



TELECOMMUNICATION TECHNOLOGY  
FOR TRAINING AND INFORMATION  
DISSEMINATION

TELECOMMUNICATIONS  
TECHNOLOGY  
FOR TRAINING  
AND INFORMATION DISSEMINATION

OFFICE OF  
JUVENILE  
JUSTICE  
& DELINQUENCY  
PREVENTION

*prepared and submitted by*  
Training Resource Center  
Eastern Kentucky University  
Richmond, Kentucky 40475-3127

*under contract to*  
U. S. Department of Justice  
Office of Juvenile Justice and Delinquency Prevention

Grant No. 92-JN-CX-0007

October 1993

1  
888  
414

Y UNIVERSITY  
RCE CENTER

U.S. Department of Justice  
Office of Justice Programs  
*Office of Juvenile Justice and Delinquency Prevention*

146883

U.S. Department of Justice  
National Institute of Justice

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the National Institute of Justice.

Permission to reproduce this ~~copyrighted~~ material has been granted by

Public Domain/OJP/OJJDP  
U.S. Department of Justice

to the National Criminal Justice Reference Service (NCJRS).

Further reproduction outside of the NCJRS system requires permission of the ~~copyright~~ owner.

# Telecommunication Technology for Training and Information Dissemination

by  
Bruce I Wolford, Director  
Jack E. McDowell, Telecommunications Coordinator  
Michael A. Jones, Project Manager

October 1993

---

This report was prepared by Eastern Kentucky University's Training Resource Center and was supported by grant #92-JN-CX-0007 from the Office of Juvenile Justice and Delinquency Prevention, Office of Justice Programs, U.S. Department of Justice.

Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

---

The Office of Juvenile Justice and Delinquency Prevention is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance, the Bureau of Justice Statistics, the National Institute of Justice, and the Office for Victims of Crime.

---

# TABLE OF CONTENTS

Executive Summary . . . . .	1
<b>SECTION A:           DEFINING THE CONCEPTS, REVIEWING THE                           TECHNOLOGIES, AND EXAMINING THE COSTS</b>	
Understanding the Concepts and the Challenges . . . . .	6
Telecommunication Technology: Today and Tomorrow An Overview of Current and Future Technology-Based Delivery Systems . . . . .	11
•     Audioconferencing . . . . .	13
•     Audiographics . . . . .	16
•     Two-way Compressed Video . . . . .	19
•     Satellite Teleconferencing . . . . .	22
Tradition Versus Technology: A Cost Analysis. . . . .	25
Future Trends . . . . .	28
<b>SECTION B:           DEMONSTRATION AND EVALUATION</b>	
The Development, Delivery, and Evaluation of Distance Training Pilot Demonstrations . . . . .	31
<b>SECTION C:           NEEDS ASSESSMENT AND RECOMMENDATIONS</b>	
OJJDP Technology Needs Assessment . . . . .	37
Recommendation and Three Year Plan . . . . .	41
Utilizing Bloom's Taxonomy as a Technology Selection Factor . . . . .	51
Potential Integration of Technology into Existing OJJDP Grants .	53
FTS2000: The Federal Government's Telecommunication System . . . . .	59
Overcoming Barriers and Impediments to Implementation . .	60
Conclusion . . . . .	62

## Foreword

The Office of Juvenile Justice and Delinquency Prevention (OJJDP), United States Department of Justice has taken preliminary steps in evaluating current and future trends in telecommunication technology and the applicability of these technologies for the agency's training and information dissemination activities. With a mission to lead and support the vast and diverse juvenile justice field, OJJDP's desire to invest in telecommunication technology only strengthens the agency's leadership role as it guides the juvenile justice profession into the Twenty-First century.

The Eastern Kentucky University Training Resource Center (EKU/TRC) has spent the past twelve months actively working with OJJDP and distinguished leaders of the juvenile justice and the telecommunications profession to evaluate past training and information dissemination endeavors of OJJDP and to ascertain future needs. Once this overall assessment was complete, EKU/TRC staff began introducing various types of technology that might be beneficial for an agency, such as OJJDP, to provide modernized methods of training and information dissemination.

In the following document, references to previous literature and research have been intentionally limited to works after 1988. Aside from limited time, project staff's rationale for the limited scope is founded in the belief that primarily work within the last five years contained any relevant information due to the rapidly changing field of telecommunications. Some may disagree with the scope of the research contained herein. No computer-based training systems are discussed, because these did not fall into the relevant area of client interest. In the technologies discussed and reviewed, a great degree of selectivity was inherent to making this document an easy-to-use guide. Therefore, authors have designed this report for easy reading and understanding to assist OJJDP staff in understanding the fundamental concepts of each available technology as they wrestle with economic limitations and numerous other barriers that conceivably could hinder the incorporation of telecommunication technology into the juvenile justice profession.

### *Thomas Jefferson on Change*

*I am not an advocate for frequent changes in laws and constitutions. But laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances, institutions must advance also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbarous ancestors*

*Inscription on Jefferson Memorial, Washington DC*

## Executive Summary

### Introduction

This report has been prepared to assist the Office of Juvenile Justice and Delinquency Prevention (OJJDP) staff in their efforts to evaluate the efficiency of using telecommunication technology to enhance the delivery of training and information dissemination. The report includes:

- a review of the concepts and technologies;
- a cost analysis;
- an evaluation of the project pilot telecommunication demonstration;
- a needs assessment of OJJDP;
- project recommendations;
- a review of benefits; and,
- a discussion of the barriers and impediments to implementation.

### Telecommunication Technology

Telecommunications is defined as communicating over a distance. Telecommunications systems are often referred to by the medium, the type of information (signal) transmitted, and the directional flow of information. The type of information includes audio, video, and data signals. The media for communication are usually radio waves through the air, electronic impulses over transmission lines, or light through fiber made of glass or plastic silicon.

### Purpose of Project

This project's primary goal was to ascertain possible advantages or benefits of using the application of telecommunications technology for the training and information dissemination activities of OJJDP. This goal was achieved by the undertaking of a number of objectives. The primary project objectives, as delineated by OJJDP, were to:

- conduct an assessment of what current programs being implemented by OJJDP may lend themselves to telecommunications;
- conduct an assessment of what modes of technology (e.g., audio or video teleconferencing, distance education, business television, fiber optics, etc.) would best suit the needs of the target audiences and be in the best interests of the government;
- conduct an assessment of what cost benefits OJJDP would reap through application of the technology; and
- test the use of the technology through a demonstration effort.

Project staff met these objectives by conducting a series of activities involving OJJDP staff, juvenile justice professionals, and telecommunications experts.

### Project Activities

The primary focus of the project can be summed up in one word: education. Project staff educated themselves by conducting an in-depth needs assessment with the OJJDP staff and learning about agency training and information dissemination endeavors within the past twenty-four months. The information gleaned from the needs assessment was presented to an Expert Panel consisting of juvenile justice professionals and telecommunication professionals from across the United States. Feedback from the Expert Panel assisted project staff in forming recommendations to OJJDP for utilizing and integrating technology-based delivery systems into the juvenile justice field. Furthermore, project staff visited with and communicated often with the staff from the government's federal telephone system to better understand the FTS2000.

Project staff educated OJJDP staff by making presentations and demonstrating various forms of technology-based delivery systems. Project staff developed and provided written materials to OJJDP which discussed the concepts behind audioconferencing, audiographics, satellite teleconferencing, and two-way compressed digital video conferencing. Project staff provided feedback to OJJDP staff during the project by using audiographics. In addition, the project's primary deliverable was a national satellite teleconference demonstration which was received by 149 sites and approximately 5,000 people across the United States. The feedback and knowledge culled from the project activities helped form the recommendations to OJJDP regarding the implementation of technology-based delivery systems.

#### **OJJDP Training and Information Dissemination Activities**

Current training and information dissemination activities within OJJDP are primarily limited to the traditional conference format where the trainer takes the information to the masses. While some staff have participated in technology-based delivery of training and communication, no current deliverables from the OJJDP or its grantees are transmitted via technology. Project staff have identified several areas of potential implementation of technology-based delivery systems.

#### **Telecommunication Recommendations**

This project's recommendations provide strategies for the usage by OJJDP of four distance technologies: audio conferencing; audiographics; satellite teleconferencing; and, two-way compressed video. Basically, the project's recommendations involve the usage of satellite teleconferencing for training and information dissemination to large groups, audio conferencing and audiographics for small group meetings and training and limited involvement with two-way compressed video conferencing as costs permit. Following are brief descriptions of each technology and a summary of recommendations.

##### **Audio Conferencing**

Basically, audio conferencing is a phone conversation between more than two people at two or more sites. There may be up to 10-12 people at each location. Special equipment at each site allows participants to speak freely without feedback or echo and special "bridging" equipment allows more than two sites to be connected. Often, the rooms being used for group audio conferencing are acoustically treated to ensure good audio quality. Transmission costs are basically long distance phone charges.

The project's recommendations for this technology are basically that OJJDP should utilize this technology to improve communication with SAGs and other agencies in the states. Regular meetings, perhaps on regional schedules, could have agendas that would allow SAGs greater access to OJJDP staff and vice versa.

There are challenges inherent in this technology for training and project staff recommend that audio conferencing first be established as a tool for increasing communication to states by meetings before considering the use of an audio conferencing network for training.

##### **Audiographics**

Audiographic technology builds on audio conferencing by adding the visual elements of computer generated graphics as well as writing with an electronic pen on a computer screen. Sites communicate by phone lines for audio, just as with audio conferencing. Using modems, computers at each site send impulses to each other through the same phone lines to provide the still image visuals and electronic writing. Transmission costs are low, the same as for audio conferencing.

The project's strategy for audiographics is based on the technology being used more for training purposes since it has more of a visual element than audio conferencing. Once an audio conferencing network is in place, audiographic equipment could be added if there is a need for distance small group training. Of course, the audiographic technology could still be used for meetings and information dissemination.

#### Satellite Teleconferencing

Satellite teletraining is a technology that primarily disseminates information to a large, geographically diverse group of people. Basically, television video and audio is sent (uplinked) to a satellite transponder which rebroadcasts the signal to a wide geographic area where it can be received by satellite receiving dishes (downlinks). Telephone lines allow participants at the downlink sites to speak with presenters at the uplink site.

Satellite teleconferencing is generally time-consuming and expensive to produce and requires relatively large numbers of participants to justify its usage. Because of its large numbers of participants, interactivity with each individual is lessened and the design of satellite teleconferencing events should compensate for the relative lack of feedback and interaction.

The project's recommendations are based on the belief that satellite technology will give OJJDP the greatest impact on the largest number of juvenile justice professionals in the shortest period of time. This is because of the large numbers who can participate in satellite teleconferencing and also because of the desire among juvenile justice professionals for hard information that they can utilize immediately.

#### Two-Way Compressed Video

Two-way compressed video uses special large capacity phone lines to send audio and video signals between two or more sites. Computers with special coder-decoder software compress the video signal, send the signal to one or more sites and decompress the signal at the receiving site(s). This happens both ways so that all participants have the capability to see and hear each other.

This is a small-to-medium group technology that in some ways more closely duplicates live human interaction than the other distance technologies. Obviously, the more participants and sites that are present, the more difficult interactions becomes. This is also an expensive technology, both for equipment and for transmission costs.

Recommendations for this technology are based primarily on its high cost, the relatively limited resources of OJJDP and the broad geographic dispersion of its constituents. Project staff feel that OJJDP should look to the lower cost audio conferencing and audiographics format initially to meet its small group needs until the costs of compressed video decreases.

Finally, project staff do not recommend any action at this time by OJJDP to incorporate the newer technologies based on fiber optics. It is recommended that OJJDP wait until the fiber optic "information highway" is closer to completion and the technologies and usages are more defined before any action is taken. Many of the skills, protocols and instructional design elements learned on the more established technologies listed above should be transferable in the future to the newer technologies.

## Summary

After conducting a needs assessment with OJJDP staff and administrators, an Expert Panel meeting with juvenile justice and telecommunications professionals, and a demonstration satellite teleconference, it is the conclusion of project staff that there are many significant benefits to the gradual but steadily increasing usage of telecommunications technology in future OJJDP training and information dissemination activities. OJJDP activities in information dissemination and training could be enhanced, improved and made more cost effective by the increased usage of distance technology. Project staff conclude that, by skillfully utilizing telecommunications technology, OJJDP could:

- increase access to needed information and training for juvenile justice professionals,
- increase communication and the flow of ideas among juvenile justice professionals and organizations as well as with the OJJDP,
- increase the general level of skills and productivity in the juvenile justice field,
- reduce costs and time spent in training and meetings,
- help stimulate awareness and discussion in the juvenile justice field and the OJJDP through increased access to information and ideas,
- help reduce the sense of isolation which exists for many juvenile justice professionals,
- provide leadership to the juvenile justice field.

Project staff conclude that there is ample research and anecdotal evidence supporting the effectiveness, as well as, cost and time savings related to the application of telecommunications technology. The primary challenge is for the OJJDP and other juvenile justice professionals to learn to appropriately utilize the various technologies which currently exist.

For example, using appropriate technologies and instructional designs for small group versus large group applications, or for knowledge versus skill-based learning, will necessarily be a part of the process. Project staff strongly believe that instructional design is every bit as important a factor in training and application as the choice of which technology to use.

Again, the effectiveness and benefits of telecommunications technology are well documented. Organizations in business, education and government throughout the world are using telecommunications technology to improve communication and lower costs. The OJJDP is encouraged by project staff to view challenges in its implementation not as shortcomings of the technology but rather as necessary steps in learning to properly utilize its use.

# **SECTION A**

**DEFINING THE CONCEPTS AND  
REVIEWING THE TECHNOLOGIES**

## Understanding the Concepts and the Challenges

### Introduction

During the last five years, a series of studies have been undertaken and numerous books and reports have been published which examine the rapidly expanding field of telecommunication technology and its applicability to increased training and information dissemination for current and future organizational needs. An even more fundamental issue at the core of technology-based training has to do with the changing nature of today's professional world, much of which is based on the transmission of information. Evidence suggests that the United State's workforce is entering a period when the training that workers receive will become obsolete within three to five years after they receive it. The imposition of budget, time, distance, and other constraints on workers will create a strong demand for more efficient and expedient ways to distribute necessary information (Chute, Hancock, & Balthazar, 1991). Future successes will be determined more by organizational and human-resource requirements than by the availability of the training technology, which currently exists and is widely available across the United States (CAE-Link Corporation, 1991). As continually proclaimed by the relevant literature, telecommunication technology is a viable and cost-effective method for providing training in individual workplaces. Moreover, this trend will continue in the face of reduced travel budgets and increasing training requirements. In summary, the technology exists now, and will continue to improve, to provide ever-more sophisticated training and information dissemination opportunities. The challenge will be for each individual agency to outline its own specific strategy for successfully incorporating the technology to enhance their current training and information dissemination techniques.

### Statement of Problem

Today's challenge for OJJDP, and for every organization, is to consider training and training technology as a key component of a complex, organizational system. Meeting current and future needs for enhanced human performance will require a broad view and clear understanding of the interrelated issues that are involved. A primary concern that must be faced revolves around how to introduce the concept of technology-based delivery systems to the OJJDP and the juvenile justice field, and how to make the appropriate use of these systems in accordance with organizational needs. For large, complex fields such as juvenile justice, the wide variety of information dissemination and training requirements can likely best be met by an integrated system -- one that combines a full range of training, design and distribution options for individual, small-group, and large group instruction. OJJDP's ability to meet this challenge rests in finding ways to "do more with less," and to use the strengths of these technology-based systems to offset shortages in other critical resource areas. Key facets that must be addressed immediately include:

- an assessment of what current programs being implemented by OJJDP may lend themselves to telecommunications;
- an assessment of what modes of technology would best suit the needs of the target audiences and be in the best interests of the government;
- an assessment of what cost benefits OJJDP would reap through application of the technology; and,
- the use of technology through a demonstration effort using the technology to conduct an evaluation.

Again, the technology is available. Selecting and matching the technology to the range of training needs is the primary task; however, the interim task is to educate agency staff and the

field on these relatively new concepts and the pertinent benefits of incorporating the utilization of technology into future plans. The information in the following sections is designed to educate those individuals with questions and to assist those staff in making the important decisions regarding implementation by addressing the aforementioned facets.

### **What Is Distance Training?**

The concept of distance training is enlarging the definitions of how individuals learn, where they learn, and who teaches them (U.S. Congress, 1989). Distance training has become increasingly sophisticated since the first educational radio programs. Barker (1989) referred to distance training as a "catch all" phrase for any form of instruction in which the learner and instructor were separated geographically and were linked by telecommunication systems that permitted live, interactive audio and/or video exchanges.

Applications of distance training have increased dramatically during the last five years. Fewer than ten states were promoting distance training in 1988 (U.S. Congress, 1989). The quality of distance learning has been recognized with increasing respect and credibility (Turnbull, 1988). Many trainers in the United States subscribe to the philosophy that distance training does not differ from conventional training in any real structural sense, but only in the delivery mechanism (Zigerell, 1984).

The motivation for distance training is a practical one -- train people where they are, instead of bringing them to the trainer(s). This concept allows untold productivity benefits while enabling agencies to reach more line staff who might otherwise not be offered traditional training. In addition, the distance training effectively utilizes qualified trainers, which may mean leaving them in one location instead of dragging them all over the country, with the subsequent wear and tear of constant travel (Ostendorf, 1989).

