

# Producing an Instructional Videotape: An Instructional Design Approach

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## *INTRODUCTION*

Pictures, words, and sounds, when skillfully combined, have the power to evoke emotions, to change attitudes, and to motivate actions. The impressions created by combinations of pictures, words, and sounds have been shown to be retained by viewers significantly longer than those created by only one component of this group (1). Instructional media also make use of the power of pictures, words, and sounds to command attention; to help an audience understand ideas and acquire information too complex for verbal explanation alone; and to help overcome the limitations of time, size, and space.

While the advantages of using instructional media have been recognized for a long time, acceptance and integration of media within instructional programs has been slow. Recently, there has been increasing evidence that positive results take place when carefully designed, high quality instructional media are used either as an integral part of classroom instruction and training or as the principal means of instruction (2).

Slides, filmstrips, motion pictures, video recordings, and other

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instructional media have been in use for many years. While some of these materials do an excellent job of informing or instructing, of teaching skills, of motivating, or of influencing attitudes, others are less effective, are of poor quality, or may even be detrimental to accomplishing the purposes for which they were made. Too often the production of a videotape recording or the planning of a multi-image presentation is based on intuition, subjective judgment, personal preferences, or a committee decision. These, unfortunately, are ineffective bases for ensuring satisfactory results (2). How can one be more sure that the materials one plans and produces will be effective for the purposes intended? Can evidence from research and some general principles serve as guides?

Using an instructional design developmental process that employs the logical steps of developing planning objectives and getting ready to take or make recordings can help ensure some degree of success for media materials (3). Although we can only speculate on how people learn, research in educational psychology has identified several ways in which we can improve the probability that learning will occur. The field of instructional design employs findings from educational psychology to produce efficient instructional systems. Through identification of the most significant findings of educational psychology and use of an instructional design system, successful instructional media programs can be developed (4). In addition, it has been shown that there are principles and practices from the fields of perception, communication, and learning theory that can contribute to the design and development of all instructional media forms (2). But as Fleming and Levie caution:

Adherence to the procedures and principles offered will not automatically result in better learning and these ideas are not offered as substitutes for experience and creativity. It is hoped, however, that this information may guide the insightful designer to analyze problems from more than one point of view, and may suggest effective solutions which might otherwise have been overlooked. (5)

Finally, a media psychologist (Witt) suggests some practical guidelines (Figure 1) for designing media to present factual information (6).

**Figure 1. Guidelines for Designing Media<sup>1</sup>**

1. Design the production for your specific audience.
2. Tell your viewers what is coming, and what they should learn from the media presentation.
3. Associate new facts and ideas with ones the viewer already knows.
4. Rely on visuals and mental imagery (associating words with pictures) to help viewers remember.
5. Don't overload your production with information.
6. Give the viewer time to "let the information sink in."
7. Use repetition to hammer in critical facts.
8. Present a closing review of the major points in an organized pyramidal structure.

<sup>1</sup>Witt, Gary A. Media Psychology for Trainers. Dr. Gary Witt, 9th and Brazos, Suite 800, Austin, TX.

### **LEVELS OF INSTRUCTIONAL MEDIA PRODUCTION**

The production of instructional media can take place on any of three levels (2). First, there is the mechanical (preparation) level. Here, the concern is solely with the techniques of preparation. Examples are running a printed page through a copy machine to make a transparency or recording sound or other presentation on videotape. At this level, little planning is required, and the actual preparation follows a routine procedure.

A step above the mechanical level is the creative (production) level. Here, decisions must be made about materials being considered for production, and planning accordingly becomes an important forerunner of production. Production implies an order of activity beyond preparation: the production of a set of thoughtfully designed transparencies to teach a concept, a videotape recording that illustrates a process, or a multi-image presentation as the motivational introduction to a topic. The skills developed on the mechanical level become tools for use in the creative level.

The third level is the design (conception) level. The concern at this level is careful integration of the instructional media into learning activities that serve specific instructional objectives that meet the needs of specific learners. During the planning for materials on this level, attention must be given to factors such as specificity in serving objectives, adaptability for certain individuals or groups, flexibility in method of use, and integration with other experiences. The skills developed on both the mechanical and creative levels are used here. The design of an interactive computer/video program is an example of the design level. The design of good instructional material requires more than the ability to write. Successful designers must understand both the subject upon which the lesson is based and the principles of learning.

This paper describes the planning and developmental process used to produce a flexible, instructional resource that can be used by pharmacy faculty members who are teaching in such areas as gerontology, communication, and nonprescription drugs. This project employed all three levels of instructional media production, as well as other instructional design techniques (2, 3, 7, 8).

