Interactive, satellite-delivered, televised instruction in corporate training

by

Douglas F. Lonowski

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CHAPTER I. INTRODUCTION

This chapter serves as an introduction to this study of the use of satellite-delivered, televised instruction for distance education and training in American business and industry. It consists of six sections: 1) A brief literature review to provide background information about distance learning and the diffusion of innovations, 2) a statement of the problem, 3) a statement of the purpose of the study, 4) the research questions, 5) definitions of terms, and 6) a chapter summary.

Education and training of employees has become a major concern of business and industry in America. Because of the rapid changes in technologies being used by business, and the large numbers of personnel who were educated and trained years ago, businesses are faced with the task of retraining their employees. Employee training and retraining are important concerns, and will continue to be important as long as new technologies continue to be developed and used by American businesses and industries (Weatherall, 1988).

According to a 1985 report by the Carnegie Foundation for the Advancement of Teaching, American corporations are increasingly committed to education in the workplace. The Foundation reported that U.S. companies were training and educating nearly 8 million people--nearly as many as U.S. four-year college and universities. Another estimate put that figure four times higher, at 36.5 million people in 1986 (Gordon, 1986), almost 31 percent of the total civilian labor force. Yet another study revealed that in 1985, training executives indicated that on the average 38 percent of their work forces participated in some form of training ("Employee Training," 1986).

One of the primary impediments to such wide-scale training appears to be cost (Lusterman, 1985; Weatherall, 1988). Costs of personnel training include, but are not limited to, wages while in training, lost work, course fees, trainer fees, transportation,

lodging, and subsistence. Because of the constantly changing skills required of employees, and the costs of traditional methods of training, businesses must strive to find new ways to maintain a skilled and educated work force in order to achieve the high productivity they require. Thus educators are pursuing alternatives to traditional methods of instruction--alternatives that enable them to deliver the quality courses they need, and to do so in a cost-effective manner.

A simple method for reducing training costs is to bring the course to the trainees, rather than sending the trainees to the course. In doing so, travel and subsistence expenses are saved for employees. But those expenses incurred for the trainers can still be considerable. One way to eliminate the travel and subsistence costs for trainers is to use technology to deliver the trainer to the trainees without physically bringing the trainer (Weatherall, 1988).

Background

Distance education

The phrase "distance education" describes a type of instruction in which the student and the instructor are in different locations, and the instruction is delivered via some form of communication delivery system. Although the term has become widely accepted in that it encompasses a concept broader than "correspondence study," there are diverse opinions regarding its precise meaning and scope (Garrison, 1989). In 1973, Moore defined distance education as

> the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices (p. 664).

In 1986, Barker defined distance learning as the "transmission of a master teacher's lesson from a host site to previously identified reception sites simultaneously by means of telecommunications" (p. 4). According to Batey and Cowell (1986), the definition of distance education is a set of three elements:

1. Communication between the teacher and the students is not face-to-face.
2. An organization plans, coordinates, and supervises the program.
3. A technology based delivery system often is used (but is not required). (p. 2)

Although these definitions include fundamental concepts like separation of teacher and learner, and use of communications technologies, they fail to include some elements that others have seen as necessary. Keegan (1986), after an extensive review of the literature and reexamination of his own and other definitions, defined distance education as a form of education consisting of five interdependent elements:

- the quasi-permanent separation of teacher and learner throughout the length of the learning process; this distinguishes it from conventional face-to-face education.
- the influence of an educational organisation both in the planning and preparation of learning materials and in the provision of student support services; this distinguishes it from private study and teach-yourself programmes.
- the use of technical media; print, audio, video or computer, to unite teacher and learner and carry the content of the course.
- the provision of two-way communication so that the student may benefit from or even initiate dialogue; this distinguishes it from other uses of technology in education.
- the quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and not in

> groups, with the possibility of occasional meetings for both didactic and socialisation purposes. (p. 49)

Keegan also stated that distance education often is confused with educational technology. The use of two-way communication, included in his definition of distance education, designates a key difference between the two. For example, the use of broadcasting in schools would not be considered distance education by this definition. Rather, it would be a use of *educational technology* lending support to the classroom instruction (1986).

The reason behind the differences in these definitions may be that a definition must be precise, and precision does not lend itself to new ideas, perspectives, or approaches (Garrison, 1989). In view of this limitation, Garrison and Shale (1987) prefer to use a minimum set of criteria on which to judge the process of distance education:

1. Distance education implies that the majority of educational communication between (among) teacher and student(s) occurs noncontiguously.
2. Distance education must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process.
3. Distance education uses technology to mediate the necessary two-way communication. (p. 11)

With this approach, according to Garrison and Shale (1987), the criteria serve as a basis for comparison. A particular case need not be totally congruent with the criteria to be classified as falling within the concept. Using the criteria one may observe the extent to which a particular practice approaches the ideal of distance education, regardless of the medium used.

Today's educators have the opportunity to choose from a wide variety of instructional delivery methods for distance education. Whereas in the past, educating over distances involved instructional delivery methods like the traditional correspondence course, one-way televised instruction, and videotaped lessons, modern definitions of distance learning include the use of telecommunications technologies like audioteleconferencing, computerteleconferencing, and satellite-delivered videoteleconferencing.

Batey and Cowell (1986) noted six benefits that distance education can provide to education. Though discussing K-12 education, the six are similar to benefits provided by distance education to business:

- Provides equity and increase quality of educational opportunity.
- Provides access to content experts or role models not available in the local business or community.
- Provides interaction and joint activities with personnel in remote plants or offices.
- Provides increased access to information and instructional resources.
- Provides opportunities for staff development and inservice training.
- Promotes increased work/community linkages.

Advances in instructional/communication technologies in recent years have changed the look of distance education considerably. Historically, the primary means of communication between teachers and learners separated by space and time has been through the written word. During the 1940s and 50s, radio became an instructional delivery medium. In the sixties, educators began to experiment with televised instruction. In the 1970s and 80s, a variety of communication technologies, including videotaped lessons, audioteleconferencing, computerteleconferencing, and satellite-delivered videoteleconferencing were introduced. "Clearly the most important and visible change [in distance education] has been the emergence of new communications technology" (Garrison,

1989). Looking into the coming decade, Moore (1988) predicted that "the 1990's will be the era in which we see the development, application, and promotion for education of the teleconferencing media. These include the already long established but still underutilized medium of audioconferencing, the relatively new medium of computer conferencing, and, most importantly, the application of videoteleconferencing delivered by satellite" (p. 1).

The phrase "*Interactive* distance learning" implies immediate and direct communication between the instructor and the learners. The interactivity of distance education depends on the type and number of delivery technologies chosen for the instruction (Batey and Cowell, 1986). The most interactive type of distance instruction uses live two-way video and audio communication, and is often provided by satellite technology. Such instruction is referred to as interactive, satellite-delivered, televised instruction.

The focus of this study is on the use by business of interactive, televised instruction using communications satellites. Although many forms of technology are being used to provide distance learning, businesses are increasingly using live, interactive, televised instruction transmitted by satellite (Black, 1984; Moore, 1988; Rumble, 1986). Such instruction includes both two-way audio and one or two-way video. This type of interactive, instructional delivery provides audio and video transmission of the instructor, and allows immediate student feedback by telephone or satellite.

Diffusion of innovation.

The use of satellite technology for the delivery of interactive, televised, distance instruction is relatively new, and its use in business and industry continues to expand. Research on the acceptance and use of such new technologies tends to support Rogers' diffusion of innovation theory (1983).

The theory holds that an innovation will diffuse more rapidly through a user group if it is perceived to have the following characteristics: 1) a relative advantage over what it is replacing; 2) compatibility with the user's existing values, past experiences, and current needs; 3) ease of use; 4) ability to be examined on a trial basis; and 5) easily observable results.

Rogers claimed that *innovators*, representing just 2.5 percent of the total market, are the leaders in adopting new technologies. Innovators are almost obsessive about trying new ideas. They are able to handle possible financial losses, and able to cope with the uncertainty inherent to innovations. The next group to adopt, comprising 13.5 percent of the market, are known as the *early adopters*. The early adopters are a more integrated part of society, and are opinion leaders. Potential adopters seek the opinions and advice of the early adopters. These two groups are followed by the *early majority*, who make up 34 percent of the market. The early majority are slightly ahead of the average member of society in adopting innovations, relying on their peers' opinions about new technologies. They are perfectly willing to adopt innovations, but seldom lead the way. The remaining groups are the *late majority* (34 percent) and the *laggards* (16 percent). The late majority could be described as skeptical; they adopt new ideas later than most people. They approach innovations with caution, and must be certain that innovations are safe to adopt before spending relatively scarce financial resources. Laggards are the last to adopt a new idea. Their decisions regarding new ideas are based on past experiences. And by the time laggards adopt an innovation, innovators may already be using its successor (1983).

Much of innovation diffusion theory is concerned with the diffusion of innovations to *individuals*. This study, however, is concerned with the diffusion of innovations to *organizations*, specifically American businesses and industries. In previous research, there has been a tendency to simply transfer innovation diffusion models and methods developed

for individuals to the study of organizations, often without consideration of their differences (Eveland, 1979). According to Rogers (1983), organizations are made up of groups of individuals, and groups make decisions differently than individuals. Thus, the decision-making process leading to the adoption or rejection of an innovation is different for organizations than for individuals. This subject will be discussed more fully in Chapter 2, Review of the Literature.

The use of satellite technology for the delivery of instruction is relatively new, and continues to see increased application in business and industry (Black, 1984; Moore, 1988; Rumble, 1986). This study was designed to provide some insight into the factors that influence companies' decisions to adopt satellite delivered instruction.

Statement of the Problem

In the last decade, the technologies used in most large U.S. corporations have changed significantly. "Rapid technological change and the adoption by many companies of new strategies--in response to heightened global competition, deregulation, and other changes in the business environment--have imposed new skills and knowledge [requirements upon personnel]" (Lusterman, 1985, p. v). In order to gain these new skills and knowledge, more employees than ever before are involved in formal training. In 1985, training executives reported that 38 percent of their work forces participated in some form of training ("Employee Training," 1986). Even during difficult economic times, when many departments were forced to reduce staff, many companies were reported to have increased the number of professionals involved in training (Lusterman, 1985).

Along with this increased interest or need for employee training has evolved an increase in the use of new technologies for training. Many new technologies, including computer-aided instruction, teleconferencing, interactive video, and satellite broadcasting,

have made their way into the corporate training environment (Rumble, 1986). One of the most recent innovations, satellite broadcasting, began to be used in corporate training in the early 1980's.

Research, however, has not always kept up with the introduction of new technologies into the corporate training environment. A review of the literature found little data to show the level of diffusion of such new technologies, or why one medium is chosen over another. Indeed, there is very little reliable data about the state of employee training in the United States, ("Employee Training," 1986; Saari, Johnson, McLaughlin, & Zimmerle, 1988). This study concentrated on providing such information regarding the use of interactive, satellite-delivered, televised instruction for training in U.S. business and industry.

It is apparent that the use of new information technologies in business has grown considerably in the last decade, and the body of literature on these uses continues to expand. However, a review of the literature found little that documented the uses of interactive, satellite-delivered instruction in corporate training or the factors that influence companies decisions to adopt this use of satellite technology, and no data were found to show its current stage of diffusion.

Purpose of the Study

The purpose of the present study was to survey a carefully selected sample of corporate training developers in U.S. corporations to ascertain the extent to which satellite-delivered instruction was used, how satellite-delivered instruction was used, and what factors influenced the organization's decisions to use this technology. Further, this study helped identify areas where rigorous statistical research might be appropriate.

Research Questions

1. What are the demographic characteristics of the respondents?
2. What are the characteristics of the companies represented by the respondents?
3. What types of instructional delivery systems do the companies use for employee training?
4. For what types of activities do the companies use satellite delivery?
5. What factors influence the companies' decisions to use interactive, satellite-delivered, televised instruction?
6. What are the major problems or obstacles a corporate training developer encounters when developing and implementing satellite-delivered, televised instruction?
7. How do corporate training developers developers obtain in-depth information about satellite-delivered, televised instruction?
8. Who is responsible for making decisions regarding the use of a particular delivery system for training?
9. When developing instruction, when does the corporate training developer decide which medium/delivery system to use?

Definition of Terms

Corporate Training

Corporate training refers to instruction provided to personnel in business and industrial settings by their employer. This training is usually designed to teach employees a specific skill or procedure that is directly related to their job requirements.

Corporate Training Developers

Corporate training developers are those individuals in business or industrial settings who are responsible for planning, developing, managing, and/or implementing personnel training programs.

Diffusion

Diffusion refers to the degree to which members of a social system, individuals or organizations, have adopted an innovation.

Innovation

An innovation is an idea, practice, or object that is perceived as new by an individual or organization.

Satellite-delivered, Televised Instruction

Satellite-delivered, televised instruction refers to the use of satellite technologies for the delivery of instruction. Such instruction includes the transmission of both two-way audio and one or two-way video. This type of interactive instructional delivery provides video and audio transmission of the instructor, and allows immediate student feedback by telephone or satellite.

Summary

Rapid changes in business and industry have imposed a need for employees to gain new skills and knowledge (Lusterman, 1985; Weatherall, 1988). Because of this, businesses are continually faced with the often costly and time consuming task of retraining their employees (Weatherall, 1988).

It is not surprising, then, that alternatives to the traditional face-to-face classroom are being sought to enable management to deliver high quality courses in what is perceived as a cost-effective manner. One way to do so is to use technology to bring the trainer's expertise to the training site without bringing the actual person (Weatherall, 1988). This type of instruction is called distance education. Though there are many approaches to distance education, *interactive* distance education implies immediate and direct communication between the instructor and the learners (Batey and Cowell, 1986). The new electronic communication technologies have made it possible for education at a distance to remain interactive, yet be more cost efficient than traditional teaching methods.

Businesses are increasingly using live, interactive teleconferencing media for the delivery of instruction (Black, 1984; Moore, 1988; Rumble, 1986). This instruction includes both two-way audio and one or two-way video which provides for audio and video transmission of the instructor, and allows immediate student feedback by telephone or satellite.