### **What is Telecommunications?**

Telecommunications is defined as communicating over a distance. Rapid advances in technology, deregulations of these technologies, and decreases in costs have made telecommunications attractive to many agencies and businesses (Jones & Simonson, 1993).

Telecommunications systems are often referred to by the medium, the type of information (signal) transmitted, and the directional flow of information. The type of information includes audio, video, and data signals. The media for communication are usually radio waves through the air, electronic impulses over transmission lines, or light through fiber made of glass or plastic silicon. The flow is defined as one-way (simplex) or two-way (duplex).

One-way communications are usually referred to as broadcast systems and are usually "top-down" communications in which the information is transmitted by electromagnetic waves to anyone with a receiver. Signals may also be transmitted (uplinked) to an orbiting satellite and then broadcast (downlinked) to receivers on the ground. These one-way systems are also referred to as point-to-multi-point. Television broadcasts are examples of one-way communications. Multi-point-to-point transmissions are also available (Jones *et al.*, 1993). An example of multi-point-to-point would include having presenters in several locations and a single target audience.

Two-way communications occur when each site has an equal opportunity to both send and receive communication signals. The telephony technologies, such as audio conferencing, audiographics and compressed digital video are examples of two-way communications. Obviously, these technologies more closely re-create the way we communicate verbally, while only two-way compressed digital video allows participants to both see and hear each other.

### **Technology for Training and Information Dissemination: An Overview**

Today, the technical capabilities exist for agencies and organizations to provide distance training and dissemination to employees. While the trend in distance training in the United States is to provide distant learners with live, two-way interactive instruction, the majority of beginners

in the field approach that level in a building block, step wise fashion. Quality distance training is dependent upon interaction and the participation of learners. The goal of implementing an interactive system is to make distant training situations as close to traditional training as possible. When used appropriately, any technology-based delivery system can have desirable levels of interactivity (Jones et al, 1993).

Telecommunication technology comprises many different types of systems and mediums. This report will focus on the more established technologies of distance training and information dissemination, audio conferencing, audiographics, two-way compressed digital video conferencing and satellite teleconferencing (business television). In addition, fiber optic technology, the future of telecommunications, will also be examined. Each medium discussed herein have several factors in common:

- the technologies use a telecommunication channel and require terminal equipment at each participating site;
- the technologies link individuals or groups at multiple locations;
- the technologies are interactive, providing two way communications.

As an example, a telephone system is considered a teleconferencing system, because it has an input device (mouthpiece), an output device (earpiece), and a telecommunications carrier (telephone wire).

For any organization anticipating its initial use of technology for training and information dissemination, it is important to know that:

- there is no single, dominant training technology;
- no single technology can completely serve the training needs of a large organization;
- in the near future, most of the capabilities represented by several of these stand-alone devices will be combined into one single device. Today's multimedia computers represent the first generation of this combined capability.

Furthermore, it should be noted that, with the rapid advances in technology, most systems have a three year life cycle before they undergo major change. One of the major challenges will be "second guessing" these advances, and selecting a strategy that can grow and adapt to tomorrow's enhancements.

## Planning Considerations

Arguably the single most important planning consideration is cost. With telecommunications, it is also the most difficult with which to deal because of the myriad of factors that are involved in communication and training. Start-up costs versus recurring costs must be balanced. Issues of effectiveness and design should be considered along with cost. Also, a technology can only be effective as the instructional design and instructional design takes time and money. Therefore, since distance training systems require significant cost commitments both in monetary terms and time, those responsible for making such investments must have reliable data available to help them in the decision making process and have the ability to answer pertinent questions regarding the implementation.

The following sections will focus on start-up costs pertaining to the necessary hardware and on recurring costs, particularly transmission expenses. Chapter Two will provide an overview of costs applicable to specific technology-based delivery systems. Chapter Three will focus on a cost analysis and comparison of traditional delivery systems versus technology-based delivery systems.

### Start-up Costs

The most significant portion of technology-based delivery system costs is the start-up costs, which include hardware, a transmission system, a needs assessment, engineering design, and

building wiring/remodeling. The amount of money required to establish a system is often seriously underestimated (Rumble, 1988). Obviously, personnel and curriculum costs to train and revise materials may also be considerable, especially when transforming traditional training to a video format, but the primary expense with any system will be involved in obtaining hardware.

Hardware costs have come down in a number of ways in the last ten years. Likewise, the availability of services has increased to the point that most major commercial telephone corporations offer a wide range of options in facilities known as public rooms which are located across the United States (Chute, et al, 1991).

A public room expense for an audiographics session would be approximately \$75 per half hour that would include all equipment needs. This rate can go as high as \$200 per half hour for fully interactive videoconferencing equipment between several sites; transmission costs are additional charges. Likewise, equipment can be leased. Among the two major telephone service providers, the fees for fully interactive videoconferencing equipment range from \$5000 to \$7000 per year (for each location).

If an agency wishes to purchase their own hardware system, that option has become more affordable, but is still expensive compared to other options. Sheridan estimates that the hardware for a fully interactive system permanently set up between two locations would cost about \$115,000 per site. Since a multi-point control unit is needed for additional sites, the minimum cost to set up three sites with a fully interactive system would be about \$240,000. In addition, mobile systems that can be rolled from room to room are available for \$25,000 to \$45,000, while suitcase sized models start low as \$37,000. Both of these can make an agency's videoconferencing options more flexible for little additional cost.

#### Recurring Costs

With hardware equipment secured, the next major decision concerns the transmission options. The transmission medium will be a recurring expense applicable to each delivery. The telecommunications channels, or carriers as they are commonly called, may be voice grade telephone lines, high speed data lines, fiber optic lines, satellites, or microwave. The information carried may be in the form of data, text, still or motion video and audio. Transmission services have seen the most dramatic reduction in prices in the last ten years. What might have cost \$1,000 in 1982 today costs approximately \$150 to \$300 per delivery.

For example, the highest-quality presentation between two U.S locations, using a major telephone line network, costs \$175 to \$350 per hour, depending on the distance between the sites. That same training or information event, using lower quality transmission, may cost as little as \$60 per hour.

Although digital telephone networks increasingly cover the United States, satellites are nearly mandatory for reaching remote locations. With a portable receiving dish, videoconferencing can go virtually anywhere in the United States. In addition, satellite charges usually do not increase dramatically with additional locations, while cable services add the cost of another separate call for each location. Satellite downlink facilities are readily available at relatively low costs for ad hoc teleconferencing events at many universities, community colleges, schools, libraries, hotels, and motels.

#### Level of Desired Interaction

Beyond cost concerns, the primary step in selecting an appropriate delivery system is to consider the psychological requirements of the learning task, in particular the level of desired interactivity and the instructional capabilities of the delivery system. While there seems to be little doubt that technology-based delivery systems can provide effective, efficient and affordable alternatives to face-to-face training or information dissemination, Graham and Wedman (1988) contend that there continues to be some resistance to distance training programs. These researchers have argued that training will be more appealing when the opportunity for interaction among

participants (trainers and trainees) is increased. After a number of possible strategies are prescribed, specific information delivery options can be considered.

Trainers and trainees often list the term "interaction" as a contributing variable in determining whether or not a training event will be successful. However, many individuals lack a clear understanding of what is involved in forming interactive training sessions. The ability to provide feedback is one issue. Whether or not feedback occurs and its inherent instructional value is another consideration. Thus, one of the key factors in training-media selection (and training design) is the level and type of feedback required. Another consideration is the size of the training audience and whether instruction is to be presented to individuals, small groups or large groups. Delivery systems are built around this concept. Satellite teleconferencing is a good medium for large-group training or information dissemination situations, where providing information is more important than discussion and interaction. Two-way compressed video teleconferencing is an example of technology that is good for small group instruction where a high degree of interpersonal interaction is required. Most organizations still require a mix of technologies and training strategies to answer all their training requirements. Many bad training experiences have resulted from attempts to make one technology fit all training situations.

A final underlying and typically overlooked factor in the selection and implementation of any type of technology is staff acceptance within the organization that is seeking undertake such a venture. Chute, Balthazar, and Poston (1988) found that initial resistance to the non-traditional delivery methods soon dissolved and the new technologies began to generate high levels of acceptance among users. However, Chute (et al) did claim that implementation may require some staffing changes and restructuring so that a flexible support structure can be established and maintained. Typically, teams of specialists are behind the deployment, integration, and utilization of technology-based delivery systems.

## Summary

Each telecommunication medium is unique, with its own strengths and weaknesses. Many elements combine to give each technology its uniqueness, including start-up and recurring costs, ease of acceptance and use, small group versus large group usage and amount of interactivity that is possible.

The research and literature is clear on the effectiveness of distance technology. However, most of the literature deals with organizations that have multiple fixed sites that are under their control, such as corporations, the military, school systems, and universities. OJJDP is unique in that it provides services to its constituents and does not control them. Training and information dissemination is often contracted out through grants. Therefore, the remainder of this report will deal more with the uniqueness of OJJDP's situation. For example, we will concentrate more on existing systems and services that OJJDP could initially utilize rather than on costs of purchasing equipment. We will talk about what can be accomplished through working with grantees rather than OJJDP hiring new staff. Finally, it should be noted, that in the end, quality instructional design and organizational commitment will have as much to do with the successful integration of distance technology as will the choices of which technologies to employ.

## Telecommunication Technology: Today and Tomorrow An Overview of Current and Future Technology-Based Delivery Systems

*Teleconferencing helps us make the best use of two valuable resources, time and knowledge. It allows us to bridge time and distance like no other vehicle.*

*-- Jatcko, 1991*

Just as OJJDP must make decisions on what, when and how training and information is currently distributed to the juvenile justice field, the Office will also have to make choices on which technology to employ to accomplish particular goals and objectives for its many varied and diverse programs. To date, only audio conferencing is readily available from every desk. To use an audiographic, video or satellite teleconference, people must physically move to a separate setting. Until these teleconferencing systems become as ubiquitous as the telephone, their usage will be less than optimal.

For greater flexibility and economy, most agencies and organizations tend to design multipurpose facilities that support audioconferencing and audiographics, for example, as well as videoconferencing. The following sections will provide an explanation of four primary types of telecommunication technology, a discussion of the technology as a training medium, a review of strengths and limitations, and finally an examination of costs specific to the task. Again, the reader should remember that this project did not focus on any type of computer-based training systems.

There are some general concepts that apply to all the technologies being considered in the following sections:

### Cost Savings

There is abundant research that indicates that the four technologies being considered in this report, when compared to the cost of traditional training or meetings, saves money. There are many factors that affect exactly how much money is saved. The cost analysis on page 25 of this report attempts to quantify, as much as possible, the savings found in the technologies under consideration in this report.

### Times Savings

For the instructor, more time is generally required to prepare training for distance technology than for face-to-face training. More visuals and print materials need to be prepared and more discussions, exercises, questions, and other interactions need to be planned. Time can be saved for the instructor in travel and in the number of times he or she has to deliver the material.

### Level of Acceptance

There is ample research and anecdotal evidence that suggests participants generally have a high acceptance of telecommunications technology. Often, acceptance is more a function of content and instructional design than it is of the technology. If relevant and timely information is presented in a way that allows participants to become involved, there will generally be a high level of acceptance. If there is poor instructional design, or trainers are not taught to

properly use the strengths of the technology and minimize the weaknesses, then there will be low acceptance and the technology will be blamed for the failure.

Trainers and instructors generally accept the technology once they become accustomed to its usage. However, some instructors adapt better than others and a few never become comfortable. One reason some trainers may not adapt is because they dislike not being able to see the participants. They are accustomed to accessing understanding through students non-verbal cues and do not like losing that aspect. However, most adapt and utilize the alternate strengths the technology may offer.

#### **Training of Instructors**

Just as it would not be expected for a correctional officer in an adult institution to function in a juvenile detention facility without additional training, trainers should not be expected to develop and deliver training utilizing telecommunications technology without an opportunity to receive training specifically for that technology. Ideally, they should be able to understand and practice aspects of both the instructional design and development and with the technical aspects of the technology.

An exception would be if a trainer is working with an experienced producer of satellite teletraining who can work cooperatively with the trainer. In this case, the trainer would make decisions on content and the producer would assist in designing the most effective presentation of the content, utilizing print, exercises, video vignettes, facilitation and other tools to involve participants in the learning process. Generally, trainers working in audio conferencing, audiographics and two-way video are expected to develop and present on their own.

Thus, instructors should be taught to not limit themselves to a technology, but to utilize print, video tapes and other materials. They should be taught to use individual and group activities as well as guest speakers. (Since learning is taking place from a distance anyway, experts can be available by phone to answer questions and/or participate in discussions.)

## Audio Conferencing

Audio conferencing is voice-only communication linking people in different locations using ordinary telephone lines. Audio systems include simple conference calls that connect a few (three or four) parties, as well as more sophisticated systems that connect many locations via a central audio "bridge." Thus, an audio conference could be as simple as three or more individuals speaking together by phone from their desks, to groups of people at multiple sites meeting together utilizing sophisticated audio equipment and bridging to allow all of them equal opportunities to speak. Audio conferences are used for both meetings and for training.

Audio conferencing is rarely used as the sole delivery medium in training situations. The only form of information exchange is audio. When it is used, it is usually used in conjunction with other media, such as print, audiographic devices and video tapes. The obvious advantage of this medium is that the only equipment required are standard telephones, although high-quality sound systems are sometimes used. For large audio conferences where special bridging equipment is needed, organizations often contract for these services through the telephone companies and other companies that provide bridging as a service.

More detailed preparation in class notes and handouts is often required to overcome the limitation of having to speak to the class without the use of visual props. Case histories and research have shown that when used in instructional settings, the amount of preparation time increases 150 percent in relation to the time needed to prepare for a traditional class setting (Turnbull, 1988). This extra time is needed to prepare supplemental class materials to be sent ahead electronically or by mail.

In order for groups of people to comfortably participate in an audio conference, special equipment must be used at each site, including microphones, a microphone mixer, a telephone interface, a speaker amplifier and a speaker. This equipment can be either permanently installed in a room designed for audio conferencing or it may be portable.

The purposes of audio conferencing equipment is to:

- mix the microphone audio together and send it to the remote location(s),
- receive the remote location(s) audio and drive a speaker so the remote location(s) can be heard in the room,
- remove any of the remote location audio that is picked up by the microphones from being sent back to the remote location (echo cancellation),
- maintain proper audio levels so everyone can be heard at a comfortable level, and;
- provide a variety of other functions such as dialing, volume control, etc..

### Audio Conferencing Advantages

- Low equipment and transmission costs;
- Readily available equipment and services;
- Short lead-time to set up and use;
- Good way to rapidly update information;
- No special equipment training needed by end users; and,
- Excellent way of adding experts to classroom discussions who might not otherwise be able to participate.

### Audio Conferencing Limitations

- More preparation time needed;
- Difficult to gain and maintain participant interest with audio alone;
- Difficult to track who is speaking in multi-site configuration; and,

- In training, difficult to determine if learners are comprehending and following the instruction.

#### Quality and Effectiveness of Instruction

Audio conferencing is probably the least inherently effective of the technologies for training purposes. The reason for this is obvious: there is no visual aspect intrinsic in the medium and seeing is an important part of learning. In order for learning to successfully take place, print, video and other materials should be sent to each site ahead of time so they can be used by participants. There also needs to be a strong focus on site facilitation and local activities. It is generally difficult for the trainer using audio conferencing to access the amount of learning that is taking place. Site facilitators can assist in this process. If each of these aforementioned elements are present, audio conferencing can be an effective tool for training, especially at a knowledge and comprehension level (see Bloom's Taxonomy in Appendix A).

#### Production Requirements and Responsibilities

Generally, the trainer assumes responsibility for the development and delivery of audio conferencing training. There should be someone who is technically proficient at the originating site to assist the trainer in originating the telephone bridging and getting the system on-line. The trainer is generally responsible for insuring that materials are sent to the sites in advance.

#### Audio Conferencing Costs

As previously mentioned, development costs for training will exceed traditional classroom development costs by one-third to one-half. While no special equipment is needed for course development, most distance instruction requires more detailed planning and makes extensive use of support materials that take additional time to prepare and disseminate. For meetings, a detailed planned agenda would be essential.

Systems installation are usually provided by a dealer or integrator in larger rooms designed for more than six participants. Costs vary from \$2,500 to \$25,000.

Portable systems can be installed by the customer and are designed for smaller rooms with 1-6 persons. Costs range from \$1,000 to \$1,500. Prior to selection of equipment, staff would need to decide what type of hardware would be appropriate for its needs.

Transmission rates are the same as for any long distance call. Bridging rates vary, depending on the day, time, number of participants involved, and if the calls are operator assisted.

#### Example of Low Level Usage - Audio Conference

The lowest level of an audio conference would be three individuals calling from their desks. There would be no equipment costs, because the individual's phones would be used. Transmission costs would be long distance plus bridging charges. A typical bridging fee for a three party unassisted conference call for one hour, Monday through Friday, would be approximately \$33. Long distance rates, for the purpose of this exercise, could be approximated at \$12 per hour per site for a total of \$69.

