or main talent in a film.
Production - contains the stages of creating the film.
Scoop - a type of fill light.
Script - a written version or blueprint of a film.
Sound Effects - sonic sound that is not voice or music.
Storyboard - pictorial representations of each shot.
Sub-plot - a secondary story line, usually personal.
Talent - the actors and actresses used to make a movie.
Voice - live or recorded spoken language used in film.
CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

The purpose of this literature review is to give some examples and insight into the elements of making a movie, and address some elements involved in the creation of an instructional or educational media. Though there are many processes within the making of a movie, the following will provide some of the overall general elements that are typically found in the making of all films.

Likewise, this review will cover some helpful hints or issues that concern creating a more successful or effective instructional media. The purpose is to eventually combine these two efforts into an instructional media entitled 'The Elements of Filmmaking' to assist those who wish to learn about the movie-making process.

Also, other pertinent factors will be discussed, such as motivation of self-guided learners, in order to give a comprehensive overview of what one needs to consider when creating a successful instructional media.
Film Elements

Making a movie can be an incredibly complex task. That is why there are many different projects within the overall process of making a movie. Many people are involved and jobs are divided up accordingly to handle each task. There are cameramen, grips, actors & actresses, writers, directors, artists, fashion designers, lighting operators, special effects persons, and the list goes on and on (Travis, 1997). However complex this task is, it is made easier to understand through a layout that one can follow from beginning to end.

There are generally three phases of production, called pre-production, production, and post-production. In the pre-production phase a script is written or chosen to use in the film, the cast is chosen, locations are chosen, and storyboards are drawn. In the production phase, this is where the actual shooting of the footage happens along with all the live special effects, and sets are built, etc. And in the post-production phase, the film is edited and put together into the final cut. Credits and special effects are added and the soundtrack is dubbed (Benedetti, Brown, Laramie, & Williams, 2004).

The first thing to start off with is the script or story (Cowgill, 1999). If the film is going to have very
few special effects, then it should probably have an attention catching story. If the film is going to have a lot of effects, then the story doesn’t matter as much. But, generally when you have both a good story and great special effects you end up with something like 'The Matrix' (Schmidt, 2000).

Usually the more popular the actor the better the chances are that the movie will do well. So, generally a cast of very good actors is chosen, that is, if one can afford it in the budget that the movie companies provide you with. Generally, top-notch actors charge a lot of money (Rodriguez & Stubbs, 2000).

During the production phase, camera operators use a variety of different shots and tricks to give the movie some continuity (Zettl, 2005). Here are a few shots. A close-up is when the camera focuses in on a person from about the neck up. A medium shot is when the cameraman gets the person’s body from the waste or knees up into the camera screen (Compesi, 2000). And a long shot is a shot from a distance that encompasses multiple persons or a scenic shot (Bronfeld, 1984).

There are also high and low angle shots. A high-angle shot, also known as a God’s eye view, is when the camera is positioned above pointing down at the subject,
which gives the impression of an unseen presence looking down on the subject. A low-angle shot is just the opposite. In this type of shot the camera is positioned below pointed up at the subject, which gives the impression that the subject is larger than they actually are (Dick, 1990).

Before any live footage is shot, storyboards are drawn. Storyboards are pictorial representations of what each camera shot should look like (Musburger, 2002). This is similar to every single scene that is seen in a movie. Each of these is drawn first so as to guide the director and cameraman when shooting starts. It’s kind of like a road map for them to follow to make sure they get the shot right. Also, it’s kind of like a movie that is drawn in many individual little squares.

There are four main types of film that are used in major cinema movies today - 8mm, 16mm, 35mm, and 70mm. The larger the size of the film is the better the quality picture it will produce. This is because the larger the size of the film the more pixels per section it will hold meaning that the picture will be more detailed or sharp (Benedetti, Brown, Laramie, & Williams, 2004). Although recently, there has been the advent of the DV camera, or
digital video camera, most major films are still filmed using raw stock film (Bobker, 1979).

The 180-degree rule is another important element (Zettl, 2005). This rule suggests that the viewer must be able to follow the character’s perspective to see what the character is seeing. If the camera crosses this line, it can look odd to the viewer, as if the character is not talking to the person sitting in front of them (Rea & Irving, 1995).

Sometimes the camera operator will use tricks to make the viewer feel like the things in front of them are more realistic. For example, a cameraman can make a truck look like it is moving towards the viewer by moving the camera toward it when the truck is not even moving. There are several ways to move the camera around. One way is by using a dolly, which is like a moving tripod system (Musburger, 2002). Another way is by using a crane, which is like a giant tripod that has an arm coming off of it. Other ways are by using a car, helicopter, or boat to name a few (Rea & Irving, 1995).

