

Chapter 8

ISD CONSIDERATIONS FOR INTERACTIVE VIDEO TELETRAINING AND INTERACTIVE TELEVISION INSTRUCTION

Overview

Introduction

There are differences in the application of the course planning, design, production, and postproduction processes for IVT courses. This chapter describes the ISD considerations for the analysis, design, development, implementation, and evaluation of Interactive Video Teletraining (IVT).

One-way vs. Two-way Video

During the analysis and design process, it must be decided if the course can be delivered using one-way video, or if two-way video is required for the effective accomplishment of the learning objectives. This needs to be determined since:

- Satellite uplink capability is not available at most remote training sites.
- Two-way video instruction is much more costly.

The Air Force currently provides only one-way video/two-way audio, or Interactive Television (ITV), instruction. As such, the primary focus of this chapter is on ITV instruction. Special ISD considerations for VTC lessons are addressed separately in Section E of this chapter.

Where To Read About It

This chapter contains five sections.

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Overview (continued)

References

The material in this chapter is based on the following references:

- MIL-PRF-29612, *Training Data Products*
 - MIL-HDBK-29612-1, *Department of Defense Handbook, Guide for Acquisition of Training Data Products and Services*
 - MIL-HDBK-29612-2, *Department of Defense Handbook, Instructional Systems Development/Systems Approach to Training and Education*
 - MIL-HDBK-29612-3, *Department of Defense Handbook, Development of Interactive Multimedia Instruction (IMI)*
 - MIL-HDBK-29612-4, *Department of Defense Handbook, Glossary of Training Terms*
 - *Distance Learning Curriculum Analysis and Media Selection*, Air University, Maxwell AFB, AL, 4 Feb 1994
 - AF Handbook 36-2235, *Information for Designers of Instructional Systems, Volume 4*
 - AF Manual 36-2234, *Instructional Systems Development*
 - AFDLO Home Page web site: <http://www.au.af.mil/afdlo>
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Section A

ITV Analysis and Design

Selecting the ITV Course

Selecting the Course

In order to determine if a course of instruction or a segment of a course of instruction is a candidate for ITV, complete the following steps:

- Perform media analysis to determine whether a course of instruction or a segment of a course of instruction is a suitable candidate for ITV based on the learning objectives.
 - Perform a cost analysis comparing costs of alternative methods with the estimated costs of ITV delivery.
 - Identify estimated offsets and/or expected educational or training benefits to be derived from conversion of the course of instruction—this is known as Return on Investment (ROI).
 - Identify the team responsible for developing the course of instruction for ITV.
 - Identify the instructor(s) for presentation of the course of instruction, and evaluation of student performance.
 - Identify and secure approval/participation of functional managers and guest presenters
 - Identify administrative procedures, and secure administrative support.
 - Ensure a DITIS search has been done to avoid duplication of instructional development.
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Analysis and Design

Entertainment Versus Instruction

ITV instruction differs from television entertainment.

- Emphasis is on instructional content not video production.
 - Visual presentations enhance the instructional content.
 - Presentation is interactive, not passive.
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Why Planning is Essential

ITV instruction differs from traditional classroom instruction.

- In classroom instruction, the instructor provides information, distributes course materials, operates presentation equipment (audiovisual and computer-based), personally interacts with the students, and is solely responsible for the presentation of instruction.
 - In ITV instruction, the instructor must rely on a team of technical experts to produce (broadcast) the instruction.
 - The video crew is a support group of television experts; the instructor is the content expert.
 - The instructor must convey a plan of instruction to the video crew.
 - Lesson plans that worked in the traditional classroom will not necessarily work for ITV. The ITV team may have to reconfigure instruction for the medium and use different instructional strategies.
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Instructor Preparation for an ITV Course

Instructor Preparation

Effectively teaching an ITV lesson requires preparation.

- Specific training is required prior to developing and presenting an ITV lesson.
- Instructors need an opportunity to practice effective ITV techniques.

Instructors should have a thorough understanding of the ISD process as presented in *AF Handbook 36-2534, Instructional System Development*. Use of the ISD process will ensure:

- Development of instruction based on criterion-referenced education and training (job performance) requirements.
 - Sound instructional design and management decisions.
 - Graduates acquire the knowledge skills, and attitudes (KSAs) to perform a job.
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The Affective Component of Distance Learning

In any classroom situation, there is a strong relationship between attitudes and behaviors displayed by an instructor, and the attitudes and classroom behaviors shown by the students.

- ITV instruction does not provide observable one-on-one student-teacher classroom relationships.
- ITV instruction does not provide the ability to observe student non-verbal cues.

Maintaining student interest in distance learning is a challenge for the instructor. The instructor must employ variety, interaction, and involvement to maintain student interest. Instructors can mitigate the affective deficiencies of distance learning by:

- Asking frequent in-depth questions (Key is to interact early and often and ask direct questions)
 - Fostering interactive discussions.
 - Using teaching interviews with recognized experts.
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Instructor Preparation for an ITV Course (continued)

Team Approach

An effective distance learning course requires a closely coordinated effort by a number of people working as a team.

