Depreciating print: putting video-based instruction to the test

Shauna Leigh Lemieux
Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Part of the English Language and Literature Commons, and the Rhetoric and Composition Commons

Recommended Citation
https://lib.dr.iastate.edu/rtd/16113

This Thesis is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
# Table of Contents

Chapter 1: Evolution of Video-Based Instruction ................................. 1
  - Introduction ................................................................................. 1
  - Evolution of Technical Documentation .................................... 3
  - Evolution of Technical Communication ................................. 8
  - Evolution of Technical Communicators ............................... 12

Chapter 2: Theory of Video-Based Instruction .................................... 16
  - Multimedia Instruction .......................................................... 16
  - Cognitive Learning Theory ..................................................... 18
  - Application of Cognitive Learning Theory ......................... 23

Chapter 3: Evaluation of Cognitive Learning Theory ......................... 26
  - Methods .................................................................................. 26
    - Project Materials ................................................................. 26
    - Project Participants ............................................................ 27
    - Project Procedure ............................................................... 27
    - Data Collection ................................................................. 28
    - Data Analysis ..................................................................... 29
  - Average Results ................................................................. 32
    - Retention ........................................................................... 32
    - Transfer ............................................................................. 33
  - Written Instruction Results .................................................... 35
    - Retention ........................................................................... 35
    - Transfer ............................................................................. 35
Trends .............................................................................................................. 35

Video-Based Instruction Results ........................................................................... 39

Retention .......................................................................................................... 39

Transfer ............................................................................................................ 39

Trends .............................................................................................................. 40

Implications ......................................................................................................... 43

Appendix ......................................................................................................................... 47

References ......................................................................................................................... 53
Chapter 1: Evolution of Video-Based Instruction

Introduction

Without question, the advent of digital media has made possible a wide range of new products and services and has dramatically influenced the role of the technical communicator. However, it has not yet been determined whether this influence has been for the better. As with any new phenomenon, it is necessary to take a step back and evaluate its effects. How are digital media used within technical communication, what theory informs that use, and how can we combine the theory and practice of digital media to ensure this technology is being used to create effective communication products?

In order to answer these questions, this paper examines three distinct issues. First, it explores the history and evolution of technical communication that has created a space for digital media and, more specifically, video-based instruction. Second, it discusses theories of cognitive psychology that explain how learners process information presented through different media and how those theories can be applied to the development of multimedia learning products such as video-based instruction. Third, this paper discusses the results of an exploratory study conducted to analyze the effectiveness of video-based instruction compared to more traditional written instruction. Together, these three issues illustrate the significant role of
video-based instruction within technical communication and how we can apply specific learning theory to ensure we create effective multimedia learning products.

Before we can begin to evaluate current applications of digital media, we must first follow the evolution of technical communication and how digital media have come to play a significant role within documentation. As many scholars have understood, there are always frustrations encountered when attempting to write a history of technical communication. The work of Thomas S. Kuhn and Richard Rorty is often used to help explain the source of this frustration. They suggest the concept of history is not a continuous progression, but rather a series of arcs in the literature that represent changes in understanding. In addition, they propose that “minor adjustments in our understandings may lead to major changes in overall perspectives (what Kuhn calls ‘revolutions’) and that those changes tend to follow a more helter-skelter pattern, characterized by stagnant periods and episodic upheavals, rather than the tidy progression our textbooks, literature reviews, and pedagogical approaches typically present” (Allen, 1999).

As this concept is applied to the history of digital media, a new “revolution” in the literature seems to appear every few years as more advanced technology is introduced and new applications of that technology are developed. Currently, we are beginning a new, more substantial revolution that attempts to evaluate the impact digital media has had, and is having, on the field of technical communication, and the how that impact is altering the skills, duties, and responsibilities required of the technical communicator. In addition, technical
communication seems to be shifting its focus from the specific tools used to produce information products, back to the content itself. This shifting focus is the basis for the current revolution of literature within technical communication.

Evolution of Technical Documentation

The terms new media and digital media are often used interchangeably, which causes some confusion within the literature. A wide variety of tools and applications fall within the scope of these two terms, including but not limited to web-authoring tools, desktop publishing, and, most recently, digital video. The term digital media will be used here to refer to this set of technology because many forms of digital communication are no longer new, but any new communication medium will certainly be digital.

Digital video is a relatively new form of communication that has been rapidly changing since its advent. For example, camcorders were first used simply as tools to record chronological procedures to later serve as the basis for written documentation and illustration (Schneider, 1994b). As recently as the mid-1990's, video within technical documentation was used for nothing more than a record-keeping tool to replace hand-written notes or to provide illustration for written documentation. Video expertise was not necessary because these videos only needed to be in rough form for chronological reference and to reveal possible trouble spots or a need for warnings (Schneider, 1994b). In rare cases, the videos
might have been edited and used for marketing or promotional use, but certainly not as stand-alone products. By the late 1990's, advancing technology allowed for video-recorded procedures to become a distinct form of documentation that was increasingly used to supplement traditional written documentation. However, the evolution from print to video-based documentation is one that has been taking place gradually over the past two decades.

During the early 1980’s, thick written manuals were traditionally considered the main source, if not the only source, of technical documentation. However, as the types of products changed, so did the information about how to use those products. The first computers were multi-million dollar machines that filled entire rooms, and the first users of those computers were programmers and technicians. However, the development and proliferation of the desktop computer made computer technology affordable and available for business as well as personal use. As a result, computer documentation needed to evolve from highly technical information focusing on how the program works to less technical information focusing on what the program can do (Leetham, 1994). New owners of personal desktop computers did not necessarily want or need to read several volumes of reference material describing the details of how or why a particular product works; “they just want to know enough to use the product quickly and effortlessly” (Leetham, 1994). Unfortunately, most documentation still serves the old users of technology and fails to meet the needs of the current users, who “expect software to be versatile and intuitive, and do not expect to invest a great deal of time and effort in the learning process” (Leetham,
1994). In fact, research shows that many users never even look at the reference materials and user manuals included with a particular software program; instead, "they go to a training seminar, buy a third-party manual, experiment, ask a friend, or call customer support" (Leetham, 1994).

During the early 1990's, alternatives to standard written user manuals began to emerge. The first step in the move away from lengthy written documentation was shorter, user-friendly quick-reference materials. For example, in addition to a thick manual containing general information about a software program, quick-reference cards were included that summarized common tasks and listed keyboard shortcuts to perform these tasks (Leetham, 1994). These more compact user guides allowed for increased portability and usability for the customer, and decreased printing and shipping costs for the company (Rehling, 1999).