Bridging charges	\$33
Long distance charges	\$36
<b>Total</b>	<b>\$69</b>

**Example of Medium Level Usage - Audio Conference**

A medium level usage might be a one hour, unassisted training session held between eight locations, six people at each location. Initial cost of portable audio conferencing equipment for eight sites would be \$8,000. Typical one-time costs might include:

Training development (8 hrs.):	\$160
Faxing materials:	\$10
Bridging charges:	\$88
Long distance charges:	\$120
<b>Total:</b>	<b>\$378</b>

## Audiographic Conferencing

Audiographic conferencing systems are similar to audio conferencing except computer graphics and video still images are also sent to multiple sites via normal phone lines. Computers and special equipment at each site can allow sites to annotate on the visual images using graphics tablets and also use keypads to allow participants to answer questions. The answers are compiled by the computer and the results given to the trainer so he/she can monitor the participants' progress. Training using this technology can be effective if the content being taught does not require video motion (Barker, 1989).

Just like audio and computer conferencing, audiographic conferencing uses standard telephone lines to carry the data. Special equipment is required at the send and receive sites to display the graphic information. Depending on the size of the file that is transmitted, the information can be transmitted prior to a training session, downloaded to computer hard disk, and then displayed at each site during the training session, perhaps in conjunction with an audio conference. There are also audiographic devices that allow for real time interaction through a graphics tablet, so that still images can be annotated and seen by all participants. If standard telephone lines are used, consideration must be given to the time that will be required to send the files. If these technologies are used extensively, dedicated telephone lines may be required.

Audiographic applications abound, but are less well-publicized than other forms of graphic communication. Educators have used these systems extensively to reach populations in remote areas (Sheridan, 1992). The appeal is that the information travels over existing telephone lines, albeit quite slowly in cases where large files must be transferred. The medical community has used this technology extensively for passing medical images and discussing the information. Building floor plans, equipment diagrams, maps, routes, and other still video or graphic information can be passed. Again, given the favorable cost profile for this technology, many users are finding that much of their graphic image requirements can be satisfied by still, rather than motion, images (CAE-Link, 1991).

This technology is similar in concept to the document video image creation and transfer which is gaining popularity in the business community. Large companies that have invested heavily in these technologies are finding that existing data networks lack the bandwidth capacity to handle the volume of information that is being created (U. S. Congress, 1989). This is mentioned to emphasize that information systems can grow rapidly as people see the benefits that can be gained. As with any telecommunications system, a network analysis should be performed prior to purchasing and installing new equipment (Chute, *et al*, 1991).

### Audiographic Advantages

- Relatively inexpensive method of passing graphic information over long distances to support training activities or other professional needs;
- Information transmitted over existing telephone wires;
- Augments verbal information in audio conferences;
- Presentations can be prepared in advance, sent to remote locations, and brought up on cue while on-line; and,
- Facilitates long distance decision making, diagnosis, and testing through the use of interactive graphics.

### Audiographics Limitations

- Limited number of applications where this is the only technology that will satisfy the requirements;
- Transmission will be slow for large files;

- Requires detailed planning to prepare and present material;
- Lack of compatibility between systems;
- Would require someone at each site to turn on equipment and to schedule use of equipment.

#### Quality and Effectiveness of Instruction

With appropriate instructional design, the effectiveness of instruction with audiographic technology can be surprisingly high. Many training subjects do not require motion to be taught effectively and, where motion is needed, video tapes can be sent to the audiographic sites and shown when needed to supplement the instruction. Keypads and electronic writing tablets can provide a relatively high level of interaction.

One factor that affects the quality of audiographic instruction is when it is used by trainers who do not understand the medium and/or do not take enough development time to prepare the training. If trainers do not understand how to supplement their materials visually and involve the learners, or simply do not take the extra time needed to prepare for an audiographic training session, the training will probably be unsuccessful and learners and administrators will blame the technology.

#### Production Requirements and Responsibilities

Generally, the trainer assumes responsibility for the development and delivery of audiographic training. There should be someone who is technically proficient at the originating site to assist the trainer in originating the telephone bridging and getting the system on-line. The trainer is generally responsible for ensuring that materials are sent to the sites in advance.

#### Audiographic Costs

Audiographic conferencing requires special equipment, such as graphics tablet, modem and slow scan TV, and computer software which will generally cost approximately \$5,000 per site. Again, each site must have a personal computer and a telephone line to serve as the communications link. (Some systems require two lines, one for voice and one for data.) Development time and cost would vary with the nature of the application, but would probably be similar to that of audio conferencing. A scanner may be used at the originating site to input visual images into the computer.

#### Example of Low Level Usage - Audiographic

The simplest example of an audiographic event would be between two sites, up to twelve persons per site. Initial costs would be:

Hardware and software:	\$5,000
PC Computer:	\$2,200
Total x 2 sites:	\$14,400

Typical one-time costs might include:

Training development (8 hrs.):	\$160
Faxing materials:	\$10
Long distance charges:	\$30
Total:	\$200

#### Example of Medium Level Usage - Audiographic

This usage could be four sites, twelve persons per site for a one hour training event. Initial costs would be:

Hardware and software:	\$5,000
PC Computer:	\$2,200
Total x 4 sites:	\$28,800

Typical one-time costs might include:	
Training development (8 hrs.):	\$160
Faxing materials:	\$10
Long distance charges:	\$60
Bridging charges:	\$44
Total:	\$274

## Two-Way Compressed Video Teleconferencing

Compressed video conferencing, sometimes called interactive video conferencing or interactive television, is the most life-like of the distance learning technologies in that it provides two-way video and audio capability between sites (Barker, 1989). Special boards in computers compress the signals in order to transmit the video/audio over special phone lines (T1, ISDN, Switched 56) to and from sites. Thus, a trainer can see the students at other sites as they speak. Current applications often use two screens per site, one for the speakers and one for visual presentation materials. External sites are usually limited to a maximum of five.

Compressed video is a name routinely, and somewhat incorrectly, used to refer to digital video, audio, and data signals that are processed to reduce the amount of information in order to minimize the necessary bandwidth required for transmission (Turnbull, 1988). It is important to note that compressed video refers to a technique for reducing the amount of information transmitted between two sites. A "compressed" signal can be carried by fiber or microwave, but since it has been compressed, traditional, inexpensive, and readily available copper wires can also be used (if switched 56 is used).

Compressed video conferencing has been shown to be comparable to the traditional method of training, both in terms of the trainer and trainees' acceptance and in levels of achievement (Hughes, 1988). This medium has been the format of choice for many U.S. distance training systems (U. S. Congress, 1989).

In compressed video transmissions, redundant information is removed. For example, if the background does not change for several seconds, this information is sent only once and remains in memory. Video compression is achieved by sacrificing small amounts of color, motion, or resolution information. Although there is some loss of picture quality, compressed video is considered a viable alternative for many training situations (U. S. Congress, 1989).

### Advantages of a 2-Way Compressed Video Conferencing System

- Well-suited for small group interaction to a limited number of sites;
- Most closely approximates the way trainers are used to training as well as the way people are used to meeting;
- A technology in transition, costs are coming down, quality is going up;
- Can interactively pass video, audio, text, and graphic information which can be stored on computers for later use;
- The equipment is relatively easy to install and use;
- Compressed video requires less bandwidth and therefore it costs less to transmit;
- Compressed video can have a price advantage over fiber or microwave in long distance installations or systems in hostile terrain; and,
- Compressed video interfaces with existing systems and is easily upgradable. (Todd Communications, 1992).

### Limitations of a 2-Way Compressed Video Conferencing System

- Equipment costs are still high and special phone lines are costly;
- Requires detailed planning for effective training;
- Requires in-service for trainers;
- Would require someone at each site to turn on equipment and to schedule use of equipment;
- Systems have high start-up costs;
- Motion can become jerky;

- Color may be substandard and picture quality may be poor;
- There is dependence upon the lease-lines of the utility supplier;
- Compressed video systems do not transmit full motion video; and,
- Not suitable for large groups.

#### Quality and Effectiveness of Instruction

The effectiveness of two-way compressed video can be very high, especially when the instructional design elements discussed for the previous technologies are used to supplement the increased visual aspect inherent in the medium, and also when the medium is used for small groups. There is a hidden danger, however, to this technology. Since it is so expensive, there is a tendency to increase the number of participants to help justify the costs. Of course, the more participants there are, the less opportunity each has to interact with the trainer and with each other.

For examples, universities, because they are so cost conscious, often utilize this technology with relatively large numbers of students. The teaching/learning model becomes that of a large lecture hall where students take large quantities of notes. This is probably not a good model for adult learning in a professional situation.

Finally, research indicates that learning generally takes place just as effectively in a one-way video application as in a two-way video application. The main advantage to two-way video is in the comfort level of the instructor and for situations where the instructor needs to see trainees demonstrate a skill. Thus, for most training applications and not considering the larger numbers usually involved in satellite teleconferencing, one-way video (satellite) is as effective as video conferencing.

#### Production Requirements and Responsibilities

Generally, the trainer assumes responsibility for the development and delivery of two-way video training. There should be someone who is technically proficient at the originating site to assist the trainer in originating the telephone bridging and getting the system on-line. The trainer is generally responsible for insuring that materials are sent to the sites in advance.

#### Two-Way Compressed Videoconferencing Cost

Transmission and equipment costs are higher for video conferencing than for any of the other applications under consideration in this report. Hardware and software for each site can run from \$20,000 for a very basic setup to over \$100,000. Special phone lines, such as switched 56, ISDN or T1, need to be accessed. These costs will vary greatly, but can run about \$2,000 per month for a T1 line.

#### Example of Low Level Usage - Video Conference

The simplest example of an video conference event would be between two sites, up to twelve persons per site. Initial costs would be:

Hardware and software:	\$40,000
Total x 2 sites:	\$80,000

Phone line per month:	\$1,500
-----------------------	---------

Typical one-time costs might include:

Training development (8 hrs.):	\$160
Faxing materials:	\$10
Total:	\$170

**Example of Medium Level Usage - Video Conference**

The simplest example of an video conference event would be between three sites, up to twelve persons per site. Initial costs would be:

Hardware and software:	\$80,000
<b>Total x 3 sites:</b>	<b>\$240,000</b>

Phone line per month:	\$6,000
-----------------------	---------

Typical one-time costs might include:

Training development (8 hrs.):	\$160
--------------------------------	-------

Faxing materials:	\$10
-------------------	------

<b>Total:</b>	<b>\$170</b>
---------------	--------------

## Satellite Teleconferencing

Sometimes referred to as "business television", satellite teleconferencing is a term used to describe one-way video transmitted to many sites via satellite with audio-only interaction between the originating site and receiving sites via phone lines. Thus, this format is one-way video and two-way audio. Because of the technology and preparation time involved, this medium is most cost effective when large audiences are participating. Unfortunately, the more participants involved, the less chance each individual has to interact. Thus, this technology works best for information dissemination to large groups that do not require a great deal of interaction and personal attention. Basically, the amount of interaction would be comparable to a large lecture hall as opposed to a more intimate classroom.

If the transmission of a training and information dissemination event is going to many locations, satellites may be the most viable option. Since the signal is bounced into outer space and back to earth, there is no additional cost for long distances. And even the most rural locations, which may not have digital phone lines, can easily receive the signal. In addition to the equipment needed for any transmission, this option requires an antenna at each location to send or receive the signal, as well as a receiver at each downlink location to unscramble the satellite signal.

### Advantages of Satellite Teleconferencing

- Cost effective way to present information to a large, geographically diverse audience;
- Excellent method of putting out consistent information of an immediate nature;
- Presentations can be taped at local sites for replaying at a later time for those who missed the presentation or for refresher training;
- Can save participants travel time and expenses;
- Many receive sites (downlinks) are already in place; and,
- Interaction can be supplemented using site facilitators.

### Limitations of Satellite Teleconferencing

- Expensive. High initial and recurring costs;
- Very little individual interaction;
- Labor intensive to develop;
- Tends to be burdensome for site coordinators; and,
- There must be someone at each site to tune in the receivers.

### Quality and Effectiveness of Instruction

Satellite teleconferencing has been shown to be a very effective medium for training and instruction, especially at the knowledge and comprehension levels. Where it gets into trouble is when it is inappropriately used to try to teach skills. With large audiences and one-way visual communication, the trainer is unable to assist and give feedback to participants seeking to learn and practice skills. In order for this to be done, strong reliance on site facilitation must take place.

Like audioconferencing, it is difficult for the trainer to access the level of learning that is taking place. He/she must rely on random sampling and facilitators to provide feedback.

### Production Requirements and Responsibilities

One way this technology is utilized is for the trainer or instructor to be responsible for the design and development of all aspects of the delivery. This occurs most often when a course is being delivered over a period of time. Since satellite training often originates from a television

production facility, there may be an instructional designer or producer available to give general assistance.

However, where there are a limited number of satellite events or an ad hoc event, production levels are generally higher and require the active involvement of a producer. If this person is experienced in satellite training, he or she may be able to assume some instructional design responsibilities and assist the trainer in those aspects.

#### Satellite Teleconferencing Cost

Costs for satellite teleconferencing are very difficult to quantify. While the other technologies somewhat resemble face-to-face training, satellite teleconferencing often resembles a TV program, with a TV studio, sets, lighting, etc.. Each event has different development costs and each television production facility has its own rates. For example, a university television production facility would typically charge less than a commercial facility. Generally speaking, production qualities and costs are higher for a one-time event than for one of a continuing series of satellite events, such as a course.

A satellite "uplink" can cost \$500,000 to install, with additional recurring costs to maintain. Usage would have to be extremely high to justify the cost. A satellite dish or "downlink" can be installed for \$2,500 to \$3,500, but these are often readily available for lease on a per usage basis from universities, community colleges, schools, hotels, libraries, state and government agencies etc.. Another transmission issue is whether to broadcast on "Ku" or "C" band or both. Digital compressed video is also becoming a transmission option in satellite television.

Often, the actual production of the satellite event is only part of the cost. Development costs can be relatively high, particularly for a more complex training event. Program and/or instructional design, facilitator and participant print materials, graphics, set and lighting designs and pre-produced video inserts may need to be planned and produced. Technical assistance may need to be provided to participants seeking to use unfamiliar downlink facilities. Finally, due to the relatively large numbers of participants, evaluation of an ad hoc satellite event becomes more of an issue than with the other technologies.

#### Examples of Low Level Usage - Satellite Teleconferencing

A low level, ad hoc usage of satellite teleconferencing would be a one hour group discussion among three panelists and a call-in segment. Time would be allowed for a panel to make presentations and/or discuss a topic, and also for viewers to call in with questions and discussion.

Development would be limited to agenda planning, pre-production, technical planning/scheduling, simple graphic design and rendering technical assistance to the sites. There would be no print materials to develop and distribute, no facilitators to train, no pre-produced video segments to produce. There would be no interaction or other instructional elements to plan other than the call-in and there would be no evaluation of the event. The event would be broadcast only on Ku band.

A typical budget could be:

Pre-production	\$2,400
Panelist travel	\$1,800
Uplink	\$2,000
Transponder	\$550
Production	\$3,000
Total	\$9,750

#### Example of Medium Level Usage - Satellite Teleconferencing

A medium level ad hoc usage of satellite teleconferencing could be a two hour training event produced at a university television production facility. Two trainers, working with an instructional designer/producer, would develop a highly interactive training session with pre-produced video,

accompanying print materials and locally facilitated breakout activities. Print materials would include objectives and step-by-step instructions for facilitators as well as didactic information and exercise instructions for participants. Computer graphics would be designed and completed. Prior to broadcast, there would be a studio rehearsal.

Pre-teleconference technical assistance and facilitator assistance would be available via an 800 number. In addition, staff would also actively promote the event.

The event would be broadcast on both Ku and C band. An evaluation tool would be prepared, distributed and the information compiled.

Pre-production	\$15,000
Panelist travel	\$1,200
Uplink	\$2,000
Transponder (Ku)	\$1,300
Transponder (C)	\$700
Turnaround	\$500
Production	\$10,000
Total	\$30,700

*Like any technology, there's nothing magic about teleconferencing, but it does take some special expertise and practice before everyone involved is comfortable.*

*-- Sheridan, 1992*

## Tradition Versus Technology: A Cost Analysis

### Introduction

Technology-based delivery systems consistently produce significant savings from travel cost and productivity-related costs that are avoided by using the telecommunication medium. The information presented in the follow scenario substantiates the fact that telecommunications is a cost-effective alternative to face-to-face delivery of training and dissemination of information.

In computing the cost avoidance figures for an audioconference, an audiographics session and a satellite teleconference, the assumption was made that, at the very least, one participant from each state or territory would have to travel to a centrally located city within each of OJJDP's four geographically divided regions to receive training or information if telecommunication technology were not an alternative. The average ground and air travel cost was calculated at \$650 (using mid-week fares) and a per diem cost of \$100 per day for lodging and meal expenses resulted in a total cost avoidance of \$750 per participant per training session. The travel cost avoidance savings for fifty participants (50 x \$750) would be \$37,500.