Curriculum/Instructional Designer:

- It is essential for an individual who understands the ISD process to work with the instructor and SME to develop the course.
- Not all courses can be delivered by distance learning. After careful analysis, the designer may find only part of a course is appropriate for delivery via ITV.
- A curriculum designer must be involved because a resident course usually does not work effectively via distance learning using the same format and learning materials.

Instructors and Administrative Support:

- Instructors must take an active part in the administration of a distance learning course.
- Instructors must have a class roster for each site receiving the broadcast.
- Students must have required handouts and materials at each site prior to the broadcast.
- The training manager, scheduler and/or instructor must coordinate procedures to determine who is in class for each session.
- The instructor must establish a process for student evaluation (i.e., grading tests, getting tests from students to the instructor, and back to the students).
- The training manager/scheduler, and/or instructor must determine a proper time for delivery of the course, taking into account various time zones.

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Instructor Preparation for an ITV Course (continued)

Team Approach (continued)

On-site Facilitators, Monitors, or DL POCs:

- A designated person must be available at each remote distance learning classroom to assist with administrative and technical issues.
- The classroom must be prepared prior to each broadcast.
- Multimedia delivery technology equipment and student instructional materials must be available for the students.
- Site facilitators are responsible for letting the instructor know who is in attendance for a given session or period.

Instructional or Subject-matter Facilitators:

- Instructional facilitators help conduct instruction at the remote sites.
- Special training may be required for instructional facilitators.

Technical Support:

- Coordination between studio production crew (technical support personnel) and the instructor is essential.
- Special camera angles and shots, technical advice on appearance, movements, and limitations should be discussed in advance of the broadcast.
- The director can give advice to make presentations more professional and enhance overall delivery, ensure a smooth transition of camera shots from the presenter to the visual aids, and make the technology transparent to the student.

Visual Aid Support:

- Due to limitations on print size and lines of text, more visuals will be needed for a distance learning course than for a traditional classroom course.
- Work with visual experts to ensure the clarity and effectiveness of visual aids. Pay particular attention to colors. Colors that are acceptable in a typical classroom presentation may not pass the “groan” test when broadcast!

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Instructor Preparation for an ITV Course (continued)

Communication Skills

Distance learning students are usually more critical, and television is less forgiving of communication mistakes. Instructors need to consider two areas of communication skills:

Verbal Communication:

- Clarity of speech and enunciation are more important for ITV than they are in a live classroom.
- Changes in volume and unconscious sounds are more distracting to students.
- Grammar and vocabulary are more important for ITV.
- Effective questioning skills are critical for ITV. Allow brief periods of silence after asking a question to give students time to answer.

Non-Verbal Communication:

- Eye contact is an important non-verbal behavior in the studio environment. Instructors must maintain direct eye contact with the camera.
 - The instructor should look at, and talk to, the camera. The instructor must appear to talk to the remote site students directly.
 - Minimize looking at the monitor that provides a view of what is being broadcast to remote sites when it is not collocated with the camera.
 - The instructor must maintain appropriate eye contact with students in the studio classroom and at remote sites.
 - The natural tendency when teaching live classroom students and remote site students at the same time is to have most of the interaction and eye contact with the live classroom students instead of the camera.
 - Instructors must make an effort to overcome this tendency, or the involvement of the remote site students may be limited.
 - Facial expressions of the instructor are very clear to remote site students.
 - Movement of the instructor is an important non-verbal behavior. Excessive movement is a distracter. Hand gestures can be a distracter. Be aware of movement limitations. Watch the monitor to ensure movement and gestures are not “off camera”.
 - Listening skills are an important non-verbal behavior. Listen attentively to student questions and responses. Ensure students at remote sites understand questions and responses by repeating or paraphrasing and asking direct questions.
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Audience Analysis

Understanding the Target Audience

Planning a curriculum requires the following:

- Understanding the learner.
- Understanding the intended relationship between courses.
- Understanding how the learners will use the courses.

An effective curriculum requires a detailed understanding of the target audience. This is a sampling of questions used during an audience analysis:

- Why is the instruction needed?
 - What are the specific needs of the target audience?
 - What external data verify the need?
 - What factors led to the instructional need?
 - What past experiences indicate that the instruction being planned can effectively meet this need?
 - What are the ages, cultural backgrounds, interests, and educational levels of the students?
 - How will the audience apply the KSAs gained in the course, and how are they sequenced with other courses?
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Impact of ITV on Audience Analysis

Target audience analysis considerations for ITV also include the following:

- How familiar are the students with the various telecommunication instructional methods and delivery systems under consideration?
 - Will students other than the primary target audience be allowed to participate in the ITV course?
 - How will the expanded ITV audience differ from the primary audience?
 - Where are the students located?
 - Do all students have access to a satellite downlink site?
 - Will TDY to a downlink site be required for some students?
 - Will overseas students participate, and if so, how?
 - Will there be a studio audience at the uplink site in addition to the remote students at the downlink sites?
 - How large an audience will the uplink and downlink sites accommodate?
 - Are there special training conditions such as weekend broadcasts for the ANG and AFRC?
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Learning Objective Analysis

Review Learning Objectives

Individual course KSA learning objectives must be developed based on the:

- Educational and training requirements previously defined.
- Audience analysis previously conducted.