Another step in the evolution of technical documentation was the development of online information included in the software program itself. For example, information would appear at the bottom of the screen providing important information about how to perform a certain task or describing useful tips. Early versions of the Apple Computer even provided a guided-tour to orient users to the new technology (Leetham, 1994). Quick-reference materials or on-screen tutorials might have been sufficient for early technology with limited functionality, but as software programs became more complex, brief instructions were no longer adequate. As a result, online documentation began to take different forms, including task-based instruction, feature highlights, interactive tutorials, and prerecorded
demonstrations. For example, an on-screen tutorial might have demonstrated which mouse movements or keystrokes are required in order to perform a certain task (Leetham, 1994).

Along with these online tutorials, online manuals were also being developed. Distinct from online help systems, online manuals are soft-copy versions of print documents. The advantage is that online manuals could be accessed from any computer terminal and could also be packaged on CD-ROM, which offered additional benefits for users and technicians. Laptop computers allowed technicians to access vital information while at repair sites, and they could access information for several products from one CD-ROM. As the data capacity for a single CD-ROM increased, new, sophisticated options for accessing and displaying information also emerged, which again created more user-friendly documentation (Rehling, 1999).

Advancing CD-ROM technology made it possible to include special audio and visual effects, interactive sequences, and animation along with the software (Leetham, 1994). It is this animation technology that has continued to develop as an effective training tool. Animated demonstrations are demonstrations in which a particular feature of a program is performed by a "ghost user" or an unseen user. The consumer, then, passively watches certain tasks being performed on-screen. These animated demonstrations began replacing text as the preferred method for information delivery for instruction, help, and training on new software systems (Lipps, Trafton, & Gray, 1997). By the late 1990's, access to the World Wide Web was widespread, and animated demonstrations, online manuals, and online help systems
could now be accessed through a company website, which then could be linked to that company’s support and service departments. This integration provided significant benefit to both consumers and technicians (Rehling, 1999).

Despite the increase in multimedia documentation, video-based training for technical products and programs was less popular. During the 1980’s and 1990’s, the VCR found its way into nearly every household in far greater numbers than the personal computer, and how-to videos were developed that demonstrated a wide range of tasks, from household repairs to workout routines. Although there were videos illustrating how to install and set up a desktop computer, videos detailing specific software procedures were much less common. In addition to the more complex subject matter, there were logistical problems associated with this type of video documentation because “users may not have access to a video player in close proximity to their workstations; unless the training is limited to conceptual information, the distance in time and space from the task and instruction may lessen effectiveness” (Leetham, 1994).

As complex and expensive analog video technology was surpassed by the development of digital video, the use of the video for technical documentation changed dramatically. This change was made possible by the introduction of the digital video format referred to as the Moving Picture Experts Group (MPEG) format, around 1995 (Schneider, 1994a). This format allowed for “the sweeping application of digital technology to video, text, graphics, sound, music, film, and
animation that merge the power of television, compact disc, and computer” (Schneider, 1994a).

“In the past, manuals presented on computers in slide show fashion with illustrations, the use of simple animations on floppy disks, or actual VHS video packages for lengthy materials were common uses as ‘multimedia’ solutions” (Kobayashi, 2000). But, as Kobayashi points out, there is no ”multi” in this form of multimedia presentations. For the full potential of this media to be realized, the information would need to be digitized and used interactively on a computer, as digital video now allows.

Furthermore, the advancement of digital technology has merged tools used for full-motion video and film with those of the personal computer to create a place for desktop video, “the counterpart to desktop publishing” (Schneider, 1994a). The proliferation of desktop video made its way to the desktop computers of technical communicators and made possible video-based instruction. The transition from traditional written documentation to video-based documentation is one that has occurred gradually, but is now in full force and having significant influence on the field of technical communication.

**Evolution of Technical Communication**

Digital media have allowed for the possibility of presenting the same core set of information in several different forms. This concept of design “broadens the role
of technical communicators beyond the traditional boundaries of writing and page
design” (Carliner, 2003). For example, one technical communicator might be
responsible for creating a user manual, website, help file, and training video all from
the same information. But as the types of information products expand, so must our
definition of document design. Numerous terms and approaches have been
developed to widen the boundaries of how information products are created.
According to Carliner, none of these terms “comprehensively incorporates the
strengths of other approaches or describes the relationship of each issue to one
another” (Carliner, 2003). “Information Design” is an emerging term that has begun
to replace document design and attempts to overcome the shortcomings of previous
approaches. However, information design can be a difficult term to define “because
it is an interdisciplinary approach which combines skills in graphic design, writing
and editing, illustration, and human factors” (Carliner, 2003).

Information design is only one of the changes in technical communication
made possible by digital media that challenge us to rethink the way in which we
view technical communication. For example, new difficulties arise when we begin to
analyze video-based instruction as it relates to written instruction. “Thinking about
two very different things only in terms of their points of convergence promotes the
assumption that they are in fact more alike than they really are” (Landow, 2003),
and the cost of this assumption is significant. “It can render points of beneficial
difference almost impossible to discern and encourage us to conceptualize new
phenomena in inappropriate ways” (Landow, 2003). Yet, we often approach a new
product or innovation by comparing it to what we already know. While Landow applies his theory primarily to ineffective websites that fail to realize their full potential, it can and should also be applied to digital video.

Landow suggests it would be problematic to compare video-based instruction to written instruction simply by what they have in common. Instead, we need to examine video tools and products for what they are and what makes them unique. We need to apply a different set of rules and practices to these tools and need to re-educate ourselves to be effective technical communicators who utilize digital video to its full potential. Landow suggests that unlimited possibilities of digitization will be realized as long as we are able to evaluate digital media independently of the old; looking at new media solely in terms of the old is inherently flawed because it limits our perception and prevents us from recognizing the full potential of digital media.

For example, digitization now challenges us to rethink the representation of text as image. Digitization processes allow the creation of websites that contain text, images, and now streaming video and audio. Moving images can be placed inside text just as text can be placed inside video (Fagerjord, 2003). And all of these elements can be combined to create video-based documentation. The term “convergence” is often used to represent digitization, or the coming together of text and images, both static and dynamic. “Alphabetic text, still and moving images, and sound can be coded as digital numbers so they all can be displayed and manipulated by computers and distributed through computer networks...” (Fagerjord, 2003).
Because digital media tend to be predominately visual, we need to overcome historical biases in order to effectively evaluate them. “During earlier centuries, in which print was our most prestigious medium, the balance between verbal and visual representation strongly favored the verbal” (Bolter, 2003). This bias, combined with the historical domination of print forms of documentation, has established a certain perceived value inherent to print documentation. In some cases, users may even feel they are not receiving adequate information or training without a thick users manual on their shelf (Leetham, 1994). However, the development of a “series of audiovisual technologies, beginning with photography and photolithographic printing and including film and television, the balance between word and image shifted” (Bolter, 2003).