Travel cost avoidance is only part of the actual savings realized from the utilization of telecommunication technology. Substantial employee productivity savings are also incurred through the re-employment of non-productive time spent travelling, time spent waiting in airports, and time spent catching up on work once back in the home office. Assuming the average non-productive time was sixteen hours (approximately two work days) per participant, the total time expense per participant (based on a \$15 per hour salary) would be \$240 or \$12,000 per participant. Adding this savings to the earlier travel cost figure produced a total cost avoidance of \$990 per participant. These figures merely represent the expense of getting the participants to the training site. No calculations are made in terms of trainers preparation time, travel, or follow-up exercises.

The total cost avoidance is offset somewhat by telephone line long distance and bridging expenses when conducting an audioconference or an audiographics event, and by satellite uplink and transponder expenses when utilizing satellite teleconferencing. Since it is the project staff's recommendation that existing equipment primarily be used in OJJDP's early endeavors, no equipment capital investments are considered in the monetary calculations; only operating and production expenses are included. However, since the vast majority of the OJJDP constituency does not have telecommunication equipment located in their immediate facility, this would require locating and leasing equipment within the community or surrounding areas. The cost analysis does include an approximated cost for leasing of equipment (\$150 per site SEE FOLLOWING PARAGRAPH), but does not factor the minimal travel that may be required going to the technology-based site within the community.

Generally, the necessary equipment can be found within the community at universities, colleges, libraries, local schools, hospitals, hotels, and motels for very inexpensive rates (\$50-\$500). A brief survey following this project's satellite teleconference demonstration indicated that sites paid an average of \$150 to rent viewing facilities in their community. Moreover, with the opportunity to use technology-based delivery systems, more individuals are afforded the opportunity to participate at the local level for no extra cost.

**TABLE II**  
**Cost Comparison**

<u>Technology</u>	<u>Total Cost Avoidance</u>	<u>Operating/Production Costs</u>	<u>Net Cost Avoidance</u>
Audioconference	\$49,500	\$3,500	\$46,000 (\$920 per participant)
Audiographics	\$49,500	\$16,000	\$33,500 (\$670 per participant)
Satellite Teleconference	\$49,500	\$30,500	\$19,000 (\$380 per participant)
2-Way Compressed Video Conference	<i>Project staff would not recommend utilization for this size group and number of sites. The preference for this technology would be a maximum of five sites and approximately ten people per site. Net cost avoidance would still run much less than audioconferencing or audiographics, but interactivity would greatly increase.</i>		

**Discussion of Cost Calculation**

Many factors can affect a cost analysis. The total cost avoidance figures were discussed in the previous section. In calculating the operating and production costs for an audioconference, it was assumed that participants would participate from their office desk and therefore no facility costs are factored. The expenditure of \$3,500 is based on the line charges, bridging fees, and port charges of FTS2000. While it is doubtful that OJJDP would conduct an audioconference with representatives from all fifty states at one time, the figures in Table II were calculated as such to give the reader a perspective of the type of savings that could be expected across the different mediums.

The audiographics expenditure of \$16,000 was calculated similar to the audioconference with line charges, bridging fees, and port charges based on FTS2000 projections. The additional expense is based on the potential need of renting audiographics facilities (approximated at \$250 per site). If FTS2000 is conducting the event, sites could be secured through their nationwide consortia of public rooms.

Calculating the expenditures associated with a satellite teleconference is an even greater challenge. Productions expenses listed in Table II are based on one uplink site for a total production cost of \$23,000. The remaining \$7,500 is calculated from the projected expense of fifty (50) sites renting downlink facilities at \$150 per site. The pilot teleconference conducted by ECU during the project had a total production cost of \$29,000 due to the use dual uplinks. Again, this cost is not reflective of what downlink sites may have had to pay to receive the broadcast.

**Summary**

The reader should be aware that these figures are generalizations and are not intended to be accepted literally. There are too many factors involved in computing the costs of distance technology to generalize accurately. Development costs vary from event to event, depending on the type of event, transmission costs, numbers of participants, on being facilitated or not, and on other materials such as print and video that need to be developed. Even an audio conference meeting may have print materials to be prepared and distributed. Special phone line rates vary greatly from location to location. Bridging and leasing costs vary, depending on the number of sites and the

contractors. Finally, satellite technology would probably not even be considered for a meeting that included just a few people from each state as there would not be enough participants to justify development and transmission costs.

Benefits of satellite technology, in addition to cost-efficiency, include the ability of the medium to reach remote, low density locations that are too difficult and time consuming to reach through conventional travel arrangements; the ability to add multiple locations to a training session when needed; the flexibility to increase the number of trainees who can be reached at one time; the ability to quickly disseminate information to an entire work force; and the ability to share limited trainer resources (Chute & Elfrank, 1990).

## Future Trends

### Desktop Video

Desktop video will bring the traditional face-to-face meetings directly to each participating individual's office desk. Cost is still prohibitive. Most industry experts agree first and foremost that desktop systems must be affordable for a broad number of users for implementation to be feasible by any one organization or agency. Today, the most cost friendly system still ranges over \$4,000. As long as costs remain prohibitive, experimentation and, therefore, innovation will be relatively limited. Even if a common, cost-effective system currently existed, users would still face the obstacle of interconnecting via a digital highway or network, such as fiber optics, that can transport still and moving images from desktop to desktop. A common time projection for wider acceptance of this technology would be five to seven years (Gilroy, 1992).

Additionally, desktop video for training may require a shift in the teaching/learning paradigm. Studies indicate that learning for most people occurs best in a group situation. For example, home courses often have low retention rates. It may be that desktop video would suffer a similar fate for training. However, once the technology becomes more ubiquitous, it should be an excellent medium for information sharing and small group meetings.

### Fiber Optics

Fiber optics is one of the newest two-way, interactive technologies. The fiber, made of glass or plastic, transmits light signals instead of electrical signals. The main advantage to optical fiber is that, with current equipment, it can transmit more than 3,800 times as much information as copper wire, providing the band width needed for high speed data transferral, two-way full motion video and multi-media applications. Today, optical fibers have replaced copper wires in virtually every U. S. telephone line of two miles or longer. In fact, many point-to-point applications are cheaper over fiber. For example, between New York and Washington, DC, a full-time feed over satellite could cost anywhere from \$35,000 to \$60,000 per month, but over fiber, it would run \$20,000 (Howes, 1993).

#### Advantages of a fiber system

- The large bandwidth allows audio, video, and data to be combined on one line, resulting in a lower cost per channel.
- Fiber permits full motion video transmissions.
- The low attenuation rate allows for transmissions over long distances without distortion.
- The large capacity for channels means the system can be easily expanded.
- There is a maximum signal security with little possibility of tapping, eavesdropping or jamming.
- The small, lightweight cables are easy to handle and install.
- Fiber is unaffected by weather, corrosive liquid, or gas.
- Fiber is unaffected by electromagnetic currents, static inference, electric motors, fluorescent lights, and radiation.
- Durable fiber results in low maintenance costs.

#### Limitations of a fiber system

- Systems require high start-up costs.

- Special tools and tests are needed to install the fiber cable.
- Repairs can be time consuming and costly.
- Light sources have limited lifetimes and associated system reliability problems.
- Expansion is expensive if no fiber exists.
- Right-of-way costs for placing cables in the ground can be costly.

#### **Implications for OJJDP**

Although the advantages of fiber optics as a transmission medium are clear, the availability of fiber as a transmission medium is not yet readily available throughout the U.S. The technology currently is being deployed as if we operated on individual islands or archipelagos. Corporations, universities, research centers, and governmental agencies have, to one degree or another, begun rewiring their current buildings or building new "smart" structures. The institutions may be in the same building, city, state, or region but essentially they share a common ownership.

Many experts are calling for the creation of a national "information highway" utilizing digital switch and fiber-optic technologies. Utilizing that analogy, the U. S. currently has information super highways between cities and rutted dirt roads between businesses and homes. Estimates suggest the cost of connecting businesses and homes to a nationwide fiber optic network would cost \$100 billion. Difficulties include a lack of standards in the telecommunications equipment industry, lack of government support, a reluctance by the industry to invest in new technologies and the enormous time and effort involved in developing and debugging the network.

The options for OJJDP would be to try and install its own fiber optic system or wait until the technology becomes more widely available. Because installation of a fiber system would be expensive, particularly since OJJDP's constituents are widely dispersed geographically across the country, it would seem prudent to wait for increased availability and lower costs.

Additionally, since the underlying philosophy of this project's proposal is for OJJDP to position itself in the middle of the technological revolution, it would also be prudent to wait until fiber technology has matured and its advantages, limitations, and usage become more clearly defined.

# SECTION B

## DEMONSTRATION AND EVALUATION

## The Development, Delivery, and Evaluation of Distance Training Pilot Demonstrations

### Introduction

During the project, staff developed and delivered to technology-based events. The first program was an audiographics demonstration between the project staff and OJJDP staff. The second event was a satellite teleconference which originated from Eastern Kentucky University (EKU) and Washington D.C. and was available to any interested individuals and agencies throughout the United States. The primary goal of these events was to educate OJJDP in the development and delivery of such programs. With the teleconference, the secondary goal was to introduce the concept of telecommunications as a training and information dissemination tool to the juvenile justice field. Project staff are confident that each goal was accomplished and feedback from the field indicates a willingness for the integration of technology-based delivery of training and information.

### Audiographic Demonstration Discussion

From the outset, project staff believed that an underlying objective for the project was to educate OJJDP staff concerning distance training technology. For this reason, an audiographic demonstration was planned to take place between project staff in Kentucky and OJJDP staff in Washington DC. Eastern Kentucky University has audiographic equipment on campus and arrangements were made for the Optel Corporation to provide compatible equipment for the Washington site.

The meeting had a dual purpose. The first goal was to present some initial project findings and recommendations. The latter was to demonstrate some of the features of the technology. An agenda was planned and computer graphics were created by EKU staff in advance of the meeting. The meeting, conducted on June 11, 1993, demonstrated some of the features of the audiographic system in a meeting format. Due to time constraints, project staff were unable to demonstrate instructional design techniques that would be needed to conduct a training session using this technology.

### Satellite Pilot Demonstration Development

Working with project staff, OJJDP decided that a national satellite teleconference should be developed on the topic of the Abt Associates study on the conditions of confinement in juvenile detention and corrections. Together, project and OJJDP staff developed the following objectives for the teleconference:

- To disseminate information to the field concerning the findings and recommendations of the study, and
- To encourage and promote discussion within the juvenile justice field concerning the findings and recommendations of the study.

Project staff attended the National Juvenile Corrections and Detention Forum in Austin, Texas in April, 1993 to learn more about the Abt study; to conduct a focus group with juvenile justice professionals on the demonstration teleconference; and to promote the availability of the teleconference to the field. OJJDP and project staff then developed a list of panelists for the teleconference and the panelists were contacted by project staff.

A format was developed which divided the teleconference into two main sections. The first section presented a general overview of the Abt study. The second section presented a closer examination of one aspect of the study - suicide prevention. Each section contained a pre-produced

video overview, a panel discussion and a call-in from participants in the field to the panelists. In addition, Attorney General Janet Reno addressed the teleconference participants at the beginning of the broadcast and OJJDP Acting Administrator John Wilson offered summary comments at the conclusion. The teleconference agenda also included time before the teleconference to meet and greet other local participants and to read the Executive Summary as well as time after the broadcast to discuss the issues at a local level.

Project staff developed a Site Facilitator Packet which gave technical information about receiving the teleconference, a checklist on how to facilitate the event, and an announcement sheet to use to advertise the event locally. A Participant's Packet was developed which contained:

- an agenda;
- agenda discussion;
- panelist biographies;
- a discussion worksheet;
- a telephone protocol;
- an evaluation form;
- an Abt study Executive Summary;
- the OJJDP FACT Sheet on the Abt study; and,
- the recommendations from the Austin Forum.

Scripts were written and graphics developed for the pre-produced video segments. An EKU production crew traveled to Pennsylvania to document that state's attempt to develop statewide performance based standards in juvenile detention. A production crew also taped interviews at the American Correctional Association's Conference in Nashville and with line staff at the Jefferson County Youth Center in Louisville, Kentucky. Graphics, interviews, stock footage and music were edited together into two segments for the teleconference.

Teleconference advertisement flyers were disseminated to 8,200 agencies and individuals. Project staff assisted teleconference registrants by phone in locating downlink sites in their area. Ultimately, there were 149 sites in forty-one (41) states registered to receive the teleconference. In addition, the Law Enforcement Television Network (LETN) agreed to make the teleconference available to their 3,000 downlink subscriber sites.

In order to demonstrate that a teleconference can originate from several sites, arrangements were made for WETA in Washington, DC to serve as a secondary uplink site. Panelists participated from WETA in the panel discussions and call-ins just the same as the panelists in the EKU studio. The WETA signal was uplinked from their studio to the satellite transponder and received by the EKU downlink. The WETA signal was then mixed into the EKU studio signal and re-uplinked by EKU. Phone contact was constantly maintained between the TV Director at EKU and the crew at WETA so the Director could give directions.

#### **Lessons Learned from the Demonstration Teleconference**

Project staff feel that the teleconference accomplished its objectives and was a success. Many juvenile justice professionals learned about the Abt study and were given a forum to swap ideas. Nevertheless, there are lessons that were learned that OJJDP should take into consideration for future teleconference projects.

One lesson is that juvenile justice professionals want hard, specific information. A perception that came out of the teleconference evaluations was that the panelists sometimes did not address questions in a specific manner. While project staff prompted panelists to provide specific responses, perhaps for future OJJDP teleconferences using this format it would be necessary to emphasize even more to panelists the need for specificity and examples, using evaluations from this teleconference to support the idea. In addition, the next OJJDP teleconference probably should be of a training nature to meet the need in the field for practical information.

There was a problem with echo in the telecast. This was due to an audio monitor in the WETA studio which was being picked up by the microphones. If the situation arises again in a dual uplink situation, the originating staff should work more closely with the secondary uplink to ensure that panelists have IFB earplugs with which to hear the program audio. This would avoid the echo.

There was a problem with callers not turning down the audio on their TV set, even though they were instructed to do so by the telephone protocol and by the ECU operators. This is a problem in most teleconferences, not just this one. Next time, OJJDP project staff should instruct the moderator or trainer to periodically announce that callers should turn down their TV sets prior to going on the air with a question.

LETN should be utilized whenever the subject matter is appropriate since they have such a large subscriber base among criminal justice organizations. Project staff have found LETN personnel to be easy to work with and helpful, both with this project and others. There was some confusion amongst LETN subscribers because the OJJDP teleconference was not in the LETN Program Guide. Every effort should be made in the future to make arrangements with LETN in time for them to put the event in their guide.

Finally, it is felt that one of the main reasons the conditions of confinement attracted such a large number of participants is because there is such a high level of interest in the topic. In the future, the level of interest among prospective participants should be one of the major contributing factors in the choice of topics for teleconferences and again the material should be specific.

#### **Satellite Pilot Demonstration Evaluation and Feedback**

Evaluation forms were included in each of the 149 site registration packets. The intent of the project was to have each individual viewing the teleconference evaluate the broadcast and submit it to their site facilitator who in turn would return the forms for their respective site in a self-addressed, stamped envelope provided in the initial packet. Fifty-seven sites returned their evaluation forms representing the opinions of 937 viewers. Past experience with satellite teleconferences at ECU have demonstrated approximately a twenty percent response rate to the evaluation survey. Therefore, it is estimated that approximately 4,700 individuals viewed the "*Conditions of Confinement*" broadcast.

The evaluation form (Appendix B) had seven questions based on a Likert five-point scale (1= "Not Useful"; 3= "Somewhat Useful"; 5= "Very Useful"). Two questions asked for specific suggestions for improving future teleconferences and for potential topics of future OJJDP teleconferences. The final question simply asked if the viewer would be willing to participate in future OJJDP teleconferences. The quantitative results of the 937 returned surveys are summarized in Table I on page 35.

#### **Discussion of Evaluation Results**

For an initial event, evaluations for the satellite teleconference were generally quite favorable. Responses for each question ranged from 3.5 to 4.2 on the Likert scale. The majority of feedback concerned the breadth of information which was trying to be relayed in such a short time span (ninety minutes). Respondents expressed the most dissatisfaction with the call-in segments and the post-teleconference site discussions. In terms of the call-in segments, the main complaints were an inability to ask questions during the abbreviated phone-in sections. In typical teleconferences, where the topic is more specifically focused, the flood of questions would be alleviated, because

everyone would most likely have similar concerns and questions. Other concerns focused on the varying degree of satisfaction with on-site facilitation. Svenning and Ruchinskas (1986) determined that the relative success of videoconferencing was related to the ability of the conferencing facility to support effective interpersonal interaction. Environments that facilitate problem-solving, decision-making and negotiation are recognized as being most effective for conducting success teleconferences. On-site facilitation is the most uncontrollable variable when utilizing technology-based delivery systems, but can be improved with the development of materials and detailed instructions which are presented to the facilitators several weeks ahead of the broadcast. While materials and instructions were provided to all facilitators for this event, it is evident by respondent feedback that not everyone had coordinated on-site activities very effectively, especially regarding post-teleconference discussions. Nevertheless, even with the quirks of a first-time teleconference, respondents overwhelmingly agreed (80%; Likert score 4.1) that satellite teleconferencing is an excellent medium for the effective delivery and exchange of information and ideas. Furthermore, eighty percent of the respondents said that they would definitely participate in future OJJDP teleconferences, two percent said that they would not, and eighteen percent were undecided. With some minor modifications to the concerns expressed from the pilot event, OJJDP would seem to have an excellent basis from which to proceed with future satellite teleconferences.