Well-developed KSA learning objectives will ensure that the course topics are instructed in a logical and sequential order. When reviewing learning objectives:

- Note whether any objectives require special laboratory or research facilities, or equipment. Identify alternate sources at remote sites. If alternatives do not exist, the learning objectives may need revision.
- Note whether any objectives require instructor observation of student performance. The objectives may require special two-way video or use of a facilitator.

One of the goals is to select instructional strategies that will enhance the learning objectives.

Instructional Strategies

There are several important instructional strategies to keep in mind:

- ITV is a visual medium that should be fully exploited for effective instruction.
- Subject matter facilitators may be used to enable mastery of performance and group activities at the remote sites.
- Interactivity must be planned to ensure student involvement in the learning process. Design some type of interactive event every 7-10 minutes.

Student familiarity and comfort in the DL environment must be maintained.

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Learning Objective Analysis (continued)

Scheduling and Resource Considerations

Consider the following items for determining the scope and sequencing of lessons in a course of instruction:

- Availability of instructors and guest speakers.
 - Availability of students and attendees.
 - Schedule students by ability or experience groups.
 - Consider student fatigue factor for viewing video presentations.
 - Ensure access to rooms equipped for video/audio reception.
 - Determine the estimated number of students to receive instruction. Repeated deliveries of lessons may be required.
 - Determine the number of sites for delivery of instruction. Repeated deliveries of lessons to remote sites may be required.
 - Determine the difficulty of lesson content. Allow enough time for the lesson knowledge, skills, and attitudes to be absorbed by the students.
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Summary

Summary of ITV Analysis

Perform the following steps during ITV Analysis:

- Review the reason for using the ITV mode of instruction.
 - Review who the target audience is.
 - Review the learning objectives.
 - Review whether the ITV lessons are to be used for initial instruction, remedial instruction, refresher instruction, job certification or job upgrade instruction.
 - Review the lessons that are to be taught using other media.
 - Review the satellite broadcast timing limitations and any resource limitations.
 - Determine the type of broadcast setup (studio production or instructor controlled approach)
 - Select an instructor to deliver the instruction and provide training in effective communications skills for ITV.
 - Identify scope and sequence of material and generate a tentative schedule.
 - Determine whether to deliver the material over a series of short broadcasts (i.e., for two hours on Monday, Wednesday, and Friday) or to present the instruction in one large block (i.e., six hours on Monday).
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Design

Designing Instructional Protocols for the ITV Environment

There are several instructional protocols for ITV that must be considered during the design phase, and firmly established at the beginning of each course. These protocols may need to be incorporated in the script:

- *Schedule Protocols:* Identify the dates and times for ITV classes. Delineate live broadcast hours from other activities at the remote sites.
- *Attendance Protocols:* Establish a system to take attendance, and to ensure students attend class. Determine if the presenter will do a roll call from the host or uplink facility.
- *Break Protocols:* Plan breaks in advance. Determine break time and frequency.
 - Consider different time zones, and adjust break schedule accordingly.
 - Schedule frequent breaks to avoid student fatigue.
- *Student Interaction Protocols:* Determine if students can ask questions at any time or only at specific times.
 - Determine how questions will be asked and answered.
 - Determine if questions will be generated and answered using audio, computer-generated text, E-mail, or Fax.
 - Establish protocols for asking questions and response times to deal with questions.
- *Response Systems Protocols:* Decide when students will receive instruction on the use of response systems at the downlink sites.
 - Ensure students know how to use response systems.
 - Establish protocols for use of audio, computer-generated text, E-mail, or Fax communication.
- *Student Project Reporting Protocols:* Determine how students will make reports using audio, computer-generated text, E-mail, or fax transmissions.
 - Determine how students will share information between remote sites.
 - Determine if reports are to be sent to the host site and then transmitted to all remote sites.
- *Student Assessment Protocols:* Establish the protocols for formative and summative evaluation of each lesson and the course during the design phase. Determine how tests are to be proctored and administered at the downlink sites. Determine grading protocols.

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Design (continued)

Summary of ITV Design

Perform the following steps during ITV Design:

- Incorporate appropriate instructional strategies and methodologies.
- Design appropriate protocols into each lesson.
- Write the body portion of the script first.
- List the main and supporting teaching points. Use a combination of the Outline and Verbatim script formats.
- Use a topical, chronological, space, pro/con, or cause-effect pattern for the body.
- Include questions, interim summaries, and transitions.
- Add the introduction and conclusion after developing the body.
- Translate verbal teaching points into relevant audio and visual video images. Include the types of video shots that are required.
- Translate verbal teaching points into relevant graphic, video, photographic, text, animation, or simulation images. Specify exactly what images are required, and exactly how the images are to be incorporated and distributed in the ITV lesson.
- Use common cues in the script to prompt the director for all movements, transitions, visuals, etc. that the instructor wants to present.