### **USE A TEAM APPROACH**

Planning and preparing instructional media requires skills in three areas: knowledge of the subject, the planning of instructional media and visual interpretation of the subject, and the necessary technical skills in photography, graphic arts, and sound recording. Producing an instructional video entails considerations not normally associated with video production. The purpose of an instructional video is to impart new knowledge or new skills, so experts representing those areas must be heavily involved in the developmental process. Because a complete teaching and learning package is multidimensional or facts, an instructional designer must participate in the developing process. An aesthetically and technically acceptable video depends on production and engineering experience and skill; this requires video professionals. Production of an instructional video is, by necessity, a team effort.

Three individuals (or three groups) might make up the production team: subject specialist, communications specialist, and technical staff. The subject specialist (or group) is the person (or persons) who has broad knowledge of the content to be treated and most often is familiar with the potential audience. For a grant, this is often the project director. The project director's responsibility generally arises out of the content. Input from others to the director will contribute to the effectiveness of the product. Peer reviewers have input that contributes to the completeness and accuracy of the information delivered in the final video product.

The communications specialist is the individual (or group) who knows how to handle the content (treatment, script writing, camera angles, and related skills) and knows the advantages, limitations, and uses of the various instructional media. This person ensures that the resulting materials will fulfill the intended purposes. Individuals involved at this stage are a video producer, an instructional designer, a scriptwriter, and a production designer. A video producer joins the team to bridge the gap between the subject matter and the intricacies of video production. An instructional designer ensures a match between the content and the capabilities of the audience, logical sequencing of the subject matter, and practical application of proven learning theories. Additionally, this person gives close at-

tention to issues concerning goals, objectives, instructional analyses, testing, and evaluation. The scriptwriter translates subject content into a form suitable for expression through the video medium. A production designer translates the master script into a shooting script while designing elements into the production to create a unified appearance.

The third element of the team, video production staff, comprises those persons responsible for the photography, videotaping, artwork, lighting, and sound recording. The producer assigns or hires a video director to translate the shooting script into the visual and aural images that make up the finished production. The video director traditionally hires the remainder of the production crew and auditions and casts on-camera talent according to specifications supplied by the producer and the project director. Additionally, the video director recruits videographers, audio directors, lighting directors, script supervisors, production assistants, set designers, location scouts, location managers, narrators, and other specialists—including the videotape editor—who make significant contributions to the quality of the video. The videotape editor is a key contributor to the video production. The editor should participate in preproduction meetings and tape logging sessions. The quality of the final video product depends on how well the individual shots in the production are knitted together. By participating in the planning sessions, the videotape editor can help redesign the script to eliminate potential trouble spots.

These separately described areas naturally overlap. The communications person may also take the pictures or may fill all three jobs. In reality, one individual may fill more than one role in the process. For example, the producer may function as both the writer and the video director, or the video director may serve as videographer and editor. The complexity of the project and the size of the budget generally decide the degree of specialization represented on the production team. Whether by a few persons or by many, these functions are all represented. The important point is that all three jobs exist. They must be kept in mind during the stages of planning and preparation.

## **CASE REPORT**

The process can be examined in more detail through analysis of a case history. A learning module designed to prepare pharmacy students to counsel the elderly effectively on selection, storage, and use of nonprescription medicines was developed. The result was a seven-part series, "Counseling the Geriatric Patient: A Nonprescription Medication Focus." The series consisted of sections entitled "Socio-behavioral," "Communication," "Medication Interview," and "Self-Care with OTC's: Analgesics, Cough and Cold, Laxatives, and Antacids."

A review of the proposed content revealed a natural division of seven topics. A documentary-style production, making a case for the growing need for pharmacists to counsel elderly patients, leads off the series. The type of information, largely statistical and reportorial in nature, lent itself to the documentary format. The topic of communication suggested another stand-alone category. The nature of the information made it appropriate for video, suggesting a demonstration format to exploit the power of video to show and tell. Similarly, the topic on the medication interview demanded demonstration.

On the other hand, analgesics, cough and cold preparations, laxatives, and antacids fell in another group, one more appropriate to the print medium. The difficulty lay in visualization. The underlying biochemical and physiological mechanisms of the active ingredients in these OTCs are highly abstract. Animation would have been an appropriate technique had that capability been available. While print seemed a more appropriate format, lecture presentation was a good second choice. The advantages video offered, besides consistency, were pronunciation of the names of the various drugs and depiction of the products.