# Pilot Demonstration TELECONFERENCE EVALUATIONS

Question	LIKERT SCALE*					LIKERT MEAN
	1 NOT USEFULL	2	3 SOMEWHAT USEFUL	4	5 VERY USEFUL	
I found the information and ideas in the teleconference useful.	3%	8%	36%	34%	18%	3.57
I found the format of the teleconference to be effective for delivering information and the exchange of ideas.	2%	7%	27%	40%	23%	3.75
I found the use of satellite technology to be an effective medium for information dissemination.	1%	3%	17%	40%	38%	4.11
I found the call-in segments an effective exchange of ideas.	3%	11%	35%	32%	18%	3.52
I found the post-teleconference discussion an effective exchange of ideas.	3%	7%	26%	26%	15%	3.56
	<b>23% DID NOT RESPOND</b>					
I think that a video teleconference is an effective medium to deliver information.	1%	2%	16%	40%	40%	4.17
How do you rate this teleconference?	2%	6%	29%	42%	20%	3.71

\* Except where noted, generally one percent or less did not respond to each question.

\*\* Numbers based on 937 surveys returned.

# SECTION C

## NEEDS ASSESSMENT AND RECOMMENDATIONS

## OJJDP Telecommunication Technology Needs Assessment

The foremost task in being able to provide sound, logical feedback and recommendations to any agency is to conduct a needs assessment of the organization. Project staff conducted a needs assessment of OJJDP during the initial phase of this endeavor. Interviews were conducted with the Division Directors and Program Managers from the five OJJDP divisions. Staff were queried about current programs (within the last twenty-four months), methods of training and information dissemination, and perceived effectiveness of the aforementioned methods. Suggestions for strengthening training and communication efforts with the field, audiences in need of additional training and information dissemination, and the anticipated changes within OJJDP were also gleaned from the conversations with OJJDP staff. Discussion also focused on staff's prior experience with and knowledge of technology-based delivery systems. The scope and magnitude of the entire interview process yielded a wealth of descriptive and qualitative information which was a tremendous assistance in framing and understanding the function and role of OJJDP in the broad sense of juvenile justice in the United States.

### Current OJJDP Training Practices

Training is conducted primarily on a regional basis by OJJDP grantees. The National Institute of Corrections Academy (NIC-A) provides the only national training site. Four regions exist with two sectors in each geographical region. The majority of training is provided in a conference setting. Fifty percent is skills-oriented; fifty percent informational in nature. Virtually no certification exists for training events. Training is provided for practitioners (line personnel) to managers and administrators. Most trainees or conference attendees include court workers/volunteers and judges, police officers (line and administrative level), social service employees, juvenile detention workers (limited to line staff only), day treatment providers, teachers, school administrators, and prosecutors.

Major training programs funded by OJJDP have included a wide range of impact areas, such as corrections, courts, delinquency prevention, drugs and alcohol, gangs, law enforcement, missing children, and education. Particular mention was made of juvenile justice specialist training and prosecutor training. Veteran juvenile justice specialists are being trained annually, but OJJDP staff would prefer quarterly trainings. At present, the content is comprehensive, but the timeliness is poor. The same problem holds true for new juvenile justice specialists. Sometimes they are on the job for months before they receive any formalized type of training. Meanwhile, there are over 3,000 prosecutors in the United States, but only 100-150 are trained annually because of the necessity to have small group interaction. Whether the size of the training group is small to facilitate group interaction or large for more diverse groups in the social service and juvenile detention areas, the recurring limitation to providing more training activities is the human resource and economic expense.

### Effectiveness of OJJDP Training

Overall OJJDP staff seemed relatively satisfied with the majority of current training efforts being conducted by grantees under the auspices of OJJDP to the juvenile justice field. Staff identified the traditional conference format as being relatively limited in effectiveness, especially in relation to the amount of resources invested into such events. Conferences were designated as primarily information dissemination events. Drug identification training and substance abuse prevention training efforts were also noted as being sub-par, primarily because of the limited number of available pharmacological experts in the field who could serve as trainers. The field simply can not be trained with the lack of available trainers. When the trainers must travel from

site to site on a continual basis to conduct training, the grind eventually becomes overwhelming. One major employee motivation to attend training events is the opportunity to have time away from work which in turn helps reduce worker burn-out.

#### **Current OJJDP Information Dissemination Activities**

OJJDP is mandated to communicate and disseminate information across the entire scope of the juvenile justice profession. In addition, OJJDP must maintain clear channels of communication with each of over 200 grantees. The mere magnitude of the communication task is the main barrier to timely dissemination of information. Primary avenues of communication include the National Juvenile Justice Clearinghouse (NJJC), the NIC-A, the National Center for Juvenile Justice (NCJJ), traditional conferences, face-to-face meetings, state advisory groups (SAG), telephone and fax, printed material, and an electronic bulletin board.

#### **Effectiveness of OJJDP Information Dissemination Activities**

OJJDP staff indicated particular concern in regards to the effectiveness of the agency's information dissemination activities. At best, all avenues of communication were perceived as limited in effectiveness. Staff repeatedly mentioned the lack of timeliness in the dissemination of information. Material that must reach the field oftentimes is delayed in the dissemination channels and is not as relative or as noteworthy when finally delivered as it would have been with immediate dissemination. NJJC, NIC-A, and NCJJ were recognized as being the most effective of the identified avenues, but even then information must first be processed through OJJDP then transmitted to one of these organizations for dissemination. Traditional conference settings posed the same drawbacks as earlier noted with the additional limitation of having only a handful of individuals receiving the first hand information then relying on that group to deliver the information to the remainder of the profession at their respective offices. If and when delivered, the importance of the second hand translation is often lost.

Human and monetary resources limit any type of continual face-to-face meetings or one-on-one telephone/facsimile dissemination. While communication occurs with SAGs on a semi-regular basis, the information that each state receives is delivered by different personnel which typically results in various points of emphasis and conscious or unconscious biases regarding particular aspects of the information. Improving communication with the SAGs is a top priority of OJJDP.

Meanwhile, the limitation of print material is that it is often burdensome to peruse and quite easy to disregard when there is no immediate incentive to read and absorb the content. Moreover, the print material is time consuming and expensive to develop, produce, and disseminate, especially on a continual basis. Finally, the most advanced technology-based delivery system accessible to OJJDP is an electronic bulletin board which staff and individuals in the field do not utilize effectively for any number of reasons, primarily of which may be a lack of comfort with the technology.

#### **Staff Suggestions for Strengthening OJJDP Training Efforts with the Field**

OJJDP staff suggestions on what training approaches the agency could pursue that would strengthen it's efforts throughout the juvenile justice field simply focused on being able to do more. More training, better training, and more standardized training were consistent responses. Other suggestions were to develop an assessment tool to measure overall effectiveness of trainings; to reduce support to conference-type activities; and, to develop a consortium to conduct training-of-trainers, coordinate distance learning projects, and develop and maintain a cataloguing of all projects, trainings, and so forth within the juvenile justice field.

### **Staff Suggestions for Strengthening OJJDP Communication Efforts with the Field**

A nearly unanimous suggestion was to disseminate material and information in a more timely manner to the field. More specific ideas focused on conducting a monthly meeting involving every state in an effort to share information; making OJJDP officials available for quarterly SAG meetings; and pursuing better use of the electronic bulletin board.

### **Staff Exposure to and Opinions on Telecommunication Technologies**

Past exposure to or use of telecommunications technologies by OJJDP staff can be described as limited. The majority of those questioned had participated in training events involving the use of linear video. Only about fifty percent had used or participated in training events involving audio cassettes. Three staff members had participated in or witnessed the broadcast of a video teleconference. Only one staff person had prior exposure to audiographics training. Individuals exposed to the various mediums thought that each had potential training and communication capabilities in the juvenile justice environment if applied appropriately. Each individual suggested that staff in-service might have to be a top priority of OJJDP if any telecommunication technology was to be adopted.

### **Staff Suggestions for Utilizing Telecommunication Technology**

Due to limited OJJDP staff exposure to technologies, Project staff provided descriptive support material to agency staff so that they could be conversant in the various types of technology during the needs assessment. Some staff suggestions on strengthening training and communication efforts focused on the utilization of technology-based delivery systems as an efficient use of available funds. Although there were no specific system suggestions, respondents thought that the use of technology would modernize OJJDP training and communication efforts and provide greater access to these events and materials by field and line staff, as well as, provide an avenue for immediate dissemination of information, especially innovative ideas.

### **Potential audiences for additional training and information dissemination**

OJJDP staff identified the numerous groups of individuals as being in need of additional training and information dissemination. The ultimate goal would be to provide 100% coverage of the juvenile justice field in terms of training and communication endeavors. At present, some areas are only being reached at 10-20% of possible participants. The potential groups were represented by state juvenile justice specialists, state advisory groups (especially new members), blind staff, youth workers, teachers, line staff, training-related grantees, prosecutors, detention personnel, monitors, and lay people and volunteers.

### **Acceptance of Technology Implementation**

The successful implementation of any new ideas into an organization requires the acceptance of the staff who will be responsible for coordinating their activities regarding the change, as well as, the acceptance of those individuals in the field who in some aspect will be affected by the aftermath of the new ideas/changes. OJJDP staff indicated that acceptance by agency personnel would in all likelihood be split. While the majority of staff seems to be open to technology, timely staff training will probably be needed to prevent frustration and apathy. Meanwhile, OJJDP staff widely indicated that the juvenile justice field was ready for the integration of these concepts. Again, concerns were directed towards the decrease in personal contact and the quality of interaction that would be available among the various technologies. Other general staff concerns, regarding the utilization of technology-based delivery systems, focused on the misuse of technology and the belief that some material is best taught face-to-face so that participants can interact or network with colleagues.

**Policy issues regarding the implementation and utilization of telecommunication technologies**

Staff listed three issues that would affect the integration of technology-based delivery systems by OJJDP. One issue discussed was the fact that OJJDP is mandated to disseminate information to the public. The utilization of telecommunication technology would provide a vast new world of opportunities in terms of information dissemination. Meanwhile, two limiting factors that could negate some aspects of timely delivery of training and information dealt with client confidentiality and the approval process within OJJDP. Client confidentiality regulations would apply to any sort of video-based training or information dissemination process. Meanwhile, all material, including that which would be incorporated into the technology-based delivery systems, must be submitted to a review and approval process as a normal procedure within OJJDP.

**Summary**

OJJDP staff attitudes regarding technology-based delivery systems are mixed. Nevertheless, commonality was developed along the realization that some training and informational needs exist that could be met by implementing appropriate types of telecommunication technology. With the onset of economic limitations, the administrative level realizes that traditional means of training and communication just are not as cost efficient or productive as necessary in a new age of organizational growth. OJJDP staff expressed general dissatisfaction with the conference format currently being used for training and information dissemination purposes, but maintained a recognition of the continuing need for networking which conferences provide. Nevertheless, a large audience exists that in large part has never been adequately addressed by OJJDP. Furthermore, a need exists for meetings and trainings involving small groups and large groups. Any implementation of technology into OJJDP should be prefaced by the idea that it would enhance the training and information dissemination endeavors of OJJDP, but would not serve as a replacement to all face-to-face interaction. Staff training will have to be an immediate agency priority to prevent frustration and apathy toward the new technologies.

-VII-

## Recommendations and Three Year Implementation Plan

### Preliminary Findings

Based on the OJJDP Needs Assessment and the Expert Panel Meeting (see Appendix C), project staff have made the following general conclusions:

- There is limited knowledge of and exposure to distance learning technology on the part of OJJDP staff and other professionals in the juvenile justice field.
- There is a strong impression that distance learning technology could make a substantial difference in helping the field meet its training and information needs. This generally positive impression of technology is tempered somewhat by a lack of knowledge as to how to utilize the technology and fear of start up costs.
- There exists unmet training needs in the juvenile justice profession. Juvenile justice agencies and professionals lack adequate funds to obtain or develop needed training.
- There is a need for expanded communication between and among individuals and organizations in the field and with OJJDP.
- Limited funds available to OJJDP for training and information dissemination need to be maximized to provide the greatest impact to the juvenile justice profession.

Project staff have based their recommendations to OJJDP on the following general assumptions:

- OJJDP should encourage and develop uses of technology that solve problems and are not simply responses to technological advances. For example, a less advanced technology could perhaps solve a problem as effectively as a newer and more costly technology.
- There is today no single, dominant training and informational technology, and no single technology can completely serve the needs of an organization.
- The implementation of technology needs to supplement and enhance the flow of information, not serve as a replacement for face-to-face interaction. The objective is greater access to information and ideas, not less access to people.
- For organizations with limited financial resources, it is best to be in the middle of technological changes. For OJJDP to be in the front of technological changes could lead to costly mistakes and misuses of the technology. For OJJDP to fall behind in utilizing technology means that they will be unable to benefit from the advantages of technology.
- OJJDP staff and project monitors need to understand the importance of instructional design in the use of distance technology. Distance technology removes the trainer or speaker from the presence of the trainee or participant and this removal needs to

be compensated for by designing more interactivity and involvement into the instructional design. It is not enough for a grantee to simply say that they will utilize a technology in response to an RFP. They need to demonstrate a knowledge of how to design the use of that technology in order to interact with and involve trainees or participants.

- It is important that the learning curve for the implementation of technology not be too steep. There will be some resistance to using distance technology because, if for no other reason, it represents a change. OJJDP and the juvenile justice field should learn to "crawl" with the technology before they try to "run".
- On the other hand, the move to increased usage of informational technology is practically inevitable. The only questions are when and how.

One final note. It should be remembered that informational technology is changing so fast that assumptions made now may no longer be valid three years from now. While this project is making recommendations for activities two and three years from now, these recommendations should be periodically reviewed to ensure that they are still appropriate.

### Recommendations

With the preceding assumptions in mind, project staff make the following recommendations. These recommendations are not listed in order of priority.

---

#### *Recommendation #1*

*Promote the establishment of audio conferencing networks between OJJDP and the states for meetings and information dissemination.*

#### **Discussion**

Instituting audio conferencing would be a relatively easy and inexpensive way to improve communication and allow practitioners and OJJDP staff to become accustomed to meeting at a distance, because of:

- OJJDP's need to improve communication with many of its constituents;
- low equipment/transmission costs;
- readily available equipment/services;
- short lead-time to set up and use;
- little equipment training needed by users.

Audio conferencing is appropriate for small group meetings and trainings. It should not be thought of as a medium of mass dissemination. It is recommended that OJJDP utilize audio conferencing for training after the technology is in use for meetings in order to allow participants to become comfortable with its use and because of:

- the difficulty of gaining and maintaining interest that is inherent in the medium;
- the difficulty in determining if learners are comprehending and following instructions; and,
- higher expectations of a medium when used for training.

The cost of equipping a room for audio conferencing are relatively low compared to other distance technologies. A room may need some acoustical treatment. Sound systems that allow participants in the room to speak freely range from \$900-\$3,000. Bridging (connecting multiple sites) and phone charges vary, depending on the number of sites.

#### Year One

- Establish an RFP which would require the recipient to:
  - a. work with state organizations to locate or establish an audio equipped room in each state or at other selected sites;
  - b. provide technical assistance and in-service training to OJJDP and field staff;
  - c. purchase and install audio equipment; and,
  - d. conduct a pilot meeting and evaluate.

#### Year Two

- RFP recipient evaluates and revises formats, procedures and protocols.
- RFP recipient trains OJJDP staff in management of audio conferencing network.
- OJJDP staff continue the administration of audio meetings, with assistance from the RFP recipient.
- RFP recipient conducts and evaluates a pilot audio conference for training.
- Add sites as needed.

#### Year Three:

- OJJDP continues audio conference meetings and training sessions.
- Add sites as needed.

---

### *Recommendation #2*

*Encourage the establishment of an audiographic network for trainings and for meetings.*

#### Discussion

Audiographics is a relatively inexpensive method of passing visual and audio information over long distances. It is effective in training and meetings where motion video is not required. In addition to being able to transmit visuals, all locations can annotate on the visuals simultaneously and keypads can be used for increased interactivity. While not as visually stimulating as motion video, creative instructional design can help compensate for that shortcoming.

Audiographic technology is appropriate for small group trainings and meetings. It should not be thought of as a medium of mass dissemination. Audiographic technology could be thought of as a logical next step to add onto an existing audio conferencing network. Its usage in training would require some in-service training for more effective instructional design and it should be recognized that, like other distance media, audiographic training requires some additional time for detailed planning and for preparation of visual material.

Since the use of audiographic technology at juvenile justice agency sites would require expenditures for hardware and software, this recommendation includes a pilot audiographic training event to demonstrate and study effectiveness and acceptance. The grantee would locate and utilize existing facilities for the pilot training. If effectiveness and acceptance are deemed high, and if there is a need for small group regional and national training, then steps could be taken to assist selected agencies in the purchase of audiographic technology.