Final Scheduling Actions

Work with schedulers to complete the following steps after the audience has been identified, the scope and sequence of the course of instruction has been determined, a development/conversion timeline has been established, and a delivery date has been determined:

- Determine the dates and times of broadcast and confirm the schedule.
- Identify and confirm downlink sites.
- Schedule facilities and satellite time.
- Implement marketing strategies to ensure student notification of course dates and times, and how to register.
- Call ATN Program Management Office to find how to connect to other Service networks, if required.
- Refer to the AFDLO Home Page Web Site for the current listing of GETN downlink sites and locations:

<http://www.au.af.mil/afdlo/>

Section B

ITV Development

Developing the Lesson Plan

Steps for Completing Lesson Plan Development

Complete the following steps to develop lesson plan scripts and storyboards after the audience has been identified, and the scope and sequence of the course of instruction has been determined.

- Determine the type of script format and the script elements to include.
 - Prepare the script with appropriate markings and proof it carefully.
 - Develop storyboards for each teaching point to include visuals, production notes, and narration. Include instructional protocols, questions, transitions, and summaries.
 - Follow all guidelines related to the use of copyright material.
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Script Purposes

A well-written script will provide the ITV instructor with information that is required to conduct and guide an instructional lesson. The script will:

- Sequence the primary lesson topics.
 - Provide guidance to the entire studio crew.
 - Be incorporated into a teleprompter, as desired.
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Script Types

There are four types of scripts:

1. Verbatim Script. The characteristics are:

- Every word spoken by the instructor is written down.
 - Contains specific cues for graphics, wording, movement, questions, etc.
 - Customarily used with a teleprompter.
 - Beneficial if specific key wording is to be used.
 - Useful for new Interactive Video Teletraining (ITV) instructors.
 - Interpretive reading (conversational dialog) of the script is required to avoid uninteresting presentations.
 - A true verbatim script does not allow for much spontaneous discussion or development of ideas.
 - The instructor should include time for interactive discussion periods.
 - Minimal coordination between instructor and studio production crew.
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Developing the Lesson Plan (continued)

Script Types (continued)

2. **Outline Script.** The characteristics are:

- Each specific word is not written down.
- Usually, only the opening and closing remarks are listed.
- The rest of the script is in an outline format.
- The sequence of information is pre-established.
- The instructor is free to develop sentence structure to support teaching points.
- Require the instructor to be very knowledgeable of the subject being taught.
- Close coordination with the director and studio production crew is required.

3. **Keyword Script.** The characteristics are:

- Not a good type of script for the instructor to use.
- Requires the instructor to be extremely knowledgeable of subject matter.
- Primary use is for studio technicians who can use instructor-generated key words as cues for performing actions, or presenting graphics, etc.
- Extensive coordination between the instructor and studio production crew prior to rehearsing lesson presentation is required.
- Adequate for broadcasting studio setup.
- More effective if combined with other script formats to achieve maximum instructor performance.

4. **Combination Script.** The characteristics are:

- Closely resembles a typical lesson plan.
- Combines Verbatim, Keyword, and Outline formats, and enables the instructor to present a thoroughly planned lesson.
- Most versatile script type.
- Coordination between the instructor and studio production crew prior to rehearsing lesson presentation may be greatly reduced.
- Requires more instructor planning time than the other types of scripts.

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Developing the Lesson Plan (continued)

Script Characteristics

A lesson script should contain everything that a well-designed resident lesson plan contains, and more. Ensure the following elements are included:

- Learning Objectives.
- Methods for communicating the Learning Objectives.
- Contain an *Introduction*, *Body*, and *Conclusion*.
- The Introduction contains motivational statements, visual images, and usually a Verbatim Script.
- The Body lists the main and supporting teaching points, and contains both Outline and Verbatim Scripts.
- The Conclusion repeats the major teaching points, and emphasizes the teaching points that are most difficult for the students.
- Contain *Interim Summaries* that are a mini conclusion of teaching points inserted in the lesson where appropriate, using Outline Scripts and visual media.
- Contain *Transitions* to inform the students at remote sites of the continuance of new information, and to enable the students to acknowledge the changes in lesson events.
- Contain scripted *Questions* that require and encourage student interaction with the instructor.
- Include adequate time for student questions.

ITV Script Development

Script Marking:

- Use symbols or cues to highlight important teaching points in the script.
- Use lines to separate different topics.
- Use clear, precise, and consistent marking throughout the script.

Script Proofing:

- Print a hardcopy of the script and proofread it for intent and effective topical coverage.
 - Rework the script as required.
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Developing Storyboards

Storyboard Use

Storyboards are used to convey visual ideas and concepts.

- Coordinate the lesson plan text with associated visuals.
 - Cards or sheets can be organized into different sequences.
 - Usually setup on videotape or on a computer, which allows the storyboard to be scrolled up or down, highlighted.
 - Storyboard images setup on a videotape must allow minimum viewing times for each image.
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Storyboard Composition

The three main sections of the storyboard to consider when developing ITV lesson plans are:

Visual Section:

- Visualize the teaching points by drawing, sketching or illustrating the visual images that will be seen in the final screens.
- Usually accomplished using a graphic format.

Production Notes:

- Describe where, when, what, and how the visual subject teaching points will be used.
- Contain the name of the visual subject teaching points.
- Contains the video shooting, timing, and display requirements, audio production and timing requirements for each visual subject teaching point.