Along with the growing need for employee training, there has evolved an increase in the use of new technologies for training. Research on the acceptance and use of new technologies tends to support the premises of Rogers' diffusion of innovation theory (1983). This study was designed to provide some insight into the factors that influence companies' decisions to adopt satellite technology for the delivery of instruction.

The focus of this study was interactive, televised instruction delivered by satellite. It was designed to ascertain the extent to which satellite-delivered instruction was used, in what ways satellite-delivered instruction was used, and what factors influenced the organization's decisions to use satellite-delivered instruction.

CHAPTER II. LITERATURE REVIEW

The purpose of the present study was to survey a sample of corporate training developers in U.S. corporations to ascertain the extent to which satellite-delivered instruction was used, how satellite-delivered instruction was used, and what factors influenced the organization's decisions to use satellite-delivered instruction. This chapter addresses the key areas of concern in this study and investigates prior research about each topic. This literature review is organized into the following four categories: 1) the diffusion of innovations among individuals and within organizations, 2) instructional technology in corporate training, 3) satellite-delivered instruction in corporate training, and 4) factors that influence the adoption of satellite-delivered, televised instruction.

The Diffusion of Innovations

"Diffusion is the process by which innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas" (Rogers, 1983, p. 5). The four main elements contained in this definition are the innovation, communication channels, time, and the social system.

According to Rogers (1983), "An *innovation* is an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 11). Rogers claimed that an innovation would diffuse more rapidly through a user group if it was perceived to have the following characteristics: 1) a relative advantage over what it is replacing; 2) compatibility with the user's existing values, past experiences, and current needs; 3) ease of use; 4) ability to be examined on a trial basis; and 5) easily observable results.

A *communication channel* is the means by which messages are exchanged between individuals. People create and share ideas with one another through some form of communication channel. Types of communication channels include mass media channels and interpersonal channels. Mass media channels, such as radio, television, and newspapers, are a fast, efficient means of informing a large group of potential adopters about an innovation. Interpersonal channels involve face-to-face communication between two or more people, and may be more effective than mass media for persuading individuals to adopt new or reject a new idea.

Time is involved in the diffusion process in three ways. First, time passes between when an individual is first aware of an innovation until the individual adopts or rejects the innovation. Second is the relative earliness or lateness of the innovation's adoption by an individual relative to the other members of the social system. And third, is the rate of adoption, or relative speed with which an innovation is adopted by members of a social system. This rate is measured by the length of time it takes for a certain percentage of the members of a system to adopt an innovation. There are different rates of adoption of innovations among different social systems.

The *social system* is defined by Rogers as "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organizations, and/or subsystems" (Rogers, 1983, p. 24). The system being observed in a diffusion study may be elementary school teachers in Minnesota, Native Americans in South Dakota, or all the consumers in North America.

Each of the four elements contained in Rogers' definition of diffusion played a part in the present study. The *innovation*, in this case, was the idea and practice of using satellite communications for the delivery of live, interactive, televised instruction in corporate

training. *Time* was involved in two ways: 1) the relative earliness or lateness of the innovation's adoption by an individual relative to the other members of the social system; and 2) the rate of adoption of the innovation (Rogers, 1983). The *social system* consisted of corporate training developers who have some knowledge of or experience with interactive, satellite technologies within their corporations. And this study, in part, sought to gain information about the remaining element, *communication channels*, that is, the means by which this innovative idea has spread among corporate training developers.

Individuals and the diffusion of innovations

Within a social system are several types of people. Individuals are grouped according to their role in the diffusion process. Rogers (1983) discusses the roles of these groups: the change agent, the opinion leader, change agent aide, and the clients.

Change agents are professionals who serve the interests of an outside change agency trying to influence the innovation decisions of members of a social system. An example of a change agent would be a district sales representative of a computer company seeking to promote the adoption of a new line of computers in a Midwestern state. The high level of professional or technical training and social status of change agents, however, often means that they have little in common with their typical clients, and have difficulty communicating with them directly. Because change agents have little immediate influence inside a social system, they often use local *opinion leaders* to help promote or inhibit diffusion.

Opinion leaders are individuals with influence and respect in a social system. Their interpersonal communication networks allow them to diffuse innovative ideas, and their innovative behavior serves as a model for other members of the community. Following the previous example, the members of a town's city council are often considered to be opinion leaders. A council member who saw value in the use of a new computer would help the

efforts of the district sales representative by diffusing information about the innovation and influencing the opinions and actions of others.

Often the change agent and the opinion leader have little in common and the changes proposed by the change agent appear somewhat threatening. *Change-agent aides* are less professional agents who work for a change agency, contacting clients to influence their innovation decisions. The aide has more in common with the members of a social system and is therefore less threatening to the opinion leaders and more effective in diffusing innovative ideas to them (Rogers, 1983). Continuing the above example, the change agent aide might be a local computer retailer, who might convince the city council member to try the new computer in her office for a month.

Innovations, then, do not simply diffuse by themselves. Within a social system, individuals play different roles in the diffusion process: the change agent, the opinion leader, the change agent aide, and the client.

Organizations and the adoption of innovations

Much of innovation diffusion theory is concerned with the diffusion of innovations to *individuals*. This study, however, was concerned with the diffusion of innovations to *organizations,* specifically businesses and industries in the United States. In previous research there has been a tendency to simply transfer innovation diffusion models and methods developed for individuals to the study of organizations, often without consideration of their differences (Eveland, 1979, cited in Rogers, 1986). According to Rogers (1983), organizations are made up of groups of individuals, and groups make decisions differently than individuals. Thus, the decision-making process leading to the adoption or rejection of an innovation is different for organizations than for individuals.

"An organization is a stable system of individuals who work together to achieve common goals through a hierarchy of ranks and a division of labor. Although behavior in organizations is relatively stable, innovation is going on all the time," (Rogers and Agarwala-Rogers, 1976, p. 26). Organizations are often perceived as being rigid, inflexible bureaucracies that resist change. But contrary to that perception, most reports indicate that organizations are impressively imaginative and innovative, (Bardach, 1977; Pressman & Wildavsky, 1973).

During the 1960's and early 1970's many studies were completed on innovativeness as related to certain organizational characteristics (Keen, 1976; Rogers, 1983). These early studies, including those by Coleman, 1958; Cyert and March, 1963; Mansfield, 1963; Mohr, 1969; and Mytinger, 1968, examined variables such as centralization, complexity, formalization, and organizational slack, size, and system openness in order to determine the characteristics of a more or less innovative organization. The results of studies of organizational characteristics and innovativeness were summarized by Rogers (1983) and are briefly reviewed below:

Centralization: Centralization is the concentration of power and control over the organization by relatively few individuals. A greater concentration of power within the organization usually means less innovation and is, therefore, associated negatively with innovativeness.

Complexity: If members of an organization possess a relatively high degree of knowledge and expertise, they are more likely to conceive and propose innovations. Complexity, therefore, correlates positively with innovativeness.

Formalization: Organizations that enforce the strict following of rules and regulations by their employees are usually less innovative. Such formalization tends to inhibit employees from considering innovative ideas, thus is negatively related to organizational innovativeness.

Interconnectedness: When individuals are connected by interpersonal networks, new ideas can flow more freely. Interconnectedness is associated positively with innovativeness.

Organizational Slack: The availability of uncommitted resources to fund innovation is associated positively to innovativeness.

Size: Large organizations have more people and a larger budget to draw upon for innovation. Size is correlates positively with innovativeness.

The many studies of the characteristics of innovative organizations were eventually seen as simplistic and only a partial answer to the question of organizational innovativeness. The results of such studies generally showed a relatively low correlation between organizational innovativeness and each of the variables above (Coleman, 1958; Cyert and March, 1963; Mansfield, 1963; Mohr, 1969; and Mytinger, 1968). The reason for these low correlations, explains Rogers (1983), is that each of the variables are related to innovation either positively or negatively during initiation, and then in the opposite direction during implementation. For example, low centralization and low formalization encourage the initiation of innovative ideas, but inhibit the implementation of those innovations (Sapolsky, 1967; Zaltman et al, 1973).

Furthermore, the simplistic approach to these studies failed to consider *time* as a variable; thus the *process* of innovation adoption, its occurrence over time , was not studied (Rogers, 1983). As a result, this type of organizational innovativeness study generally became passè. The one thing that was learned from all this research was that "attributes of organizational structure are by no means the sole determinants of innovation adoption" (Kervasdoue and Kimberly, 1978, p. 98). In other words, there are more factors that influence the adoption of innovations by organizations than simply the characteristics of those organizations. A new approach to organizational diffusion research would soon yield further insight.

In the mid-1970s, organizational innovativeness research took a new direction. Prior studies had been designed to find the characteristics of a more or less innovative organization (Rogers, 1983). This oversimplified research approach had failed to fully consider the element of time in the innovation process. Thus, adoption-diffusion research began to follow a longitudinal, or "process," approach instead of the cross-sectional approach of prior studies. Using this process research approach, researchers like Bernas (1981), Eveland (1977, cited in Rogers, 1986), March (1981), Mohr (1978, cited in Rogers, 1986), and Walker (1977), among others, sought to determine the *time-ordered* sequence of events in the innovation adoption process.

Rogers (1983) provided a model of this *process* of innovation adoption in organizations. The model divided the organizational decision-making process into two main parts, (1) initiation and (2) implementation. The model consists of a sequence of five stages. The two initiation stages are agenda setting and matching, and the three implementation stages are redefining/restructuring, clarifying, and routinizing.

Part I, *Initiation*, which encompasses the first two stages, is defined as "all of the information-gathering, conceptualizing, and planning for the adoption of an innovation, leading up to the decision to adopt" (p. 363). In Stage 1, *Agenda-setting*, the organization's problems that lead to a perceived need are defined, and potential innovative solutions are sought. In Stage 2, *Matching*, the previously defined problem is considered together with the innovation in an attempt to establish the feasibility of the innovation in solving the organization's problem. Once this is done, the decision to adopt or reject the innovation is made. This is the turning point between Part I, *Initiation*, and Part II, *Implementation*. Implementation is defined as "all of the events, actions, and decisions involved in putting an innovation into use" (p. 364), and consists of the next three stages. During Stage 3, *Redefining/Restructuring*, the innovation is made to accommodate the organizations needs,

and related areas of the organization may be altered to accommodate the innovation. During Stage 4, *Clarifying*, the innovation becomes embedded in the organizational structure by being put to full and regular use. At Stage 5, *Routinizing*, the innovation is incorporated fully into the organization's regular activities, and loses it's separate identity. It is during this stage, as well, that de-implementation of the innovation can occur.

Rogers' model is supported by Dennis (1984) who developed a similar model of organizational adoption/diffusion. According to Dennis, the organizational adoption and diffusion of an innovation is a process involving six phases: definition, research, introduction, growth, maturity, and decline/update. He further explains that innovation adoption in organizations may be related to the characteristics of the individuals in the training department or the characteristics of the organization (centralization, size, etc). It is most likely a combination of these individual and organizational characteristics and the environment in which the innovation is being adopted that influence the rate and success of the adoption of the innovation (Dennis, 1984).

Diffusion is the process by which innovative ideas are communicated over time among members of a social system (Rogers, 1983). In the present study, information was sought regarding a) the innovation--the delivery of instruction via satellite for corporate training, b) the social system--corporate training developers in America, and c) the communication channels--the means by which information regarding this innovation was spread. The application of satellite-delivered instruction in corporate training is an example of the adoption and diffusion of innovations process.

Instructional Technology in Corporate Training

Corporate training is in the midst of constant change (Lusterman, 1985). Training delivery methods are influenced not only by developments in educational technology, but

also by developments in all areas of technology (Lusterman, 1985; Weatherall, 1988). The continual changes in technology and the inevitable learning requirements that go with them are a driving force behind changes in corporate training. Not only are corporations providing more training, but also the look of that training is changing (Gordon, 1986; Lusterman, 1985).

Evidence suggests that, overall, the use of media in U.S. companies is growing (Lusterman, 1985; Moore, 1988). Lusterman's 1985 study reported that three out of five corporate training executives reported significant changes in training methods and in the use of technologies for training during the previous five years. Examples given of such uses of new technologies in training included an intensive, interactive video training program designed to teach thirteen hundred J.C. Penny buyers to make better buying decisions, and the creation of computer-imbedded instruction to teach billing systems to new Xerox employees (Lusterman, 1985). Furthermore, throughout the last decade, interactive learning and distance education methods have increasingly been introduced, initially into higher education, and now are spreading rapidly to corporate training (Black, 1984; Lusterman, 1985; Moore, 1988). The introduction of such new technologies as computer-based training, interactive video, and satellite-delivered instruction have changed the way educators and trainers look at the planning and process of training (Bryan, 1986; Gordon, 1986).

Not only is technology having a great impact on delivery methodology, but on the preparation of materials as well. For example, a few pieces of equipment, like a microcomputer, video projector, and laser printer, can allow instructional designers and trainers to make professional quality presentation materials, graphics, worksheets, transparencies, and more (Ralphs and Stephen, 1986).

Constant growth and change in technology is one of the primary forces behind the continuing need for employee training. In a study of technical training in Fortune 500

companies by Ralphs and Stephen (1986), 84 percent of the HRD (Human Resource Development) managers and training professionals responded that technological changes would have the greatest impact on training in the next decade.

Technological changes in the last decade have prompted the development of technical training courses on the operation, maintenance, and repair of new computers, robots, lasers, and production machinery. Likewise, developments in computer, videodisc, and satellite technologies have provided innovative means of instructional delivery. Just as the types of training courses needed in the future will continue to become more technical, so will the delivery methods for those courses become more technical (Ralphs and Stephen, 1986).

Satellite-delivered Instruction in Corporate Training

Throughout the last decade, interactive learning and distance education methods have increasingly been introduced, initially into higher education, but now rapidly spreading to corporate training (Black, 1984; Lusterman, 1985; Moore, 1988). Use of the telecommunications satellite has vast potential for instruction and communication in the business environment. It is no longer necessary to gather everyone together in a central location in order to have a "face-to-face" meeting. Satellite technology allows for regional, multi-city meetings where satellite teleconferencing capabilities link together the origination point and multiple receiving sites (Black, 1984).

