2002

InTime video field production and editing

Jennifer Mohlis Peterson
University of Northern Iowa

InTime video field production and editing

Abstract

The Integrating New Technologies into the Methods of Education (InTime) project is a grant from the U.S. Department of Education. The main function of this grant is to produce and deliver videos, via the Internet, of teachers using technology with their students. The target audience is pre-service and practicing teachers.

In order to capture on tape real teachers in real classrooms with real students, many things need to be considered. Determining what activities and teachers must be included in the project, which elements of the model are to be illustrated, and how to facilitate access to the videos and lesson plans are only a few of the issues. Video production is an essential component of InTime. This paper will discuss field production techniques in general, and how these specifically relate to the InTime productions. This paper will also address editing considerations for the final videos. A glossary (Appendix A) is included to clarify technical terms.

INTIME VIDEO FIELD PRODUCTION AND EDITING

A Graduate Research Paper

Submitted to the

Division of Educational Technology

Department of Curriculum and Instruction

in Partial Fulfillment

of the Requirements for the Degree

Master of Arts

UNIVERSITY OF NORTHERN IOWA

by

Jennifer Mohlis Peterson

Spring 2002

This Research Paper by: Jennifer Mohlis Peterson

Titled: InTime Video Field Production and Editing

Has been approved as meeting the research requirement for the
Degree of Master of Arts.

April 17, 2002
Date Approved

Sharon E. Smaldino
Graduate Faculty Reader

April 18, 2002
Date Approved

J. Ana Donaldson
Graduate Faculty Reader

April 18, 2002
Date Approved

Rick Traw
Head, Department of Curriculum
and Instruction

Introduction

The Integrating New Technologies into the Methods of Education (InTime) project is a grant from the United States Department of Education. The main function of this grant is to produce and deliver videos, via the Internet, of teachers using technology with their students. The target audience is pre-service and practicing teachers. Activities are videotaped, and the tapes are analyzed by graduate assistants hired by the InTime grant to assist in various aspects of the project. These graduate assistants write scripts using the footage to illustrate parts of the Technology as Facilitator of Quality Education model (Switzer, Callahan, and Quinn, 1999). Then the videos are edited, and streamed on the Internet. The videos are embedded in web pages, with lesson plans, model information and scrolling transcripts of the audio. The transcripts are synchronized to the video, and contain hyperlinks to web pages about components of the model discussed in the video.

In order to capture on tape real teachers in real classrooms with real students, many things need to be considered. Determining what activities and teachers must be included in the project, which elements of the model are to be illustrated, and how to facilitate access to the videos and lesson plans are only a few issues that must be dealt with by the InTime project. Video production is an essential component of InTime. This paper will discuss field production techniques in general, and how these specifically relate to the InTime productions. This paper will also address editing considerations for the final videos. A glossary (Appendix A) is included to clarify technical terms.

Procedure for Taping Video

Taping on location adds credibility to the video (Cartwright, 1996). Viewers are able to experience the natural setting of the activity, rather than an artificial environment. However, unlike a studio setting, the on-location taping has many variables that are difficult to control. In a studio, many lights can be used, and microphones can be hidden in various places. The set can be prepared well ahead of time for the production's needs. On location, the production crew has to work with what it is available. The crew is not able to build the set to meet its specific needs.

"Most producers will agree that one of the most important considerations for location production is the location site survey" (Cartwright, 1996, p. 91-92). All locations should be checked prior to taping (Lyver, 1999). A plan must be developed with much exact detail. Photos are valuable, as well as notes regarding power, light, and sound considerations. The producer must plan the equipment needs, crew logistics, and other special location requirements. Equipment placement and audio recording needs must be determined ahead of time.

Taping on location also requires good problem-solving skills. If an unexpected difficulty arises, the crew needs to know how to solve or work around it. Field productions require a great deal of flexibility and competence. One must consider what could go wrong, and then figure out how to solve the challenges before the taping.

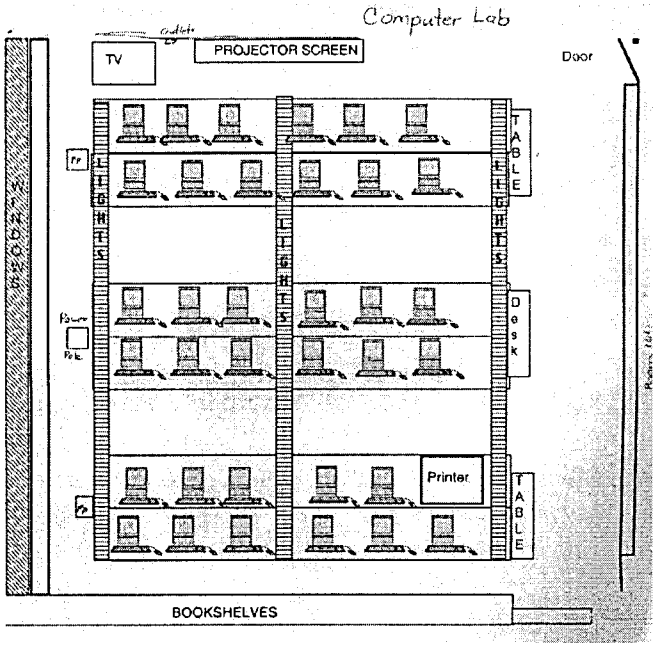
All the InTime videos are taped on location rather than in a studio. Often, InTime videos need to be taped at locations the crew is unable to visit prior to the taping date. Rather, the crew relies on room sketches submitted by the featured instructor (see Figure

1). Some plans include power sources and the layout of tables, desks, and windows. Since the instructor has many duties as an InTime participating teacher, and is not trained in videography, items that are important to the crew may seem trivial to the instructor. Fortunately, many of the teachers also submit a videotape or photos of the room. This is very useful since the producer can watch the video and study the photos ahead of time to get a sense of what challenges the crew may face on location.

Since an actual survey of the location is not possible, the video crew often takes all the project's video equipment so they can adapt to unfamiliar circumstances. Extra cables, batteries and tape are always included. It is essential for the crew to arrive on location with plenty of time to set up and solve problems. More than once, the crew has needed more time than expected to set up because unanticipated problems arose. Sometimes, a call back to an expert at the University of Northern Iowa campus has solved problems that could have been very detrimental to the entire taping. As a fairly new field production crew, it is especially important for the team to ask for advice, and to not hesitate to ask for help.