Narration: The narration supports, and is secondary to the visual images.

- Describe and enhance the teaching points.
 - ITV storyboards may not contain the complete lesson plan narration.
 - Teleprompter scripts, verbatim scripts, content outline scripts, or keyword scripts may be used.
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Developing Storyboards (continued)

Develop Visual Materials

Visual materials should have the following characteristics:

- *Visual materials should fit the setting, support the message, and heighten audience attention.*
 - *Visual materials should be pictorial.* Key points and supporting materials should be expressed using expressive or vivid photos, graphs, charts, illustrations, animations and simulations.
 - *Visual materials should be colorful.* Color induces responses and appeals to emotions. Colors can promote attention, evoke moods, create desire, and generate a favorable response.
 - *Visual materials should be creative.* Creative visuals will have more impact, and gain more attention.
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Visual Materials Tests

ITV visuals must pass three tests:

- *Aspect Ratio:* A television monitor screen has an aspect ratio that is three units high and four units wide. Visuals displayed on the screen must correspond to this aspect ratio.
 - *Safe Area:* Visuals in the correct three by four aspect ratio, with a one-to-one pixel aspect ratio (i.e., computer graphics), will require additional space when presented on a television monitor. A television monitor has a one-to-three pixel aspect ratio that makes a one-to-one pixel aspect ratio image bleed off the television screen unless the image is sized correctly for display on a television monitor.
 - *Contrast:* Television cameras handle colors in the middle of the spectrum better than colors at the ends of the spectrum, such as black and white.
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Developing Storyboards (continued)

ITV Visual Materials Preparation

Use the following general rules for designing effective visuals:

- *Write the Words First.* Develop the message, the headlines, and the outline with key points. Consider the key points in the outline that need special emphasis.
- *Keep It Short and Simple (KISS).* Design no more than one main idea per visual.
- *Keep It Large and Legible (KILL).* Use only seven lines per visual, including the title.
- *Use the Six by Six Rule:* Six lines per visual; six words per line. Use a simple typeface no smaller than 18 points for transparencies.
- *Use Descriptive Titles.* Visual titles should summarize the points to be made on the visual.
- *Decide on a Basic Design.* Use the same colors, type styles, and graphics throughout a presentation to show a continuing relationship.
- *Proof the Visuals.* Use others to proof for incorrect data or spelling errors.
- *Proof received visuals.* Proof as they will appear at receive sites. Visuals sometimes take on a different appearance after conversion from digital to analog. If this is not possible, view videotape of broadcast.
- *Allow Enough Time.* Good, quality graphics take time to develop.

Using Color

Tips for using color:

- Color combinations that look good on a computer monitor will not always look good on a television monitor.
- Use different background colors to introduce new sections of the presentation, to change a mood, or to call attention to important transitions.
- Use light colors against dark backgrounds and vice versa. Avoid bright red, magenta, and some blue colors that tend to get lost in the background.
- A solid background will enable text, graphics, and graphs to stand out. Special effects can add visual appeal.
- Use visuals with more images, and less words.
- Use words to label, highlight, and summarize.
- Yellow and white text bold with shading work well.

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Developing Storyboards (continued)

Types of ITV Visual Materials

Types of ITV visual materials include:

- *Camera Art or Hard Graphics.* Must be large enough, and pass the contrast and aspect ratio tests. Are usually prepared prior to the live presentation, rather than using a camera to shoot them “live” during the presentation. May also be shown during the broadcast using a visualizer.
 - *Computer-Generated Graphics.* Computers are used to create animated, still, and modeled images and text using templates with correct aspect ratios and safe areas.
 - *Character Generator (CG).* Used to create words and numbers in a variety of sizes and colors for display on the television monitor. Can be a stand-alone device, or a component of a computer graphics system.
 - *Full Animation Systems.* Sophisticated computers that can reproduce any type of animated, still, or modeled image; create unlimited motion; add shading; specify the angle and intensity of the light source; and give a two-dimensional drawing depth and three-dimensional effects.
 - *Still-Store.* Captures a still image from any type of video source and stores the image as a still image. Provides random access to still images, with numbered frames. Images are displayed on the television monitor by calling up the frame number.
 - *Ultimatte or Chroma Key.* Allows the presenter to interact with the displayed images. Electronically finds a particular color frequency in the television picture, usually green or blue, and removes it from the image being broadcast. Anything green or blue becomes invisible. For example, if the wall behind the presenter is green, Ultimatte removes the wall. The wall can be replaced in the broadcast image with another background video image. The presenter (who cannot be wearing green) is visible in front of the new image.
 - *Roll-Ins (video clips).* Pre-produced videotapes that are shot to videotape by a live camera and edited for desired scenes and length of display prior to the live broadcast.
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Section C

ITV Implementation

The TV Studio

ITV classes may take place in a video production facility (TV studio), or in an ITV broadcast classroom. The TV studio should normally contain:

- Draperies in a solid color, that can be used as a backdrop.
- Curved wall painted in a solid color, that can also be used as a backdrop.
- Metal framework on the ceiling, from which lights can be suspended for illumination of the set below.
- One to four analog or digital TV cameras on wheels or wall-mounted.
- Furniture for use in sets.
- Analog or digital television monitors.
- Computers with monitors and Internet access.
- Projection or digitizing systems for transparencies, slides, graphics, solid objects, etc., capable of projecting images on screens or monitors.
- Fax machine for student roster, submitting questions or course materials, etc.
- Studio doors large enough to provide access for large training support equipment.
- Clocks. Timing is important and instructors must avoid dead time while on-the-air.
- Production personnel such as camera operators, stage manager, technical assistants, etc. as may be necessary for the production.