Two other tricks can be used to make a scene more attention grabbing or enjoyable. The first is called time expansion. In using time expansion, the movie maker makes a scene last longer than it actually does. This can add
more drama to the scene. For example, a man falls out of a window. If the scene was filmed to last exactly as long as it did in real life, then it wouldn’t be very stimulating. However, if the scene is drug out, which can be done by multiple shots of the same incident, and edited to last longer, it will seem more dramatic. Alternately, *time compression* is just the opposite (Zettl, 2005).

Suppose one is filming a person walking up the driveway to their front door. It is not necessary to film the entire length of this scene and if done so would be fairly boring. Therefore, the director can shoot only part of the walking and then have the scene cut to the person arriving at the front door. This cuts out useless footage and gets to the point so that the film can move along and focus on the more important points (Harmon, 1994).

There are many kinds of special effects, the artificial reproduction of natural and unnatural phenomena. These range from images of fires, explosions, land and sea storms, human and animal mutants, and with today’s technology, just about anything you can think of.

The use of a matte is very important in making special effects possible. A matte is a one-color background that an object is filmed against, which later can be replaced with scenic imagery through editing techniques (Compesi,
For example, let’s say one wants to film a man walking next to a lion, but the lion is not tame and would probably eat the man. The lion can be filmed in a safe studio walking in front of a matte of say blue color. And the man can be filmed walking down a street, both totally separate places and times. Then later, through editing processes, the blue colored matte can be replaced by the imagery of the man walking down a street and the lion will appear as if it’s walking next to him. This is how a matte is used in special effects (Chase, 1975).

Lighting is another important element. There are two kinds of subject lighting, high key and low-key. High-key light will cast fewer shadows on the talent’s face, whereas low-key light will cast more shadows on the talent’s face (Bronfeld, 1984). Key, fill, and back light together create a lighting scheme called 3-point lighting (Musburger, 2002).

There are other forms of lighting called backlighting and silhouettes. Silhouettes give the appearance of a glow behind an actor, like the glow of an angel. Back lighting helps to separate the subject from the background (Coynik, 1976).

There are three types of sound, music, voice, and sound effects (Alten, 2005). Sounds can also be added in
the same way special effects are used. For example, one can produce thunder by rattling a metal sheet or produce horse hooves by clucking two halves of a coconut together. Many times the actual live footage sound of a filmed scene is completely discarded and replaced altogether with sounds that are created in the studio (Coynik, 1976).

When all the shots are made, the film is then edited by an editor who cuts and pieces together all of the different film shots into one coherent film. The same process also happens with an audio editor. When the film is finally finished, this is known as the Final Cut (Bronfeld, 1984).

Although there are far more elements that can be included in the movie-making process, this is just a few of the general facets that are typically found in filmmaking. Through the combination of these various elements a movie is born. Incorporating all of these elements into a lesson plan can devise a movie-making educational media.

Instructional Multimedia Design

With the rapid growth of the technical industry and its diffusion into the world around us, there is a growing need to incorporate the advances of technology into the
learning environment. It is necessary to combine audio, video, computing, and traditional tools in teaching or several media into a practical tool for non-technical users. However, the potential of technology to increase learning is relative to the quality of the planning process. Projects that are initiated without addressing conceptual and system design techniques may result in being underutilized, unreliable, or ineffective (Elmore & Jafari, 1995).

Successful educational software will have clear objectives, meet adequate standards of clarity and accuracy, and have effective instructional design (Williams & Williams, 1985). These criteria can be met by constructing a task analysis of the content to be taught.

There are four main steps: 1. brainstorm the major concepts needed to master the content area; 2. eliminate contaminators, which are those teachings not needed nor desired; 3. categorize teachings or concepts that relate to one another; and 4. sequence the teachings from simple to complex (Chan & Korostoff, 1984).

The use of a CD-ROM as an interactive video is idea for teaching elements of making a film. It capitalizes on the benefits of computer-aided instruction and video, both of which compensate for the weaknesses of each medium.
Although video is best for dynamic processes and motion, it is less adequate for presentation of static content (Schwier, 1987).

The use of graphics in educational software is helpful in conveying content to be learned. Learners can benefit from the use of graphics because graphics illustrate and show relationships about objects and ideas. Some students may have difficulty learning in an abstract manner, such as with numbers, text, and symbols. Therefore, graphics can provide concrete examples for these learners. Likewise, with video learners can engage in demonstrations or procedures, changes, and processes. Video can be especially effective when the learner has control of the video. For example, if the learner can step forward and backward one frame at a time for as many times as they need to through a segment, they can absorb the content at their own rate (Fenrich, 1997).