Another consideration during the pre-production phase is time. It is advisable to have an idea of how long the taping will last. This is especially important to know when hiring a freelance videographer. If a freelancer is available only for the morning, it may be possible to hire the person if the activity will be over by noon. Knowledge of taping time is also useful when planning the amount of videotape to bring to the site, and to schedule travel time between different activities. An outline of the proposed shooting schedule is also helpful (see Figure 2). This should include the amount of time for each

Figure 1. Sample room sketches.



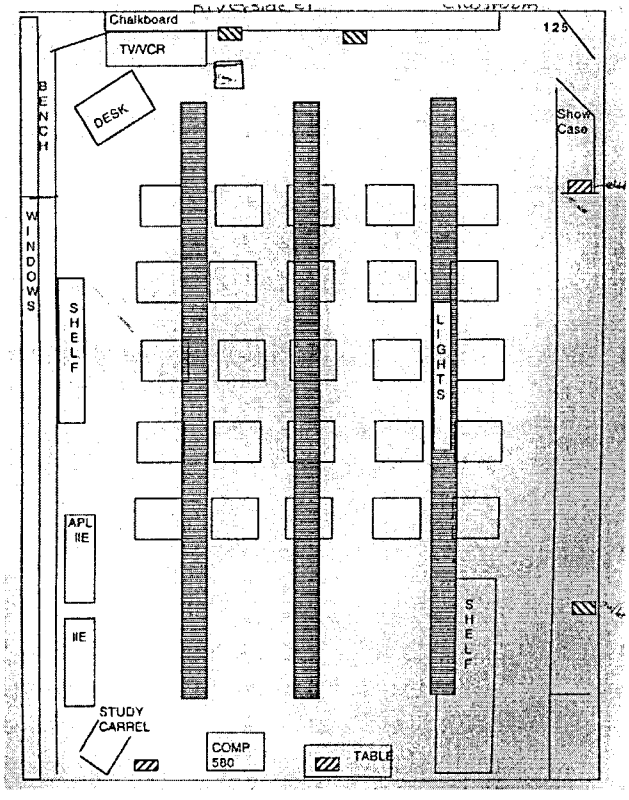


Figure 2. Sample taping schedule from participating teacher.

I plan to have half of my students (20) working in student led teams in my classroom from 9:00 to 10:00 AM. The kids will leave at 10:00, so you can interview me from 10:00 to 11:00. We will have lunch from 11:00 to 12:30. The other group of kids will arrive at 12:30 and leave at 1:30. They will work in student led teams burying and excavating for artifacts. Technology tools will be used during both the morning and afternoon activities.

part of the activity, including travel time, set up time, and breaks. In addition, the crew should also know where to park and unload the equipment, whether they need to check in at the school's office, and good places to eat lunch or possibly stay overnight.

Time schedules and other information are submitted to the InTime crew via an online form (see Figure 3). Although this information may seem unimportant, it is actually very useful and is necessary to avoid confusion. In addition, one of the grant co-directors goes over the taping schedule with the teacher. The co-director oversees the goals and activities of the grant, the teachers and lessons involved, and the timeline for completing grant tasks. By reviewing the taping schedule (see Figure 4), the co-director can make sure the essential parts of the lesson will be covered appropriately. Then she sends a copy of this schedule to the producer, or person in charge of the taping, so the producer will know what to expect and what parts of the activity are important to capture on tape.

Crew

Teamwork is especially important for any field production since all the crew members have greater control over the final product than in a studio production (Compesi, 2000). All the members of the crew should have a clear idea of their

Figure 3. Sample online form.

Taping Date: ***11/15/2000*** InTime Taping & Travel Info

School Information:

School: Perryville Elementary	**Teacher:** Mary Bauwens
School Address: 326 College Street	**Email:** mbauwens@perryville.k12.mo.us
Perryville, MO	**Teacher Home Phone:** 573-547-6788
School Phone: 573-547-6700 Ext. 625	**Teacher Arrival:** 7:15
School Fax: 573-547-6445	**Classroom Room #:** Trailer

General Directions to School:
Both motels are right off the I-55 Perryville Exit. To get to the school travel towards Perryville on
Highway 51 to the second four way stop. At the 4-way stop turn right and go on highway 61 through town.
you will go through a four way stop at Hardees on the right and keep going straight on Highway 61
You will pass the sheriff's dept. Watch for Huber Road on the right just after you pass the nursing home. Turn right on Huber and when you come to the end of that street turn right and come up the street and you will see the elementary school on the left. Office is right inside the front right door.

School Check-In Procedure:

Check in at office? yes	**Office Room Number:** 216
Office Entrance: Front (Doors to the right)	**Classroom Entrance:** Drive around the front of school to the side and my trailer is there.

Van Access by Classroom to load-in? Yes, but I will also be doing part of my lesson in the computer lab and we will have to move there.
If Yes, Can we park there? Yes
If No, Alternate Parking?

Taping Info:

Taping Time: 8:15 **Can we tape out of sequence? yes**
Taping Locations: Trailer classroom and computer lab
Interview Location: my trailer classroom

Motel Info:	***First Choice***	***Alternate Choice***
Motel:	Comfort Inn	Best Western
Phone:	573-547-1727	573-547-1091
Street Addr:	1517 S. Perryville Blvd.	Interstate 55 & Hwy 51
City/State:	Perryville	Perryville
Approx. Dist. to School:	5 miles	5 miles

Can Jennifer & Laura check email? Probably
Restaurants: Kelly's, Ponderosa, Chinese garden

Additional Info: I checked the video-taping schedule you have posted. Please change Gayle and I. I will be doing mine on November 15.

Caroline's Home # 319-277-6239
Karla's Office # 319-273-7241
Rick's Office # 319-273-7218

UNI Information 319-273-2311
Assoc. Dean's Office 319-273-2719
UNI Motor Pool 319-273-2610

Figure 4. Sample taping schedule from the grant co-director.

The kids eat breakfast before classes start. If they are in the classroom, you may get just a few informal shots of this. I'm thinking about the section of the model for Teacher's Knowledge of Student Characteristics where it refers to the teacher seeing that their physical needs, etc., are met. This would be one way to do that.

9:00 The students will look at class the web page. They will talk about where they have been as a community study. There will be a whole class discussion about the class web page. They also have class mascot (a monkey), and they will talk about where the monkey has been, including Grand Rapids and Egypt. They will talk about what those places look like and how they look different from their community. The monkey will be going to Ireland after this day of taping. The kids may be all gathered around her computer to look at their class web page, or they could go to the computer lab where she could project the web page. It might be more effective to show their excitement gathered around her computer as they normally do. As of now, she is planning to stay in the classroom for the activity.