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Implementation (continued)

The Control Room

The control room is the heart of the ITV production facility and should normally contain:

- All equipment for transmission of ITV broadcast and the appropriate crew to ensure a successful broadcast.
- A director or videographer, linked to a key personnel instructor by microphones, headsets, and earphones.
- Several analog or digital TV monitors.
- Large electronic control panels for management of equipment and personnel.
- Videotape and audiotape players.

Each of the television monitors in the control room displays a specific video output. Each camera on the studio floor is tied electronically to the control room so that the director can monitor what each camera is recording. Other video or computer monitors are used to display:

- Analog or digital graphics.
- Scripts, animations, and computer simulations.
- Digital and analog videotape lesson segments.
- Prerecorded lesson segments.
- The image that is being transmitted to students at remote sites.

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Implementation (continued)

ITV Equipment

The following devices are commonly used during ITV production. Instructors should become familiar with all of the equipment/devices used during the production.

- *Lavalier or clip-on microphones:* Designed to pick up the voice of one person, and clipped to the clothing of the presenter.
 - *Tabletop microphones:* These are important if students are present in a studio classroom so that their questions can be transmitted to students at the remote or downlink sites. Students at downlink sites often use “push-to-talk” tabletop microphones to talk to the instructor and to other sites.
 - *Lighting:* Spotlights are placed to eliminate shadows on the presenter, and to create appropriate shadows on the set and backdrop.
 - *Cameras:* Usually, three cameras are used.
 - One camera is used to shoot graphics. It can be mounted in the ceiling, in a lectern, or in a visualizer.
 - Two cameras are mounted on movable bases to achieve different shooting angles.
 - Cameras in the broadcast classroom are mounted in the back of the room, and are operated by remote control from the control room.
 - Most studio cameras have red lights on top to indicate which camera is in use.
 - *Teleprompter:* Designed to display text within view of the on-camera presenter. The script is entered into a computer that is used to scroll pages of the script through the machine as the presenter reads them. May be controlled by the director or the instructor.
 - *Monitors:* Each ITV receiving site must have one or more analog or digital video monitors that enable the students to see the presentation.
 - *Computers:* Each ITV receiving site must have instructor and student computer stations that enable the presentation of Interactive Multimedia Instruction, computer simulations, and electronic testing (Internet access).
 - *Video cassette recorders (VCR):* Required at the ITV receiving site if local videotapes (not a part of the broadcast) are to be presented to the students and for recording broadcasts for remediation or future reference.
 - *Voice/Data fax/Computer modem:* Required at the ITV receiving site to provide text and voice interface between students and the instructor. Also used to control the transmission of test information.
 - *Whiteboard (Softboard™):* Connects to a Windows®-based computer. Information written on the whiteboard is displayed on the computer monitor in color. Files can be created and saved.
 - Interactive presentation system (instructor controlled).
 - Visualizer.
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Preproduction Phase

Preproduction Activities

The ITV preproduction phase involves the following activities:

- Conducting preproduction conferences.
 - Development of television platform skills.
 - Conducting rehearsals.
 - Production preparations.
-

Preproduction Conferences

The instructor, studio director, and graphics designer must meet to discuss and coordinate the sequencing of the various instructional media elements of the distance learning course.

- Decide whether, when, and how the ITV components are to be broadcast.
 - Determine the development times and resources required to develop and integrate the ITV course.
-

Develop ITV Skills

ITV is a visual medium, and instructor presentation skills are very important aspects of instructing using this medium. It is strongly recommended that instructors and developers attend a course to learn ITV techniques. Rehearsals and “dry-runs” should be accomplished by the instructor to hone verbal and nonverbal presentation skills, and practice using the equipment.

Conduct Rehearsals

Rehearsals will allow the instructor and production team to work out the broadcast details to include the exact presentation sequence/timing, camera shots, supporting graphics/display requirements, etc. Video tape rehearsals for review.

Production Preparations

Below are just a few of the considerations and preparations that may need to be accomplished prior to the actual production (use checklist if available).

- Ensure the production and remote site facilities have been reserved and are still available.
 - Ensure the remote sites have all the necessary instructional materials.
 - Ensure site monitors are trained.
 - Ensure the facilitators are aware of their responsibilities/roles.
 - Ensure the telephone link/audio bridge is operating properly.
 - Conduct last minute checks on equipment, instructional materials, etc.
 - Confirm satellite connection with downlink sites and ensure all remote classroom sites are up and operating on production day.
-

Production Phase

The Broadcast

The Production phase is actual on-air time, when the lesson is being broadcast by the instructor and received at all downlink sites. Videotape the broadcast and conduct a debriefing with the production team after the production.