According to Nanny, those who express their ideas efficiently and concisely in a visual manner will be successful in gaining the attention of an audience for their ideas. Learners scan for visuals that communicate ideas with minimum time invested. Images are "...like the head of the hammer, which drives the point home" (Nanny, 1990, p. 88).
The way information is presented on the screen is important in the learning process. Therefore, it is necessary that information is presented to the learner in a structured format. A good screen layout will make it clear to the learner that specific types of information will be found at specific places on the screen throughout the whole program (Assink & van der Linden, 1990).

The way text is used and presented on the screen is also important. Characters displayed on screen are different than on paper in two ways: 1. the resolution quality is poorer than on paper; and 2. characters on screen are projected by light rather than being reflected. These pose problems to using text on screen in the same way one would on paper. For example, a small serif font on screen can look crowded. Therefore, careful selection of font should be considered when designing the layout of a lesson on screen. A sanserif font is often used for blocks of text, whereas by contrast, a serif font might be used for headings to create a decorative effect. Note: Serif fonts have the little decorations on the ends of the letters, while Sanserif fonts don’t (Boyle, 1997).

Another important element in developing an educational CD-ROM is the use of hypermedia, or hyperlinks. Hypermedia is defined as an electronic
collection of links among two or more of the following: graphics, sound, text, and video - also known as multimedia. Use of hyperlinks expands the field of applications beyond standard information retrieval (Osin & Venezky, 1991).

Hyperlinks can be helpful in that they allow the connecting of information easier. For example, if when working through an educational CD-ROM one sees the word car underlined, they can click on it and will be taken to a picture of a car. Likewise, one can click on a picture of a car and hear a sound of a car running, see a text explanation of how a car runs, or watch a video of a car being driven down the highway. It allows for quick access to similar subjects or objects (Franklin & Kinnell, 1990).

With the use of hyperlinks and well-designed menus, learners can skip around. This is known as skip-branching, a method presented by Leiris. This method was designed to allow learners of varying speeds of learning to be matched more closely. By allowing learners to jump around through the use of links, fast learners can skip to the next content level while slower learners can go back if they need to in order to refresh their memory. This helps to solve one of the major problems with designing
instruction for a variety of people who learn at different rates (Pocztar, 1972).

There are two kinds of interactive multimedia, drill and practice, and tutorials. These differ from other kinds of educational presentation tools such as web pages, kiosks, and slide shows in that they engage the learner. In drill and practice, learning objectives are separated into sequential tasks that increase in complexity. Before the learner can proceed to the next level of difficulty, one must answer questions at the end of each lesson, at which time feedback on correct or incorrect responses is received. Tutorials basically present information or skills to the learner and guide them along, like turning the pages in a book. More advanced tutorials diagnose problems in the learner and attempt to prescribe feedback during the process (Hooper & Reinartz, 2002).

These ideas are helpful in designing a successful instructional CD-ROM; however there are other factors to take into consideration. Self-guided instruction is a study all its own. For years scientists have studied subjects to find out what motivates self-guided learners. Motivation is a key element that should also be addressed when designing an instructional CD-ROM since the only interaction will be between the user and the computer.
Motivation

When creating an instructional CD ROM one should take into consideration that the learner will most likely be sitting at a computer alone when utilizing the CD ROM. This means that an important issue in the lesson planning process is that of motivation. In other words, the lesson should be motivating to the learner.

According to Keller’s motivational design model (Keller, 1983) there are four motivational influences, which include Attention, Relevance, Confidence, and Satisfaction. This model is based on the premise that motivation in instruction can be increased when applying strategies to each of the categories (Keller & Strong, 1991). For example, attention can be increased by perceptual arousal - capturing student interest, inquiry arousal - stimulating student inquiry, and variability - maintaining student attention. Relevance can be increased through goal orientation - meeting student needs, motive matching - matching student interest and learning styles, and familiarity - creating links to student experiences. Confidence can be increased through learning requirements - developing an expectation for success, success opportunities - supporting student belief in competence, and personal responsibility - establishing effort as the
basis for success. And satisfaction can be increased through intrinsic reinforcement - encouraging natural enjoyment of learning, extrinsic rewards - providing rewarding consequences, and equity - demonstrating fair treatment among students (Newby, Lehman, Russell, & Stepich, 1996).

According to Barker, humans are multi-channel communicators, meaning that they use numerous communication channels to send and receive messages. For example, when two people are talking they can be using hand and arm gestures, raising or lowering the tone of their voice, blinking their eyes, making noises with their mouths, etc. The list goes on and on. A person's channel, or bandwidth, is the amount of information that can be transferred per unit of time. Some channels have a greater bandwidth, such as touch. Because of this fact, when using a computer-aided instruction medium to communicate messages many of the natural channels of communication are lost. Therefore, it is necessary to give careful thought into designing an instructional human to computer environment (Barker, 1989).