### ***Design and Development***

The design and development of the module was completed following an instructional design process consisting of the steps listed in Figure 2. Progression through these steps was not strictly linear; sometimes it was necessary to repeat part or all of a previous step.

Figure 2. Steps to produce an instructional video

1. Consider the audience (the learner) and develop objectives of the program.
2. Define the purpose or idea of the module (video and written materials).
3. Collect resource materials from textbooks, experts and manuals.
4. Brainstorm to generate ideas for the videoscript.
5. Organize the ideas eliminating those that are not appropriate to teach by video (prepare a content outline).
6. Produce the video and written materials on paper.
7. Storyboard the video.
8. Tape the video on location and/or in the studio.
9. Conduct formative evaluation of the quality and effectiveness of the module.



For example, the sociobehavioral series was completed before the other series to verify the proper sequence.

The instructional designer began with an analysis of the characteristics of the learners (viewers), in this case, pharmacy students. They were characterized as intelligent, motivated young adults who were literate, possessed above average verbal and mathematical skills, were facile in grasping concepts, and actively desired knowledge relevant to their personal goals.

The production designer used screen design, transitional devices, musical cues, type style and size, and various other production values to add unity and cohesiveness to each component and to the series. These elements have an advantage beyond aesthetic and production values, since good production design increases the teaching effectiveness of video by improving recall.

Traditionally, video production has three phases: preproduction, production, and postproduction. Every element of the process depends upon the master script—the common element linking the three phases. The master script is the outcome of the preproduction phase. Every visual and audio element specified in the master script is the outcome of the production phase. The complete video production is the product of the postproduction phase.

### ***Preproduction***

The video director considers the content, audience, approach, instructional strategy, and production design and then writes the initial document describing the production. This document is called the treatment; it lays the foundation for the production. Analogous to an architectural rendering of a proposed building, the treatment similarly communicates the general appearance of the production. Content, instructional design, and production design all contribute to a clearly focused treatment. Differences of opinion among members of the team in conceptualization, approach, and presentation methods are more easily and efficiently resolved and refined from the treatment than from a fully developed script. Scripting begins after everyone agrees to the structure delineated by the treatment. The script, analogous to a fully executed blueprint, contains the

complete verbal and visual information required for the video. The script presents the content in a form suitable for peer review.

Peer review of the script is encouraged, particularly for video programs intended for wide distribution. The major purpose of peer review is to validate accuracy of program content. However, problems can arise during review. By virtue of its unique format, a script can be difficult for the uninitiated to interpret. The verbal component, at the expense of visualization, generally receives the greatest attention. Even if the visual information described in the script reflects either cursory examination or misinterpretation by reviewers, the project director (subject specialist) generally receives enough clues from it to make appropriate revisions. The producer, writer, instructional designer, and program designer should all participate in revisions. Even seemingly minor changes can have profound effects on the script.

### ***Production***

Once the script is revised to the satisfaction of the project director, the video is ready to go into production. The preparation of a videotape recording requires attention to a number of production steps (Figure 3). The first step after script approval is preparation of a shooting script from the master script. The production designer breaks the script into various categories. These include locations, graphics, video text (character generator), and other subdivisions. In a sense, the script is dissected into its component parts.

These divisions make it possible to estimate budgets and initiate simultaneous production activities. Production budgets are largely based on time, material, and services. The number of locations directly affects time. The length of the scenes and the type of format determine the quantity of material. Special needs decide the services. For example, file footage, animation, video text, and distribution copies, as well as other special requirements, all have an impact on production costs. The scene breakdowns of the production script allow the producer to identify, isolate, and estimate costs associated with each video category.

The video director usually becomes involved with the project during scene breakdowns. Once the requirements for producing the

**Figure 3. Steps in Videotape Production**

- 1. Prepare shooting script from the master script.**
- 2. Record scenes on videotape from the master script.**
- 3. Preparing titles, captions, and graphics.**
- 4. Recording titles, captions, and graphics on videotape.**
- 5. Recording narration, music, and sound effects on audiotape.**
- 6. Editing and mixing all above elements to a composite master video recording.**
- 7. Making distribution copies from the master videotape.**
- 8. Developing any correlated printed and visual materials for use with the videotape recording.**

video crystallize, he or she begins scouting locations, determining the various camera angles, selecting the production crew, and auditioning talent (actors, actresses, and narrators). The video director may involve the videotape editor in these preliminary stages. From his or her unique perspective, the editor can spot potential problems in camera angles, transitions, special effects, and other combinations of audio and visual material. The purpose of this consultation is to ensure that all elements can be smoothly edited together during the postproduction phase. The video director must turn the script into a finished production consisting of moving images, sound, and narrative or dialogue. By the time the production gets under way, most of the creative and technical decisions will have been made.