Potential Technical Problems During Production

Visual or audio problems may occur when conducting ITV live via satellite:

- *Visual difficulties* include the loss of the transmitted uplink image due to:
 - Studio cameras not relaying the image properly.
 - Camera operators and switchers not being in sync with each other according to which image needs to be broadcast.
 - Space satellite malfunctions.
 - *Visual difficulties* include the loss of the transmitted downlink image due to:
 - Television monitor malfunctions in the ITV classroom.
 - Satellite downlink dish not receiving signals properly.
 - *Audio difficulties* include the loss of the transmitted uplink signal due to:
 - Instructor's microphone not functioning properly.
 - Satellite may be sending the visual image but not the audio signal.
 - *Audio difficulties* include the loss of the transmitted downlink signal or audio return due to:
 - Television monitor volume variations in the ITV classroom.
 - Inoperative television monitor speakers.
 - Student microphones problems.
 - Telephone patch-in/audio bridge problems.
-

Have a Backup Plan

Develop a backup plan and coordinate it with the remote site facilitators in case of transmission problems or failures. This should include an alternate lesson plan at the remote sites which may include showing a previously taped ITV lesson if appropriate, or accomplishment of other instructional activities under the direction of the site facilitators.

Section D

ITV Evaluation

Overview

Evaluation usually refers to anything that occurs after implementation, such as evaluation of the effectiveness of the ITV course of instruction, including assessment of the learning outcomes, instructional skills, and studio services.

- Evaluation is the last phase of the ISD process.
- Effective evaluation requires a continuous feedback process.
- Evaluation identifies both intended and unintended outcomes so that decision-makers can make necessary adjustments in the instructional program.
- Evaluation usually involves formal and informal processes that measure the effectiveness of instruction and support functions.
- There are unique evaluation requirements for ITV and distance learning courses of instruction.
- The quality control procedures described in Chapter 2 are part of the evaluation process for ITV courses of instruction.
- Evaluation of ITV, and the required documentation, is based on the distance learning metrics described in Chapter 2.

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ITV Evaluation (continued)

Formative and Summative Evaluation

The formative and summative evaluations provide a feedback mechanism that allows for adjustments and modifications of strategies being used to assure achievement of program goals and objectives. They include:

- *Evaluation of Internal Processes:* Look at how well the process worked. Was ISD followed? Did the team work well? Were policies followed? Was required documentation maintained? Were general quality control (QC) procedures followed?
 - *Design/Development Criteria for ITV:* Were the proper procedures and design techniques followed? Did the team members follow the QC procedures in the design and development of the courseware?
 - *Validity and Beta Testing Prior to Release:* This is to ensure instruction works prior to wholesale implementation. For ITV, this involves pre-production coordination, rehearsals, and feedback from the field for the initial broadcast.
 - *Monitor Technical Production:* The technical and studio production staff must continuously monitor the output signal as well as return audio during a production. Testing of equipment must occur prior to broadcast time and must be factored into the ITV schedule. The production crew must be able to work with site monitors or POCs to fix technical problems that occur during production.
-

Formative Evaluation

Formative Evaluation is a continuous feedback mechanism that includes:

1. *Evaluation of Internal Processes:*
 - How well did the process work?
 - Was the ISD process followed?
 - Did the team work well together?
 - Were policies followed?
 - as required documentation maintained?
 - Were Quality Control procedures followed?
-

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ITV Evaluation (continued)

Formative Evaluation (continued)

2. *Design/Development Criteria for ITV:*

- Were development procedures and design techniques followed?
- Did team members follow Quality Control procedures in the design and development of courseware?

3. *Validity and Beta Testing Prior to Release:*

- Has beta testing been accomplished to measure the validity of the instruction?
- Have pre-production coordination and rehearsals been accomplished?
- Has feedback from the field for the initial broadcast been obtained?

4. *Monitor Technical Production:*

- Does the technical and studio staff continuously monitor the output signal and the return audio during a production?
- Has testing of equipment prior to broadcast time been accomplished and factored into the ITV schedule?
- Can the production crew work with site POCs to fix technical problems that occur during production?

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ITV Evaluation (continued)

Summative and Operational Evaluation

Summative Evaluation is based on data collected upon conclusion of a program. It indicates the initial level of success. The Operational Evaluation is conducted throughout the life cycle of the course. It indicates the on-going level of success. Operational evaluations will show trends over time and should help differentiate between an isolated incident and potential system/program failure. As with all DL programs, ITV Evaluation is based on DL Metrics in Chapter 2 and includes:

1. *Instructional Effectiveness:*

- The instructor, along with the course director or training manager, is responsible for determining if students achieved the desired learning outcomes. This is usually accomplished through some form of testing or course completion data.
- An important indicator of effectiveness is how well the instructor and any subject matter facilitators performed in the ITV environment. Measurement of the effectiveness of these people is usually accomplished through student critiques of the instructional program and feedback from peer or supervisory evaluations as well as site POCs. Also, ITV producers/directors are a source of feedback. Student critiques of ITV instructional effectiveness should provide feedback on:
 - Content
 - Relevancy of material.
 - Level of student-instructor and student-student interactivity.
 - Effectiveness of instructor presentation techniques.
 - Instructor knowledge of subject matter.
 - Overall technical quality of presentation.
 - Quality of the learning environment at the remote sites.