There is a wide range of audiographic hardware and software available, up to very expensive CLI and PictureTel units that cost \$30,000 to \$50,000 per unit and utilize the latest in compression, storage, manipulation and transmission technology. But there are relatively inexpensive technologies, such as the Optel system used in the Project's audiographic demonstration, that provide freeze frame, electronic writing tablets and even trainee keypads, and use low cost conventional phone lines for transmission. These less expensive systems are the type recommended for initial usage by OJJDP.

Hardware would include a computer with a modem and a monitor. Electronic writing tablets, computer scanners, and 10-12 keypads per site can be added to increase interactivity and visual elements. Hardware and software costs per site could range from \$5,500 to \$10,000, depending on the choices of computer, tablet, monitor, scanner, and keypads.

#### **Year One Recommendations**

- Encourage and provide support to state agencies in locating existing public audiographic facilities and developing a directory of available facilities.
- To the best knowledge of project staff, there are two main providers of low cost audiographic equipment and they are not compatible. It is recommended that OJJDP research the providers, decide on one and provide leadership to the field in ensuring that audiographic equipment purchased by juvenile justice agencies are compatible.

#### **Year Two Recommendations**

- That through the issuance of an RFP, OJJDP authorize the development of a pilot audiographic training course utilizing some of the available existing facilities identified in the previous year.
- That the grantee provide an evaluation as to the effectiveness of the pilot audiographic training.
- That, based upon the results of the pilot project, OJJDP offer matching funds to targeted juvenile justice institutions for the purchase of audiographic equipment.

#### **Year Three Recommendations**

- That, based upon the decision in the second year to purchase equipment, OJJDP fund continued audiographic training and also seek to utilize audiographic equipment for distance meetings with members of constituent organizations.

---

#### **Recommendation #3**

*Encourage the use of satellite teleconferencing in selected RFPs where information and training needs to be disseminated to a large, geographically dispersed audience.*

#### **Discussion**

Many of the activities funded by OJJDP would seem to meet the criteria for effective use of ad hoc satellite video teleconference events. OJJDP has an active role in the dissemination of information and training to professionals located around the country. There exist numerous downlink facilities available at relatively small costs at universities, community colleges, schools, police training academies, libraries, etc. One outcome of this project is a listing of 149 juvenile justice-related downlink sites in 41 states that could be utilized for future events. There are specialized networks, particularly the Law Enforcement Television Network, that, at this time, will also provide access to their member agencies for free.

Ad hoc satellite teleconferences are an excellent means for OJJDP to disseminate consistent information of an immediate nature. Presentations can be video taped at local sites for replay or as a refresher. For training purposes, OJJDP can encourage grantees to utilize site facilitators with local activities and exercises to compensate for the relative lack of interactivity with the originating site. Project staff believe that satellite teleconferencing is the technology that will allow OJJDP to make the largest impact on the juvenile justice field in the shortest period of time.

Satellite teleconferences are usually relatively expensive and time consuming to produce. There are often high administrative costs of scheduling and communicating with facilitators, printing, mailing, and faxing. Usually, satellite teleconferences require large numbers of participants to justify the time and cost.

It is not recommended that OJJDP invest in any kind of uplink equipment because of the high costs and because improving telephony technology could make satellite technology less economically feasible in the near future. Instead, existing uplink facilities should be utilized on an ad hoc basis.

Downlink facilities can generally be rented for \$50 to \$500 per day with \$200 being a reasonable average. Design, production, uplinking and transponder costs vary widely, from perhaps \$6,000 for the most basic to \$100,000 for a very complex event at a high-end facility.

Finally, it is felt that OJJDP should follow the "Conditions of Confinement" teleconference, which was a general information dissemination event, with a more narrowly defined training event with more specific information. That is the type of training and information the field seems to need, judging from the evaluation forms received following the teleconference.

#### Year One Recommendations

- Encourage state and local juvenile justice organizations to locate and price available downlink facilities in their state.
- Disseminate RFPs seeking to utilize satellite dissemination for appropriate training and information dissemination of a specific nature.

#### Year Two and Three Recommendations

- Continue to fund appropriate usage of satellite dissemination.

---

#### *Recommendation #4*

*In order to meet the need in the juvenile justice field for higher level training, OJJDP should encourage grantees utilizing satellite technology to work with the ACA, NASJCA, NIC, NJDA, SAGs, and others to provide facilitators for satellite teletraining.*

#### Discussion

One way to understand the difference between facilitated and unfacilitated teletraining is to refer to Bloom's Taxonomy (see Appendix A). Unfacilitated satellite teletraining functions primarily at the lowest levels of cognitive processing, knowledge and comprehension. The learner is only asked to know and understand the information the teletraining imparts.

This project's demonstration event on the conditions of confinement is an example of such a training event. The goal primarily was to acquaint participants with the results and recommendations of the Abt study so they would know and understand them. This was certainly a valid goal and basically was accomplished. At the same time, many of the evaluations that were returned from the teleconference indicated a thirst for higher level training among practitioners in the field.

It is the contention of this recommendation that, in order to utilize satellite teletraining to achieve the higher levels of learning-application, analysis, synthesis and evaluation, more reliance on local site facilitation will need to be utilized, because it is difficult for the television trainer(s) to work with trainees at a level where they can practice and demonstrate skills. Practice, demonstration and feedback exercises need to be coordinated at each site by a facilitator who understands the objectives of the training.

Under this higher level model, expert trainers, via the satellite, present knowledge and skills and are available for questions and feedback on a national and regional basis. Learners model, practice and demonstrate skills and get feedback from other trainees at each site under the supervision of a trained facilitator.

It is recommended that OJJDP grantees work with ACA, NASJCA, NIC, NJDA, SAGs, and other professional organizations to develop a cadre of facilitators for teletraining. It would be the responsibility of the grantee to train the facilitators for each teletraining event. This could be accomplished by bringing facilitators to a central site for training on the event. This is effective and not too costly if there is a relatively small number of facilitators.

This project's staff has had success in utilizing the technology to train facilitators. Facilitator's packets are sent to facilitators that contain training objectives, exercises, lesson plans, and step-by-step instructions for the facilitator. Prior to the teletraining event, a facilitator training event is held by satellite where the trainer(s) discuss the event with the facilitators and answer their questions. This method has the advantages of holding down travel costs and allowing facilitators to become familiar with the technology before the training event.

This method of training requires a high level of planning and coordination but is necessary to successfully teach skills to a large number of geographically diverse trainees. It is believed by project staff that this utilization of satellite technology would allow OJJDP to meet a very real need in the field and also assert increased leadership in juvenile justice training.

---

### *Recommendation #5*

*Explore in a limited fashion the usage of 2-way compressed video conferencing.*

#### **Discussion**

Two-way compressed video conferencing is, in some ways, the most life-like of the distance technologies, allowing participants to see and hear each other. For that reason, many people, once they get used to the jerkiness of the picture, are most comfortable with this technology. There are public rooms available around the country that could possibly be utilized by OJJDP and other juvenile justice agencies. This technology is best suited for small group interaction among a limited number of sites, generally no more than 5-7 sites maximum and usually fewer.

Most of the limitations of 2-way compressed video have to do with costs. Equipment costs are high, ranging from \$30,000 - \$100,000 per site. Additionally, transmission costs are high, generally requiring expensive T-1 phone lines. These costs would probably preclude OJJDP's purchasing and utilizing the technology on a full-time basis in the near future.

Technical limitations include jerkiness and low image quality if low transmission rates are used, but indications are that most people become accustomed to the image quality after some initial disappointment. Another area of concern is the limited number of persons at each site that can be seen clearly on most systems. Trainers are often surprised by this reality, which can limit either the effectiveness of the two-way contact or limit the number of people trained.

However, it seems to be a general consensus among technology professionals that distance technology will be moving increasingly toward telephony in the future and it could be advantageous to the OJJDP to have some experience and knowledge now in order to gain a foothold on the future.

#### Year One Recommendation

- Explore public accessibility of 2-way compressed video facilities with Sprint and/or through juvenile justice state agencies locating existing networks and facilities.

#### Year Two Recommendation

- Through an RFP, obtain a provider for a pilot demonstration training project utilizing 2-way compressed video technology and utilizing existing networks and facilities.

#### Year Three Recommendation

- Pilot and evaluate a training project utilizing 2-way compressed video technology.

---

#### *Recommendation #6*

*Encourage the use of video tape as a dissemination method for selected and appropriate training.*

#### Discussion

Video tape is a useful means for distributing training to a large group of people that are geographically dispersed and need some flexibility in the times they receive the training. Since VCRs are so common today, most people can get access to one in order to receive the material on the video tape at a time that is convenient for them.

It is recommended that OJJDP encourage grantees to utilize instructional design methods that are interactive in their use of video tape; that require the viewer to actively participate and not just passively watch the TV screen. By utilizing accompanying print materials, exercises can be devised that require the learner to practice identification skills on materials in the video.

OJJDP could encourage grantees to consider satellite delivery as a means of distribution of large numbers of video tapes. For example, large numbers of police training video tapes could be disseminated to police departments through an arrangement for broadcast through the Law Enforcement Television Network.

---

#### *Recommendation #7*

*Focus not on newer technologies, but on the management and creative application of established distance technology.*

#### Discussion

Because of the relatively limited resources available, it is recommended that OJJDP not focus on keeping up with "cutting edge" technology, but rather concentrate on learning the effective use and management of distance technology that is more established and stable. Newer technologies are generally more expensive and there is much trial and error in their use. Thus, OJJDP should

concentrate more on encouraging creative uses of existing and entrenched technologies. Lessons learned from these creative uses of established technologies can later be applied to newer technologies as they become more widely available and cost effective.

---

#### *Recommendation #8*

*Provide training for trainers and other staff who will be involved in the implementation and delivery of telecommunication training and information dissemination.*

#### **Discussion**

Make sure the staff and trainers have some familiarity with any technology before it is actually used. Most people are uncomfortable the first time they are required to train via distance. Trainers ideally should experience training simulations using the technology; otherwise, they risk alienating audiences and may tarnish the image of the new training investment. Trainers who like to interact with participants usually do well; those who simply lecture may be in danger of losing off-site students. Furthermore, be sure the training or information to be delivered is clear and concise. A typical rule of thumb is to determine what's nice to know and what people really ought to know — and stick with the latter.

---

#### *Recommendation #9*

*Strive to bring about technology change, not through a "grand design" project, but through smaller, well-designed, flexible and integrated projects.*

#### **Discussion**

OJJDP probably does not have access to the resources needed to bring about a "grand design" technology change in juvenile justice on a national level. What it can do is encourage the gradual implementation of distance technology through the issuance of RFPs that will allow OJJDP staff and juvenile justice professionals to become comfortable with the technology, to learn and change in its usage, and to allow juvenile justice professionals to feel a sense of ownership as they grow with the technology. Finally, this gradual approach will allow mistakes to be made without too much being at stake.

---

#### *Recommendation #10*

*Select a grantee to serve as a distance resource for the agency and its grantees.*

#### **Discussion**

Since there is so little knowledge about and usage of distance technology among juvenile justice professionals and institutions, OJJDP could take a step in assuming leadership in this area by providing technical assistance and distance learning resources to the field. The increase in knowledge and utilization of distance technology should result in less resistance and more efficient usage. This recommendation should also provide OJJDP with a consistent level of quality and a simpler

approach to the application of telecommunications technology.

The grantee would provide a range of services to the Office, other designated grantees, and to the juvenile justice field. The distance grantee should be an organization that has the demonstrated resources and ability to:

- provide instructional design assistance appropriate to each technology,
- plan and implement needed video production,
- design and produce support materials,
- provide technical assistance to downlink sites,
- deliver distance training and information dissemination,
- provide evaluation of distance training and information dissemination,
- provide education to the field through workshops and seminars,
- assist in setting objectives for the utilization of distance technology.

The distance grantee should also have a demonstrated knowledge of juvenile justice in order to assist the Office in developing telecommunications technology objectives and strategies, and in identifying current and future projects and activities that would have a maximum impact on the juvenile justice field.

Activities of the contracting agency could include:

- providing technical assistance and facility support to selected OJJDP grantees in the planning, development and delivery of telecommunication activities,
- delivering distance technology training and information dissemination,
- assisting other juvenile justice agencies in locating and utilizing facilities and other resources,
- providing technical assistance to juvenile justice professional organizations,
- consulting with OJJDP on the planning and implementation of telecommunications technology,
- providing in-service training to OJJDP staff,
- conducting workshops on the utilization of distance learning at juvenile justice conferences and conduct other training events as needed.

Designated grantees could include in their project budgets the support of distance technology information dissemination and/or training activities.

---

### *Recommendation #11*

*Develop and disseminate a directory of juvenile justice downlink sites.*

#### **Discussion**

Based upon data collected during the initial OJJDP distance training event, the agency and a contractor should develop a computer-based juvenile justice downlink directory. Additional listings in this directory would be added based upon participants in subsequent distance training events and the response of the state juvenile justice specialists.

The directory could be used by OJJDP and its contractors and grantees in the promotion and distribution of future teleconferences.

#### **Year One Recommendations**

- Work in conjunction with the state juvenile justice specialists to identify downlink sites available for use during OJJDP distance training events.
- Compile and maintain on an automated system a comprehensive listing of juvenile justice downlink sites.

#### **Year Two Recommendations**

- Continue to identify and add to the listing of juvenile justice downlink sites.
- Make available for distribution copies of the juvenile justice downlink site directory.

#### **Year Three Recommendations**

- Continue to identify and add to the listing of juvenile justice downlink sites.
- Make available for distribution copies of the juvenile justice downlink site directory.

---

#### ***Recommendation #12***

***Explore with Sprint the accessibility of the various distance technologies, transmission rates and other ways Sprint could assist OJJDP in utilizing distance technology via FTS 2000.***

#### **Discussion**

With the Sprint contract, federal agencies have a unique opportunity to partner with and utilize the services of a major commercial telecommunications agency. OJJDP should explore the existing and planned telecommunications options available through the FTS 2000 System. Working in conjunction with FTS 2000 personnel, OJJDP should develop a plan for the expansion and use of this telecommunication network.

Specific services that could be explored with Sprint include:

- training that is available to government staff;
- technical assistance; and,
- available facilities and bridging services for audio conferences and two-way video.

#### **Year One Recommendations**

- Examine planned existing options available through FTS 2000.

#### **Year Two Recommendations**

- Develop and implement a plan for expanded use of FTS 2000 system options.

#### **Year Three Recommendations**

- Continue to use and expand use of FTS 2000 system.

## Utilizing Bloom's Taxonomy as a Technology Selection Factor

The training and information dissemination activities of the OJJDP have been categorized into eight general groupings (see Matrix on Page 52). These categories represent a broad range of topics and possible audiences. These categories were developed by the project staff based upon the OJJDP needs assessment which included a review of the Office's activities within the last twenty-four months and interviews with current OJJDP staff. The categories provide a basis for examining the most opportunistic use of technology in the dissemination of information and training of personnel.

The eight categories have been placed into one or more of the six levels of Bloom's Taxonomy (see description, Appendix A). This hierarchical classification of cognitive processing ranges from the lowest level of knowledge to the highest level of evaluation. Based upon what appear to be realistic training/information cognitive processing, outcome expectations for each category at a Bloom level(s) have been identified.

The application of the Bloom's Taxonomy is useful in determining the most appropriate technology based on delivery systems for each activity. The usefulness of a particular technology-based system in achieving a performance objective set to a particular Bloom's level is partially a function of availability of distance facilitation and support materials. Some distance technologies can be used in a stand alone delivery (without facilitation or support materials) if the desired level of cognitive processing is relatively low on Bloom's Taxonomy. Other delivery systems require both support materials and active, well-prepared facilitators to assure that any significant cognitive processing above the competency level can be achieved.

Best practice in distance delivery of information dissemination or training include the provision of support materials and whenever possible on-site, pre-trained facilitators who actively participate in the training process. As the matrix indicates, the only two technologies that are recommended for use without facilitation or support materials are linear video and two-way compressed video conferencing. Well-developed linear video production can be useful at the knowledge/competency level to provide basic information to viewers. Two-way compressed video conferencing, because of its two-way audio/visual interactivity can be used effectively to achieve higher levels of cognitive processing. However, best practice would continue to dictate that support materials and on-site cooperative learning activities (with or without facilitation) be included in any training or information dissemination packet.

This matrix does not suggest that distance delivery of training or information would or should replace all face-to-face single site deliveries. The matrix rather suggests that when distance delivery is deemed appropriate for a particular training and/or information dissemination activity due to limited time, economic factors, or convenience that there are more appropriate approaches from which to select. The matrix does not factor in any cost factors of the various technology-based delivery systems (see page 25 for cost analysis). This matrix simply matches up delivery systems with categories based upon perceived participant performance expectations as indicated on one of the six Bloom's Taxonomy levels.