Motivation of the learner can not be entirely affected by a computer-aided learning program. Learners' feelings of self-doubt and inferiority are hindrances to
their motivation and overall achievement. These feelings are out of the realm of what a computer-aided learning program can do to affect a learner's motivation. However, McCombs suggests that helping learners see the relevance in learning activities, countering negative self-evaluations of competence and control, and setting realistic learning goals can help to improve a student's self-regulated learning.

According to Schunk (1989), there are two major classes of self-reactions during self-regulated learning. Evaluative motivators are personal feelings of satisfaction or dissatisfaction; and Tangible motivators are self-administered stimuli, such as taking breaks and eating food. Therefore, a good motivator during a self-guided instruction session might be to design a lesson in such a way as to give the learner a chance to take a break, get some food, then come back and start up again (Zimmerman, 1989).

Overall, there is no one strategy, formula, or set of devices that will motivate every learner. What motivates one may turn another off. A blend of different environments, attitudes, aspirations, and self-concepts is the best focus we can have as instructors to creating
successful learning tools and enhancing motivation to learn (Hamachek).

Although these are not all of the elements that can be used when creating an instructional CD-ROM they are some attributes to think about when creating a motivational lesson structure. These strategies are valuable in that they inform us of what we can do to increase the extent to which our instruction motivates our students (Newby, Lehman, Russell, & Stepich, 1996).

Summary

Of the many elements of film making that can be included in an instructional media on this subject; only the most common elements have been included in this research project. Also, because of the nature of the subject, 'movie-making', the use of the computer and its multimedia capacities is a good platform for which an instructional media can be created. Because of the capabilities of the computer, the graphical nature of the subject matter can be well displayed. Furthermore, with the advent of new technologies, such as portable CD/DVD players, this media can be quickly and easily referred to with the use of such devices.
The highlights of instructional design contained in this review hit on the main points that relate to the development of an instructional computer-aided learning program. With the use of the examples explained above, these concepts should suit well to develop an instructional media.

Finally, the motivation aspects mentioned above give an insight into some of the factors that affect the learner when utilizing self-regulated instructional media. These points are food for thought when designing the structure of the instructional media. Hopefully, by understanding some of these facets of the human learner, an instructor might be able to grasp the attention of the learner in order to help motivate the learner in being successful in their learning endeavors.

Moreover, these are just a few of the many factors that can be involved in creating an instructional media. Through the use of these criteria one can develop more effective and appealing lesson plans and structure a more successful presentation media.
CHAPTER THREE
PROJECT DESIGN PROCESSES

Introduction
This chapter reviews the steps taken in developing this project using the A-D-D-I-E process. Specifically, it describes the focus groups involved in collecting preliminary data during the analysis stage. Then describes the type of design and development processes used (with pictorial examples), as well as how the media was tested, what instruments were used, what the results were, and what changes were made to achieve finality of the project. Lastly, it summarizes the results of the media project discussing its overall effectiveness in meeting the needs of the users.

Analysis
This instructional media was created and designed to assist and inform adults who are interested in making an independent film, exploring a career or education in filmmaking, or just want to learn more about filmmaking in order to produce better homemade films. It is a compilation of the more common facets of the filmmaking process combined into a quick reference tutorial.
Currently, the majority of the tutorial programs about filmmaking on the market today are very long, extremely in depth, collections or sets of multiple DVDs that take hours, if not days, to view. And they can be very expensive.

The instructional media created in this project is an answer to this need, as it avoids lengthy studying and provides a quicker look at filmmaking. During the literature review for this project, many books were reviewed. These books, specifically on filmmaking, repeated the same elements over and over. The goal of this project was to summarize these common points into one concise media. It is a synopsis of filmmaking practices, standards, techniques, equipment, and processes that allows the user to learn a lot quickly.

First, in order to obtain data about content that should be included in this project, a focus group of 10 randomly selected adults were asked to complete questionnaires. Each member of the focus group was given a survey (see Appendix B) containing 10 questions to answer in order to obtain information about the member, what they knew or didn’t know about filmmaking, and what they would like to learn from the media. The questions included in the survey were based on the content that was
to be included in the instructional media and the group member responses were indicated by selecting a check box (Yes-Uncertain-No) indicating whether or not they had knowledge of the content.

The process used for selection of these focus group members was random selection. The preliminary questionnaires were presented to these individuals outside of a well-known multimedia store. Each member was asked if they had an interest in learning about filmmaking then given the questionnaire to complete. Their participation was strictly voluntary and their data was used to address whether or not specific information about the film making process was included in the media.

The media includes much more subject matter than the focus group members actually indicated that they wanted to learn. Nevertheless, this data was used as a starting point to determine that the necessary content would be included in the media.

Second, subject matter to be included in the instructional media was compiled from various sources ranging from textbooks and magazines to Internet articles and websites. For examples of the graphical content, pictures were downloaded from the Internet and video clips
were obtained from various popular DVD movies. These were all used in compliance with the Fair Use standards.