Then the students will take a field trip into town (10 minutes from the school) to the Chamber of Commerce, Memorial Park, and the library. The teacher will also be taking pictures for the class web page during this trip. Try to get shots of the kids' reactions and some of the teacher recording the event for the web page. If possible, also get shots of what they are seeing on their fieldtrip.

After the fieldtrip, the kids will eat lunch.

After lunch, the students will come back to classroom to do an activity comparing the school library to the town library. The kids will be drawing pictures and talking about libraries where they have been. Try to get shots of this.

Kim will put the pictures into the web page with her web master. She scans in pictures of the kids' library drawings to go on the class website as a record of what they have seen in their community. Please get some footage of them discussing how they are going to put this up on the web page, showing the collaborative relationship and the class working together with other professionals.

The interview will follow this.

responsibilities. Each member of the team will have his or her own area of expertise, and individual concerns should be addressed (Cartwright, 1996). Crew members should

try to communicate clearly with each other at all times (Compesi, 2000). New crew members should be walked through a typical day of InTime taping before the actual production begins.

There are several roles to be filled on a field production. The first member of the team is the producer. This person is in charge of the overall organization and delegation of responsibilities. It is important to have only one producer to minimize confusion. The second member is the videographer, who is responsible for the visual treatment and camera operation. The third role is the production assistant, who typically monitors the audio, helps with lighting, and does other support work. These roles may overlap. It is possible to have one person do all of them, or to have several people helping with each role.

The InTime video crew usually consists of three people (see Figures 5 & 6). One person is considered the "crew leader" or producer. This person organizes the taping, and informs the crew about what will be happening. This person also determines the camera locations and works with the teacher to organize the taping events. The InTime producer is also a videographer. Typically, the producer captures the wide shot or close ups of the screen or chalkboard. This way, the producer is able to lock the camera on a shot and walk to the other videographers if they need assistance. In addition, the producer is also a production assistant and video editor. The producer delegates responsibilities to the other members of the team. This person must have a clear idea of the type of shot to get, so she can share this information with the other videographers. She must also be able to direct the sequence in which to tape the segments of the activity. This information also needs to