This shifting focus has allowed digital video to become a popular field within technical communication; it is a field “that can explain complex ideas, engage an audience in a dynamic way, and showcase new products and services” (Chu, 2002). In addition, digital video is now widely recognized as an excellent way to train both customers and employees (Chu, 2002; Smith, 2002). Because the cost of video technology is decreasing and the quality and usability of these technologies is increasing, “corporations will be using more videos, coupled with powerful and popular streaming media, to deliver training classes, employee communications, product manuals, user guides, and video press releases—to list just a few examples—to employees, customers, partners, and other stakeholders” (Chu, 2002).
According to D.B. Robbins, there are three main reasons for the increasing role of digital information products within technical communication: lower costs for digital desktop video, digital video “makes sense,” and video is a popular consumer medium (Robbins, 2001). He suggests that “technical videographers must learn and apply video design principles and good production practices to create effective video that communicates the information” (Robbins, 2001). In addition to visual design and production practices, there is another key element that is essential to creating effective video communication: principles of multimedia learning. It is not enough to simply apply visual rhetoric and effective production practices; technical communicators must now learn how users and consumers of their products learn, and we must apply those learning principles to the design of video communication products.

Evolution of Technical Communicators

As a result of the increase of digital video production, the role of the technical communicator in video production is evolving. Technical communicators are taking on new responsibilities from simply writing video scripts to managing and taking part in all levels of production, such as scheduling, budgeting, producing, filming, editing, distributing, and everything in between. Therefore, we must now be familiar with an entire new set of tools from camcorders, to non-linear editing software, to DVD authoring programs.
"Many [technical communicators] will be involved in the production of interactive multimedia. Some as scriptwriters, others as video editors, others in the creation of sound tracks, and yet others in producing animation" (Schneider, 1994a). As we approach these positions, we need to be informed in theories and practices that have been previously overlooked, at least in the field of professional communication. We need to understand both how interactive multimedia is created, but more importantly, we need to understand the most effective way to create these products in order to achieve the greatest results. "If we are to maintain currency in this technical communication profession of ours, we must become proficient in motion media design and production" (Shelton, 1999). Furthermore, "new technologies are blending technical communications into one medium. With today's multimedia technologies, a writer at a computer terminal can create many of the same visual and audio effects that just a few years ago required a multimillion dollar studio" (Shelton, 1999). And quite accurately, Shelton points out that even though the tools to create these multimedia products are in the hands of almost anyone who owns a personal computer, "the knowledge of how to use these tools to design and produce effective sight-and-sound media (ones that communicate the message effectively) is often lacking in the technical writer" (Shelton, 1999).

However, it is not only the technical writer who is affected by multimedia technology; the line between trainer and technical communicator is blurring, and, as a result, the distinction between the products they create is also blurring. Typically, technical communicators were responsible for developing documentation based on
solid design principles and writing techniques, and trainers were responsible for delivering this information based on teaching techniques. With the proliferation of video-based documentation, in many cases the need for a trainer to physically deliver the information is no longer necessary. Therefore, one person often performs the roles of technical writer and trainer. Regardless of his or her title, the person performing these duties must now have a wider arsenal of skills, which include, but are certainly not limited to, design and writing skills as well as education and teaching skills. These skill sets must be combined in order to create quality technical documentation.

Developing quality documentation is an issue that is valued by technical communicators and trainers alike (Carliner, 1997). However, the issue of how to create quality documentation is much less important to academia than to industry (Spilka, 2000). Perhaps one effect of these conflicting values is that industry professionals regard the influence of academic research on the workplace as minimal, and the amount of academic research into workplace practices within the last few years has also been minimal (Spilka, 2000). As a result, “industry is relying increasingly on knowledge from nonacademic sources, such as from the Internet and R&D operations, and less so on knowledge from academic sources, and often disdains or deliberately ignores knowledge generated by academics” (Spilka, 2000). This disconnect between academic research and industry practice is concerning. As new burdens are being placed on technical communicators, we are being asked to master an entirely new set of skills. In order to design and create documentation
effectively in the age of digital media, industry professionals must be able to rely on sound results from academic research.
Chapter 2: Theory of Video-Based Instruction

Multimedia Instruction

Digital media has played a major role in the evolution of documentation and has also influenced the evolution of the term *usability*. Because the information products created in the age of digital media are changing, so must the way we test and evaluate usability (Grice, 2002). Rather than evaluating how users learn from written instruction, we must now evaluate how users learn from multimedia instruction, which is a very different kind of learning. First, however, we must define what is meant by *multimedia instruction*. There are three main ways to view the term *multimedia* when it is used to describe delivery of an instructional message: by the devices used to present information, by the format used to present information, or by the senses used to receive the information presented (Mayer, 2001). The third view is the sensory modalities view of multimedia instruction; in order to be considered *multimedia*, two or more of the learner’s senses must be involved with processing the information, such as the eyes and the ears. For example, in a video tutorial, the images and written text are received visually and the narration is processed auditorially.

Multimedia learning might also be referred to as E-learning, which is defined as “instruction delivered on a computer by way of CD-ROM, Internet, or intranet with the following features:
• Includes content relevant to the learning objective
• Uses instructional methods such as examples and practice to help learning
• Uses media elements such as words and pictures to deliver the content and methods
• Builds new knowledge and skills linked to individual learning goals or to improved organizational performance” (Clark & Mayer, 2003).

According to these criteria, video-based instruction products might also be considered a form of E-learning. And these videos, like other E-learning products and courses, “ignore cognitive processes and as a result do not optimize learning” (Clark & Mayer, 2003).

In addition to different form of learning, there are also three different levels of learning that should be considered when designing information, as supported by educational and instructional design theory: physical, cognitive, and affective. Physical design focuses on the user’s ability to find or locate information in the product. Cognitive design focuses on the user’s ability to understand information, and affective design focuses on the user’s ability to feel comfortable with the presentation of information (Carliner, 2003). Effective cognitive design is guided by several basic principles governing human memory informed by dual-coding theory: it is made up of two channels for processing information, it has a limited capacity for processing information, it requires active processing of information, and it applies new knowledge to long-term memory (Clark & Mayer, 2003).
According to Mayer, usability evaluation of written and multimedia instruction differ:

Multimedia learning is a sense-making activity in which the learner seeks to build a coherent mental representation from the presented material. Unlike information, which is an objective commodity that can be moved from one mind to another, knowledge is personally constructed by the learner and cannot be delivered in exact form from one mind to another (Mayer, 2001).