Design

A CD-ROM or website was the perfect host for such subject matter, because it combined graphics, sound, video, and text, as well as hyperlinks, which could be easily accessed with a computer or portable DVD player. Together, the information from the literature review provided from both sections of multimedia design and filmmaking worked together well, especially using the Flash 8 software. The media was designed in .html and .swf formats, and can be viewed through a computer Internet browser.

The main page (see Figure 1) is similar to that of an Internet homepage or a PowerPoint presentation. The learners can follow steps of instruction in a linear fashion, as well as be able to jump around to different sections as they desire.
The Elements of Filmmaking

An instructional media that explores the various facets of the filmmaking process

Figure 1. Title Page.

Each section consists of menu buttons, or hyperlinks, which the learner can click on to navigate to a desired lesson. They can also step forward and backward one frame at a time. No matter which page the learner is on, menu buttons are available so that the learner can jump around to whatever section they wish. (See Figure 2)
A zoom is accomplished when the zoom lens assembly of the camera is moved causing the lens to zoom in or out. With the camera staying in a fixed position zooming in brings the subject closer to the viewer or tighter in the frame and zooming out moves the subject farther away from the viewer.

Figure 2. Lesson Page.

The main menus consist of general categories such as, production, story, lighting, camera, etc., which the user can click on to jump to that section. In each of these sections there is a sub-menu (see Figure 3) of the content in that section. Each sub-menu item is a link that the learner can click on to jump to and start viewing that lesson.
Maintaining continuity refers to maintaining the viewer's mental map. This helps the viewer make sense of where things are, where they're going, and where they are supposed to be. When these elements are out of place, the viewer is thrown off in terms of perspective.

Figure 3. Sub-menu Page.

The lessons are presented in linear form similar to a book with a table of contents and an index. Although, this media contains an instruction page (see Figure 4), which details the use of the navigation buttons and video playback pane.
The media contains graphics and sound, as well as text that, not only capture the attention of the learner, but also engage them and keep them motivated. The graphics are helpful and beneficial in getting the point across in each lesson, as visual aids. After all, film making is very visual.

The look and feel of the media is based on a film theme. The entire visual area was designed to look like a film clip. Each menu button was placed within the film tracking holes. There is a title area, video area, and
text areas that complete the layout. The title area tells the current location within the media content. The video area displays example video clips and pictures for those who learn better visually. And the text, or narrative, area explains the content in written form for those who learn better by reading.

Development

Production

This media was designed to teach the learner about the various (and most prominent) facets involved in the making of a film. Since the CD was designed for those who wish to create a film or learn about the film making process, it was designed to meet the needs of these people.

The testing of this project follows the rapid prototyping format. Evaluation stages were used to complete the project during testing.

Testing Plan

The instructional media project was created after the required information was obtained to complete the project. This project was created in the Flash 8 Professional program, which is a software program used to design and create web-based graphics. The project created in this program is called "The Elements of Filmmaking" and can be
used on the web or on a stand alone computer, as the Flash 8 program provides various file formats through which this project can be displayed.

A focus group of 10 randomly selected adults were asked to (alpha) test the media. They were asked to complete two questionnaires. The first questionnaire (see Appendix C) asked them to indicate any technical, graphical, content, and textual errors and asked them to rate the media overall of a scale of 1 to 10 (1 being "not at all satisfied" and 10 being "completely satisfied"). Then, they were asked to complete a second questionnaire (see Appendix B) about the content, which was used to determine whether or not each member had retained knowledge from the media.

After the data gathered from these questionnaires was compiled, the errors were corrected and the media was (beta) tested a second time to identify any errors not encountered during the alpha testing phase. Two questionnaires were used again during this process to indicate errors found and knowledge of the content. Afterwards, the errors were again corrected. Upon completion of this stage the project was completed.

The overall results of knowledge of the content increased between the first (alpha) testing questionnaire
and the second (beta) testing questionnaire. This was indicated by many more of the questions about knowledge of the content being answered with a "Yes". This was good news, as it showed that the use of this media was successful in conveying the content and indicating that the users learned from it.

Finally, the satisfaction of the focus group members indicated a percentage of 90%. This was an increase from the 80% average indicated during the alpha testing phase.

**Alpha Testing**

Upon preliminary completion of the instructional media 10 focus group members, including average persons, students, and professors of film (industry professionals), were asked to test the functionality of the media and its content. Then these members were asked to complete a questionnaire (see Appendix C) that instructed them to indicate any technical, graphical, textual, or content errors found in the media. The questionnaire also asked if there was any content not included in the media that they felt should be. And, lastly, asked each member to rate whether or not it met their needs by instructing them to select a number between 1 and 10 (1 being "not at all satisfied" and 10 being "completely satisfied").
A second questionnaire (see Appendix B) was also given to the focus group members during this phase. This questionnaire was designed to test each member’s knowledge of the content after they had tested the media. Group member responses were indicated by selecting a check box (Yes-Uncertain-No) indicating whether or not they had knowledge of the content. (See Table 1) A total of 2 males and 8 females participated during the alpha testing session.