# OJJDP Technology Needs Application Matrix

Categories of OJJDP Training and Information Dissemination Activities	Bloom's Taxonomy	With Facilitation	Without Facilitation
<b>Conferences</b> (National / Regional)	Knowledge / Comprehension	AC, AgC, ST, LV	CDVC
<b>Practical Training Events</b> (Formerly at FLETC & NIC-Longmont)	Application and Above	CDVC, LV	*
<b>State Juvenile Justice Specialist Information Dissemination</b>	Knowledge / Comprehension	AC, AgC, ST	CDVC
<b>State Juvenile Justice Specialist Training</b>	Application and Above	CDVC, ST, LV	*
<b>Communication with State Advisory Group Members</b>	Knowledge / Comprehension	LV, AC, ST	CDVC
<b>Dissemination of Research Findings</b>	Knowledge / Comprehension	ST, AC, AgC	LV, CDVC
<b>Dissemination of Demonstration Project Information</b>	Application and Above	ST	LV, CDVC
<b>Dissemination of Information on Legislation and Regulations</b>	Application	AgC, ST	CDVC

**LEGEND:**      Alternative Technology-Based Delivery Systems

AC:    Audioconferencing                      ST:    Satellite Teleconferencing                      LV:    Linear Video

AgC:    Audiographics                              CDVC: Compressed Digital Video Conferencing

## Potential Integration of Technology into Existing OJJDP Grants

### Introduction

Following are some suggested uses or recommendations for telecommunications technology for selected OJJDP funded projects found in the *1993 OJJDP Source Book*. Listed projects are limited to those over \$150,000 and whose project period had not expired as of October, 1993.

These suggestions are not meant to imply that these are the only uses of telecommunications for these projects. They are merely intended as examples of possible uses of technology by OJJDP. It should also be noted that it is recommended that OJJDP would need to prioritize the gradual integration of telecommunications technology into its many grants, which also is not reflected in these suggestions.

### *Information Dissemination Unit*

#### Juvenile Justice Clearinghouse/National Criminal Justice Reference Service

Little apparent usage of telecommunications technology

### *Research and Program Development Division*

#### Contract to Evaluate OJJDP Programs

Could use audio conferencing or audiographics for meeting purposes and exchange of information.

#### Effective Screening of Child Care and Youth Services Workers

At the completion of the study, a national teleconference or audio conference could be conducted that would present the findings and recommendations of the study to administrators of child-serving agencies. Project staff and other experts could conduct discussions and answer questions. One or two best practice sites could be presented through pre-produced video segments.

An informational or training video tape presenting an overview of the study and the best practice sites from the teleconference could be edited and distributed, along with appropriate print materials.

#### Family, Non-Family Abductions and Other Missing Children: Additional Analysis and Dissemination of Nismart Data

At its completion, a national teleconference could be conducted that would present the findings and recommendations of the study. This could possibly be a combination information dissemination and training event. An informational video tape could be edited from the teleconference and distributed.

#### Juvenile Justice Statistics and Systems Development Program

For the Systems Development Track portion of the project, training, technical assistance and information sharing among test sites could take place through regularly scheduled audio conferences between project staff and staff at the test sites.

Once the project is completed, the developed models for decision making, related management information systems and lessons learned at the test sites could be presented in a national teleconference, either as an informational or as a training event. An informational video tape and print material could be developed from the teleconference.

#### Juvenile Justice System Handling of Sex Offenses and Offenders

One or more high impact national teleconference(s) could be developed from the results of this study. Effective practices and weaknesses in the juvenile justice system that were identified in the study could be presented to a national audience. Pre-produced interviews with offenders, prosecutors, judges and others could be presented to illustrate offender characteristics and other factors that relate to inconsistent responses. Utilizing the NCCD survey, best practice sites could be presented, also through pre-produced video segments.

Additionally, a shorter informational video tape, with accompanying print materials, could be edited from the teleconference and distributed to juvenile justice professionals.

Finally, this also could be a topic of interest to the general public and several approaches could be utilized. One would be for the grantee producing the teleconference to produce a thirty minute overview which would be made available to PBS stations and cable systems. A second scenario would be to seek a large PBS station to produce the program and make the pre-produced video segments from the teleconference available to them.

#### Missing Children Program to Increase Understanding of Child Sexual Exploitation

A national teleconference could be produced that presented the results of the study. The results and recommendations of the study could be strongly illustrated through interviews with victims of child sexual exploitation, prosecutors, judges, law enforcement personnel and others. A shorter informational video tape and print materials could also be produced from the teleconference materials and distributed.

#### National Juvenile Court Data Archive

No apparent usage of telecommunications.

#### Planning of Second National Incidence Study of Missing, Abducted, Runaway and Thrownaway Children

No apparent usage of telecommunications unless there are key geographically diverse team members who would benefit from the increased communication provided by regularly scheduled audio conferences.

#### Prevention of Parent or Family Abduction of Children Through Early Identification of Risk Factors

A training video tape with accompanying print materials could be developed to train judges, attorneys, court social workers and other authorities on the early identification of at-risk parents and the development of prevention strategies and distributed by OJJDP.

Additionally, these materials could provide a basis for audio conference training that could be offered to professional organizations on a statewide or regional basis. Project staff could be available to lead groups through the materials, answer questions and conduct discussions using audio conferencing technology and techniques.

#### Program of Research on the Causes and Correlates of Juvenile Delinquency

Results of the study and related discussions could be presented in a national teleconference. Audioconferencing and audiographics could be utilized to present information and formulate discussion among small groups.

#### Testing Juvenile Detainees for Illegal Drug Use

A video tape, with accompanying print materials, could be developed that would illustrate the recommended intake procedure in a step-by-step process. Additionally, examples of intakes could be presented and the learner could be asked to identify what was appropriate and inappropriate about the examples. These materials would support classroom training.

This information could also be designed and packaged in a stand alone, self-paced interactive training package designed for usage by individual staff during short periods at work. Trainees would alternatively receive didactic information and exercises from a workbook and view illustrative examples of intake procedures as well as practice identifying appropriate and inappropriate intake procedures.

This training package could be made available to juvenile detention facilities for new employee training or as a refresher to more experienced staff and could help reduce time away from the job.

### *Special Emphasis Division*

#### Boot Camps for Juvenile Offenders

Using an audio and/or video telemeeting format, an on-going nationwide discussion could be implemented among all such programs.

#### CNBC National Anti-Drug Technical Assistance and Training

A motivational video tape could be produced targeting church organizations. The tape would explain the National Anti-Drug Campaign and how each church can become a part of the effort.

#### Community Anti-Drug Abuse Prevention Technical Assistance Voucher Program

Little apparent usage of telecommunications

#### Ida B. Wells Satellite Prep School

No suggestions for usage of telecommunications

#### Juvenile Corrections Industries Ventures

Little apparent usage of telecommunications

#### National Center for Missing and Exploited Children Resource Center

NCMEC could contract with the Law Enforcement Television Network (LETN) to periodically broadcast updated information concerning missing and exploited children to the law enforcement field.

#### Partnership Plan, Phases IV and V

Training, technical assistance and information sharing activities by the five regional CIS centers could be enhanced through regularly scheduled audio conferences with CIS state and local programs in their service region.

#### State Clearinghouse Technical Assistance

Under this area, a sophisticated technical assistance system built on audio and video distance meetings could be developed rather than the traditional on-site assistance format currently being utilized. Delivery could be to single or multiple sites depending on the situation.

#### Technical Assistance and Support to OJJDP

Regularly scheduled regional audio conferences could be scheduled from NYGIC to acquaint interested participants in the latest gang related information and allow participants to swap information and ideas.

## *State Relations and Assistance Division*

### Incarceration of Minorities Programs

This is a major issue within the juvenile justice profession and would be very applicable to the integration of technology-based delivery systems. For small meetings, audiographics would be the suggested format. For wide dispersion of information and ideas, a satellite teleconference would be recommended.

### Technical Assistance and Support to OJJDP to Ensure that States Comply with the Juvenile Justice Act

Regularly scheduled audio conferences could be used to improve communications between project staff and its constituents. State and local juvenile justice agencies, State Advisory Groups and others could be kept abreast of the latest information for improving detention practices, policies, facilities, alternative services and other issues. The audio conferences, with accompanying print materials, could also be used to highlight the "profiles" of especially effective juvenile programs, answer questions and promote the discussion of ideas and practices.

At the end of the year, the project could produce an informational video tape on one of the six "profile" juvenile justice programs that was deemed most worthy. If project staff desired, they could promote interest by sponsoring a contest where organizations that had participated in activities during the year could vote on the profile program that would be highlighted in the video tape. The video tape would be distributed to all interested agencies.

## *Training, Dissemination, and Technical Assistance Division*

### Juvenile and Family Court Training Project

The judiciary time is very precious and time away from court can have a serious impact on the entire juvenile justice system. This is an audience in need of real time at work information. Therefore, primary focus should be on audiotapes or linear video tapes with supporting information. If that option is not feasible and this is a long term training project, project staff could investigate what telecommunications resources are available at the University of Nevada-Reno and access those resources. If sufficient telecommunication resources are not available at the home university, they could seek other nearby universities, public television stations or organizations with which to partner.

Once facility and instructional development resources are secured, the project could offer training and information dissemination via satellite or audio conferencing.

### LRE-Five Grantees

Even though the *OJJDP Source Book* lists these projects as ending in 1993, it is assumed that OJJDP will continue to support LRE. One suggestion would be to use video tapes and printed Teacher's Guides to provide teachers with period long class programs on LRE. The programs could be used in other situations as well, such as in juvenile correctional facilities, and eventually could consist of a series of interactive, moderated video tapes that lead youths through an LRE curriculum.

The video tapes could present basic LRE concepts as well as vignettes that would be used to stimulate classroom discussions and exercises. These discussions and exercises would be facilitated by the teacher or by a visiting police officer, judge or other juvenile justice professional. Time could be allowed on the video tape for the exercises and discussions so the tape would not have to be stopped and started.

For example, a video tape could present the concept of alternate sentencing of juveniles, such as diversion programs, restitution, etc. After the class became acquainted with the concept, they could be shown a series of vignettes illustrating juvenile crimes and misdemeanors of varying degrees of seriousness. After each vignette, the video tape would go to a graphic and count down the time the group had to decide on the disposition of the youth in the vignette. The teacher or facilitator would be given instructions on facilitating each discussion in the printed Facilitator's Guide accompanying the video tape. At the end of each discussion time, the narrator of the video tape could summarize the reasonable options of each case.

EKU produced two such video tapes last year for the Kentucky Administrative Office of the Courts and they were very successful. One tape, whose subject was the rights of juveniles, illustrated the Gault case and used it as a basis for facilitated discussion. The tape then contrasted a similar case today in Kentucky and the children again discussed the differences.

The second tape presented the concept of Kentucky's Court Designated Worker and let the classes practice being CDWs by discussing and deciding the dispensation of three typical cases. Over 20,000 Kentucky school children participated in both programs and evaluations from teachers and youths were extremely high.

In addition, satellite teleconferences and audio conferences could be utilized for in-service training, technical assistance and to promote the flow of ideas among those involved with LRE.

#### National School Safety Center

The NSSC could conduct a survey to determine what satellite downlink facilities are available in schools. If it is found that a sufficient number of schools have access to downlinks, the NSSC could seek to partner with Pepperdine University or another organization to produce regularly scheduled teacher in-service teleconferences to the schools on subjects related to school safety. The in-service teleconferences would need to pick topics that had a high level of interest, be presented in a highly interactive design, and conducted at a time convenient to teachers. This in-service project would need to be guided by a standing Advisory Panel of teachers and managed by someone with experience in planning and coordinating satellite teleconferences.

#### Professional Development for Youth Workers

During the early phases of the project, staff could attempt to establish a satellite downlink network by surveying community-based youth-serving agencies to ascertain availability of satellite downlinks. In addition, OJJDP could provide lists of downlink sites from previous OJJDP sponsored teleconferences.

At the same time that a satellite network for community-based agencies is being established, project staff could be planning periodic satellite tele-training events that would supplement and enhance the developed training. Satellite tele-training could be used to precede and/or follow up face-to-face training so the face-to-face training is less time consuming and more effective. In this manner, four days of training might require the trainees to be out of town only two or three days. Several tele-training events could be conducted and included in the process evaluation.

Additionally, the use of national focus groups comprising members of the National Network of Runaway and Youth Services could be enhanced through carefully formatted audio conferences.

Realistically, this project is probably too far along to institute much of the aforementioned. Ideally, the use of telecommunications in a time-limited project should be planned from the beginning.

#### Project to Expand and Improve Juvenile Restitution Programs

Project staff could be provided assistance in ascertaining if telecommunications technology could improve the effectiveness of their training and technical assistance marketing plan as well as for the design and implementation of technology into the delivery system.

Additionally, "best practice" video tapes could assist with the stated goal of "describing innovative restitution program models or prototypes."

#### Technical Assistance to Juvenile Courts

Again, time is a premium within the judicial scene. Audio conferencing could be used by project staff to link juvenile courts that have similar needs and challenges so they could discuss ideas, strategies and solutions. Also, the audiotapes and linear video tape format with supporting materials could also be explored as a method of information dissemination.

#### Training and Technical Assistance for Juvenile Detention and Corrections

It should be noted that this grantee conducts a national teleconference series on literacy programs. If it has not already been done, evaluations of the teleconferences should be conducted as well as a needs assessment of the constituents being served.

Additionally, ACA might consider originating an informational teleconference from the National Juvenile Corrections and Detention Forum so other practitioners could increase their awareness of the issues being considered at the conference.

Finally, audio conferencing could increase the effectiveness of their training and technical assistance mission.

#### Training and Technical Assistance for Nonprofit Missing and Exploited Children's Organizations

The 1993 *OJJDP Source Book* reports that this project is in the curriculum and technical assistance planning phase so it is probably too late to provide for the usage of telecommunications technology. Similar projects in the future could probably benefit by the usage of satellite teleconferences, audio conferencing and/or video tapes.

#### Training in Cultural Differences for Law Enforcement and Juvenile Justice Officials

Video tapes could be utilized to illustrate best practices and to present situations that would stimulate discussion and analysis on the part of trainees.

## FTS2000: The Federal Government's Telecommunication System

As the world's largest private telephone system, the Federal Telecommunications System (FTS) serves more than one hundred government agencies throughout the United States and offshore territories. Although the original FTS network was state-of-the-art when introduced during the late 1960s, its analog transmission technology is now outdated and unable to deliver the service capabilities or transmission quality of a modern, digital fiber optic network.

Today the federal government is stepping into the future of telecommunications with FTS2000 - a government-wide network that utilizes the most advanced technology available to deliver a range of audio, data, and video communications services. With an Integrated Digital Network (IDN) already in place, the FTS focuses on adapting services and systems to specific requirements, rather than creating network solutions from scratch. This means government users can utilize advanced FTS2000 features very quickly, thus benefiting from reduced costs and increased flexibility with services and features. Another important advantage to government agency users is Sprint's ability to provide essentially all FTS2000 services and features without relying on an array of subcontractors. Subcontracting arrangements are essentially limited to the provision of some access facilities and all wideband (satellite teleconferencing) video services. With the absence of sub-contractors, Sprint can generally offer more cost effective rates than most other potential suppliers. Again, the exception would possibly be with satellite teleconferencing where costs would be reflective of other commercial suppliers. FTS2000 is a distinct network comprised of approximately 200 dedicated and shared facilities, sometimes referred to as Sprint Public Rooms, designed to deliver state-of-the-art performance and capabilities. The all digital, fiber-optic transmission FTS2000 network, with over 23,000 miles of fiber optic cable, is able to withstand power surges and plant failures such as cable cuts. In addition, it incorporates extensive performance monitoring and control systems that manage problems in real-time.

Sprint has contracted with the federal government to provide technology-based delivery systems to agencies within the system. Services may be utilized in a variety of capacities depending upon the need of the agency. The prices to lease these capacities is proportional to the amount of capacity required. For example, compressed digital videoconferencing requires much more capacity than audioconferencing. One of the primary benefits of the Sprint system is that it provides great flexibility of selecting different conference sites at different times. Furthermore, agencies are only required to pay for the actual time the system is being used.

## Overcoming Barriers and Impediments to Implementation

*The Difficulty lies not so much in Developing New Ideas as in Escaping from Old Ones.*

*-- John Maynard Keynes*

### Common Objections

Following are some common objections to the use of telecommunications technology and discussion concerning the way this proposal addresses those objections.

#### Telecommunications technology is too expensive.

Expense is a substantial factor in the utilization of distance telecommunications technology, but the strategy outlined in this report is a cautious one in relation to costs. Basically, this report's recommendations are to not invest in hardware and software in the more expensive satellite and two-way video teleconferencing and to invest slowly in less expensive audio conferencing and audiographics hardware/software. The cost for this can be justified by the increased communication to and among OJJDP constituents.

Satellite teleconferencing can be utilized immediately because there is an extensive national network of public downlink and uplink resources that can be leased on an ad hoc basis. OJJDP should be able to choose topics for satellite events that would have a relatively large number of participants. This would justify the cost when amortized over the larger numbers of participants reached.

Thus, cost is only half of the equation. The other aspect is: "How many juvenile justice professionals will be effectively served?"

#### Telecommunications technology is changing so rapidly that OJJDP should wait and see what happens.

The point is, when will the technology not be changing rapidly? In order to reap the benefits of telecommunications technology, OJJDP needs to begin somewhere. The strategy of this report is for OJJDP to begin slowly with well-established technologies so as to minimize costs and to allow lessons to be learned and mistakes to be made in a growth process.

The skills and lessons learned will be transferrable to the newer technologies as they become more cost effective and OJJDP becomes more knowledgeable in its usage. OJJDP and juvenile justice professionals should also learn new uses for distance technology as they become familiar with its usage. Finally, OJJDP, with its resources and national constituency, is the logical choice to take the lead in the utilization of telecommunications technology in the juvenile justice field.