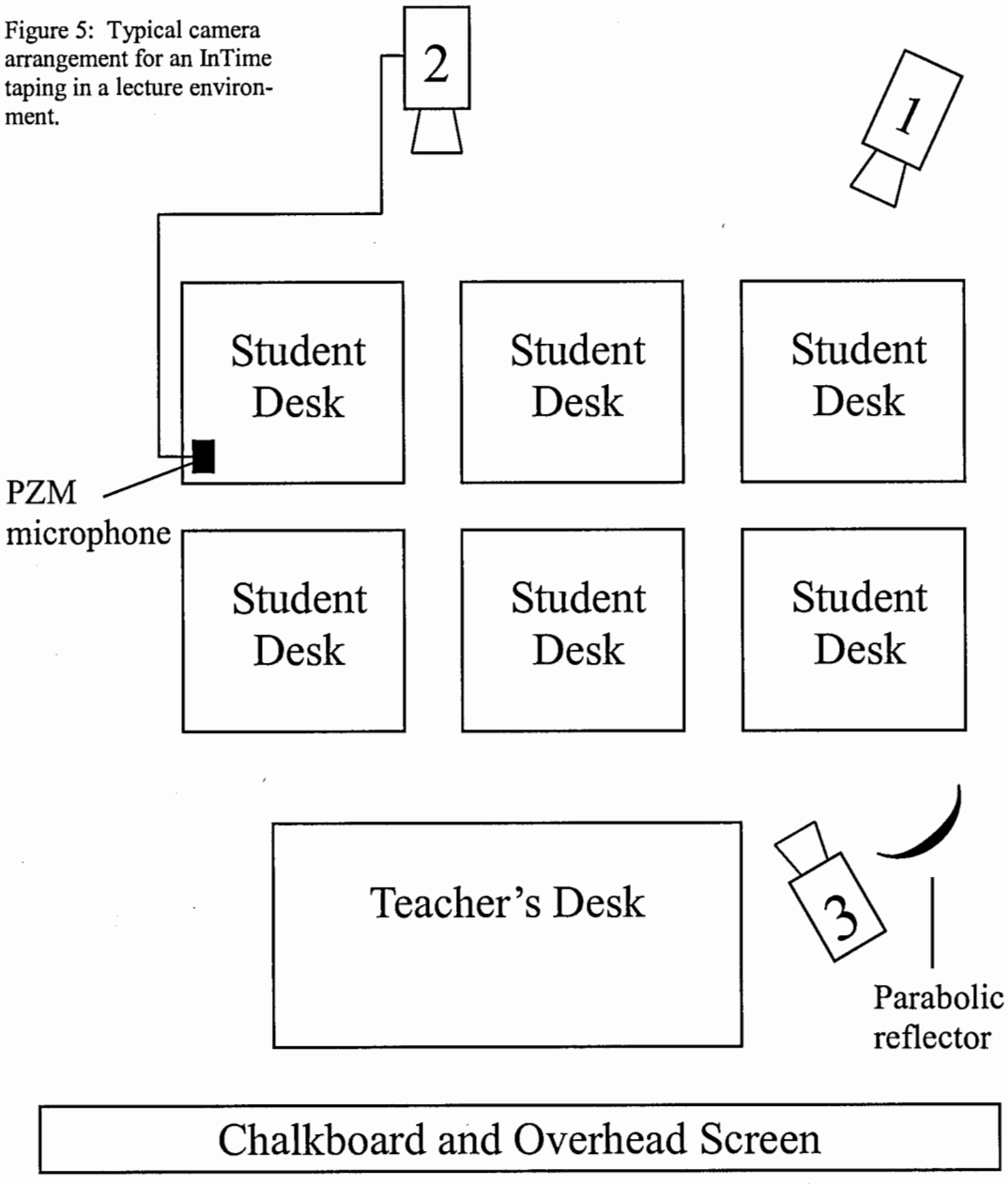


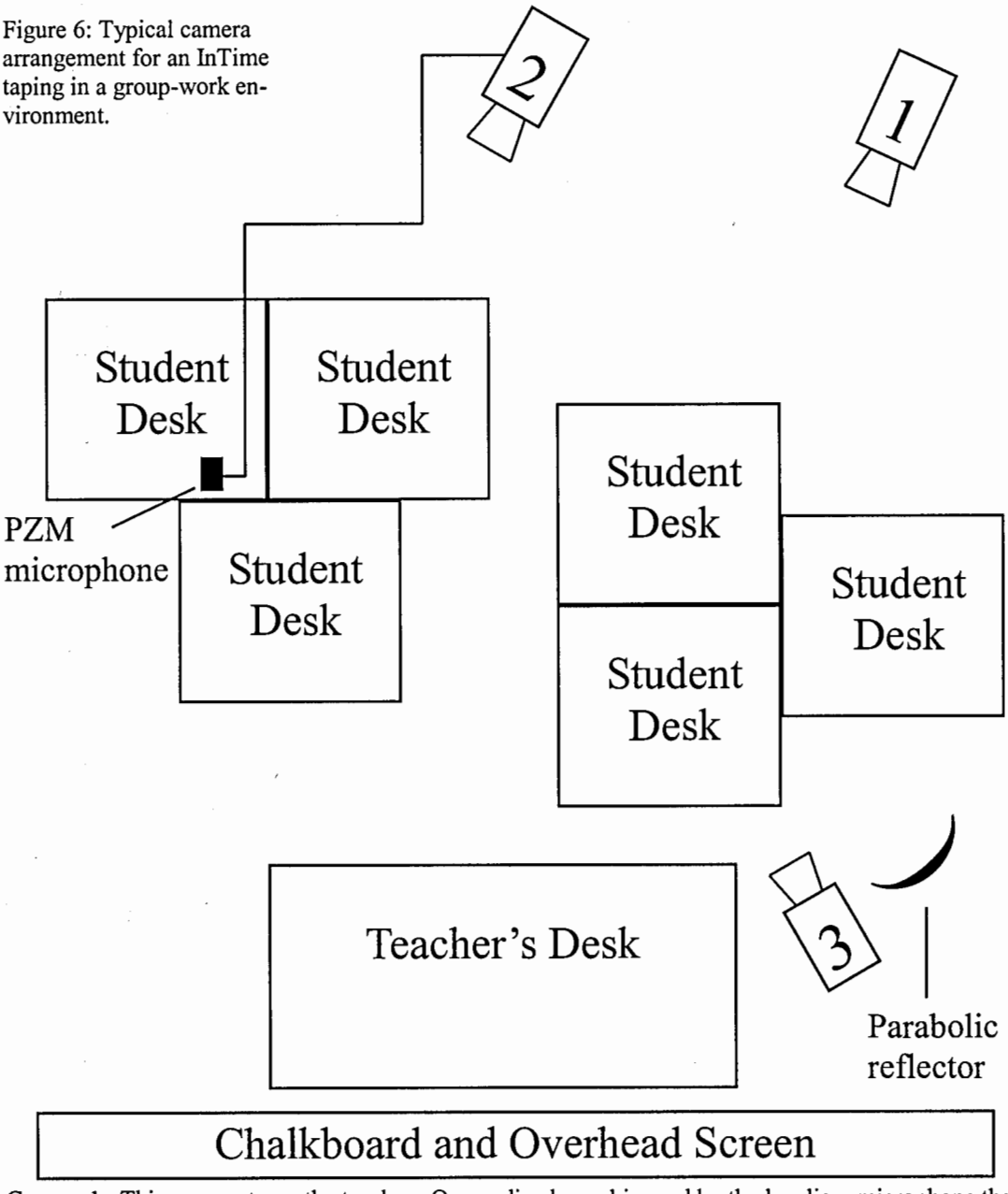
Figure 5: Typical camera arrangement for an InTime taping in a lecture environment.

Camera 1: This camera tapes the teacher. One audio channel is used by the lavaliere microphone the teacher wears. The second audio channel is used by the microphone mounted on the camera.

Camera 2: This camera tapes a wide shot, the overhead and chalkboard, and other miscellaneous events. One audio channel is used by the PZM microphone, placed to capture sound far from the parabolic reflector. The second audio channel is used by the microphone mounted on the camera. If there are two teachers, the second audio channel is used by a lavaliere microphone on the second teacher.

Camera 3: This camera tapes the students. One audio channel is used by the parabolic reflector. The second audio channel is used by the microphone mounted on the camera.

Figure 6: Typical camera arrangement for an InTime taping in a group-work environment.



Camera 1: This camera tapes the teacher. One audio channel is used by the lavaliere microphone the teacher wears. The second audio channel is used by the microphone mounted on the camera.

Camera 2: This camera tapes one group of students, and a second teacher if there are two teachers. One audio channel is used by the PZM microphone, placed to capture sound far from the parabolic reflector. The second audio channel is used by the microphone mounted on the camera. If there are two teachers, the second audio channel is used by a lavaliere microphone on the second teacher.

Camera 3: This camera tapes a second group of students. One audio channel is used by the parabolic reflector. The second audio channel is used by the microphone mounted on the camera.

be conveyed to the other team members. The producer needs to communicate what to expect, the video segment objective, results hoped for, and as much background information as possible.

The other members of the crew are the assistant producer and production assistant. The assistant producer is responsible for capturing footage of the teacher, and the production assistant tapes student reactions and questions. Both assist with lighting, monitoring audio, and whatever other needs arise. In addition, the assistant producer also works with the teacher to get correct placement of the microphone, and gives the instructor tips on where to stand and what mannerisms to avoid.

The producer and assistant producer are permanent participants in the productions. They are at all the tapings, and they have specific responsibilities. They know what they are expected to do since they have experience with the project. The production assistant is a freelancer. This person may have helped with an InTime production before, but often, this person needs some training. This person is usually hired weeks before a taping, so there is plenty of time to make appropriate arrangements for his or her other responsibilities. Once the person is hired, the freelancer is encouraged to view InTime videos on the Internet to familiarize himself with what is expected. Once the crew arrives on location, the producer and production assistant help the production assistant with setting up his camera and microphones. Then the production assistant is reminded of the types of footage the project needs. Several points are stressed, including the importance of getting screen shots of computers, and making

sure to adjust the camera and microphone to record student responses as quickly as possible.

The production assistant is also told about hand signals used to indicate when to start and stop taping. Since the footage from each camera will be synced, or matched up with the other cameras, during the editing process, it is important to have all the cameras start and stop at the same time. This is unique since many productions shut off the camera to move it around the room. Keeping the tape running through small location changes is important not only for syncing the tapes, but for getting the audio from the microphones connected to the camera.