Examples of the use of satellite technologies for live, distance instruction can be found in many large corporations. Hewlett-Packard, for example, transmits live, televised instruction via satellite to over 65 receiving stations at company facilities in the Unites States and Canada. This instruction is used primarily to provide training to sales, service, and other support personnel, but is also used for the continuing education of engineering personnel (Lusterman, 1985).

> Hewlett-Packard's manager of corporate training and development regards the initiation of live broadcasts via satellite several years ago as a major advance in training methodology for his company: "It has several important advantages over videotape. First, you can't procrastinate about using it: When a broadcast is scheduled live, the people are usually there to watch it. Second, all of our live broadcasts have audio feedback--interaction. A phone-line system allows people at any of the sites to call in questions, and includes a screening and control arrangement whereby operators appraise the value and timing of each question. Third, and quite unexpectedly, the live presentations are better than the taped ones. For some reason, people are motivated to prepare better and to rehearse more often. Finally, we can tape live broadcasts at headquarters for distribution, and they can be taped locally for the use of people who missed the telecast--including new employees--or for a refresher, say, the day before an important sales presentation" (Lusterman, 1985, p. 15).

In conducting training in the areas of technical skills and management training, training executives reported using a variety of instructional methods ("Employee Training," 1986). The most frequently used were the traditional media--lectures, discussion groups, films, and slide presentations. The least frequently used media included the newer, high-tech media--computer-assisted instruction, interactive video, and teleconferencing. Fourteen percent of the respondents indicated they use teleconferencing in some facet of training ("Employee Training," 1986). Gordon (1986) indicated that 23.9 percent of U.S. organizations with 50 or more employees used some form of audio or video teleconferencing for instructional purposes. However, these studies did not provide specific data regarding uses of interactive, satellite-delivered, televised instruction.

Factors that Influence the Adoption of Satellite-delivered, Televised Instruction

In today's economic and technologically changing environment, training is no longer considered a luxury. It helps maintain the skills and quality of a work force and helps an organization enhance the quality of its products and services (Ralphs and Stephen, 1986). Training is a massive investment. Not only are there the expenses for the training, but also for the employees who are not at their jobs, but in the classroom. Responses to a 1986 survey showed that 82 percent of all the formal training conducted in organizations occurs on paid time. (Gordon, 1986). Today, corporate administrators view training as an investment in the future of their companies (Ralphs and Stephans, 1986).

According to Black (1984), the growth of satellite telecommunications in large corporations is driven by the same underlying forces that have been driving the growth of electronic communications in general:

- The need to communicate more information accurately to more people on a timely basis.
- A growing reluctance to travel great distances for relatively brief, non-problem solving meetings.
- Very high transportation costs, particularly for long-distance air travel.
- Decreasing costs of communications services, particularly those that are satellite-based. (p. 142)

No longer is it necessary to gather everyone together in one location in order to have a "face-to-face" meeting. Satellite technology allows for regional, multi-city meetings where satellite teleconferencing capabilities link together the origination point and multiple receiving sites (Black, 1984). Black (1984) notes the most commonly cited advantages to videoteleconferencing:

- Greatly enhanced "reach," to include many more participants in important meetings.
- Immediacy and impact of the video medium.
- Uniformity of message.
- Time savings for key professionals.
- Cost effectiveness. (p. 142)

As Black's list of advantages indicates, cost may be an advantage to using satellite delivery of instruction. Noted often in the literature, a major concern of adopting a new technology for training is often the cost of using that technology (Brown and Fortosky,1986; Lusterman, 1985; Rogers, 1983; Weatherall, 1988). The cost of sending a trainer from corporate headquarters to several distant facilities for traditional classroom instruction is directly related to the distances the trainer must travel and the number of hours the trainer must spend giving presentations (Weatherall, 1988). The cost of satellite-delivered instruction, however, is not related to distance. Instruction sent by satellite can be received simultaneously at any number of receiving sites across the country. Costs, rather, can be relatively expensive or inexpensive depending upon the number of learners served. (Black, 1984; Brown and Fortosky,1986; Rumble, 1986). Companies with multiple plant cites, nationwide sales forces, and/or distributor/dealer networks are increasingly using satellite communications (Black, 1984).

One factor omitted in Black's list of advantages, however is educational effectiveness. According to Rumble (1986), another factor involved in making decisions about distance education is educational effectiveness. Use of a particular instructional technology, Rumble notes, may be educationally effective without being cost effective. However, for an instructional method to be cost effective it also must be educationally effective.

> New technologies--video, computer-aided instruction, interactive video, and satellite broadcasting--are having important effects on the training function. They are providing such benefits as increased instructional effectiveness, training paced to individual needs, and the ability to train individuals, as needed, rather than in groups. They also offer greater opportunity for centralized program development and, therefore, control of content (Lusterman, 1985, p. v).

In today's economic and technologically changing environment, training is no longer considered a luxury. It helps maintain the skills and quality of a work force and helps an organization enhance the quality of its products and services (Ralphs and Stephen, 1986). There are many factors that influence an individual's or company's decision whether or not to use satellite technology for the delivery of live, interactive televised instruction. Among them are educational effectiveness, interactive learning, time savings for key professionals, cost effectiveness, centralized development of instruction/uniformity of message, and wide reach. The present study, in part, sought to identify those factors that most influence a company's decision to use interactive, satellite-delivered, televised instruction as a tool for their corporate training.

Summary

Diffusion is the process by which innovative ideas are communicated over time among members of a social system (Rogers, 1983). Within a social system are several types of people; individuals are grouped according to their role in the diffusion process: the change agent, the opinion leader, change agent aide, and the clients. More factors come into play in innovation adoption within organizations. According to Dennis (1984), the organizational adoption and diffusion of an innovation is a process involving six phases: definition, research, introduction, growth, maturity, and decline/update.

In the present study, information was sought regarding a) the innovation--the delivery of instruction via satellite in corporate training, b) the social system--corporate training developers in America, and c) the communication channels--the means by which information regarding this innovation was spread. The application of satellite-delivered instruction in corporate training is an example of the adoption and diffusion innovations process.

Corporate training is in the midst of constant change (Lusterman, 1985). Training delivery methods are not only influenced by developments in educational technology, but also by developments in all areas of technology (Lusterman, 1985; Weatherall, 1988). Continual changes in technology and the inevitable learning requirements that go with them are a driving force behind changes in corporate training. Evidence suggests that, overall, the use of media in U.S. companies is growing (Lusterman, 1985; Moore, 1988). Developments in computer, videodisc, and satellite technologies have provided innovative means of instructional delivery. Just as the types of training courses needed in the future will continue to become more technical, so will the delivery methods for those courses become more technical (Ralphs and Stephen, 1986).

A review of the literature disclosed a limited amount of research on the use of satellite instruction in business and industry. Nevertheless, it appears that throughout the last decade, interactive learning and distance education methods have increasingly been introduced into corporate training (Black, 1984; Lusterman, 1985; Moore, 1988). The use of telecommunications technologies has vast potential for instruction and communication in the business environment (Black, 1984). Examples of the use of various satellite technologies for distance instruction can be found in business and industry throughout the U.S. (Lusterman, 1985), but there is little specific data regarding the uses of interactive, satellite-delivered, televised instruction ("Employee Training," 1986; Saari, Johnson, McLaughlin, & Zimmerle, 1988).

In today's economic and technologically changing environment, training is no longer considered a luxury. It is an investment that helps maintain the skills and quality of a work force and helps an organization enhance the quality of its products and services (Ralphs and Stephen, 1986). There are many factors that influence an individual's or company's decision whether or not to use satellite technology for the delivery of live, interactive televised instruction. Among them are educational effectiveness, interactive learning, time savings for key professionals, cost effectiveness, centralized development of instruction/uniformity of message, and wide reach. The present study, in part, sought to identify those factors that most influence a company's decision to use interactive, satellite-delivered, televised instruction as a tool for their corporate training.

The focus of this study was to obtain key information regarding the uses of interactive, satellite-delivered, televised instruction in corporate training. It was designed to ascertain the extent to which satellite-delivered instruction is used, in what ways satellite-delivered instruction is used, and what factors influence organizational decisions to use satellite-delivered instruction.

CHAPTER III. METHODOLOGY

The purpose of the present study was to survey a sample of corporate training developers in U.S. corporations to ascertain the extent to which satellite-delivered instruction was used, how satellite-delivered instruction was used, and what factors influence the organization's decisions to use satellite-delivered instruction. This study was an investigation that used descriptive statistics to identify trends and implications, and to determine areas where rigorous statistical research would be appropriate. This chapter consists of four sections explaining the following areas: 1) subject selection, 2) instrument design, 3) data collection, and 4) data analysis.

Subjects

Potential subjects for this study were identified by reviewing the 1990 membership directory of the American Society for Training and Development (ASTD). This resource was chosen because it contains the most readily available comprehensive list of training professionals in the United States.

Because of the wide variety of professional positions held by ASTD members, not all members were part of the target population. Professionals appropriate for the population were those who worked in U.S. corporations and made decisions regarding the use of instructional delivery systems in their companies, and those who designed and developed instruction for satellite-delivery in their companies, not necessarily those who simply used the technology. Members listed in the ASTD directory with a job title indicating directorial or managerial positions were likely candidates. Members also had to be employed by corporations, and not governmental agencies or institutions.

The procedure used to select the sample subjects required several steps. First, the job titles listed in the directory were evaluated in order to select only those that fit the population. In other words, the only job titles selected were those that indicated corporate positions where individuals were likely to make decisions regarding the use of instructional delivery systems in their companies.

This evaluation process required the researcher to construct a list of all job titles used in the ASTD directory that indicated that the position involved the conducting, managing, directing, or coordinating of some form of training, education, human resource development, or instructional design. The result was a list totaling 71 job titles. This list was then presented to four professionals involved in education, training, educational technology, and instructional design, who were familiar with the current study and who have expertise in working with private businesses and organizations. These individuals each indicated with check marks those job titles that would be appropriate for the population.

After collecting the experts' responses, the researcher compiled a final list that included only those job titles that at least three out of the four experts agreed would be appropriate. The final list contained 26 titles including Manager of Training and Development, Senior Education Specialist, Instructional Designer, and Director of Training, among others.

Next, the sample was selected. The ASTD directory listed in nearly 25,000 members alphabetically. This large number of individuals in the accessible population made a simple random sampling impractical. So in order to derive an appropriate sample, a modified random sampling technique was used. Twenty of the 320 pages of the membership listing in the directory were selected at random, and members of the population on each of those twenty pages were included in the sample. This process, although somewhat unconventional, was systematic and is replicable. The result was a sample of 228 corporate training professionals.

Instrument Design

Instrument choice

A survey questionnaire was the instrument used in this study. A questionnaire is an instrument that presents information to a respondent in writing or through the use of pictures and then requires a written response--a check mark, circle, word, sentence or several sentences. Questionnaires are appropriate tools for researchers attempting to obtain answers to a variety of questions, and are frequently designed so that each question can represent a discrete concern and can yield a score specific to that concern (Henerson, Morris, & Fitz-Gibbon, 1978).

The questionnaire was identified as the most direct method of surveying a large group of subjects (Henerson, et al., 1978). There are several advantages to using questionnaires that make them popular survey tools. They are designed to be self-administered and are often mailed, allowing for a large sample size and diverse locations of subjects (Ary, Jacobs, & Razavieh, 1985). Henerson et al., (1978) described this instrument as one that 1) permits anonymity, 2) allows respondents time to think about answers before responding, 3) can be given to a large number of people simultaneously, 4) can be mailed to widely-dispersed subjects or administered directly to a group, 5) provides uniformity across measurement situations, and 6) allows for a variety of questions.

Because there were no existing instruments available, one was designed according to the procedures outlined by Henerson et al., (1978).

Instrument design

The research questions outlined in Chapter One were presented to twenty teaching professionals familiar with the study, including approximately 14 graduate students and six college professors in instructional technology and other areas of specialization. These twenty

individuals provided the researcher with numerous potential survey questions appropriate for each research question. An initial set of survey questions was then constructed by the researcher. The questions were examined for content validity by the researcher's major professor and one graduate student familiar with the study. From their comments and suggestions, and the researcher's own reexamination of the items, the questionnaire was revised.

A pilot test of the questionnaire was then conducted with a random sample of eight members of the population. With four returns, the researcher analyzed the responses, judged the appropriateness of each of question, noted various comments made by respondents, and revised the questionnaire. The professor and graduate student again examined the questionnaire for content validity, and further revisions were made.

A second pilot test was then conducted with a random sample of fifteen members of the population. With eight returns, the responses were examined by the researcher, and final revisions were made. Once again the professor and graduate student examined the questionnaire and found the content to be appropriate. With that, the final survey questionnaire--Interactive, Satellite-delivered, Televised Instruction in Corporate Training (ISTICT)--was completed (see Appendix A).

Validity of the questionnaire The development, pilot testing, and revision procedures described above were used to give the survey questions content validity. Content validity is the degree to which an instrument measures the content it was designed to measure, and is most often determined by an appraisal of experts or professionals in the content area (Ary, Jacobs, & Razavieh, 1985; Borg and Gaul, 1989). At each step of the questionnaire development, the researcher conducted a careful and critical examination of the test items as they related to the research questions. The instrument was also examined at each

stage by the researcher's major professor and one graduate student familiar with the study. Their comments and suggestions were used to modify the instrument. In addition, the two pilot studies produced responses and comments from the respondents that were of help to the researcher in revising the questionnaire. The final instrument was judged to have content and face validity. One possible limitation of the questionnaire development process, however, was that no professional corporate training developers were used as judges for content validity.

Part One of the questionnaire The ISTICT questionnaire was divided into two parts. Part 1 of the questionnaire was designed to obtain the background information necessary to establish descriptive profiles of the respondents and the companies they represented. The items were designed to answer research questions 1 and 2.