The goal of multimedia instruction, then, is to provide guidance for how to process the information being presented through digital media “for determining what to pay attention to, how to mentally organize it, and how to relate it to prior knowledge” (Mayer, 2001).

Cognitive Learning Theory

In order to cope with changing forms of instruction as well as new forms of usability analysis, Grice suggests we should borrow research techniques from other disciplines, such as cognitive psychology (Grice, 2002). Cognitive psychology suggests that in addition to multiple levels of learning, there are two goals of all forms of learning, including multimedia learning: remembering and understanding, or retention and transfer. A retention test can be used to determine how much information a learner has remembered; this test asks learners to write down all information they can remember from a certain passage they have read. Similarly, a
transfer test can be used to test how much information a learner has understood; this test asks learners to perform a similar set of tasks in which they, in some way, apply the information presented (Mayer, 2001).

There are also three basic learning outcomes: no learning, neither retention nor transfer of information; rote learning, good retention and poor transfer; and meaningful learning, good retention and good transfer. Meaningful learning, then, should be the goal of all information presentation, whatever its form, because “well-designed multimedia instructional messages can promote active cognitive processing in learners, even when learners seem to be behaviorally inactive” (Mayer, 2001).

The sensory modalities view of multimedia learning distinguishes between separate systems for visual and auditory processing. Specifically, the visual channel is used to process visual images, both text and graphics, and the auditory channel is used to process sounds and spoken voices. In addition, there are several assumptions of cognitive theory that can also be applied to multimedia learning. One such assumption is the dual-coding theory which assumes that humans possess separate channels for processing visual and auditory information (Mayer, 2001; Pavio, 1986). We can assume there are three basic methods with which information can be presented: picture, spoken words, and printed words. The following indicates how each method of information delivery is processed:
• Pictures: visual/pictorial channel
• Spoken words: auditory/verbal channel
• Printed words: initially, visual/pictorial channel, moves to auditory/verbal channel

Allan Pavio’s definition of dual-coding (or dual-channel theory) rests on a basic assumption that “there are two classes of phenomena handled cognitively by separate subsystems, one specialized for the representation and processing of information concerning nonverbal objects and events, and the other specialized for dealing with language” (Pavio, 1986). In addition, dual-coding theory has a “hierarchical conceptual structure.” The most general level deals with symbolic or cognitive systems that serve a symbolic or representational function. From there, the general level divides into verbal and non-verbal symbolic subsystems, which expand into sensorimotor (visual, auditory, haptic) subsystems. Finally, the lowest level consists of the representational units of each system, called logogens and imagens (Pavio, 1986) (See Table 1).

**Table 1: Conceptual Relationship between Symbolic and Sensorimotor Systems**

<table>
<thead>
<tr>
<th>Sensorimotor Perception</th>
<th>Symbolic Systems Verbal Information</th>
<th>Non-verbal Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td>Visual words</td>
<td>Visual objects</td>
</tr>
<tr>
<td>Auditory</td>
<td>Auditory words</td>
<td>Environmental sounds</td>
</tr>
<tr>
<td>Haptic</td>
<td>Writing patterns</td>
<td>“Feel” of objects</td>
</tr>
<tr>
<td>Taste</td>
<td>--</td>
<td>Taste memories</td>
</tr>
<tr>
<td>Smell</td>
<td>--</td>
<td>Olfactory memories</td>
</tr>
</tbody>
</table>

(Pavio, 1986, p. 57)
When evaluating multimedia learning, several assumptions must be considered. First, the limited-capacity assumption suggests that humans are limited in the amount of information they can process in each channel (either visual or auditory) at one time. Therefore, if information is presented through multiple channels, more information can be processed successfully, increasing the amount of information that is both remembered and understood (Mayer, 2001). Second, the active-processing assumption suggests that humans actively engage to “make sense” of multimedia presentations. During this participation, learners pay attention, organize information, and attempt to integrate that information with previous knowledge (Mayer, 2001).

Third, the modality principle suggests that students learn better from animation and narration than from animation and on-screen text. This theory suggests that when images and texts are both presented visually, all the information is being processed through one channel, causing sensory overload. However, if words are spoken rather than printed, they are processed auditorially and both channels are utilized (Mayer, 2001). The modality principle is an attempt to increase the capacity of our working memory by presenting information using both aural and visual sensory modes (Feinberg, Murphy, & Duda, 2003). The modality effect operates under the same or similar assumptions as the dual-coding theory. The assumption is that portions of working memory are dedicated to aural processing and others to visual processing.
Fourth, cognitive load learning theory deals with the amount of "mental energy" required to process a given amount of information. This assumption suggests that as the amount of information increases, so does the cognitive load on our mental resources (Feinberg et al., 2003). In addition, within dual-coding theory, the cognitive load learning assumption suggests a way of processing information that distinguishes between three distinct types of memory or modes: sensory memory, working memory, and long-term memory (Clark & Mayer, 2003; Feinberg et al., 2003; Mayer, 2001). The working memory was previously referred to as the short-term memory, and is the part of our mind that allows us to think, solve problems, and be expressive. It is the working memory that is responsible for how we direct attention, what we direct our attention to, and how much we are able to attend to simultaneously. Long-term memory refers to the amount of information we store and are able to access on a permanent basis. According to cognitive load learning theory, "instruction communicated in dual information modes will expand working memory and thereby enhance performance" (Feinberg et al., 2003). While the principles of dual-coding theories have been directly applied to web-based instruction (Feinberg et al., 2003), they are just as, if not more, applicable to video-based instruction.
Application of Cognitive Learning Theory

Scholars have applied dual-coding theory to multimedia learning, and results suggest that students learn better from two or more formats than from only one, for example from words and pictures than from words alone. Mayer conducted two sets of tests in which he compared the retention and transfer performance of students who received a narrated animation to students who received narration alone. The second set of tests compared the retention and transfer performance of students who received information in text and illustration to text alone. According to the dual-coding theory and its related assumptions, the students receiving information presented through multiple media should out-perform students who were presented information through a single medium. These tests showed that the students had better retention with information presented from words and pictures than from words alone. In addition, students had better transfer from words and pictures than from words alone. These results are consistent with the theory of dual-coding or multimedia learning (Mayer, 2001).

In the middle 1970s, research showed that information presented auditorially almost always resulted in greater retention than did information presented visually (Penney, 1989). This phenomenon is generally referred to as the modality effect and refers to the different sensory modes through which information can be presented. Penny also sites evidence that suggests retention is greater if information is presented through both modalities (visual and auditory) than when only a single
mode is used. These effects were recorded as they affect the working or short-term memory (Penney, 1989). These early studies presented the same information visually and auditorially, and then tested retention results on working memory (Penney, 1989). Research conducted in cognitive psychology suggests that information is more likely to be retained when in it presented redundantly, or when in can be coded both visually and auditorially (Wiley, 2003).