The questions that received the most “Yes” answers were questions 4, 6 through 9, and 10, which included knowledge of close-up, medium and long shots, back-lighting, camera cranes, camera dollies, editing, and final cut. The questions that received the most “No” answers were questions 1, 5, and 10, which involved knowledge of the 180-degree rule, the production phases, and a final cut.
Table 1. Alpha Testing Questionnaire Results (raw data)

<table>
<thead>
<tr>
<th>Person</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>F</td>
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<td>F</td>
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<td>0</td>
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<td>50</td>
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<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>U</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>U</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>3.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>4.</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>U</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
</tr>
<tr>
<td>6.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>9.</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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</tr>
<tr>
<td>10.</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
</tr>
</tbody>
</table>

Revision

These responses were recorded (see Table 2) and used to revise the media addressing any technical, graphical, or textual defects and make any necessary changes in the content to meet the needs of the users.
Table 2. Alpha Testing Errors

<table>
<thead>
<tr>
<th>Errors</th>
<th>0</th>
<th>10</th>
<th>20</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

| □ Content | 2 |
| □ Textual | 27 |
| ■ Graphical | 2 |
| ■ Technical | 4 |

Beta Testing

During the secondary or beta testing stage, 10 focus group members, again including students and professors of film, were asked to test the instructional media a second time completing a second questionnaire (see Appendix D) to identify any errors in the functionality of the media or its content. This had two purposes: 1) to find any errors previously undetected, and 2) to determine whether or not any issues that they may have pointed out had been addressed. This was the final stage of the testing process during which all of the bugs were worked out and perfection of the instructional media was achieved.

Again, a second questionnaire (see Appendix B) was also given to the focus group members during this phase. This
questionnaire was designed to test each member's knowledge of the content after they had tested the media. Group member responses were indicated by selecting a check box (Yes-Uncertain-No) indicating whether or not they had knowledge of the content. (See Table 3) A total of 4 males and 6 females participated during the beta testing session.

The questions that received the most "Yes" answers were questions 2, 4, 6 through 9, and 10, which included knowledge of storyboards, close-up, medium and long shots, back-lighting, camera cranes, camera dollies, editing, and final cut. The questions that received the most "No" answers were questions 1, 3, 5, and 10, which involved knowledge of the 180-degree rule, high and low key lighting, the production phases, and a final cut.
Table 3. Beta Testing Questionnaire Results (raw data)

<table>
<thead>
<tr>
<th>Person</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
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<td>Y</td>
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<td>U</td>
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<td>Y</td>
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<td>Y</td>
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<tr>
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<td>Y</td>
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<td>U</td>
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<td>U</td>
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<tr>
<td>9.</td>
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<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>10.</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>U</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Corrections**

Again, this data was recorded (see Table 4) and revisions were made to correct any technical, graphical, or textual defects as well as make any necessary changes in the content to meet the needs of the users that were not addressed during the alpha testing stage.
Table 4. Beta Testing Errors

<table>
<thead>
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<th>Errors</th>
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<th>10</th>
</tr>
</thead>
<tbody>
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<td>□</td>
</tr>
<tr>
<td>Textual</td>
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<td>□</td>
</tr>
<tr>
<td>Graphical</td>
<td>□</td>
<td></td>
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</tr>
<tr>
<td>Technical</td>
<td>□</td>
<td></td>
<td>□</td>
</tr>
</tbody>
</table>

Implementation

During testing of the media, some unexpected points were noted. During the initial testing phase it was assumed that the users would know how to start using the media on their own. Some users asked how to start the program in order to test it. The explanation seemed somewhat tedious and some users said that there was no way that they would be able to remember it. It seemed too complicated.

To resolve this problem, an auto play feature was added to the media test discs. This allowed the users to simply put the disc in a computer CD-ROM drive, which would automatically start the program in the computer’s Internet browser.
Some instruction was still necessary to get the users going on testing and using the media. One user simply stared at the main screen, thinking that it was automatically going to play a video without them having to click on anything. Therefore, some instruction of the navigation was necessary, but only to get to the second screen, which was the instruction screen.

It might be a good idea to instruct users of the media on the layout of the content. For example, the content is arranged in order from the left side of the screen from top to bottom, then to the right side of the screen from top to bottom. Also, simply clicking on the step button to the right will take the learner one screen at a time in order all the way through the entire media from beginning to end. Index and instruction buttons are available on each screen.