Section 1 of Part 1 addressed Research Question 1: What are the demographic characteristics of the respondents? This section was designed to obtain a descriptive profile of the respondents, including information about the respondents' 1) gender, 2) age, 3) highest level of formal education, 4) number of years of experience in corporate training, 5) personal educational experiences with satellite-delivered instruction, 6) current involvement with satellite-delivered, televised instruction, and 7) perception of their own level of knowledge about satellite-delivered, televised instruction.

Section 2 of Part 1 addressed Research Question 2: What are the characteristics of the companies represented by the respondents? It was designed to obtain a descriptive profile of the companies represented by the respondents, including information about 1) the type of company, 2) the size of the town/metro area in which company was located, 3) the number of company branch facilities, 4) availability of in-house video facilities, 5) possession of company satellite uplink and downlink equipment, 6) the training budget, 7) the number of

branch and company employees, 8) the value of the company, 9) the number of employees trained, and 10) the number of employees trained using satellite-delivered, televised instruction.

Part Two of the questionnaire Part Two of the ISTICT questionnaire was designed to obtain information regarding the companies' current use of media for instructional delivery and, more specifically, their use of satellite technology. It also gathered information about what factors influenced decisions regarding the use of satellite technology for the delivery of instruction. The Items were designed to answer Research Questions 3 through 9.

Section 1 of Part 2 addressed Research Question 3: What types of instructional delivery systems do the companies use for employee training? This section gathered information about the types of instructional delivery systems used and whether or not satellite-delivery was used. Section 2 of Part 2 addressed Research Question 4: For what types of activities do the companies use satellite delivery? This section gathered information on the respondents' use of interactive, satellite-delivered, televised instruction in the company; whether the facility received or created satellite-delivered instruction; the types of activities that satellite technology was used to deliver; and the departments within a company that used satellite-delivered instruction. Section 3 of Part 2 addressed Research Question 5: What factors influence the companies' decisions to use interactive, satellite-delivered, televised instruction. Section 4 of Part 2 addressed Research Question 6: What are the major problems or obstacles a training developer encounters when developing and implementing satellite-delivered, televised instruction? Section 5 of Part 2 addressed Research Question 7: How do instructional developers obtain in-depth information about satellite-delivered, televised instruction? Section 6 of Part 2 addressed Research Question 8: Who is

responsible for making decisions regarding the use of a particular delivery system for training? Section 7 of Part 2 addressed Research Question 9: When developing instruction, when does the training developer decide which medium/delivery system to use?

Data Collection

The Iowa State University Committee on the use of Human Subjects in Research reviewed and approved this project. A copy of the approved human subjects form can be found in Appendix B.

The ISTICT questionnaire was sent to each of the 228 members of the sample in January, 1991. The questionnaire was accompanied by a cover letter explaining the study and asking that it be completed by the appropriate training developer. A stamped, self-addressed envelope was enclosed. Two weeks after the first mailing, non-respondents were sent another copy of the questionnaire with a follow-up letter asking them to complete and return the survey. Two weeks later, all remaining non-respondents were sent reminder postcards. Finally, a phone call follow-up of a random sample of 5 of the remaining non-respondents was conducted to determine if there were differences between the respondents and the non-respondents.

Data Analysis

The data collected from the ISTICT survey questionnaire was analyzed to include the following descriptive statistics: 1) frequency counts, 2) percentages, 3) means, 4) standard deviations, 5) ranges, and 6) correlations.

Summary

The purpose of the present study was to survey a sample of corporate training developers in U.S. corporations to ascertain the extent to which satellite-delivered instruction was used, how satellite-delivered instruction was used, and what factors influence the organization's decisions to use this technology. This chapter consisted of four sections concerning the following areas: 1) subject selection, 2) instrument design, 3) data collection, and 4) data analysis.

Corporate training professionals were identified by reviewing the membership directory of a training professional organization, and a modified random sampling technique was used to obtain the sample. The survey questionnaire was identified as the most direct method of surveying the large and diversely located sample (Ary, et al., 1985; Henerson, et al., 1978). Because there were no existing instruments available, one was designed according to the procedures outlined by Henerson et al., (1978).

The questionnaire, Interactive, Satellite-delivered, Televised Instruction in Corporate Training (ISTICT), was sent to each member of the sample accompanied by a cover letter explaining the study and asking that it be completed and returned. This was followed by two additional mailings to non-respondents to obtain a high return rate. The data collected from the survey was analyzed to include the following descriptive statistics: 1) frequency counts, 2) percentages, 3) means, 4) standard deviations, 5) ranges, and 6) correlations.

CHAPTER IV. RESULTS

This chapter reports the results obtained from a questionnaire sent to 228 corporate training professionals across the United States. The purpose of the survey was to obtain data on the extent to which satellite-delivered instruction was used by U.S. corporations, how satellite-delivered instruction was used, and what factors influenced organizations' decisions to use this technology. This chapter is divided into five sections: 1) a description of the sample, 2) a descriptive profile of the respondents and their companies, 3) a descriptive profile of the use of satellite-delivered, televised instruction, and 4) additional analyses.

Description of the Sample

The results reported in this chapter were obtained from data gathered from 91 questionnaires returned by corporate training professionals. The subjects consisted of a sample of corporate training professionals identified from the 1990 membership directory of the American Society for Training and Development (ASTD), the most readily available comprehensive list of training professionals.

The sample included 228 corporate training professionals who were sent questionnaires, cover letters, and self-addressed, stamped envelopes. Of the 228 people sampled, 69 (30.26%) returned the questionnaire from the first mailing, six of whom declined to participate and did not fill out the questionnaire. A second mailing to non-respondents resulted in questionnaires being returned by another 37 individuals (16.23%), 11 of whom did not complete the questionnaire. An additional 2 questionnaires (0.88%) arrived after the third mailing, which was a post card follow-up. Mailings addressed to eight individuals were returned by the postal service as undeliverable because the address had changed or that the individual no longer worked at that address. The overall

return rate for those responding to the survey was 49.09% and was calculated using 220 (228 - 8 returns) as the number of corporate training professionals sampled and 108 (69 + 37 + 2) as the number of respondents.

Following the returns from the final mailing, a phone call follow-up of non-respondents was conducted to determine if there were differences between the respondents and non-respondents. Five non-responding members of the sample were selected at random, telephoned, and asked why they did not return the questionnaire. The first individual called was no longer with the company. A telephone receptionist at the company explained that the individual had not been with the company for several months. The second individual said that he did not recall receiving the survey. He explained that he receives many such surveys, and that if he did not respond, lack of time would have been the factor that kept him from doing so. The third stated that she had been on medical leave for several months only having returned that day, and had not received mail during the period of her absence. The fourth could not be reached even after more than one dozen telephone calls over a three week period; the telephone was never answered. The fifth, like the first, was no longer with the company.

Descriptive Profiles of the Respondents and Companies

Profile of the respondents

Research Question 1: What are the demographic characteristics of the respondents?

The questions in Part 1, Section 1 of the questionnaire obtained information about the respondents' 1) gender, 2) age, 3) highest level of formal education, 4) number of years of experience in corporate training, 5) personal educational experiences with satellite-delivered instruction, 6) current involvement with satellite-delivered, televised instruction, and 7) perception of their own level of knowledge about satellite-delivered, televised instruction.

Frequency distributions were computed for all items in order to report information about the characteristics of the respondents. The characteristics are reported in terms of percent of the total number of usable responses for each item. These data are illustrated in Figures 1-12.

1) Of the 90 respondents who reported their gender, forty-nine (54.4%) were male and forty-one (45.6%) were female (Figure 1).

2) Approximately nine percent (9.3%) of the responding corporate training developers were from 20 to 29 years of age, 41.9% were from 30 to 39, 37.2% were from 40 to 49, 9.3% were from 50 to 59, and 2.3% were over 60 (Figure 2). The average age of the respondents was 39.9 years, and almost eighty percent (79.1%) were from 30 to 49 years of age. There were 5 missing cases.

3) Approximately seven percent (6.6%) of the respondents had earned only a high school diploma. Four percent (4.4%) had earned a two-year Associate of Arts or technical degree, while another 5.5% had earned additional credits beyond the two-year degree. Eighteen percent (17.6%) of the respondents had earned four-year undergraduate college degrees, with another 22.0% having earned credits beyond the bachelor's degree. Approximately twenty percent (19.8%) of the respondents had earned master's degrees, while an additional 17.6% had earned credits toward a doctorate degree. Less than six percent (5.5%) of the respondents had earned their doctorate degrees, and only one individual (1.1%) had pursued post-doctoral work (Figure 3).

4) Thirty-seven percent (37.4%) of the respondents had from 1 to 5 years experience in corporate training. Thirty-six percent (36.3%) had 6 to 10 years of experience. Those with 11 to 15 years experience made up 20.9% of the respondents. Three percent (3.3%) had from 16 to 20 years experience. And a small percentage, 2.2%, reported having 21 or more years of experience in corporate training (Figure 4). The average was 8.3 years, and the standard deviation was 5.4 years.

5) Questions about their personal experiences with satellite-delivered instruction revealed that 37.4% of the respondents had participated via satellite in business meetings (Figure 5). Nearly twenty-eight percent (27.5%) had attended job-related training sessions delivered via satellite (Figure 6). And 19.8% of the respondents had attended satellite-delivered, formal education courses or multi-session workshops (Figure 7). Slightly over forty-five percent (45.1%) of the respondents had personal, past experiences with at least one of these three types of satellite telecommunications.

6) Nearly eight percent (7.7%) of the respondents indicated that they were currently involved in *facilitating* satellite-delivered, distance instruction (Figure 8). Almost ten percent (9.9%) reported that they were involved in *purchasing* satellite-delivered, distance instruction (Figure 9). Nearly seven percent (6.6%) stated that they were currently involved in *designing* satellite-delivered, distance instruction (Figure 10). And 5.5% indicated that they were involved in the actual *production* of satellite-delivered, distance instruction (Figure 11).

7) Respondents were requested to rate the degree to which they were knowledgeable about satellite-delivered, televised instruction. On a scale from 1 to 5 where one equals "Not Knowledgeable" and five equals "Extremely Knowledgeable," the average value of the

responses to this question was 2.2 and the standard deviation was .927. Nearly twenty-seven percent (26.7%) responded that they were "Not Knowledgeable" about it. Thirty-three percent (33.3%) indicated a point in between "Not Knowledgeable" and "Somewhat Knowledgeable." Thirty-four percent (34.4%) responded that they were "Somewhat Knowledgeable." Four percent (4.4%) indicated a point between "Somewhat Knowledgeable" and "Extremely Knowledgeable." And only one individual (1.1%) indicated being "Extremely Knowledgeable about satellite-delivered, televised instruction," (Figure 12).

Profile of the respondents' companies

Research Question 2: What are the characteristics of the companies represented by the respondents?

The questions in Part 1, Section 2 of the questionnaire obtained information about the companies represented by the respondents, including 1) the type of company, 2) the number of company branch facilities, 3) the size of the town/metro area in which company was located, 4) availability of in-house video facilities, 5) company possession of satellite uplink and downlink equipment, 6) the training budget, 7) the number of branch and company employees, 8) the value of the company, 9) the number of employees trained, and 10) the number of employees trained using satellite-delivered, televised instruction.

Frequency distributions were computed for all items in order to report information about the characteristics of the respondents' companies. The characteristics of the companies are reported in terms of percent of the total number of usable responses for each item. These data are illustrated in Figures 13-28.

1) Given a list of business types, the respondents were asked to select the one that most closely matched their own company. One percent (1.1%) of the companies were "Agriculture, forestry, and fishing (except agricultural services)." None (0.0%) of the companies were "Mining." Four percent (4.4%) of the companies were "Construction." Thirty-two percent (32.2%) of the companies were "Manufacturing." Twenty percent (20.0%) of the companies were "Transportation, communications, and utilities." One percent (1.1%) of the companies were "Wholesale trade." Nearly eight percent (7.8%) of the companies were "Retail trade." Fourteen percent (14.4%) of the companies were "Finance, insurance, and real estate." Nearly nineteen percent (18.9%) of the companies were "Services (including agricultural services)." (Figure 13).

2) The range of answers to the question regarding the number of company branch locations was widespread, from as few as zero to over seven thousand (minimum = 0, maximum = 7100). The average response for number of branch offices and plants was 201.9. Breaking the responses down into three groups, 83.9% of the companies operated from 0 to 99 branch locations, 13.6% operate from 100 to 999 branch locations, and only 2.5% operate in excess of 1000 branch facilities (Figure 14). The distribution was positively skewed because of two extraordinarily large companies with 5600 and 7100 locations. Eliminating these two would produce a more normal distribution with a average of 46.2 branch offices. There were 10 missing cases.

3) One percent (1.1%) of the companies were located in towns or metro areas of populations "Less than 1000;" none (0.0%) were in areas from 1000 to 2500; 3.4% were in areas from 2500 to 5000; 4.6% were in areas from 5000 to 10,000; 4.6% were in areas from 10,000 to 25,000; 5.7% were in areas from 25,000 to 50,000; 6.9% were in areas from

50,000 to 100,000; 6.9% were in areas from 100,000 to 250,000; 11.5% were in areas from 250,000 to 500,000; 12.6% were in areas from 500,000 to 1,000,000; and 42.5% were in areas of 1,000,000 or more in population (Figure 15). It was obvious that the largest number of companies were in cities of one million or more in population. The average response, however, was closest to the response "250,000 to 500,000" in population. There were 4 missing cases.

4) Questions about the availability of video production facilities and equipment revealed that 18.7% of the companies maintained an in-house television studio (Figure 16), 65.9% possessed in-house video production equipment (Figure 17), and 41.1% possessed in-house post-production, video equipment (Figure 18).

5) Nearly nineteen percent (18.7%) of respondents stated that the facility in which they worked maintained satellite uplink equipment (Figure 19). Twenty-seven percent (27.0%) stated that their company headquarters maintained satellite uplink equipment (Figure 20). Thus, at least 27% of the respondents' companies operated one or more satellite uplink facilities, located either in the respondent's own branch facility or at the company headquarters. In addition, twenty-one percent (21.1%) of the respondents stated that the facility in which they worked had downlink equipment (Figure 21).