#### Juvenile justice professionals will not accept this new technology.

While there will always be some resistance to any change, juvenile justice professionals seem remarkably open to using telecommunications technology for training and information dissemination. This project's Expert Panel, OJJDP Needs Assessment and the pilot demonstration teleconference evaluations all indicated a general willingness in the field to utilize the technology.

There appears to be a large need for more training and information among juvenile justice professionals and a willingness to give telecommunications technology a chance to help fill that need. Eighty percent of the respondents to the "Conditions of Confinement" teleconference found the event either "useful" or "very useful" and only three percent indicated that they would not be willing to participate in another one.

By utilizing telecommunications technology, OJJDP will be sacrificing human interaction and networking.

It should be stressed that telecommunications technology does not replace or eliminate human interaction but rather supplements it by increasing the flow of information. There will still be a need for conferences, workshops and face-to-face meetings but telecommunications technology can supplement what already exists to provide more training, information dissemination and meetings to more people in a cost effective manner.

Indeed, it is not inconceivable that, as the field utilizes telecommunications more and more, that networking at the local level might increase as professionals gather to participate in teleconferences and audio conferences. Finally, direct human interaction can take place through facilitated exercises and discussions at each site.

**Telecommunications technology is not as effective as face-to-face interaction.**

There are numerous studies that indicate that training via distance technology can be just as effective as face-to-face training, particularly if the learners are motivated to learn and if the instructional design involves the learner. As mentioned earlier, there are many juvenile justice professionals who are hungry for training and information that they can use and are willing to utilize telecommunications technology if it will help them meet their needs.

Appropriate instructional design is a strong weapon for increasing the effectiveness of distance learning. Depending on the level of learning that needs to take place, print materials, graphics, pre-produced video segments, question-and-answer segments and local discussion and exercises can all be utilized to increase participant learning and involvement. The high degree of planning that is required for distance learning improves the possibility that effective design and learning will take place.

Telecommunications can also improve the effectiveness of meetings and other information sharing and planning events. It's usage does not mean that project members will not need to meet face-to-face, but rather that communication between those meetings is enhanced through technology.

For example, audio conferencing and/or audiographics can be utilized as a supplement for scheduled face-to-face meetings, both before and after those meetings. Audio conferences before a face-to-face meeting could improve the planning for the meeting and/or handle some agenda items in order to free up time at the other meeting. Audio conferences after a face-to-face meeting could improve the quality of follow-up activities that had been planned at the meeting.

Members of projects who are geographically diverse can improve planning and information flow through regularly scheduled audio conferences. Again, these distance meetings need agendas and protocols to follow in order to be effective, but the improved information flow should be worth the effort.

## Conclusion

Research and anecdotal literature abound testifying to the effectiveness of telecommunications technology. Costs are receding and there is now a wide range of technologies offering a spectrum of advantages and benefits. OJJDP is to be commended for its efforts in investigating telecommunications technology in order to increase its services to the juvenile justice field. Without question, OJJDP should initiate the integration of telecommunication technology. Throughout this report, the reader has been provided with discussion and information on how technology-based delivery systems enable more practitioners and line staff to have greater access to training; enable the maximization of monies by reduced travel expenses and increased personnel productivity.

The recommendations included in this report are intended to cautiously allow OJJDP to provide more information and training services to the juvenile justice field without jeopardizing scarce resources and alienating staff and practitioners. It is not anticipated that the path will necessarily be a smooth one, but rather that a process of gradual, steady increase in technology usage will be instituted that will allow for mistakes in order to learn and grow.

Finally, one unexpected benefit to distance technology is that all training and teaching by those involved improves. Project staff repeatedly hear professors at ECU speak on how their face-to-face teaching has improved since they began teaching by satellite. Skills learned in utilizing visuals and in involving students, for example, are certainly transferrable to face-to-face teaching. Project staff submit this report with the hope that OJJDP will become an even greater catalyst in improving the overall training and flow of information in the juvenile justice field.

## BIBLIOGRAPHY

- Barker, B. O. (1989). Distance education technologies: All that glitters is not gold. Paper presented at the 2nd Annual Meeting of the Decisions about Technology Conference, Bismarck, ND. (ERIC Documentation Reproduction Service ED 309 894)
- CAE-Link Corporation. (1991). Bureau of prison's training technology report. Prepared under contract to U. S. Office of Personnel Management, Office of Training and Development, Contract No. OPM-87-9002/WO6002-044. (Obtained from Instructional Systems Design, Aurora, CO)
- Chute, A. G., Balthazar, L. B. & Poston, C. O. (1988). Learning from teletraining. In The American Journal of Distance Education. Vol. 2 No. 3.
- Chute, Alan G. and Elfrank, James D. (1990). Teletraining: Needs, solutions and benefits. Paper published in International Teleconferencing Association 1990 Yearbook.
- Chute, A. G., Hancock, B. W., & Balthazar, L. B. (1991). Distance education futures: Information needs and technology options. In Performance and instruction (pp. 1-6).
- Coy, Peter. (1991). How do you build an information highway? In Business Week (p. 108).
- Coy, Peter. (1991). Why the highway won't reach home just yet. In Business Week (p. 112).
- Fiber-optic applications. (1990). In Editorial Research Reports (pp. 18-26).
- Garvin-Kester, Barbara and Chute, A. G. (1991). Student response systems improve teletraining. In International Teleconference Association Yearbook.
- Gilroy, Kathleen. (1992). Bridging videoconferencing to the desktop. In Teleconferencing News. September/October.
- Howes, Karen. (1993). Cover story: Teleports - satellites, fiber and compression. In Via Satellite. August (pp. 26-34).
- Jatcko, Tony. (1991). The state of the industry. In Teleconference. Volume 10, No. 6.
- Jones, J. I. & Simonson, M. (1993). Distance education: A cost analysis. Paper presented at the Annual Convention of the Association for Educational Communications and Technology, New Orleans, LA. (Obtained from the Research Institute for Studies in Education, College of Education, Iowa State University of Science and Technology)
- Jordan, Ruth. (1992). The new telecommunications technology. In Future Choices Toward a National Youth Policy (pp. 58-59).
- Kupfer, Andrew. (1993). Communications: The race to rewire. In Fortune Magazine (pp. 43-61) April 19 edition.

- Ostendorf, Virginia A. (1989). Teaching through interactive television. Virginia A. Ostendorf, Inc.
- Sheridan, D. (1992). Off the road again: Training through teleconferencing. In Training (pp. 63-68).
- Svenning, L. L. & Ruchinskas, J. E. (1986). Decision factors: Why people choose to video conference. In Teleconferencing and electronic communications V: Applications, technologies and human factors. (pp. 258-266).
- Turnbull, A. J. (1988). Distance education--The trend setter. In D. Stewart & J. S. Daniel (Eds.), Developing distance education (pp. 429-431). Paper submitted to the World Conference of the International Council for Distance Education, Oslo, Norway. (ERIC Document Reproduction Service No. ED 320 544)
- U. S. Congress, Office of Technology Assessment. (1989). Linking for learning: A new course for education. (OTA-SET-430). Washington, DC: U. S. Government Printing Office. (ERIC Document Reproduction Service No. ED 310 765)
- Venditto, Gus. (1992). Fiber-optic phone system faces a long road. In PC Magazine (p. 30).
- Zigerell, J. (1984). Distance education: An information age approach to adult education. Columbus, OH: ERIC Clearinghouse on Adult, Career, and Vocational Education, National Institute of Education. (ERIC Document Reproduction Service No. ED 246 311)

# APPENDIX

Appendix A -- Blooms Taxonomy

Appendix B -- Teleconference Evaluation Form

Appendix C -- Expert Panel

## APPENDIX A -- BLOOMS TAXONOMY

TAXONOMY OF EDUCATIONAL TRAINING OBJECTIVES

# BLOOM'S TAXONOMY

1. **KNOWLEDGE (Recall):** Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.

Illustrative Behavioral Terms: Know, define, memorize, repeat, record, list, recall, name, relate.

2. **COMPREHENSION (Understand):** Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.

Illustrative Behavioral Terms: Restate, discuss, describe, recognize, explain, tell, express, identify, locate, report, review.

3. **APPLICATION (use):** Application refers to the ability to use learned material in new and concrete situation. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.

Illustrative Behavioral Terms: Translate, interpret, apply, employ, use, dramatize, demonstrate, practice, illustrate, operate, schedule, shop, sketch.

4. **ANALYSIS (Take apart):** Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.

Illustrative Behavioral Terms: Distinguish, analyze, differentiate, appraise, calculate, experiment, test, compare, contrast, diagram, inspect, debate, inventory, question, relate, solve, examine, criticize.

5. **SYNTHESIS (Create new):** Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behavior, with major emphasis on the formulation of new patterns or structures.

Illustrative Behavioral Terms: Compose, plan, propose, design, formulate, arrange, assemble, prepare, collect, construct, design, create, set up, organize, manage.

6. **EVALUATION (Judge- Why or Why Not?):** Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. The student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.

Illustrative Behavioral Terms: Judge, appraise, evaluate, rate, value, measure, revise, score, select, choose, assess, estimate.

## TAXONOMY OF EDUCATIONAL/TRAINING OBJECTIVES

Level	Educational/ Training Objective	Description
<u>Highest</u>	<u>Evaluation</u>	Trainee can make judgements based on criteria either self-determined or from an external source. Can recognize logical fallacies in arguments and evaluate ultimate usefulness and effectiveness. Example: The Correctional Officer is able to evaluate the effectiveness of institutional roles.
	<u>Synthesis</u>	Trainee can put together elements to form a whole. Can produce a plan, a proposed set of operations, or a unit of training curriculum. Can formulate innovative solutions to problems. example: The Correctional Officer can develop institutional rules based on policies or principles of operation.
	<u>Analysis</u>	Trainee can break down the whole and identify the elements, can understand the relationships among elements, and can break down information to show its structure or principles. Can recognize the general principles. Example: The Correctional Officer can recognize the underlying principles of the institutional rules.
	<u>Application</u>	Trainee is able to abstract information to concrete situations. Can apply technical principles, ideas, and theories to other situations. Can predict probable effect of a change in a variable. Example: The Correctional Officer can apply institutional rules to a specific situation.
	<u>Comprehensive</u>	Lowest level of understanding. Trainee knows what is communicated and can make use of information without necessarily relating it to other material or seeing its fullest implications. Example: Institutional rules are understood by a Correctional Officer.
<u>Lowest</u>	<u>Knowledge</u>	Memorization of information, such as terminology, facts, trends, theories, strategies, and processes. Involves little more than remembering information. Example: A Correctional Officer remembers/can recite the rules of an institution.

\*\*\*\*\*  
 Note: This is a hierarchial chart, with the lowest cognitive processing being knowledge and the highest cognitive processing being evaluation. Training programs should strive for the highest level of cognitive processing appropriate.  
 \*\*\*\*\*

It is important to know that each level of educational/training objectives subsumes the preceding level. In other words, Application would also include the two lower-level objectives of Comprehension and Knowledge. Therefore, when a particular level is indicated for a strategy used by the Academy, it means that all preceding lower levels of cognitive processing are included.

# DEVELOPING TRAINING OUTCOMES

LEARNING  
TASKS

OUTCOME  
STATEMENTS

BLOOM'S  
TAXAMONY

VALUES/ATTITUDES

*Evaluation*

PROCESS

*Synthesis*

*Analysis*

SKILLS

*Application*

CONTENT/  
INFORMATION

*Comprehension*

*Knowledge/  
Awareness*

**APPENDIX B -- TELECONFERENCE EVALUATION FORM**

**OJJDP NATIONAL TELECONFERENCE  
on CONDITIONS OF CONFINEMENT  
EVALUATION FORM**

Please take a few minutes to provide feedback about the teleconference. Circle the number that most closely represents your opinion, with "1" being "Not Useful" and "5" being "Very Useful". Thank you!!

NOT USEFUL		SOMEWHAT USEFUL		VERY USEFUL
1	2	3	4	5

*(Circle your Choice.)*

1. I found the information and ideas in the teleconference useful. 1 2 3 4 5
2. I found the format of the teleconference to be effective for delivering information and for the exchange of ideas. 1 2 3 4 5
3. I found the use of satellite technology to be an effective medium for information dissemination. 1 2 3 4 5
4. I found the call-in segments an effective exchange of ideas. 1 2 3 4 5
5. I found the post-teleconference discussion an effective exchange of ideas. 1 2 3 4 5
6. I think that a video teleconference is an effective medium to deliver information. 1 2 3 4 5
7. How do you rate this teleconference? 1 2 3 4 5
8. Do you have any specific suggestions for improving future teleconferences?  
\_\_\_\_\_
9. Would you be willing to participate in future OJJDP teleconferences? \_\_\_\_\_
10. Please suggest topics for future OJJDP teleconferences: \_\_\_\_\_

*Please return evaluation form to your Facilitator or to:*  
**Training Resource Center  
 Eastern Kentucky University  
 Perkins 217  
 Richmond, KY 40475**

## APPENDIX C -- EXPERT PANEL

## **Expert Panel Meeting and Discussion**

The Expert Panel discussed four major topics during the meeting. These included the needs of the juvenile justice field, potential topics and audiences for a pilot demonstration of telecommunication technology, the acceptance of telecommunication technologies to the juvenile justice field, and technology selection factors.

The needs of the juvenile justice field as identified by the Expert Panel can be summarized by the word "more" - more training, more information dissemination, more collaboration, more training accountability, and the establishment of a national agenda. There was a general consensus among panel members that distance technology could assist the field in meeting many of these needs. Resistance to change, the absence of some of the elements of face-to-face training, accessibility and quality of product were some of the reservations expressed. Mr. Louis Bransford and Dr. Virginia Ostendorf made the observations that audio conferencing and audiographics were the least costly technologies, satellite teleconferencing is the most used, and two-way compressed video is the most costly and limiting in number of sites.

### **Members of the Expert Panel included:**

Robert Baughman, Executive Director  
Coalition for Juvenile Justice

Linda Bender, Director  
Statistical Analysis Center  
Center for Juvenile Justice and Training Research  
Shippensburg University

Larry Bleck, Vocational Specialist and Accrediation Manager  
New York State Division of Youth

Louis Bransford, President  
Public Service Telecommunications Corporation

Bebs Chorak, Director for Juvenile Justice  
National Institute for Citizen Education in the Law (NICEL)

Gwen Chunn, Director  
North Carolina Division of Youth Services

Earl Dunlap, Executive Director  
National Juvenile Detention Association

Jack Greene, Director  
Training and Contracts  
American Correctional Association

Martha Kilbourn, Assistant Director  
Judicial College, The Supreme Court of Ohio

Virginia Ostendorf, President  
Virginia A. Ostendorf, Inc.

John J. Sheridan, Administrator  
New Hampshire Bureau of Residential Services

## BIBLIOGRAPHY

- Barker, B. O. (1989). Distance education technologies: All that glitters is not gold. Paper presented at the 2nd Annual Meeting of the Decisions about Technology Conference, Bismarck, ND. (ERIC Documentation Reproduction Service ED 309 894)
- CAE-Link Corporation. (1991). Bureau of prison's training technology report. Prepared under contract to U. S. Office of Personnel Management, Office of Training and Development, Contract No. OPM-87-9002/WO6002-024. (Obtained from Instructional Systems Design, Aurora, CO)
- Chute, A. G., Balthazar, L. B. & Poston, C. O. (1988). Learning from teletraining. In The American Journal of Distance Education. Vol. 2 No. 3.
- Chute, Alan G. and Elfrank, James D. (1990). Teletraining: Needs, solutions and benefits. Paper published in International Teleconferencing Association 1990 Yearbook.
- Chute, A. G., Hancock, B. W., & Balthazar, L. B. (1991). Distance education futures: Information needs and technology options. In Performance and instruction (pp. 1-6).
- Coy, Peter. (1991). How do you build an information highway? In Business Week (p. 108).
- Coy, Peter. (1991). Why the highway won't reach home just yet. In Business Week (p. 112).
- Fiber-optic applications. (1990). In Editorial Research Reports (pp. 18-26).
- Garvin-Kester, Barbara and Chute, A. G. (1991). Student response systems improve teletraining. In International Teleconference Association Yearbook.
- Gilroy, Kathleen. (1992). Bridging videoconferencing to the desktop. In Teleconferencing News. September/October.
- Howes, Karen. (1993). Cover story: Teleports - satellites, fiber and compression. In Via Satellite. August (pp. 26-34).
- Jatcko, Tony. (1991). The state of the industry. In Teleconference. Volume 10, No. 6.
- Jones, J. I. & Simonson, M. (1993). Distance education: A cost analysis. Paper presented at the Annual Convention of the Association for Educational Communications and Technology, New Orleans, LA. (Obtained from the Research Institute for Studies in Education, College of Education, Iowa State University of Science and Technology)
- Jordan, Ruth. (1992). The new telecommunications technology. In Future Choices Toward a National Youth Policy (pp. 58-59).
- Kupfer, Andrew. (1993). Communications: The race to rewire. In Fortune Magazine (pp. 43-61) April 19 edition.

Eastern Kentucky University  
Training Resource Center  
449 Stratton Building  
Richmond, Kentucky 40475-3127

(606) 622-2326