Talent

It is important to meet the teachers in advance, especially to explain the goal and what they are expected to do. Most of the teachers featured in the InTime grant attend a training workshop. The teachers are familiarized with the project and what is expected from their activities. They also analyze finished videos, so they will have a more complete understanding of what the project is about and the intended objectives.

The producer also needs to meet the teacher in advance. While they often meet at the workshop, a more thorough discussion is needed to determine the logistics of the actual taping. This can be done in person or via phone. For InTime, this is usually done via phone since the teacher may be in another city or state. A pre-interview may make the video lose its spontaneity (Compesi, 2000), but that is not a concern for InTime tapings. The producer and instructor do not delve deeply into the activities of the lesson.

They review the activity, but concentrate on the technical side of the taping, making sure to not make the activity too scripted.

The producer should try to put the talent at ease. This person will probably be anxious and apprehensive. The producer should share as much information as possible, and show the teacher previous videos with non-professional talent. This is available on the InTime web site. Seeing other amateurs in video will help the teacher understand the process and give an idea of what is expected (Cartwright, 1996). "They were probably chosen for the program because of their skill or expertise. Let them know that their contribution is important to the success of the program" (Cartwright, 1996, p. 160). In addition, Meilach (1993) writes, "Observing how others appear before a camera in a variety of situations is the first step toward understanding what and what not to do" (p. 7).

During the pre-production phase, the producer should discuss wardrobe selection with the teacher. The talent needs to know what clothes and accessories will be flattering on television. "Clothes should be a frame for you; not the picture itself. You, plus your message, are important" (Meilach, 1993, p. 25).

Pinstripes, plaids, and floral designs flicker or shimmer on screen, so the teacher should avoid wearing these prints. Sharply contrasting colors should also be avoided since the camera must adjust to one color or the other. White shirts make the skin look darker, while bright colors attract the viewer's attention. In educational television, it is important to keep the viewer's attention on the message, so distracting bright colors and bold patterns should be avoided. Jewelry is also distracting and can jingle in the microphones adding an audio problem (Meilach, 1993).

Often, the video crew will ask the teacher to run the microphone cord under the clothing so the wire will not be seen. The crew should ask for permission to affix the microphone to the teacher, or give clear instructions on how to do it. The teacher will have to wear a transmitter for the microphone, which is about the size of a deck of cards. The teacher should wear clothes with a place to attach this. It can attach to a belt or waistband, or it can fit in a pocket. This microphone is very important, so if there is no place to attach the transmitter, it must be duct taped onto the clothing.

It is important to use non-professional talent since they add credibility to the video, but the talent needs to appear natural. "Most non-professional talent will not really want to appear in front of the camera...so the more details you can communicate about the production, the more success you will have" (Cartwright, 1996, p. 160). Luckily, when someone is doing her usual job, she should be less nervous than if she has to do something new. Many directors also give the talent time to relax or rehearse before the taping (Meilach, 1993). The talent should practice ahead of time, but everything should not be memorized or scripted (Cartwright, 1996). If everything is scripted or memorized, the video will lose its natural feel, along with its credibility.

On the taping day, the video crew should arrive early. The teacher should be introduced to all the crew members and made to feel part of the team. The crew should always be positive and supportive of the talent's performance (Cartwright, 1996). An explanation of the production process and each crew member's role is also helpful so the teacher is aware of who is doing what. If something needs to be re-done due to a crew

member's error, always tell the talent. Then they will not blame themselves and lose confidence in their performance.

Meilach (1993) suggests showing the cameras to the talent, then having her tape some footage and play it back. The idea is to make the camera seem less intimidating. This is not done for the InTime tapings. Often the teacher is so nervous that learning how to run a camera is not something she wants to do. In addition, the crew is very busy setting up the equipment, and the teacher is often busy with last minute tasks as well.

Equipment

Lower-budget video departments rarely use more than one camera. The main reason multiple cameras may be used is if the event only occurs once and will never be duplicated (Stevenson, 2001). This is the case for InTime. In addition, multiple angles of the event can be taped without needing to repeat the action.

Typically, all cameras in a multi-camera taping are linked by cables to a central switcher. The person at the switcher controls which camera signal is recorded, and another person chooses and controls the audio signals. Tapes are not recorded for each camera. This method is very sophisticated, cumbersome, and expensive.

InTime records a multiple-camera taping in a different way. Three cameras are set up, with one on the teacher, one on the students, and one on a wide shot and miscellaneous shots. The time codes, or numbers assigned to each frame of footage, are set on the cameras to be three hours apart from each other since the crew uses three-hour tapes. Various microphones are attached to each camera. Each camera has two audio channels, so each camera can have two microphones. Usually, one channel is used for

the microphone mounted on the camera, and the other channel is used for an additional microphone. When the taping begins, all the cameras start at the same time, and they tape until all the cameras are ready to stop taping. This way the time code will line up easily. All three video signals are recorded, as well as six audio tracks. Rather than choosing the video and audio on location, the InTime staff is able to choose them after analyzing the footage.

Audio

Audio is the most challenging part of a field production. Each situation, and each shot, has different audio requirements. "There is no 'magic solution'" (Lyver, 1999, p. 64). No book exists that will be able to specify one method that will result in perfect audio. There are several factors that create problems on location. Some examples include location acoustics, wind noise, ambient noise, camcorder noise, and radio frequency or electrical interference (Compesi, 2000).

Several questions should be asked prior to taping. Factors to consider include: if power is available, where microphones can be placed, and how noisy is the location. It is also important to know if the performers will be moving, or if the entire location will be changing. The producer should know how many performers may need to be recorded, and if there will be plenty of time for the appropriate set up (Lyver, p. 65).

One of the best ways to get good audio quality is to get the microphone as close to the person speaking as possible. This makes the voice loud compared to the background noise, and it is more controllable.

Microphones can be either wired or wireless. Wired microphones are fairly simple to set up, and they are less expensive than wireless microphones. Wireless microphones do not have a cable attached to the camera, making it easier for the subject to move. However, the subject needs to wear a transmitter, which is about the size of a deck of cards. Wireless microphones also need power, both for the transmitter and the receiver. The transmitter usually uses batteries, while the receiver may need batteries or AC power. Wireless microphones are susceptible to interference if they use the same frequency as other nearby electronic transmissions.