Evaluation

These questionnaires were designed to determine whether or not the focus group members had retained knowledge, or learned, in the process of using the media. In the future further testing can be conducted on different focus groups to compare results between 1st and
2nd focus groups to measure any changes between knowledge retention.

According to the questionnaire results, the number of questions answered "Yes" about knowledge of the content increased between the alpha and beta testing phases from a score of 87 to 88. (See Table 5 & 6)

Table 5. Alpha Testing Questionnaire Results

<table>
<thead>
<tr>
<th># Correct</th>
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<tr>
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<td>9</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

□ Yes
■ Uncertain
□ No
Summary

The testing process was an enlightening process. Some of the focus group members were literary persons actively engaged in writing poetry. These persons helped to identify spelling and grammar errors and offered suggestions on rewording sentences to be more effective.

Professionals in the film industry were used to meet industry standards in determining the correctness of the content. Some of the persons were actively involved in the production of films. Others were actively involved in the teaching industry and were very helpful and understanding of the educational design processes involved in creating this project.
Overall, the project was deemed a success. Focus group members learned content from the media and enjoyed using it. Several members commented that they liked the look and feel of the media. One member commented that they would like to see some of the movies presented in the media. Therefore, the media seems to have an inspirational quality to it as well.
CHAPTER FOUR
CONCLUSIONS AND RECOMMENDATIONS

Introduction
This chapter discusses some conclusions that resulted from the creation of this project. More specifically, it discusses some problems encountered during the software development portion. Then it discusses recommendations regarding procedures taken to create this project pertaining to the software development portion. And, lastly, it provides a summary of the overall endeavor.

Conclusions
The focus group members had various comments about using the media. Several of the project testers commented that they found the instructional media to be very informative and well laid out. Others commented stating that they enjoyed seeing the different movie clips and it excited them to use the instructional media. Also, they expressed that they liked the overall look and feel, or design, of the project and many of them commented that they thought it was a great tool for learning about filmmaking.
Some conclusions extracted from the software development portion of this project detail different problems encountered during its creation. This project required the use of several different software programs. These graphics and video editing programs consisted of Photoshop CS2, Movie Maker, Pinnacle Studio 9, and Adobe Premiere. These programs were the easiest to use.

Other programs, such as Sony Visual Creation Studio 10, Sony Vegas Movie Studio, Magix Movie Edit Pro 10, and Ulead Video Studio 9, were tried but resulted in problems arising from limitations in file format compatibility and hardware problems. Some programs did not meet system requirements. In other words, they would run slow and were unable to handle the video capture process.

Time constraint was another problem encountered. Because of the expensive cost of these programs, trial versions were downloaded from the Internet and used for this project. The trial versions of these software programs only allow a 15 to 30 day trial period, so the work had to be done within that time period. Otherwise, a new program would have to be switched to in order to complete the project. Also, this project was created in the midst of other coursework requirements. And deadlines
for the completion of this thesis development project had to be achieved.

Some of the video capture programs would not recognize the video capture hardware device that was being used for this project. The first hardware device was a Dazzle 80, which was limited to a 352 X 240 resolution. This was too low, so this hardware device was swapped out for a newer version, called the Dazzle 90. This functioned much better and with a higher resolution of 720 X 480, but lacked video quality. The picture would come out pixilated. Therefore, it was also swapped out and replaced with a Pinnacle Movie Box capture device. This also had a resolution of 720 X 480, but with much better video quality. This device was used for the majority of the project.

Another problem encountered was the inconsistency of capture video in a widescreen format. Not only was a video capture program that supported widescreen format required, but in order to take advantage of this feature, external video playback devices (DVD players) had to be set to widescreen output. This consistency between player and capture device allowed for recording of widescreen video.
The previously mentioned programs that were tried did not support 16 X 9 widescreen resolution. Pinnacle Studio 9, which came with the Pinnacle Movie Box device, offered this feature. This program was used as Widescreen format was a necessary requirement of the video clips format. Once this was achieved completion of the project was easier.

Much of the knowledge required to use Flash 8 professional was not at hand. Therefore, the project was more tedious that it would have been had there been prior knowledge of how to use it to its fullest extent. Much of what was needed to create this project in Flash 8 was learned in the process.

Recommendations

It is recommended that if this endeavor were to take place again, much research and pre-design would take place before attempting it. Research of software programs and their compatibility with video hardware and file formats would save time. Some programs that supported one file format would not be supported by another program. It would be better to find a program in advance that can use various file formats across the board.
Checking system compatibility is another important recommendation because one should make sure that the program will function on their computer platform. This can avoid timely hang-ups and unnecessary uninstallation and reinstallation of software.