2. *Costs:* These are kept in accordance with DL Metrics in Chapter 2.

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ITV Evaluation (continued)

Operational Evaluation (continued)

3. *Technical/System Reliability:*

- The production/engineering and ITV studio (uplink) crews are primarily responsible for monitoring technical and ITV system reliability.
- Site POCs must report any technical difficulties at the remote sites. The production/engineering crew must determine if the problems are system or site related. These difficulties are documented and reported to the ATN program manager as directed. Documentation should include:
 - System/studio utilization.
 - Type of equipment failures.
 - Percentage of downtime.
 - Point of failure (cause and location of problem) .
 - Requests for assistance from remote sites.
 - Actions taken.
- Usually a debriefing occurs at the end of each production to identify areas for improvement.

4. *Administrative Efficiency/Operational Effectiveness:*

This involves a review of the administrative procedures that support ITV to include:

- Course notification.
- Registration procedures.
- Materials handling.
- Student access to facilities.

This information can be obtained from students as part of the course critique as well as from site POCs. Problems should be reported to the appropriate support organization.

5. *Customer Satisfaction:* Customers for ITV include all those listed for DL in Chapter 2 as well as all production/engineering and studio crews, and site POCs. Surveys are usually used to determine customer satisfaction.

Section E

Special Considerations for VTC

Overview

VTC Versus ITV

The most significant difference between ITV and VTC is the two-way video capability of VTC instruction. A VTC system provides visual communications between the participating sites. Any VTC classrooms that are networked to ITV sites would still be limited to one-way (receive-only) video. Also, there are budgeting limitations for VTC systems, therefore, the number of sites that can be conferenced at one time is limited.

Much of the ISD process for VTC is the same as for ITV instruction. This section addresses some of the special considerations or processes involved in the analysis, design, development, implementation, and evaluation of a VTC course that is not covered under the ITV sections.

Analysis

Is Two-Way Video Required?

To help determine if two-way video instruction is required, the following questions can be asked as part of the decision process:

- Is an instructor required to present the instruction?
- Do the students need to see the instructor?
- Is the desired learning objective a skill objective that requires the demonstration and performance of a task?
- Does the instructor need to observe the students' actions, performance, progress, or interaction in the accomplishment of the task? If so, does the instructor need to observe the student in real-time?
- Can student performance be adequately seen through a VTC camera?
- Can subject matter facilitators at the local sites fulfill the requirement to observe student task performance?
- Are there other instructors, SMEs, or guest speakers at any of the participating sites that are required to present some of the instruction?

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Analysis (continued)

Is VTC Feasible?

If two-way video is determined to be required, then the following questions can be asked to determine if VTC is a viable option for delivery of instruction:

- How many sites will be participating?
- Is it required that all sites participate at same time? Can the instruction be presented to different sites at different times?
- How will the fact that each participating site may only be able to view one other site affect the presentation and instruction?
- How many students will be at each participating site?
- Will each individual student be required to be observed?
- Do all the participating sites have adequate equipment and trained personnel to operate the equipment?
- Do all the participating sites have compatible connections/capability?
- Are there any other delivery options or methods of instruction available to accomplish the desired learning objective?
- Will VTC instruction be cost effective?

Design

How is VTC Design Different?

There will be some differences in the instructional design of VTC presentations since there will be more than one originating production site. It will be necessary to develop instructional strategies that incorporate and integrate the video capability at the other selected site(s).

- The production capabilities and limitations of the other sites must be considered in the instructional design process.
 - Clearly define what actions or performance are required of the students.
 - Determine what instruction or expertise is required from participating sites.
 - Determine what is expected of the other site teams or POCs and ensure those expectations are communicated.
-

Development

Develop an Integrated Lesson Plan

Develop an integrated lesson plan that includes the other participating site(s).

- Coordinate with the other site instructors/speakers in the development of the storyboards and script. They are part of the team.
- Determine how and when the video will be switched between participating sites if applicable.
- Determine who will produce the instructional materials for the other sites.

Implementation

Additional VTC Considerations

Additional implementation considerations for VTC instruction include:

- Involve other participating production teams or POCs in the preproduction conference.
- Confirm other participating production sites have proper equipment/support.
- Ensure all participating site instructors have received the required training.
- Schedule and conduct rehearsals with other production sites.
- Ensure students at each site are familiar with the production equipment and presentations procedures as applicable.
- Conduct *two-way* video/audio checks with each site prior to VTC session.
- Ensure the backup plan covers the possibility of transmission problems or failures at one or more sites as applicable.
- Have the other sites videotape their productions.

Evaluation

Guidelines

Formative and summative evaluation for VTC media is the same as for ITV and IMI. Ensure the evaluation plan and process includes all participating sites. Detailed guidelines for IMI formative and summative evaluation are contained in MIL-PRF-29612 and the associated handbooks in this series.