In addition, numerous studies have been conducted that look at whether information is more effective when presented through visual and auditory channels than through only one channel, focusing on various information media including television, news broadcasts, websites, print documentation, CD-ROM, or classroom instruction (Carliner, 2003; Clark & Mayer, 2003; Feinberg et al., 2003; Mayer, 2001; Pavio, 1986; Penney, 1989; Wetzel, Radtke, & Stern, 1994; Wiley, 2003). Several of these studies suggest that multimedia presentations are preferred by users (Wetzel et al., 1994; Wiley, 2003). For example, when given the choice, users prefer illustrated text to written text and prefer dynamic images to static images. But of the studies designed to determine which is better, image or text, there has been no definitive conclusion (Wiley, 2003).

Taken together, rather than suggesting that one medium is better than another, cognitive learning theories suggest that there is an effective way to present information through multimedia and an ineffective way. As technical communicators, we need to understand these theories and apply them to the information products we produce, whether they are print or video-based.
According to Mayer, "graphics play an important role in both book-based and computer-based instruction but often are not used in a way that fosters learning" (Mayer, 2001). As cognitive learning theories apply to video-based instruction, the same can be said: video-based instruction is often not created in a way that fosters significant learning. Clark and Mayer suggest that E-learning products, such as instructional videos, “should be based on measurement of how well and how efficiently learners achieve the learning objective. This measurement requires a validation process in which learners are formally tested on their skills after completing the training.” And in their experience, this sort of formal testing is rare (Clark & Mayer, 2003).

And because formal testing is rare, we lack significant understanding of the actual effectiveness of the multimedia information products we produce. As the field of technical communication continues to evolve and becomes even more saturated with digital media products, it is increasingly important that we acknowledge and understand the importance of applying cognitive learning theories to usability testing. The following study was developed and conducted to help determine the effectiveness of one particular instructional video as it compares to similar written instruction and gage the user response to each medium.
Chapter 3: Evaluation of Video-Based Instruction

Methods

This project focused on the use of video-based instruction for external or corporate training and included an exploratory study to analyze the effectiveness of video-based instruction compared to more traditional written instruction. This study was designed to evaluate these two training media to determine whether one can be considered more effective or to produce greater results. The design of this study was based on principles of cognitive psychology and modeled after previous studies of multimedia instruction.

Project Materials

The specific set of instructions used in the study described a set of tasks to be performed within Adobe Premiere 6.5, a non-linear video-editing software program. With purchase of this latest version of the software, customers receive a written user manual as well as a Total Training Video, which contains video-based instructions to perform certain tasks. For this study, a portion was selected from both the written and video-based instructions that demonstrate the same set of tasks. Because the two sets of instructions are not identical, the written instructions from the user manual were combined with written instructions from Adobe Premiere 6.5 Classroom in a Book and modified to correspond more directly with the video tutorial (See Appendix).
Project Participants

Eight participants were used in the study, four male and four female. All eight subjects were graduate students in the English Department at Iowa State University. This demographic was chosen in order to help ensure participants had a similar educational background and familiarity with basic technology and computer applications. In addition, potential subjects were asked a few basic questions in order to exclude individuals who had significant experience with video-editing programs. Once eight participants were chosen, each participant was randomly assigned to a particular medium (either print or video) with equal gender representation (two male, two female for each medium).

A study such as the one described with only eight participants does not have significant statistical power; however, eight participants is an adequate number to generate exploratory data and suggest trends in consumer usage.

Project Procedure

The study included a four-step procedure that each participant completed during an individual session. First, participants were asked to review a set of instructions as they normally would. For example, participants reviewing the written instructions were told to read at their own pace but were not allowed to take notes or to return to the instructions later for review. Likewise, participants reviewing the video-based instructions were not allowed to take notes and were
only allowed to view the tutorial once. Second, the participants were asked to write
down as many of the steps or tasks they recalled from the instructions with as much
detail as they could remember. This step was designed to test retention of the
information presented in the instructions. Third, participants were asked to work
with Adobe Premiere 6.5 and use the information they had learned from the
instructions to complete as many tasks as they could recall. This step was designed
to test transfer, or the participants ability to apply what they had learned in order to
complete a similar set of tasks. Finally, participants were asked to answer a set of
open-ended questions designed to examine why they believed they were successful
and/or unsuccessful at both retaining and transferring the information presented by
the instructions.

Data Collection

During the study, each participant was asked to complete a think-aloud
protocol during the retention and transfer steps, which was recorded and later
transcribed for analysis. In addition, time spent on the retention and transfer tasks
was also recorded. As a result, four methods of data collection were used to record
the level of success each participant achieved during the study: number of tasks
successfully retained and transferred, time-on-task measurements, think-aloud
protocol, and open-ended questions.
Data Analysis

The transcripts generated from each participant were analyzed qualitatively; in order to standardize the way in which the results were analyzed, the following criteria were used.

Number of Tasks Retained

A task was considered successfully retained if the participant was able to write down the general procedure or task to be performed, regardless of the level of detail he or she included. For example, if one participant wrote, “create a new storyboard” and another wrote “click file>new>storyboard”, both tasks would be considered successfully retained.

A task was also considered successfully retained if the participant was able to write down the general procedure or task to be performed, even if he or she used incorrect terminology when describing the details of that task. For example, if a participant indicated that there was a step that included selecting an icon at the bottom of the dialog box but could not remember the icon was the Automate to Timeline icon, the task was considered successfully retained.

However, if the participant wrote down a general procedure but could not recall significant detail or accurate terminology, the task was not considered successfully retained. For example, if the participant wrote that there was a step that included opening a new window but could not remember the name or function of
the window, the task was not considered successfully retained. This method was used because “opening a new window” could refer to any number of tasks discussed in the instructions. However, it is clear in the first example that the participant is referring to the Automate to Timeline icon, even if he or she did not remember the exact terminology.

Number of Tasks Transferred

A task was considered successfully transferred if the participant was able to create the desired result following the steps discussed or illustrated by the instructions. For example, several participants discovered an alternative method of performing a task by trial and error, such as moving clips to the timeline. However, if this method was not discussed or illustrated by the instructions, the task was not considered successfully retained because the participant could not have learned that information from the instructions.