Planning time better and allowing one's self the time needed to create such a project will also ease the process of this type of project. Another consideration to consider when planning time is that of the focus group members. Many members were difficult to track down and when testing this project had to find time to participate. This prolonged the completion of the project due to waiting for results to be acquired from its participants. In the future, interviewing potential focus group members and setting time schedules can help avoid this problem as well.

Summary

Overall, the project could have been completed quicker and easier with ample planning of time and researching of software programs to be used in its creation. Also, financial budgeting to know ahead of time what one is able to afford when choosing software programs
can help avoid many computer problems, which create headaches.

Nevertheless, the entire process was an enlightening one. Much was learned about the use of the Flash 8 program as well as hands-on experience with recording and editing digital video. And it was interesting to see how inconsistent the market is in regards to software compatibility.

Lastly, future users of this project might consider testing it further to explore other uses for it. Educators may want to elaborate on its content or use its design structure as an example to teach future instructors about learning object layouts. Perhaps further testing of the media can be conducted to explore knowledge retention and what contributes to learning.
APPENDIX A

CD OF PROJECT
APPENDIX B

INSTRUMENT FOR ACQUISITION OF

INFORMATION
Instrument for Acquisition of Information

An Instructional Media on the Elements of Filmmaking

☐ Male  ☐ Female  Age ___ I agree to take the survey (initial here) ___

The following questions are to access your knowledge of some elements of film-making.

Please answer the following questions (Check Yes, Uncertain, or No):

1. Do you know what the 180-degree rule is?  □ Yes - □ Uncertain - □ No
2. Do you know what a storyboard is?  □ Yes - □ Uncertain - □ No
3. Do you know what high-key and low-key lighting is?  □ Yes - □ Uncertain - □ No
4. Do you know the difference between a close-up, medium shot, and a long shot?  □ Yes - □ Uncertain - □ No
5. Do you know what the pre-production, production, and post-production phases of film-making are?  □ Yes - □ Uncertain - □ No
6. Do you know what back-lighting is?  □ Yes - □ Uncertain - □ No
7. Do you know what a camera dolly is?  □ Yes - □ Uncertain - □ No
8. Do you know what a camera crane is?  □ Yes - □ Uncertain - □ No
9. Do you know what editing is?  □ Yes - □ Uncertain - □ No
10. Do you know what a Final Cut is?  □ Yes - □ Uncertain - □ No

Is there anything that you would like to learn about how to make a film? (Please list below):

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

55
APPENDIX C

INSTRUMENT FOR PROJECT TESTING

(ALPHA)
Instrument for Project Testing (Alpha)

An Instructional Media on the Elements of Filmmaking

☐ Male  ☐ Female  Age: ___  I agree to take the survey (initial here): ___

The following questions will identify errors (if any) for beta testing.

Please answer the following questions (Check Yes, Uncertain, or No):

1. Did you find any technical errors? (Please list below): ☐ Yes - ☐ Uncertain - ☐ No

2. Did you find any errors in the content? (Please list below): ☐ Yes - ☐ Uncertain - ☐ No

3. Did you find any graphical errors? (Please list below): ☐ Yes - ☐ Uncertain - ☐ No

4. Did you find any textual errors? (Please list below): ☐ Yes - ☐ Uncertain - ☐ No

5. Is there any comments you would like to make about this instructional media? (Please list below): ☐ Yes - ☐ Uncertain - ☐ No

Does this instructional media meet your expectations? (Please indicate on a scale of 1 - 10, 10 being "completely satisfied" and 1 being "not at all satisfied")

1 2 3 4 5 6 7 8 9 10
APPENDIX D

INSTRUMENT FOR PROJECT TESTING

(BETA)
Instrument for Project Testing (Beta)

An Instructional Media on the Elements of Filmmaking

☐ Male  ☐ Female  Age ___  I agree to take the survey (initial here) ___

The following questions will identify errors (if any) for beta testing.

Please answer the following questions (Check Yes, Uncertain, or No):

1. Did you find any technical errors? (Please list below):  ☐ Yes - ☐ Uncertain - ☐ No

2. Did you find any errors in the content? (Please list below):  ☐ Yes - ☐ Uncertain - ☐ No

3. Did you find any graphical errors? (Please list below):  ☐ Yes - ☐ Uncertain - ☐ No

4. Did you find any textual errors? (Please list below):  ☐ Yes - ☐ Uncertain - ☐ No

5. Is there any comments you would like to make about this instructional media? (Please list below):
   ☐ Yes - ☐ Uncertain - ☐ No

Does this instructional media meet your expectations? (Please indicate on a scale of 1 - 10, 10 being “completely satisfied” and 1 being “not at all satisfied”)

1  2  3  4  5  6  7  8  9  10
REFERENCES


Hamachek, D. Motivation in Teaching and Learning. CSUSB Library.


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