There are several types of microphones from which to choose. A microphone comes mounted on most cameras. This microphone is convenient, and it records the sound where the camera points. Unfortunately, this microphone needs to be close to the sound source, since sounds closer to the microphone are more prominent. The camera-mounted microphone is very good at gathering general sound (Compesi, 2000). InTime generally uses the camera microphone on the second audio channel. This microphone works well for recording room noise and audio, including students, near the camera.

The InTime teachers wear lavaliere microphones. These are small microphones that attach to the clothing. Lavaliere microphones are great for moving subjects, especially if the microphone is wireless. These microphones have a narrow range, so are limited to the sound of the person wearing the microphone. It is acceptable for the microphone to be visible since the sound is best if it is not deadened by fabric (Meilach, 1993).

Another microphone option is the handheld microphone used with a parabolic reflector. The parabolic reflector is a large dish that focuses the sound waves onto an omni-directional microphone facing into the dish. An omni-directional microphone gathers sound in a sphere around the microphone. One advantage of this method is that it amplifies the sound, so quieter sounds can be recorded with less noise. A disadvantage is that this method is very directional. It also captures all the sounds including air conditioning and computer fan noises. The InTime crew uses a parabolic reflector to gather the student responses and sounds.

The InTime video crew often uses a pressure zone microphone (PZM) or boundary microphone. This microphone is small and usually omni-directional. Omni-directional microphones capture sound in a sphere around the microphone. It can be easily mounted to a wall, floor, or desk. This microphone is good for confined spaces, and for discussions around a table. This microphone is often placed between or among students during discussions when taping an InTime activity.

Once in a while, a handheld microphone is used. Handheld microphones need to be pointed in the correct direction, and it should not be tapped. The talent should never hold the microphone. A crew member should always do this, to eliminate handling noise, and so it is pointed in the proper direction.

Headphones are essential for monitoring audio. Microphones are unable to filter out unwanted sounds. It is crucial to know what sounds are actually being recorded, and if changes can be made to improve the audio. The crew needs to know if background noises are disrupting, and if the recording level is correct.

The previously identified microphones are used for typical InTime tapings. Other methods have been considered. One method considered was to use 16 microphones connected to a 16 track audio recorder. This would not work for InTime for several reasons. An audio engineer would need to be hired to handle this aspect. In addition, cables would have to be run from each microphone to a mixing board, creating a confusing mess through which the teacher would have to navigate. Also, there are three cameras taping, so even though there would be 16 tracks of audio, there would only be three tracks of video. There may be audio of students engaged in parts of the activity, but there would be no video of them to show. Finally, this method would add several expenses, with little to no improvement over the method currently used.

Another method for recording student responses would be to use a boom microphone rather than the parabolic reflector. Many productions use a boom microphone with a crew member running the microphone close to the speaker. This is also not ideal for an InTime taping. The microphone operator would be seen by all of the cameras while moving close to the speaker. InTime videos are supposed to have a fly-on-the-wall feel. The viewer should feel like they are listening in on a real lesson and should not notice the crew. Another problem is that often the student responses are very short. By the time the microphone operator would get to the speaking student, another student across the room may be speaking.

Other methods for capturing audio would be to record in a studio or script the scenes. This would give a lot more control over the audio and microphone placement. However, this would not be real teachers in real classrooms, a basic principle of InTime.

On Location

Problem solving skills are vital during a field production. There are no two days of taping that are alike, nor are any two locations alike. The crew members need to know the technical side of taping so they can fix problems as they arise. In addition, the crew should always plan for more time than they think they will need, even if all the various locations are in one building. Every time the equipment needs to be powered down and moved, it is considered a location change. This means plenty of time needs to be made available.

In order to make location changes go smoothly, the shooting order should be planned with convenience and efficiency in mind, even if that means the activity is not taped in chronological order. If the crew spends a lot of time changing locations and returning to locations used earlier, morale and enthusiasm can quickly diminish. The teacher and students may become bored or distracted since they have to wait while the equipment is powered down, moved, and set up again. It is best to get all the shots needed in one location before moving to a new place. Extra footage should also be shot before moving. This may include posters the instructor referred to, or evaluation sheets for the assignment.

It is important to remember that people tend to learn more from simple videos. Less intricate camera work leads to more mental effort devoted to the content of the video. Unrelated images, complex vocabulary, and distracting camera work interfere with the message (Compesi, 2000). It is important to keep this in mind on location. The taping may not seem exciting, but it is very important to keep it simple.

It is also important to label the tapes as they are shot. Usually, the tapes are labeled before the taping. They should always be labeled before leaving the location. If they are not labeled, it could cause great confusion further on.

The last thing to remember while on location is to take breaks as needed (Taylor, 1988). If problems keep happening, the best thing to do is take a break. Getting flustered will only make problems worse. Crew members and the teacher should be able to take a few minutes to collect their thoughts or clear their minds if things are not going well. Taking a short break often makes a big difference.

Interview

Taping the interview is different than taping the actual activity. InTime interviews only show the teacher. The questions are not heard on camera, and the interviewer is not seen. Only a small amount of what the teacher says will actually be used in the final video, and much of what is used will be covered by cutaway shots of the activity.

The interview location, scenery, and layout are carefully selected. The interviewer or producer sits right beside the camera. The camera tapes an almost full-face shot of the teacher when he or she looks at the interviewer. It is important to keep the interviewer close to the camera so the teacher is not looking too far off-camera. The producer should always make sure the teacher knows where to look. "Several producers interviewed agreed that it is often difficult to get a nonprofessional to speak naturally to a video lens and not feel silly. Rather it disconcerts the novice; eyes tend to flash about and that erodes the appearance of confidence" (Meilach, 1993, p. 57). In addition, the

format of the InTime videos does not lend itself to the direct address approach, or having the teacher look directly into the camera. The videos are taped as though the viewer is a fly on the wall watching what is going on. Great lengths are taken to make it appear as though a camera crew is not present. This impression is decreased if the teacher looks directly into the camera during the interview.

The background for the interview should not be distracting. It is best to have the background relate to the subject. Plants and other items can be used to fill large blank spaces in the background, but care should be taken to not have strange objects sticking into the shot. If possible, the background should be at least slightly out of focus so attention is drawn to the teacher. The foreground should have a minimal number of items. Clutter and hotspots should also be avoided. Cables and microphones should be hidden.

While the crew is setting up the interview location, the teacher should take a break. The interview follows the activity, and often the teacher is very relieved to have finished that part of the taping. She should head to the teacher's lounge or wherever makes her feel comfortable. She may want to review her notes for the interview during this time.