Time on Task

After receiving instruction, each participant was asked to indicate when he or she was finished with the assigned task, either retention or transfer, and then told to begin. Therefore, time began when the participants were told to begin and ended when they indicated the task was complete.
Open-Ended Questions

A set of open-ended questions was developed to help determine whether one medium produced greater results from the participants. More specifically, these questions were used to help determine whether certain elements of each medium were more effective than others in presenting instructional information. The following set of questions was asked of each participant:

- What aspect(s) of the instructions were most useful/memorable? Why?
- What aspect(s) of the instructions were most challenging/confusing/problematic? Why?
- What, if anything, contributed to your successful retention of the tasks?
- What, if anything, hindered your successful retention of the tasks?
- What, if anything, contributed to your successful transfer, or replication, of the tasks?
- What, if anything hindered your successful transfer, or replication, of the tasks?
- What else would you like to share or do you think I should know that was not covered by these questions?

Additional clarification was given when asked for, and participants were allowed to respond to each question as they understood them and allowed to continue talking as long as they felt it necessary. If their response digressed from the original question, all information given was still recorded, transcribed, and included in the results of this study.
Think-Aloud Protocol

The participants were asked to perform a think-aloud protocol after reviewing the instructions and for the remainder of the study. More specifically, participants were vocalizing what they were thinking during the retention and transfer tasks. Audio recording continued as they responded to the set of open-ended questions. The audio recording was transcribed and included in the results of this study.

Average Results

The results of this study were compiled from time-on-task measurements, number of tasks retained and transferred, think-aloud protocol results, and answers to a set of open-ended questions, as described above.

Retention

The average level of successful retention of the participants reviewing the written instructions was 3.75 tasks in an average time of 3:12 minutes. The average level of successful retention of the participants reviewing the video-based instructions was 4.5 tasks in an average of 3:16 minutes (See Table 2 and Figure 1).
Transfer

The average level of successful transfer of the participants reviewing the written instructions was 3.25 tasks in 8:16 minutes. The average level of successful transfer of the participants reviewing the video-based instructions was 3.75 tasks in 7:07 minutes.

The results of this study show that the users of video-based instruction were able to successfully retain slightly more tasks in about the same amount of time as users of written instruction. In addition, users of video-based instruction were able to successfully transfer slightly more tasks in less time than users of written instruction (See Table 2 and Figure 1).

Table 2: Results from Retention and Transfer Tests

<table>
<thead>
<tr>
<th>Participant</th>
<th>Retention</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Tasks</td>
<td>Time</td>
</tr>
<tr>
<td>WF1</td>
<td>3:20</td>
<td>4</td>
</tr>
<tr>
<td>WF2</td>
<td>2:35</td>
<td>5</td>
</tr>
<tr>
<td>WM1</td>
<td>5:06</td>
<td>4</td>
</tr>
<tr>
<td>WM4</td>
<td>1:47</td>
<td>2</td>
</tr>
<tr>
<td>[M = 3:12, SD = 1:25]</td>
<td>[M = 3.75, SD = 1.26]</td>
<td>[M = 8:16, SD = 4:28]</td>
</tr>
<tr>
<td>Video</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Tasks</td>
<td>Time</td>
</tr>
<tr>
<td>VF3</td>
<td>4:48</td>
<td>6</td>
</tr>
<tr>
<td>VF4</td>
<td>2:03</td>
<td>4</td>
</tr>
<tr>
<td>VM2</td>
<td>3:07</td>
<td>3</td>
</tr>
<tr>
<td>VM3</td>
<td>3:04</td>
<td>5</td>
</tr>
<tr>
<td>[M = 3:16, SD = 1:80]</td>
<td>[M = 4.50, SD = 1.29]</td>
<td>[M = 7:07, SD = 3:33]</td>
</tr>
</tbody>
</table>
While the results illustrated above are not dramatic, they do suggest user trends. However, the results gleaned from the open-ended questions and think-aloud protocol have potentially significant implications.
Written Instruction Results

Retention

Generally, the retention rate among participants reviewing the written instructions was less than 50 percent. A total of nine tasks were described in the instructions, and the four participants successfully retained 4, 5, 4, and 2 tasks respectively, with an average of 3.75 tasks or about 42 percent.

Transfer

The average transfer rate of participants who reviewed the written instructions was lower than their retention rates. They successfully duplicated 1, 6, 4, and 2 tasks respectively, with an average of 3.25 tasks, or 36 percent.

Trends

The following results were reported from participants with the most frequency:

- Visuals and screen captures were helpful (4 of 4)
- General information that was not task-based was helpful (4 of 4)
- New or unfamiliar terminology was memorable (3 of 4)
- Organizational structure was helpful (3 of 4)
- Lack of context was problematic (3 of 4)
Visuals

Not surprisingly, each of the participants commented that the visuals included in the written instructions, such as screen captures, were very helpful. The tasks successfully completed during the transfer test most often corresponded to those presented visually within the instructions. According to one participant, "any time there was a picture, it was really helpful. I could remember the picture and look for that again" (WM4). In each case, information presented with an image was also described within the text. These results help confirm the assumptions of dual-coding theory; users learn more effectively from words and images than from words alone.

General Information

The participants also found helpful general information that was not necessarily related to a specific task they would be asked to perform. Information about how the program worked and that explained certain features was recalled more often by users of the written instructions. For example, "I remembered general information about the program because it makes me think that it’s interesting that a program can do all that" (WF1). Along with similar comments from other participants, this comment suggests technical documentation should not abandon conceptual program information for an entirely task-based approach; general information about how a program works seems to be useful in situating the more task-based information.
Unfamiliar Information

During the retention test, most participants recalled terminology or tasks that they didn’t understand or that were unfamiliar to them. One participant suggested, “The things that stuck in my mind the most were actually things that I didn’t understand or that I found interesting” (WM1). The participants recalled tasks that incorporated unfamiliar terminology such as scrubbing, real-time, and timeline. In addition, tasks that relied on unfamiliar terminology were most often retained and transferred successfully by the participants. According to another participant, “The word scrubbing is nice. I was interested in doing that because I didn’t know what it was” (WF2).

Organization

Some participants also believed the organization of the document, headings and bulleted lists, were helpful in retaining and transferring the information presented. According to one participant, “It had organized headings, which helped me identify certain tasks” (WF2). From the headings, they were able to understand there were several separate steps that were being described, and that each had its own procedure. However, the participants were not very successful at duplicating those specific procedures during the transfer test. It was common for participants to have a general understanding of the task they were to perform, such as previewing
the rough cut of the video; however, they were unclear as to how exactly to perform that task. This problem seems to have hindered successful transfer of the tasks.