6) The percentage of the company's annual operating budget allocated to employee training was 0% for 4.9% of the companies, 1-2% for 58% of the companies, 3-4% for 22.2% of the companies, 5-6% for 8.6% of the companies, 7-8% for 4.9% of the companies, and 9-10% for 1.2% of the companies (Figure 22). There were 10 missing cases.

The percentage of the annual training budget (or training resources) allocated to satellite-delivered, televised instruction was 0% for 87.2% of the companies, 1-5% for 10.5% of the companies, and 6-10% for 2.3% of the companies (Figure 23). There were 5 missing cases.

7) In terms of numbers of people employed at the respondents' facilities, the responses varied widely, with a range from 2 to 8000. The average response was 869.8. Almost twenty-three percent (22.6%) of the companies had from 0 to 99 employees, 47.6% had from 100 to 999 employees, and 29.8% had 1000 or more employees (Figure 24). There were 7 missing cases

In terms of the number of people employed world-wide by the company, the range of responses was even more diverse, ranging from 2 to 700,000. Over three percent of the companies 3.6% had from 0 to 99 employees, 16.7% had from 100 to 999 employees, 41.7% had from 1000 to 9999 employees, 29.8% had from 10,000 to 99,999 employees, and 8.3% had 100,000 or more employees, world-wide (Figure 25). The average response was 29,973.2 employees world-wide. The distribution, however, was positively skewed because of one extraordinarily large company with 700,000 employees world-wide. Excluding this company from the distribution would give an average of 21,900 employees world-wide. There were 7 missing cases.

8) The respondents were asked the value of their companies in terms of their value of production, sales, payroll, receipts, or revenues per year. The responses ranged from a minimum of $4 million to a maximum of $127 billion. For the respondents who answered this question, twenty percent (20.0%) of their companies had values up to $100 million, 36.7% from $100 million to $1 billion, 26% from $1 billion to $10 billion, 15.0% from $10

billion to $100 billion, and one company (1.6%) had a value in excess of $100 billion (Figure 26). The average company value was approximately $ 5 1/2 billion. The distribution, however, was positively skewed because of one extraordinarily large and valuable company, valued at $127 billion. Excluding this company from the distribution would give an average company value of $2.37 billion. Thirty-one respondents left this question unanswered.

9) The approximate percentage of company employees that will have participated in some form of job training during 1991 was reported to be 0% at 1.1% of the companies, 1%-20% at 18.2% of the companies, 21%-40% at 20.5% of the companies, 41%-60% at 14.8% of the companies, 61%-80% at 19.3% of the companies, and 81%-100% at 27.3% of the companies (Figure 27). The average response was 57.8%. There were 3 missing cases.

10) The approximate percentage of company employees that will have participated in *satellite-delivered training* during 1991 was reported to be 0% at 73.8% of the companies, from 1%-10% at 21.4% of the companies, 11%-20 % at 2.4% of the companies, and 21%-30% at another 2.4% of the companies (Figure 28). The average response was 2%. Among the 26.2% (N = 22) of the companies reporting that some of their employees would receive satellite-delivered training during 1991, (omitting the 73.8% (N = 62) of the companies that responded that zero percent of their employees would participate in satellite-delivered training) the average response was 7.6%. There were 7 missing cases.

Profile of Satellite-Delivered, Televised Instruction Use

Frequency distributions were computed for all items in Part 2 of the questionnaire. The data are reported in terms of percent of the total number of usable responses for each

item. Several questions asked the respondents to pick five best answers and rank order them. In order to present the response data of the ranking questions, a point system was used. The "1" responses were valued at five points, "2" responses were worth four points, "3" responses were worth three points, "4"responses were worth two points, and "5" responses were worth one point. Using this point system, a total point value was calculated for each possible response to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response. The data are illustrated in Figures 29-38 and Tables 1-8.

Research Question 3: What types of instructional delivery systems do the companies use for employee training?

1) Given a list of eleven instructional delivery systems, respondents were asked to rank, from one to five (1 = most frequently used), the five delivery systems most frequently used for training in their company. Comparing point totals gives an indication of the frequency of use of any particular delivery system relative to the other delivery systems.

The "Traditional Classroom/lecture" delivery method scored the highest with 410 points. "Film/Videotape" scored 314 points. "Computer" scored 169 points. "Audio-cassette" scored 136 points. "Computer-based interactive video (videotape)" scored 53 points. "Closed circuit television" scored 18 points. "Satellite-delivered television (Two-way audio, one-way video)" scored 15 points. "Computer-based interactive video (laser disc)" scored 14 points. "Broadcast television" scored 5 points. And "Satellite-delivered television (Two-way audio, two-way video)" scored 4 points. A final category, "Other:," scored 38 points (Table 1). There were 6 missing cases.

(2) Over sixteen percent (16.7%) of the respondents responded that their companies did use satellite-delivered instruction for training their personnel (Figure 29).

Research questions 4 through 7 (except for question 5, #3) give results from survey questions that were answered only by those respondents who indicated that their companies *did* use satellite-delivered, televised instruction for employee training. The data are based on the responses of 15 respondents and are reported in terms of the total number of usable responses for each item or in terms of the point system described previously in this chapter.

Research Question 4: For what types of activities do the companies use satellite delivery?

1) Of the fifteen respondents who used interactive, satellite-delivered, televised instruction, one (7.1%) began using it in the year 1979, one (7.1%) in 1984, two (14.3%) in 1985, one (7.1%) in 1986, three (21.4%) in 1987, three (21.4%) in 1988, and three (21.4%) in 1989.

2) The number of times the respondent had used satellite-delivered instruction ranged from a minimum of 3 to a maximum of 1800. Three, or 30.0%, of those responding to this question had used satellite-delivered instruction three times. One facility (10 %) had used it each of the following numbers of times: 6, 12, 20, 30, 100, 300, 1800. There were 5 missing cases.

3) Of the fifteen companies that used satellite-delivered instruction for personnel training, nine, or 60.0%, of the respondent's facilities *received* satellite-delivered instruction for personnel training (Figure 30), whereas five, or 33.3%, of the respondent's facilities *created*

instruction to be delivered via satellite to distant company facilities for personnel training (Figure 31).

4) Of the five facilities that created satellite-delivered instruction, one (20.0%) transmitted the instruction from it's own uplink facility, two (40.0%) transmitted from their company headquarter's uplink facility, and two (40.0%) transmitted using a paid, third-party, uplink vendor (Figure 32).

5) The respondents were asked to respond on a five-point Likert scale, indicating the extent to which their company used satellite technology for the delivery of the following activities: "Education (formal high school or college courses)," "Training (job-related skills)," "Internal communications (meetings between distant offices)," "Personal Enrichment (health, exercise, hygiene, interpersonal skills)," "Entertainment," or "Other:." The Likert scale indicated the extent to which the company used satellite technology for the delivery of those activities, and ranged from 1, "Not at all," to 5, "Extensively." The mean responses for the various types of activities were as follows: Education, 2.267; Training, 3.333; Internal communication, 2.800; Personal enrichment, 2.200; Entertainment, 1.267; and Other, 0.800 (Figure 33).

6) Respondents were asked the extent to which various departments within their company used satellite-delivery for employee training. The five-point Likert scale ranged from 1, "Not at all," to 5, "Extensively." The average responses of use by department were Accounting/Financial, 1.267; Clerical/Secretarial, 1.600; Sales, 2.200; Marketing, 1.933; Production/Manufacturing, 1.933; Manufacturing Engineering, 1.933; Research and Design,

1.800; Human Resources, 2.133; Middle management, 2.200; Upper management, 2.533; and Other, 0.533 (Figure 34).

Research Question 5: What factors influence the companies' decisions to use interactive, satellite-delivered, televised instruction.

1) The respondents who used satellite-delivered instruction for training company personnel were asked about the factors that influenced their companies' decisions regarding whether or not to use satellite-delivered instruction for a training program. They were asked to rank from one to three (1 = most influential factor) the three most influential factors. For reporting the data, the previously described point scoring system was used. Comparing point totals gives an indication of the relative importance placed on these factors by the respondents.

The factor "Cost-effectiveness of this type of instruction" scored 35 points. "Educational effectiveness of this technology" scored 25 points. "Availability of on-site facilities" scored 17 points. "Uniqueness/innovativeness of this technology" scored 4 points. "Previous successes with this technology" received 3 points. "Availability of personnel from within the company to teach via satellite" scored 3 points. "Audience" scored 2 points. And "Other:" received 1 point (Table 2).

2) Respondents were asked to rate on a Likert scale the extent to which they thought that the use of satellite-delivered, televised instruction was a priority goal within their companies. The five-point Likert scale used was from 1 (Low priority) to 5 (High Priority). Nearly twenty-seven percent (26.7%) indicated a "1," a "Low Priority." Another 26.7% rated it a "2," between low and medium priority. Thirty-three percent (33.3%) rated it a "3," a "Medium Priority." Thirteen percent (13.3%) indicated a "4," a point between medium and

high priority. And none of the respondents rated it a "5," "High Priority" (Figure 35). The average score was 2.333 on the 5 point scale.

3) Those respondents who indicated that they *did not use* satellite-delivered instruction for training company personnel were asked about the factors that influenced their companies decision to *not* become involved in this type of instruction. They were asked to rank from one to five (1 = most influential) the five factors that most influenced their companies decision to not become involved in satellite-delivered, televised instruction. Once again, for reporting the data the point scoring system was used. Comparing point totals gives an indication of the relative importance the respondents placed on the factors.

The reason "High initial investment cost for equipment" scored 216 points. "Cost of designing and producing courses" received 145 points. "Unsure of cost-effectiveness of this technology" scored 141 points. "Unsure of educational effectiveness of this technology" scored 89 points. "Unnecessary--quality training can be achieved without this technology" scored 83 points. "Unavailability of information about using satellite technology for training" received 59 points. "Unaware of its use for training purposes" received 54 points. The reason "Difficulties producing 'interactive' courses with this technology" scored 33 points. "Unavailability of satellite uplink facility" scored 32 points. "Knowledge of difficulties or failed attempts with this technology by colleagues in other companies" scored 13 points. And an "Other:" category received 34 points (Table 3). There were seven missing cases.

Research Question 6: What are the major problems or obstacles a corporate training developer encounters when developing and implementing satellite-delivered, televised instruction?

Respondents were asked about the obstacles that most often interfered with their development and implementation of interactive, satellite-delivered, televised training programs. Respondents ranked from 1 to 5 (where 1 = most frequent obstacle) the five most frequently encountered obstacles. The same five-point scoring system, described previously, was used for scoring the responses.

1) In program *development*, the most frequently selected obstacle was "Difficulty obtaining a budget appropriate for interactive, satellite-delivered instruction" with 31 points. "Difficulty staying within development budget" was next with 14 points. "Difficulty designing 'interactive' programs," received 13 points, "High initial hardware costs" received 12 points, and "Unavailability of uplink facility" received 11 points. And many additional obstacles received relatively fewer points (see Table 4). There were 6 missing cases.

2) In program *implementation*, "Difficulty staying within program budget" was the most frequently selected obstacle, receiving 22 points. Next was "High initial hardware costs" with 18 points. Then came "Lack of knowledge about interactive satellite-delivered instruction by training staff" with 16 points, and "Lack of knowledge about interactive satellite-delivered instruction by trainees" with 12 points. The obstacles "Lack of downlink equipment at potential reception sites," and "Unavailability of uplink facility" each received 11 points. And the obstacle "Constantly changing technology" received 10 points. Many other obstacles received fewer points (see Table 5). There were 4 missing cases.

Research Question 7: How do corporate training developers obtain in-depth information about satellite-delivered, televised instruction?

1) Respondents were asked to select from a list of sources from which they were likely to get information about satellite-delivered, televised instruction, and to rank order their answers from 1 to 5, where one equaled the most frequently used source. Once again, the five point system was used as a method of reporting their responses. The highest score was "Interaction with colleagues, other professionals" which scored 34 points. "Trade/ Professional Journals" scored 28 points. "Professional Association meetings, conferences, or workshops" scored 27 points. "Work with hired professional consultants" scored 19 points. "Formal college courses" scored 17 points. "Popular magazines" scored 2 points. And "Other:" scored 10 points (Table 6). There were 4 missing cases.

2) Twenty-seven percent of the respondents (27.4%) indicated that they belong to only one professional organization. Thirty-four percent (34.5%) belonged to two professional organizations. Twenty percent (20.2%) belonged to three professional organizations. Seventeen percent (17.8%) belonged to four or more professional organizations (Figure 36). There were 7 missing cases.

3) The average number of trade or professional journals subscribed to by the respondents' training departments was 2.886 and ranged from 0 to 7 (Figure 37). There were 12 missing cases.

Research Question 8: Who is responsible for making decisions regarding the use of a particular delivery system for training?

1) When asked who was responsible for making decisions regarding whether or not to use a certain medium or delivery system for a training program, 42.0% answered the "Manager/Director of the training department," 22.7% indicated that it was a "Team

Decision," and 20.5% said that it was a "High level (executive) management" decision. Six percent or fewer of the respondents cited "Head of department for which training program will take place," "Instructional Designer," "Instructor," or "Other:" as the one who makes decisions regarding delivery systems (Figure 38). There were 3 missing cases.

Research Question 9: When developing instruction, when does the corporate training developer decide which medium/delivery system to use?

1) Respondents were asked to select the one most appropriate point when, in the course of designing instruction in their company, the selection of an appropriate medium/delivery system for a training program was made. The most frequent answer was "During the development of the course outline/script," chosen by 20.0% of the respondents. Next was "After the need analysis phase," chosen by 12.9% of the respondents. "According to Budget," was chosen by 11.8% of the respondents. And "During the need analysis phase" and "During the development of learning objectives," both received 10.6% of the respondents' answers. Several other answers received smaller response percentages (see Table 7). There were 6 missing cases.