The camera crew ensures the background and lighting are set up correctly prior to taping. When the crew is ready, they let the teacher know, and she takes her place in front of the camera. Notes are left out of camera range, but are often nearby. The crew will first re-attach or adjust the lavaliere microphone. While the crew is doing last-minute adjustments, they make an extra effort to have a conversation with the teacher.

This often helps put the teacher at ease. In order to find the correct audio level, the teacher is often asked what she had for breakfast (Taylor, 1988). The tone a person uses to respond to such a question is often close to how he or she will speak when answering the interview questions.

When the interview is about to begin, the producer lets the talent know where to look when responding to the questions. The talent is reminded that if she does not like an answer, she may rephrase it and try again.

It is important for the interviewer to ask only one question at a time, and to break compound questions into parts. Often, the teacher will look at her notes between questions. It is helpful if they only have key words for notes, since it is easier to remember words rather than a paragraph. In addition, a variety of camera angles adds interest (Compesi, 2000), so the producer should give the camera operator a chance to change shots between questions as well.

Editing

There are two ways to physically edit a video. As mentioned earlier, it can be done on location. Using this method, the camera angles are selected live, using a switcher. Only the angles selected by the person operating the switcher are recorded. The other method is postproduction. Using this method, the crew concentrates on gathering all the information needed, and the arrangement of the clips is determined later. InTime uses the postproduction method. This allows different angles to be shown to illustrate different activities in the classroom. It also allows several people to determine what is important to show rather than just the person operating the switcher.

In postproduction, a video can be edited on-line or off-line. Off-line editing suites are less expensive. An off-line version is typically a cuts-only version, just to get an idea of the look of the program. It is a good idea to have window dubs of the footage, or copies with the time code recorded on screen, to work with before heading into the off-line suite. A rough idea of the program can be sketched out on paper before editing begins. An edit decision list, or list of time codes and their sequence, can be made by watching the window dubs. It is easy to find and edit the clips listed in the edit decision list using a non-linear editing system.

Once an off-line version of a program is finished, it moves to the on-line suite. This equipment is higher quality, and the time charged for using it is more expensive. It is during this phase that video moves from a rough idea to its final form.

InTime follows the off-line and on-line editing method. Once the footage is taped, window dubs are made. The graduate assistants watch these window dubs to determine which clips are appropriate for their videos. They make an edit decision list. Then they write a rough script, which is sent to the off-line suite. An undergraduate student pieces the rough script together as a "rough cut" using a linear editing system. These rough cuts are watched, and corrections and changes are made to the script. Then the script is taken to the on-line suite. At this stage, titles are added, the audio is sweetened, or adjusted, and multiple camera angles are inserted. Color corrections and other effects are also done on-line.

A video editor may have two distinct roles in the production, or a blending of the two. The first role has a creative focus. This means the editor makes and executes all the

edit decisions, or it could mean the editor may pick the angles to use within a pre-determined script. The other role has a technical emphasis. The editor executes decisions made by a producer. The editor may make suggestions, but he or she does not have control (Compesi, 2000).

The InTime video editor has a mixed role. The editor has the creative flexibility to choose appropriate camera angles, but final approval is given by the script editors. In general, the InTime video editor has a creative job, even though the scripts are pretty straightforward when she gets them.

Actually editing a video using a non-linear editing system is basically a four-step process. The first step is to log the footage. This is done before the scripts get to the InTime video editor. The graduate assistants have already determined which clips illustrate their parts of the model best, and these clips are included in the scripts. Any producer or editor should be familiar with the footage being used. This is fairly easy for the InTime editor since she is also the producer on location for many of the videos.

The second step is to digitize the best takes. Once the editor receives the scripts, she writes down all the clips that need to be digitized. The editor takes the list of needed clips, and converts the media on the tapes to computer files on the non-linear editing system. The compression rate is determined, which affects the amount of storage available on the editing system. Clips digitized with less compression have higher quality, but these clips use more drive space, resulting in less room for a variety of footage.

The editor also makes sure there is extra footage before and after what is actually needed for the video. This extra footage is needed if any transitions, such as dissolves, will be added.

Clips must be digitized in real time. If there are two hours of clips to be digitized, it will take two hours for the machine to bring those clips into the machine.

InTime uses an Avid Media Composer to edit the final videos. This system has a multi-cam option, which means clips from each of the three cameras used during the taping can be grouped together and synchronized. Once they are synchronized, the editor can switch between shots as if using a switcher. This is easier than matching up the clips in the video timeline, or while editing the actual video. The editor still needs to go through the videos several times to adjust the audio, add titles, and other on-line activities.

The third step of nonlinear editing is to actually edit the digitized material. This is where the footage is trimmed to its actual in and out points, and arranged in a proper sequence. This is when the editor uses the multi-cam feature, made possible by grouping and synching in the previous step. Necessary transitions are added, as well as graphics, music, and sound effects. Once this process is finished, it can be watched for errors, and changes can be made.

The InTime videos use continuity editing. Continuity editing is used to move action along smoothly without jumps in place or time. In contrast, dynamic editing exaggerates or intensifies and event rather than simply reproducing it. Continuity editing has several rules, which can be placed in four broad categories. These are: to establish

and maintain screen position, to use eyelines to establish the position of the target audience and the direction of view, to maintain continuity in the direction of the action, and to use shot content to motivate cuts (Compesi, 2000).

An establishing shot is used to establish and maintain screen position. This shot shows the location and position of people in relation to the environment. The establishing shot gives a context in which the action takes place. Most of the InTime videos start with a wide shot of the classroom, and the narration usually establishes what the activity is about. Both the video and the audio are used as an establishing shot.

Jump cuts occur when two consecutive shots do not match. In one shot the teacher may be at the blackboard, while in the next she is sitting at the desk. The viewer is left wondering how she got from one place to the other. If two students are working together in one shot, they should be doing the same in the subsequent shot. Otherwise, there needs to be a transition or cutaway in between. A transition is an editing effect added between two clips. Transitions include dissolves, page turns, and fades, to name a few. A cutaway is a shot of an object related to the event in the video, but it is not the main content. For example, a video may show a scene of an audience member watching a play as a cut between two scenes of the play. The shot of the audience member is the cutaway. During an InTime video, the teacher may be at the computer. Then the viewer sees a cutaway of a student listening to the teacher. When the video is back on the teacher, she is at the chalkboard. The teacher may or may not have walked to the chalkboard in the amount of time the video was on the student, but it flows seamlessly with the use of a cutaway.