Lack of Context

While participants found the use of images, general information, and unfamiliar or new terminology helpful, many of the participants believed the written documentation lacked a sense of context or purpose. Because the software program was unfamiliar to the participants, reading instructions without a firm sense of what the final outcome or product would be was a source of frustration. For example, “I didn’t understand what the purpose was...like there was not a goal, or end product, or purpose, at least to me. The problem I was having was decontextualized instructions” (WM1). After reviewing the written instructions, participants seemed to have difficulty committing the information to memory because they had no frame of reference or sense of purpose with which to associate new information.

Overall Results

Overall, participants who reviewed the written documentation tended to rely more on general or conceptual information about how the program works and apply that knowledge to memorable images and terminology. Combined with a lack of perceived purpose, these participants tended to do more guessing and achieve
results through trial-by-error methods rather than by following a specific set of instructions. For example, “I did a lot of guessing and mostly relied on things working the way I thought they should work” (M1). This trial-and-error approach could be one factor that contributed to the longer time-on-task results from the transfer test, without a larger number of successfully completed tasks.

**Video-Based Instruction Results**

**Retention**

The retention rate for the participants who reviewed the video-based instructions was about 50 percent. The participants successfully retained 6, 4, 3, and 5 tasks respectively, with an average of 4.5 tasks or 50 percent. The retention rates for the participants reviewing video-based instruction are slightly greater than those of the participants reviewing the written instructions.

**Transfer**

The transfer rate for the participants who reviewed the video-based instruction was less than 50 percent. The participants successfully duplicated 3, 3, 2, and 7 tasks respectively, with an average of 3.75 or 42 percent. The transfer rates for the participants reviewing the video-based instruction are also slightly greater than those of the participants reviewing the written instructions.
Trends

The following results were reported from participants with the most frequency:

- Visual representation was helpful (4 of 4)
- Too much stimuli was problematic (4 of 4)
- Rapid presentation of information was problematic (4 of 4)
- Misdirected attention was problematic (3 of 4)
- Aspects of the video tutorial elicited emotional responses (4 of 4).

Visual Representation

Each of the participants found the visual representation of the tasks to be helpful in recreating the procedure. "I just tried to recreate the process that the author went through. It helped guide me visually through the process" (VM2). In addition to the visual representation of specific tasks, the combination of the animated sequence and narration was also helpful. One participant commented, "I think that being able to see what he was doing in addition to hearing him talk through it. It kind of reinforced, it helped me remember better what words he was saying and visualize what he was doing" (VF3). Statements such as this directly reinforce assumptions of dual-coding theory; more learning occurs when information is presented through multiple channels.
Too Much Stimuli

Each of the participants also remarked that there was too much stimuli being presented in the video; as a result, they could not distinguish between what was important and what was not. For example, one participant said, “It was hard to follow the arrow exactly to see what he was doing, especially since he kept moving it around and not clicking on things (...) I didn’t know what to pay attention to” (VF3). While watching the video, participants were unsure of where to focus, what to pay attention to, or what was most important because too much information was being presented simultaneously.

Rapid Presentation

In addition to too much stimuli, the participants found the video presentation to be too quick. According to one participant, “It’s entirely too quick; I thought it was horrendously rapid, and because of that it was incredibly inappropriate and was making me frustrated (...) The progression from one shot to the next; there was no time to absorb it” (VM2). Not only was too much information presented, it was being presented to quickly for participants to absorb, which undoubtedly had a negative effect on retention and transfer results.
Misdirected Attention

Because of the amount of stimulation and the rapid presentation of information, many of the participants commented that they missed a small detail that was important during the transfer test. Because their attention was not at the right place at the right time, they missed an important step and could not move forward in the duplication of the tasks. One participant commented, "Things would appear or boxes would open, but I didn’t see or hear how he got that to happen. I was confused about that. He just sort of did it and I missed the details (...) I just can’t remember that one step and I was stuck. I just missed it or something. If I knew that one step I could have gotten a lot further" (VF3). Although retention and transfer tests of the video participants were greater than those of the written participants, similar comments suggest results would have been even greater had the video presentation been designed more effectively.

Emotional Responses

Participants expressed frustration with several aspects of the video presentation, and they each demonstrated emotional responses during the transfer test. Each of the four participants hit the table out of frustration at one point during the transfer test. In each case, the source of frustration seemed to come from missing a small detail from the video and, as a result, not being able to complete the task. Two of the participants missed the details of the Automate to Timeline task, and two
missed the details of the *Preview Rough Cut* task. Both steps require selecting an icon on a widow or pressing a key on the keyboard. In each case, the user knew what task was necessary, but missed the specific information about how to perform that task, which was the source of frustration.

*Overall Results*

Overall, participants found the visual representation of the tasks helpful, but the amount and speed of the information presentation caused considerable problems and limited the successful retention and transfer of the tasks. In addition, users of the video instructions were much less comfortable with guessing or using trial by error methods in order to continue. They were able to visualize the task being performed by the "ghost user" in the video and new exactly what they were supposed to do. However, problems occurred when they missed an essential step in the video and could not duplicate the task. Users of the written instructions did not express the emotional level of frustration expressed by users of the video instructions.

*Implications*

Based on the assumptions of dual-coding theory, all things being equal, instruction presented through dual modalities should be more effective than instruction presented through a single mode. However, the results of this study
show only slightly greater results from video-based instruction than from written instruction. These results suggest that instructional videos are currently not being created in a way that fosters significant learning. In addition, users of the video-based instruction performed slightly better, but they had significantly more negative responses than users of the written instruction. These results also suggest there is room for much improvement in how we create instructional videos.

Cognitive learning theories such as dual-coding theory can and should be applied to digital media, including video-based instruction, in order to create effective teaching and training tools. Currently, video-based instruction is often being created and produced based on what the software program allows and with little concern for educational or learning theory. In order to ensure digital video technology is being used to create effective, user-centered educational tools, two changes must occur. First, the ways in which instructional videos are created needs to change. Multimedia learning theory needs to be applied in addition to visual communication principles. It is not enough to just transform written documentation into video-based documentation or to simply create a visually appealing multimedia product. Video documentation needs to be as deliberate and educated as written documentation has come to be. Second, digital video products need to be created by educated trainers and technical communicators, not just video editing or product experts. Software experts are not necessarily equipped to effectively instruct consumers on how to use the program. It is clear that technical communicators have the ability to make more informed, deliberate choices based on research and
usability test results in order to create effective written documentation. However, as documentation has evolved from print to digital media, technical communicators must now learn how to create effective, quality video-based documentation based on similar research and usability results.

The field of technical communication is beginning to shift its focus from the tools that make multimedia products such as digital video possible, back to the content that is presented by these tools. Technical communicators must embrace this change and begin adding cognitive and multimedia learning theory to their ever-expanding arsenal of skills. Taken together, rather than suggesting that one medium is better than another, cognitive learning theories suggest that there is an effective way to present information through multimedia and an ineffective way; we need to know the difference.