2) When asked to pick the one instructional design model the respondent was most likely to follow when designing instruction, 45.5% chose, "I don't normally follow an instructional design methodology." Twenty-two percent (22.1%) chose "Other:" and wrote in the name or a description of the design methodology. Fourteen percent (14.3%) chose "Mager, R. F. *Goal Analysis*," and 9.1% chose "Gange', R. M., & Briggs, L. J. *Principles of Instructional Design*. The other choices each received 0 or 1 response (see Table 8). There were 14 missing cases.

Additional Analyses

The correlation coefficient is a statistical technique used for determining the strength and direction of a relationship between variables (Ary, Jacobs, & Razavieh, 1985; Best & Kahn, 1986; Borg, 1981; Norusis, 1983). The questionnaire used in this study obtained data that were expressed in a variety of ways. Thus, three different correlation techniques were used in the analyses of these data. 1) The Pearson product-moment coefficient of correlation was used to correlate interval or ratio variables. Examples of interval and ratio data are age, number of branch locations, and number of employees. 2) Some questions on the questionnaire asked respondents to rank order, from one to five, a list of possible responses. A particular form of the Pearson product-moment correlation that can be used with ranked (ordinal) data is the Spearman rank order coefficient of correlation. 3) A third type of correlation, the phi coefficient, is a simplified version of the Pearson correlation. The phi coefficient is used to correlate dichotomous nominal variables. Questions that yield dichotomous nominal data would be those that can only be answered in one of two ways, such as yes-no, or male-female.

To determine the strength and direction of the relationships between variables, the Pearson product moment correlation, Spearman rho, and phi coefficient techniques were used. The correlations are presented in terms of the Pearson r (r), the Spearman rho (ρ), and phi (ϕ) coefficients. The alpha level is .01 unless otherwise stated.

1) A moderately low, but positive correlation ($r = .397$) was found between the age of the respondents and the number of years experience they had in corporate training, $p < .001$. Certainly, this was an expected correlation (Table 9).

2) A high, positive correlation ($r = .932$) was found between the number of company employees world-wide and the value of the company, $p < .001$. This was also an expected outcome (Table 9).

3) Whether the respondents had ever attended a satellite-delivered job-related training session was positively correlated ($\phi = .521$) with whether they used satellite delivered instruction for personnel training, $p < .001$ (Table 11). Similarly, whether they had ever attended a formal education course delivered via satellite was positively correlated ($\phi = .447$) with whether they used satellite delivered instruction for personnel training, $p < .001$ (Table 11).

4) A positive correlation ($\phi = .649$) was found between whether the company used satellite-delivered instruction for employee training and whether the respondent *facilitated* such instruction, $p < .001$ (Table 11). Similarly, company use of satellite delivery for employee training was positively correlated at $\phi = .646$ with whether the respondent *purchased* satellite-delivered instruction for training, $p < .001$, at $\phi = .359$ with whether the respondent *designed* satellite delivered instruction for training, $p < .001$, and at $\phi = .542$ with whether the respondent *produced* satellite-delivered instruction for training, $p < .001$ (Table 11).

5) The number of branch locations a company had was found to be positively correlated ($r = .908$) with the number of times the company had used satellite-delivered instruction (Table 9).

6) Whether the company maintained a television studio was positively correlated at (ϕ = .470) with whether the company used satellite-delivered instruction for employee training, $p < .001$ (Table 11).

7) A positive correlation (ϕ = .571) was found between whether the company headquarters had an uplink and whether the company used satellite-delivered instruction for training employees, $p < .001$ (Table 11). Similarly, a positive correlation (ϕ = .498) was found between whether the company maintained a downlink and whether the company used satellite-delivered instruction for training employees, $p < .001$ (Table 11).

8) When asked what factors influenced their companies' decisions not to become involved in satellite-delivered instruction, respondents' rankings of the factor "High initial investment cost for equipment" were positively correlated (ρ = .383) with their rankings of the factor "Cost of designing and producing courses," $p < .001$ (Table 10).

9) There was a moderately high, negative correlation (r = - .767) between the year that the respondent first used satellite-delivered instruction and the number of times since then the respondent had used it. In other words, the more recently a company had begun using satellite-delivered instruction, the fewer times it was likely to have used it. This was an expected correlation (Table 9).

10) There was a positive correlation (ρ = .658) between the rankings of the use of satellite-delivery for training and the extent to which its use as such was a priority goal of the company/training department (Table 10).

11) The ranking of "Previous successes with this technology" as a factor that influenced companies' decisions whether or not to use satellite-delivered instruction, was positively correlated ($\rho = .752$) with the ranking of "Unavailability of production facility" as an obstacle that most interfered with the implementation of satellite-delivered instruction (Table 10). For example, respondents who thought that previous successes with satellite-delivered instruction had been a big influence on their companies' decisions to use that technology in subsequent situations, were also likely to think that their lack of a production facility was an obstacle that had frequently interfered with their implementation of such instruction.

12) The ranking of "Availability of on-site facilities" as a factor that influenced companies' decisions whether or not to use satellite-delivered instruction, was negatively correlated ($\rho = -.805$) with the ranking of "Difficulty staying within development budget" as an obstacle that most interfered with development of satellite-delivered instruction (Table 10). For example, those who thought that the availability of on-site facilities was a big factor in making decisions whether or not to use satellite-delivered instruction, were not likely to think that the ability to stay within their development budget was a particularly big obstacle during the development of satellite-delivered instruction.

13) "Difficulty staying within development budget" as an obstacle that most interfered with development of satellite-delivered instruction was positively correlated ($\rho = .885$) with "Constantly changing technology" as an obstacle that most interfered with implementation of satellite-delivered instruction (Table 10). In other words, those respondents who ranked "Difficulty staying within development budget" as an obstacle that had frequently interfered with the *development* of the instruction, were likely to rank "Constantly changing

technology" as an obstacle that had frequently interfered with the *implementation* of the instruction.

14) The ranking of "High initial hardware costs" as an obstacle that most interfered with development of satellite-delivered instruction was positively correlated ($\rho = .813$) with the ranking of "High initial hardware costs" as an obstacle that most interfered with implementation of satellite-delivered instruction (Table 10). As an example, the respondents who ranked "High initial hardware costs" high on their list of obstacles that had interfered with their *development* of satellite-delivered instruction, were also likely to rank "High initial hardware costs" high on their list of obstacles that had interfered with the *implementation* of satellite-delivered instruction.

15) Similarly, the ranking of "Unavailability of production facility" as an obstacle that most interfered with development of satellite-delivered instruction was positively correlated ($\rho = .811$) with the ranking of "Unavailability of production facility" as an obstacle that most interfered with implementation of satellite-delivered instruction (Table 10).

16) A moderate, positive correlation ($r = .451$) was found between the number of professional organizations to which the respondents belonged, and the number of professional/trade journals to which they subscribed, $p < .001$ (Table 9).