Other continuity factors include lighting and sound. All of the cameras need to be set similarly, or the color will not look right when switching between cameras. The sound must stay at a similar level between speakers and locations. The audio is closely monitored during editing to make sure it is in the correct range.

Continuity editing is especially important for educational video production. The viewer's focus should stay on the message. Any mistakes in continuity can distract the learner, and prevent him from understanding the message.

The last step of editing is to "print to tape". This is when the video is put on videotape for future playback. InTime videos are put on tape both as a back-up, and for the next step in the InTime video process. The tape with the videos is taken to another workstation, where it is encoded as an mpeg file. This file is then transcoded into a Real file, making it possible to stream the video on the Internet. A transcription of the video is added as scrolling text beneath the video. The lesson plan for the activity is also available on the same web page. Obviously, much more work than just video production goes into this project.

Conclusion

The InTime project employs many people responsible for many tasks. One of the central goals of the project is to produce effective educational videos of teachers in the classroom. This endeavor requires skilled field production and editing. Many considerations need to be made before taping, while on location, and during the final editing. These processes are important for creating worthwhile and useful educational

videos. Attention to production techniques and editing considerations are vital to successful videos.

References

Cartwright, S. (1996). Pre-production planning for video, film, and multimedia. Boston: Focal Press.

Compesi, R. J. (2000). Field video production and editing. Boston: Allyn and Bacon.

Lyver, D. (1999). Basics of video sound. Oxford: Focal Press.

Meilach, D. Z. (1993). Looking great on video. Homewood, IL: Business One Irwin.

Stevenson, D. (2001, May). How to put that professional look in your videos. Camcorder & Computer Video, 17, 40.

Switzer, T., Callahan, W., & Quinn, L. (1999). Technology as facilitator of quality education: An unfinished model. [On-line]. Available: http://www.intime.uni.edu/model/modelpaper.html

Taylor, M. H. (1988). Planning for video. New York: Nichols Publishing.

Appendix A
List of Terms

Assistant producer - An individual delegated certain responsibilities by the producer. This person is in charge when the producer is not available.

Boom - A device for suspending and moving a microphone over and through a production area.

Co-director – One of two individuals who oversees the activities of the grant.

Codec – short for "coder – decoder" A piece of software or hardware that converts one data format to another.

Compression - The process of reducing the storage size of digital information, usually by eliminating redundant information.

Compression ratio - The ratio of the amount of data in the original format compared to the amount of data after compression.

Continuity editing - The combining of shots so the action of a sequence appears continuous. The shots are arranged to support the progression of the story. This editing technique does not call attention to itself.

Cutaway - A brief shot depicting related matter that interrupts the main action of a film, often used to avoid jump cuts.

Digitize - To convert analog video and/or audio to digital form.

Dynamic editing - The assembly of a video in a series of seemingly unrelated shots, people, objects, situations, details and characters in juxtaposition with one another. This method does not support the progression of a story.

Edit - The process of assembling the video.

Edit decision list - A document containing time codes for footage to use in the final video, as well transitions between shots and narrations.

Embed - To link or to insert a video image or sound file into a web page so that it is hyperlinked and clickable. The video plays within a web page rather than opening its own window.

Encode – Using a codec to convert one data format to another.

Establishing shot - Used to introduce a scene, this shot illustrates the setting and the environment, usually with a wide angle view.

Field - One half of a frame, containing all the odd or all the even scanning lines of the picture.

Footage - A shot or series of shots of a subject. The video tape content obtained during a production.

Frame - One complete video image, containing two fields. One second of NTSC video contains 30 frames.

Jump cut - An editing technique in which one shot does not match the previous shot, resulting in a disruptive gap in time and/or space.

Lavaliere - Microphone worn on the body, either fastened to the clothing with a clip, or held in place with a lanyard worn around the neck.

Linear editing - An editing approach requiring edits to be made in the sequence required for the final version. Each segment must be found, cued and recorded in sequential order.

Log - List of time-code numbers of video and audio segments. This list is made prior to editing.

Mixing board - A device that combines two or more audio or video sources.

Mpeg - Moving Picture Experts Group. A group of standards for compressing moving pictures. A digital file format for video and/or audio.

Nonlinear editing - An editing approach based on storing video and audio on computer disk(s). The order or lengths of scenes can be changed without re-assembling or copying the program. The program does not need to be assembled in sequential order.

NTSC - National Television Systems Committee. Television and video standard used in the United States.

Off-line - A lower-end edit system in which editing decisions can be made at lower cost.

Omni-directional microphone – Microphone capable of receiving signals in all directions.

On-line - A higher-end edit system used to create the actual video master. Costlier than off-line, this edit system is used to add the final, polished touches to the video, including the final graphics, shot selections, and audio.

Parabolic reflector - A directional microphone assembly that uses a parabola-shaped reflector to focus sound into a microphone .

Postproduction - Any production work completed after the main taping is done, typically editing.

Preproduction – Any production work completed before the main taping, the planning stage of a production.

Pressure zone microphone (PZM Microphone) - A small microphone mounted on a reflecting surface, often used for group discussions around a table.

Producer - An individual who oversees the process of making a video. In the field, this person is in charge of the taping.

Production assistant - An assistant to the producer who is assigned responsibilities for a wide variety of production details.

Production schedule - A written agenda of various activities and time allotted for each activity during a production day.

RealPlayer - A streaming video and audio player developed by RealNetworks.

Real file - The file format for content streamed using RealPlayer.

Receiver - An electronic device that picks up audio and/or video signals sent out by a transmitter.

Stream – To send video or audio over a network as needed, instead of downloading the entire file before viewing it.

Switcher – A production video control device used to manipulate numerous sources of video and to select which video source is recorded or broadcast.

Sync - To cause to match exactly. To align audio and video to correspond to the same point in time.

Time code - A time reference identifying each frame recorded on tape, consisting of eight numbers representing the hours, minutes, seconds and frames related to a specific video frame.

Transcript - A written document of the dialogue in a video.

Transcode - To translate a data stream from one format to another.

Transition - Change from one shot to another, using a dissolve or other effect.

Transmitter - An electronic device that sends out audio and/or video signals.

Videographer - The person overseeing the video image, including lighting, the operation of the camera, and audio.

Window dub - A copy of an original videotape with a permanent display of the time code in the video.