While cognitive learning theory is a useful tool for technical communicators, one criticism of dual-coding theory is that the principles tend to be universally applied. They do not seem to account for different learning styles individual users might have. It has been suggested that, given a choice, most users would choose dynamic images over static images or illustrated text over written text (Wetzel et al., 1994; Wiley, 2003); however, a particular user might learn better through written instruction than visual instruction. How might this learning preference influence how effective multi-modal instruction can be for this user? Do situations such as this affect how effective multimedia instruction, even when created according to dual-coding theory, can be?
To answer this and other questions raised by the results of this study, further research is necessary. For example, it would be interesting to conduct a similar study with more participants to see if results are similar with a larger statistical pool. In addition, another study might compare retention and transfer results from users viewing different video tutorials demonstrating the same tasks. This study might help determine which elements of video-based instruction are more effective than others. Another variable worth exploring is how the subject matter of an instructional video affects the learning outcomes. For example, is multimedia instruction more or less useful to demonstrate how to use a software program than how to perform a set of manual tasks such as changing a flat tire? Therefore, another study might be conducted comparing retention and transfer results of videos demonstrating a variety of subject matters.

The effectiveness of video-based instruction is an under-explored area in the current revolution of technical communication literature. Continued research is necessary to understand the ways in which video-based instruction is used within technical communication and what theory should inform that use. Furthermore, effective application of cognitive learning theory to instructional video development is necessary to make certain we create multimedia communication products that serve as effective teaching and training tools for all users.
Appendix

Total Tasks

Create Storyboard
1. Open new storyboard window
2. Move all clips from project window to storyboard
3. Re-arrange clips to desired sequence

Automate to timeline
4. Click automate to timeline icon
5. Update dialog box (sequentially, beginning, 60 frames, default transition) and click OK

Preview Rough Cut
6. Press return (with timeline active)

Edit Rough Cut
7. Scrub with edit line
8. Select edge of clip (or transition) and drag left or right
9. Preview when edit is complete
Written Instructions for Adobe Premiere 6.5
(How to create a rough-cut of a movie using the Storyboard)

Step 1: Developing a storyboard and using Automate to Timeline

Before assembling a rough-cut of a video program, editors often create a storyboard. A storyboard is a visual outline of the project—a collection of sketches or still shots which, in combination with descriptions, indicates the flow of the story.

In Adobe Premiere 6.5, the Storyboard window makes it easy for you to create a storyboard using poster frames to represent clips. You can easily and quickly organize a set of clips in a Storyboard window. When you are satisfied with their sequence, you can move the storyboard into the Timeline window using the Automate to Timeline command to create a rough cut video.

Note: The poster frames that you see for clips in the Storyboard window are the same images used to represent the clips in the Icon view of the Project window. In your own projects, it can be very useful to choose poster frames for your new clips that clearly represent them in a storyboard and distinguish similar clips from each other.

Now, let’s create a storyboard.

1. With the Timeline window active, choose File>New>Storyboard. A blank Storyboard window open.

2. With the Project window active, select all the clips and drag them into the Storyboard window.

In the Storyboard window, the clips are displayed in the sequence you specify. Each clip’s poster frame image is assigned a number that indicates its order in the story sequence. Arrows are displayed between the poster frames to indicate the direction of flow in the sequence, and an end marker indicates the end of the sequence. Basic clip information is also provided and useful tool buttons are provided at the bottom of the window.

Note: Dragging a clip to the left in the Storyboard makes it occur earlier in the sequence; dragging it to the right makes it occur later.
3. With the Storyboard window active, drag and drop the clips as necessary to arrange them in the desired position.

Step 2: Using the Automate to Timeline command with clips in a storyboard

Now, you'll use the Automate to Timeline command to add the clips from the Storyboard to the Timeline window.

1. Click the Automate to Timeline button at the bottom of the Storyboard window to display the Automate to Timeline dialog box.

2. Look carefully at the dialog box. Notice that the dialog box has a section that identifies the Storyboard from which you are working and a section that pertains to the Timeline.

3. Verify that Placement is identified as Sequentially and clips are to be inserted at the beginning of the Timeline.

4. Change Clip Overlap to 60 frames, and select the Use Default Transition box.
5. Click OK. Now, the Video 1 track in the Timeline window displays the same clips and their icons in the same sequence as the Storyboard window.
Step 3: Previewing your rough cut (Using Real-Time Preview)

Editing a video program requires a lot of previewing. You need to know how the video program looks in its current state so you can determine any necessary changes. Or, you might make a change, preview it, and then decide to undo the change because the video program looks better without it.

Premiere lets you preview your video program in a few different ways. For now, you’ll preview what you’ve done using only one method: Real-Time Preview. Many of the latest computers can take advantage of Premiere 6.5’s Real-Time Preview feature, which allows you to view your work in progress on the Program monitor or on an external video monitor without delays needed for “rendering” the footage first.

Real-Time Preview is a boon to computer-based video, because until now most programs and most computers were unable to offer or take advantage of it. It plays instantly in fully rendered final quality without requiring additional hardware. It is a significant benefit of using Premiere 6.5.

To preview your rough cut using Real-Time Preview:

1. With the Timeline window active, press Return.
2. The current state of your video plays in the Program view of the Monitor window.

Step 4: Editing your rough cut (Using the Timeline)

For quick previewing, you can drag the edit line in the Timeline window. This method is called scrubbing because of the back-and-forth motion you use. This method plays your video program at the rate at which you move your hand, so it’s best for a quick check of your changes, rather than as a way to accurately view your video.

1. With the Timeline window active, position the pointer in the time ruler at the point where you want to start previewing. Notice that the edit line jumps to the pointer location as soon as you click in the Timeline ruler. Now, drag the edit line to scrub. The clips appear in the Program view of the Monitor window.
2. Scrub in the Timeline time ruler to move the edit line through the last half of the clip you want to edit. Position the edit line so that the Program view shows the last frame of the clip you want to use in your project.
3. Select the selection tool ( ) in the Timeline window (if it is not already selected) and position the pointer on the right edge of the clip so that it turns into a red trim pointer. Drag the trim pointer to the left until it snaps to the edit line.
Note: To edit frames from the beginning of a clip, you would scrub through the first half of the clip, position the edit line so that the Program view shows the first frame of the clip you want to use in your project, and drag the trim pointer to the right until it snaps to the edit line.

4. When you have completed editing your rough cut in the timeline, press Return to preview the changes you have made.
References