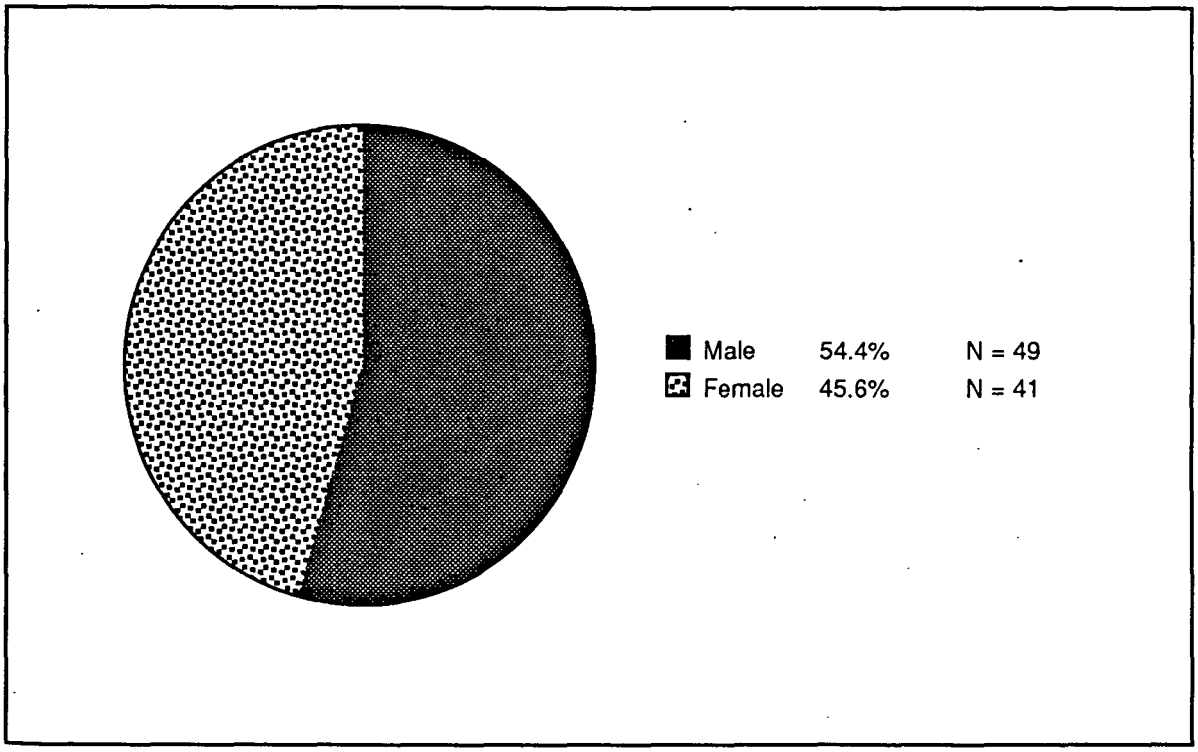

Figure 1. Gender of respondents

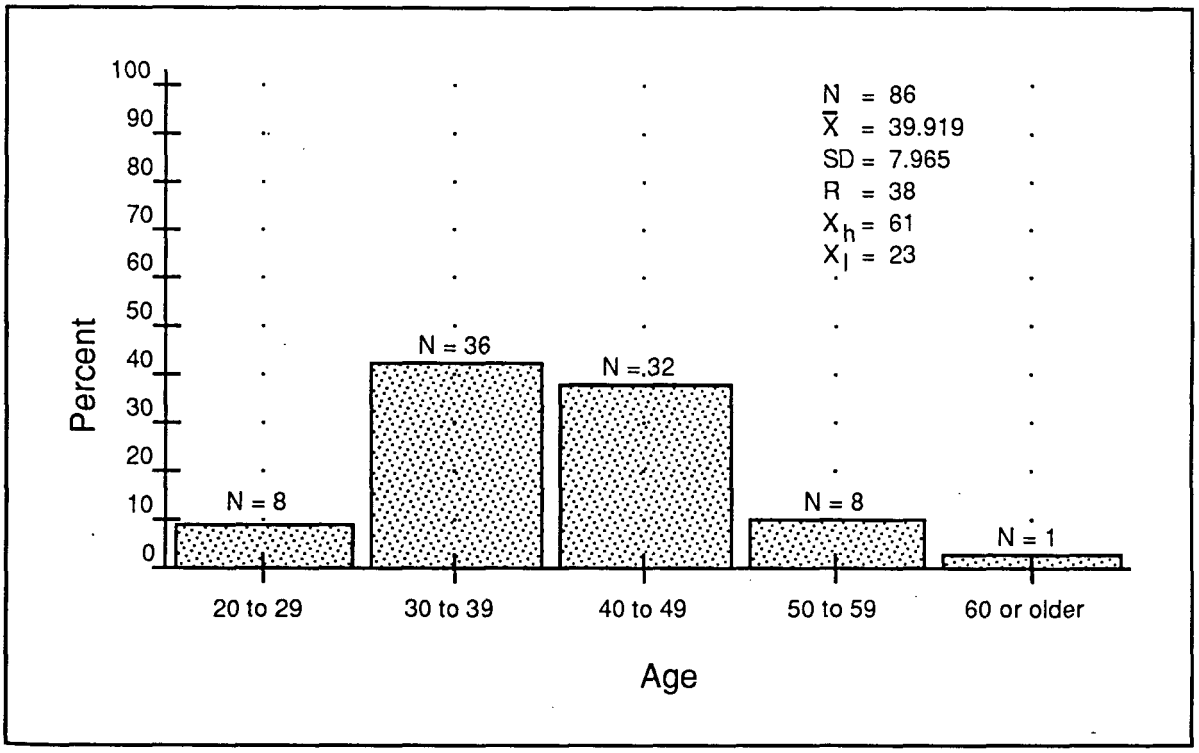

Figure 2. Age of respondents

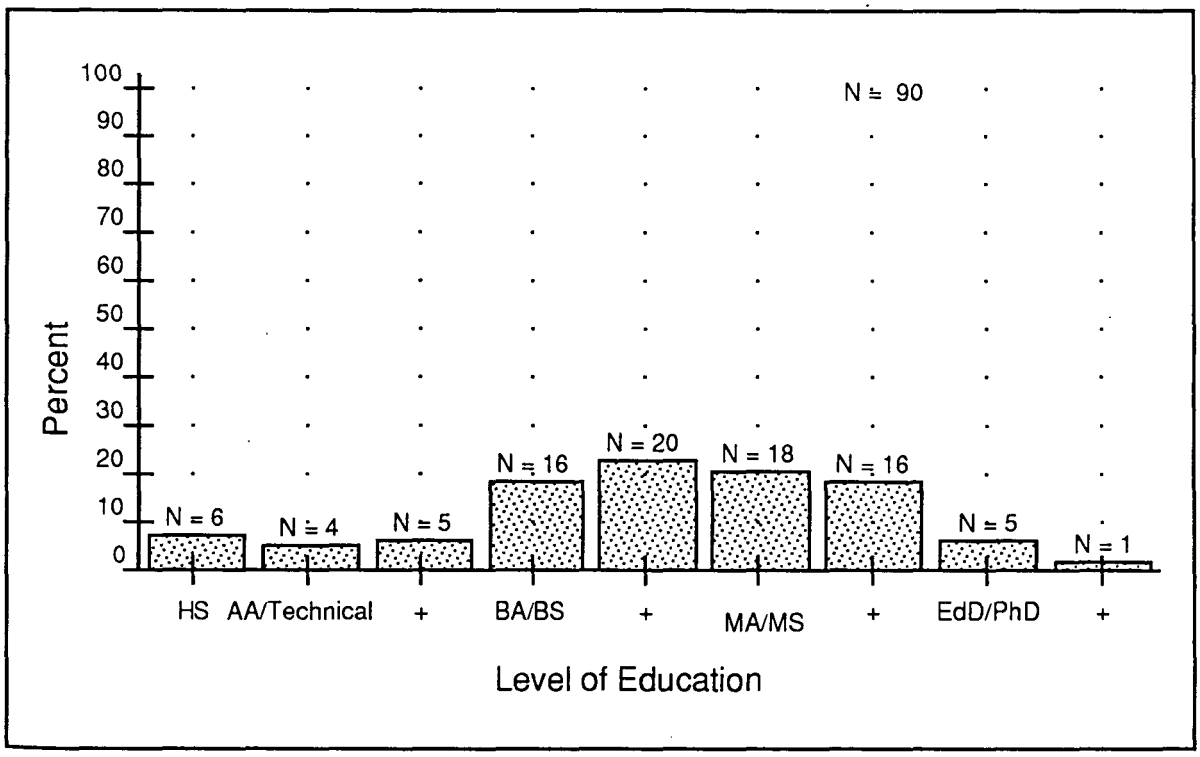

Figure 3. Level of education of respondents

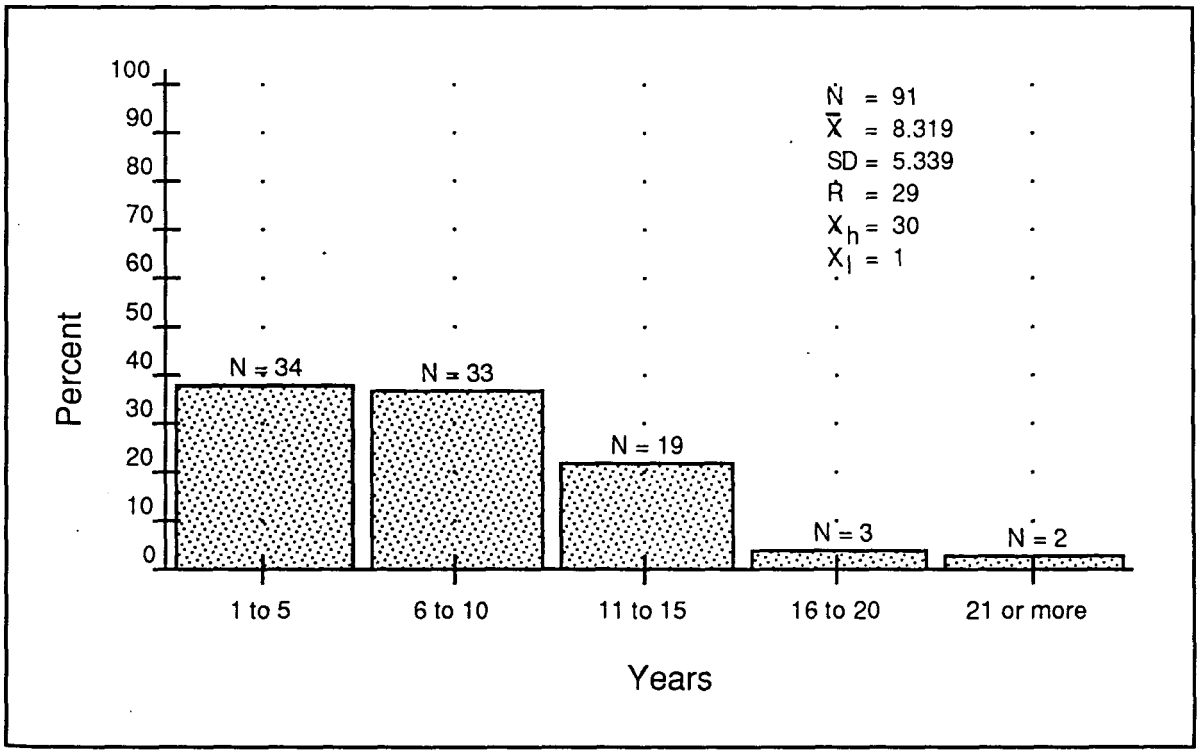

Figure 4. Number of years experience respondents had in corporate training

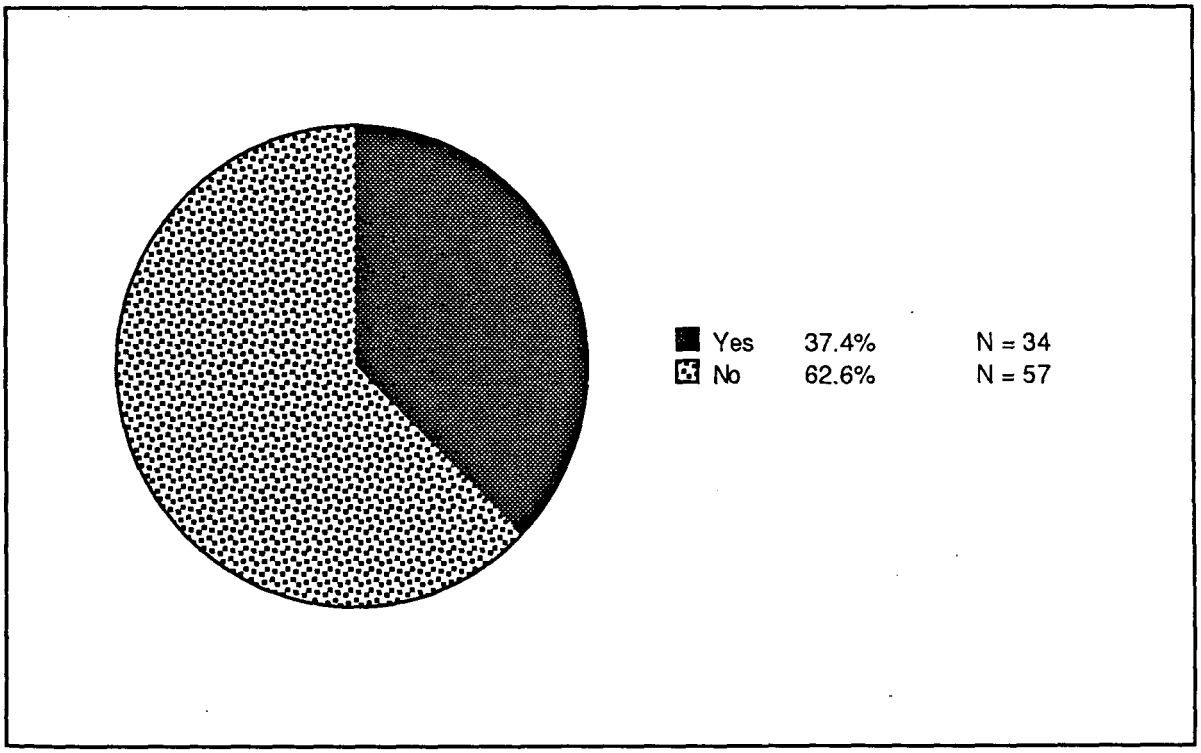

Figure 5. Respondent had participated in a meeting delivered via satellite teleconferencing

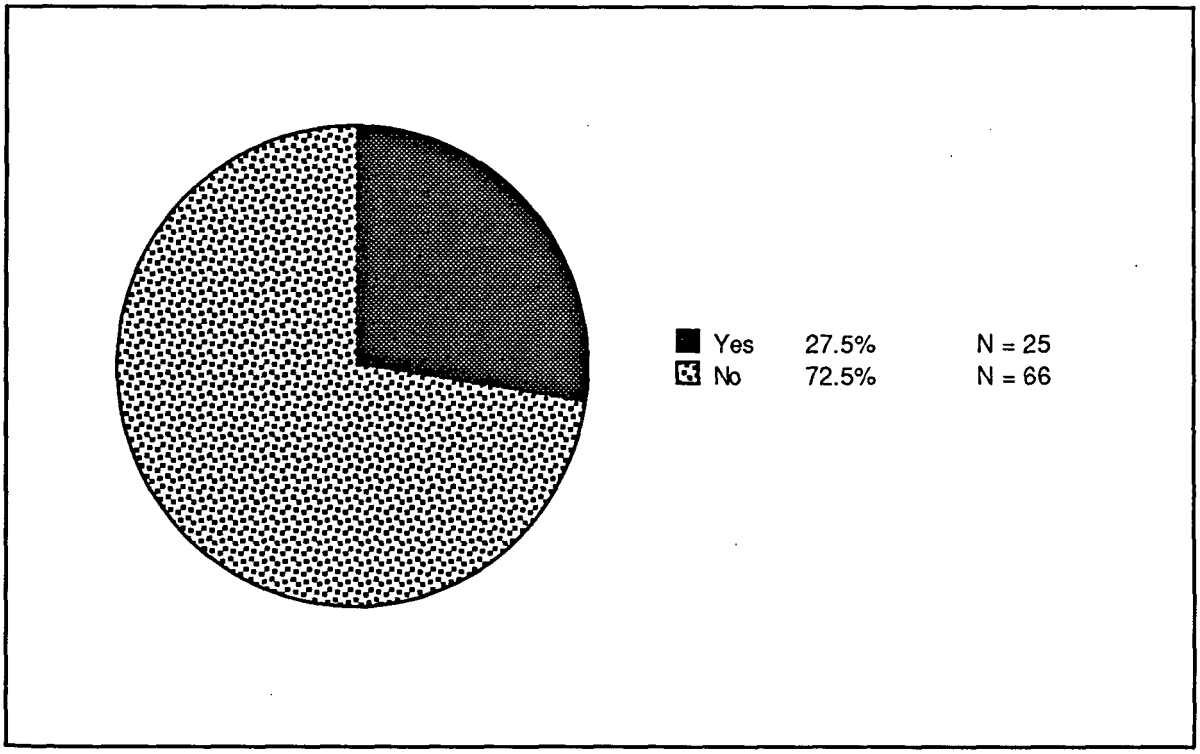

Figure 6. Respondent had participated in job training delivered via satellite teleconferencing

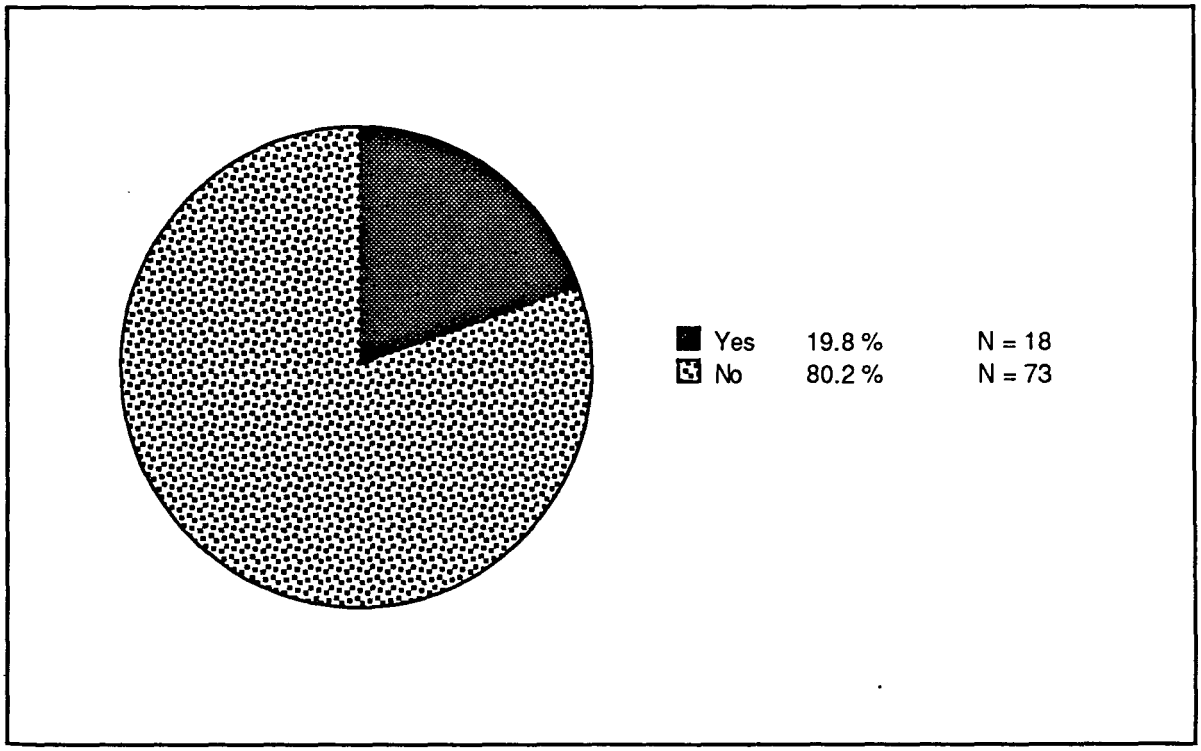

Figure 7. Respondent had participated in a formal education course or multi-session workshop delivered via satellite teleconferencing