Production takes many forms, depending on the nature of the material. For example, the narrator may be in recording sessions while graphic artists create animation sequences. Concurrently, a production assistant may be entering video text into the character generator while another is designing special transitions on the digital video effects unit. Simultaneously, dramatization sequences consisting of live video may be in production on location. The producer generally coordinates all of this activity. The master script guides simultaneous development of the various elements and ensures that they will fit together smoothly. Technical advisors oversee the various production activities to ensure accurate portrayal of the subject matter.

### ***Postproduction***

At some point, the individual elements of the production reach completion. Now, they must be put together. The process occurring in this final phase of video production — postproduction — is editing. Using the master script, the producer, video director, and videotape editor work together to make the edit decision list. The individual video and audio elements are reviewed, and decisions are made concerning which “takes” are to be used in assembling the production. The numerical data identifying the selected video and audio segments make up the edit decision list. Applying this data to the master script, the editor creates the edit script. Following this

script, the editor assembles the many video and audio components. The product is the video program.

Despite care and attention to content, design, and production values, error may creep in or unintended meaning may arise from the juxtaposition of previously isolated scenes. Consequently, the project director and others representing both content and production values critically review the program several times. Multiple screenings by representatives of the target audience follow. The purpose of these screenings is to find out how effectively the program achieves its purpose. Indicators include audience reaction, short-term and long-term retention of content, and both general and specific comments about the production. Responses differ. They may cluster; they may not. The team should be particularly vigilant for responses that cluster. Similar comments tend to signal a problem area. On the other hand, many diverse comments are not particularly significant when taken collectively. Yet, each should be examined for validity.

Revisions are common. Sometimes changes are simple; sometimes a complete re-edit is necessary. Although these changes are frequently difficult and always time-consuming, the program must be made right. Computer-controlled editing, such as that done by the Sony BVE-900 series editor, makes re-edits easier. The editor "remembers" all data from the last editing session. This memory can be recorded and saved. For example, we recently had to re-edit a production that consumed 24 hours for the initial edit. The re-edit took only six hours because we saved and used the data collected in the first edit.

### ***Distribution***

Upon receipt of final approval of the production, distribution copies are made. The most common consumer format is VHS. The number of copies, length of the program, and kind of packaging all decide the cost for making duplicate tapes. As the quantity of copies increases, the price per unit decreases. Shorter programs cost less than longer programs. Less sophisticated packaging costs less than more durable packaging. Packaging ranges from cardboard sleeves to shelf boxes to shipper boxes. Major tape duplicating facilities

provide a variety of services, such as labeling, shrink wrapping, and drop shipping.

### ***Equipment***

The video equipment and facilities used to create the productions in this GAPS project included:

- Ikegami HL-79E with 14:1 Fujinon lens with 2X extender camera
- Sony BVU-150 portable video recorder
- A/B roll suite editing system with 3 BVU-950 video recorders
- Sony BVE-900 edit controller
- Grass Valley Group 100M special effects generator (switcher)
- Sony Mxp-29 audio mixer
- Abekas A53D digital video effects unit
- Dubner 20K character generator.

A time generator was used to record an audio track of the videotape which identified each frame of the tape. This process helped identify each video frame for more accurate editing. The special effects generator (SEG) created the fade-in and fade-out scenes, the wipe of a scene across the screen, and other effects. A character generator was added to the circuit to create titles and text graphics which were transferred to the master videotape.

### ***Final Product***

These efforts resulted in two videotapes in the final module. The first videotape presentation (52 minutes) covers the sociobehavioral aspects of aging, communication skills, and medication interview skills. The second videotape (89 minutes) presents the four major categories of over-the-counter products frequently used and abused by the elderly. Finally, the module was reviewed by a group of peers and students. This formative evaluation revealed that the module held appeal as a learning tool.

## **CONCLUSION**

Production is a team effort. The subject specialist brings the information. The instructional designer arranges and presents the information in a way tailored to enhance recall by the audience. The production designer creates the general look of the production to reflect unity of design. The writer creates the shooting script. The video director translates the script into sound and images, assuming responsibility for turning the script into an effective program. The editor assembles the discrete visuals and sounds specified in the script into a unified and complete video program. Each member of the team brings a unique perspective to the project. Through their collective efforts, the product becomes a reality.

Producing a quality instructional video program is a complicated process. No production steps can be skipped. Control over the product decreases with each shortcut. In such cases, a satisfactory outcome depends more on luck than on control.

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