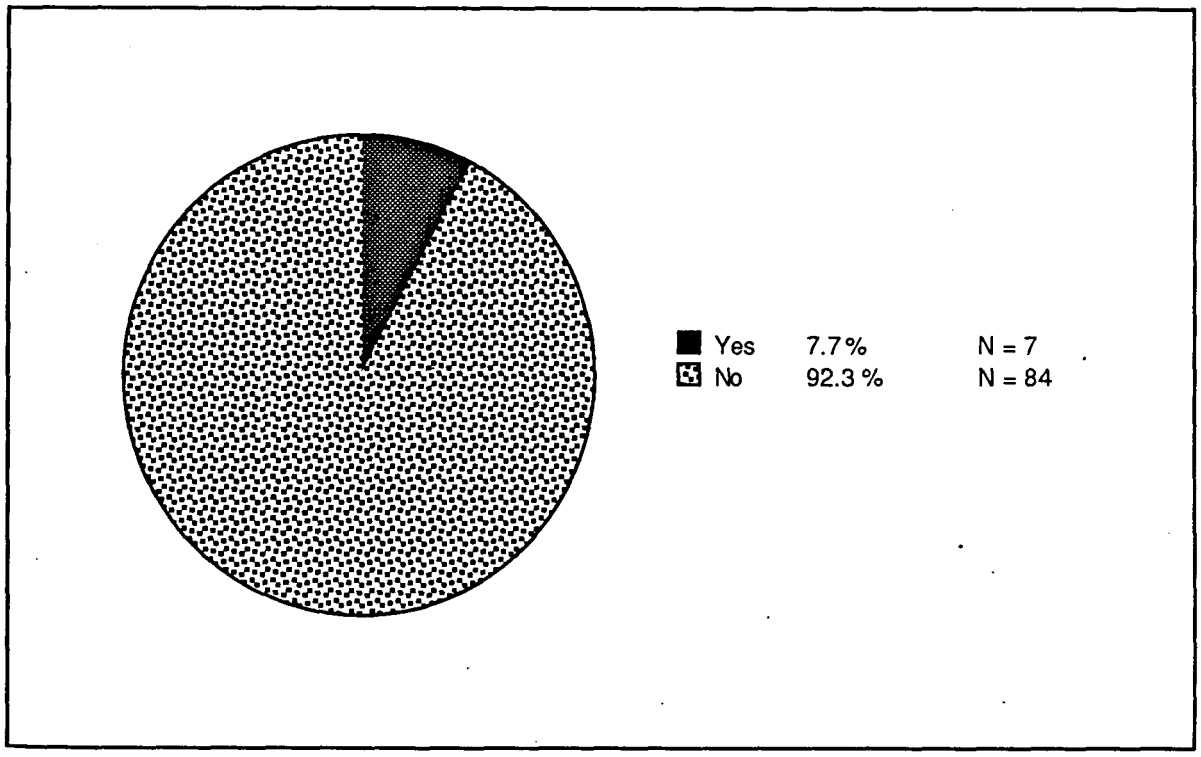

Figure 8. Respondents were involved in facilitating satellite-delivered, distance instruction for their company

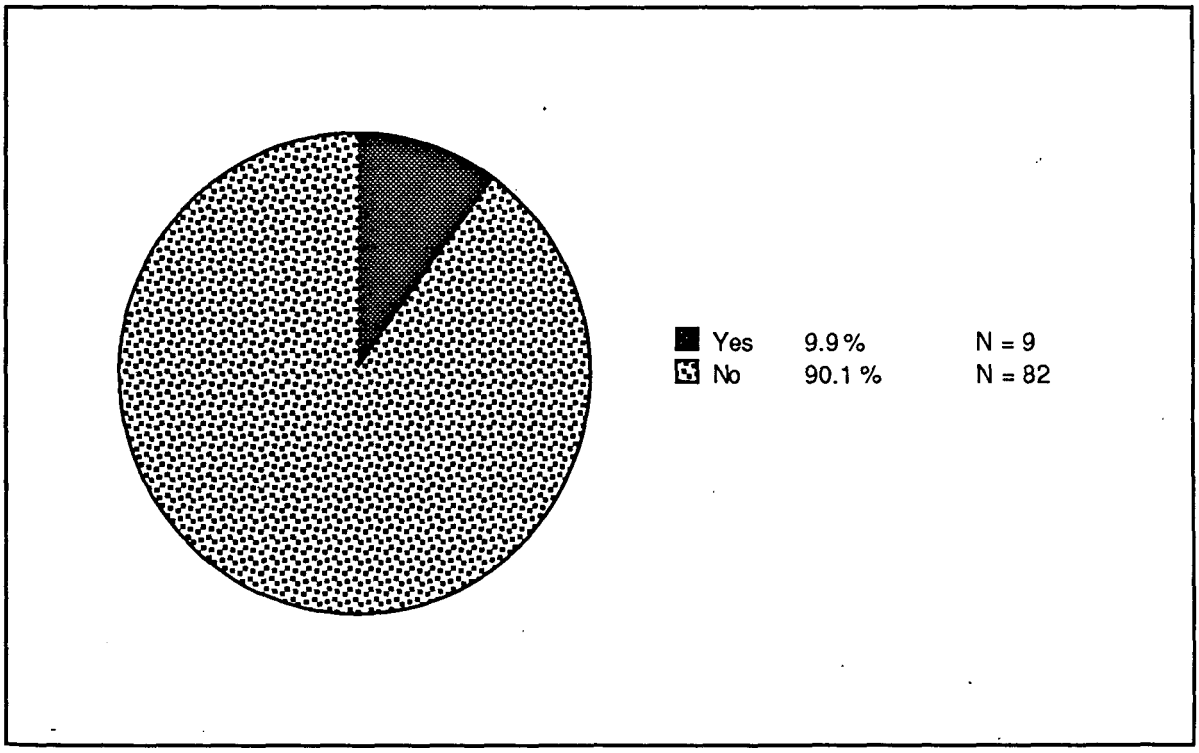

Figure 9. Respondents were involved in purchasing satellite-delivered, distance instruction for their companies

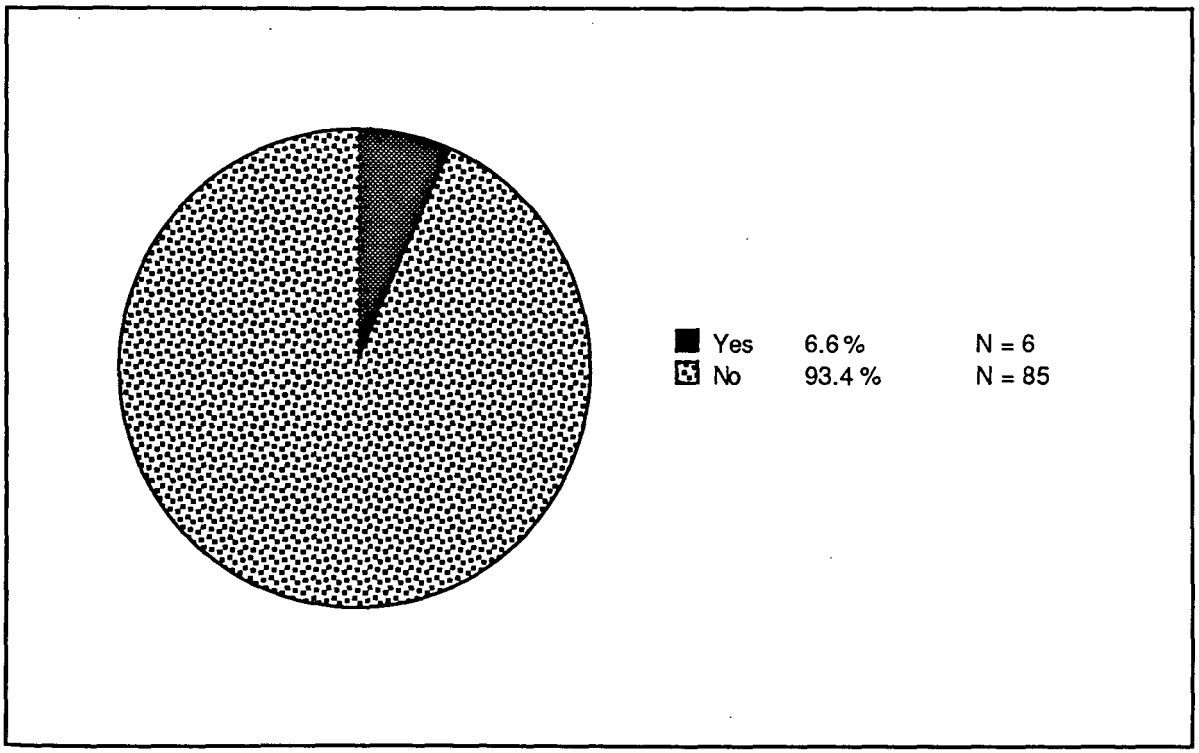

Figure 10. Respondents were involved in designing satellite-delivered, distance instruction for their companies

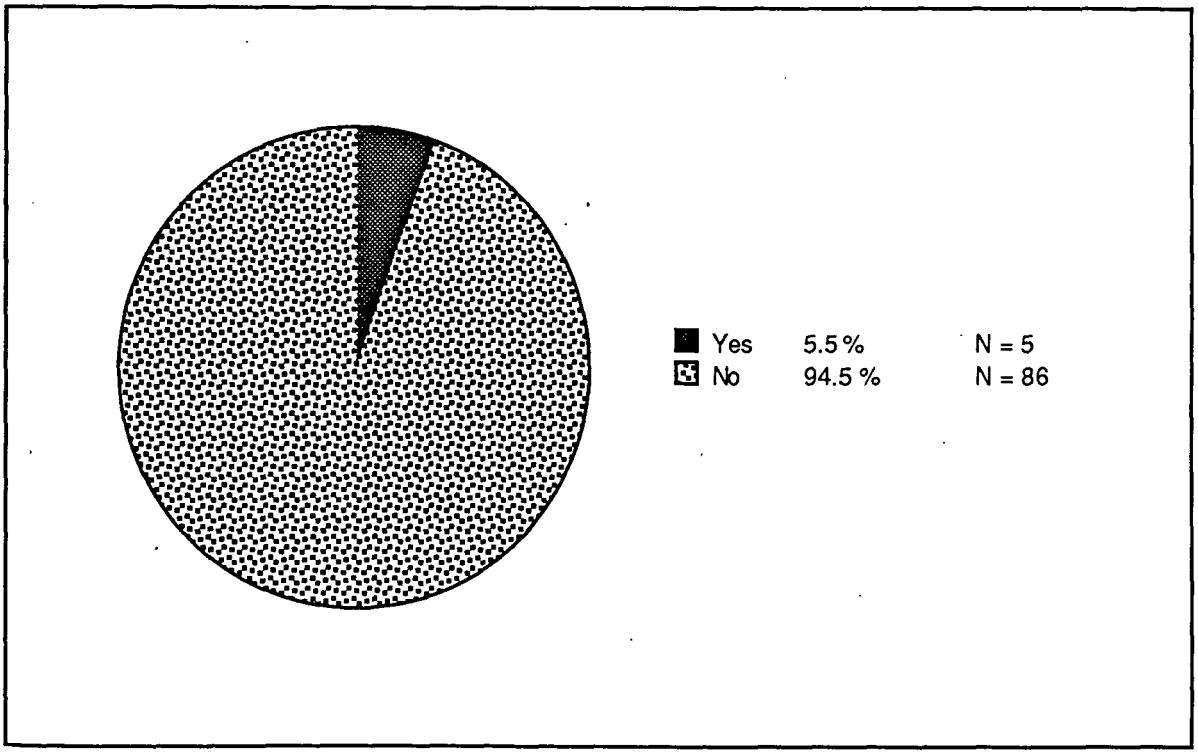

Figure 11. Respondents were involved in producing satellite-delivered, distance instruction for their companies

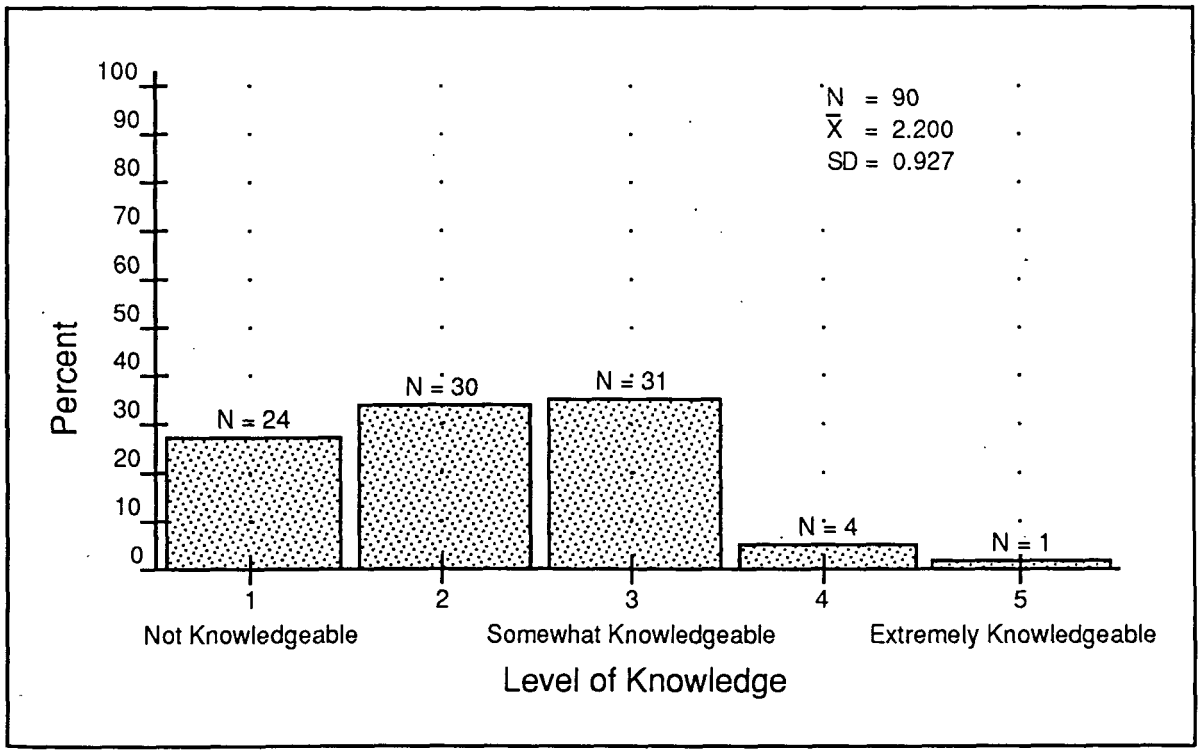

Figure 12. Respondents' levels of knowledge about satellite-delivered instruction

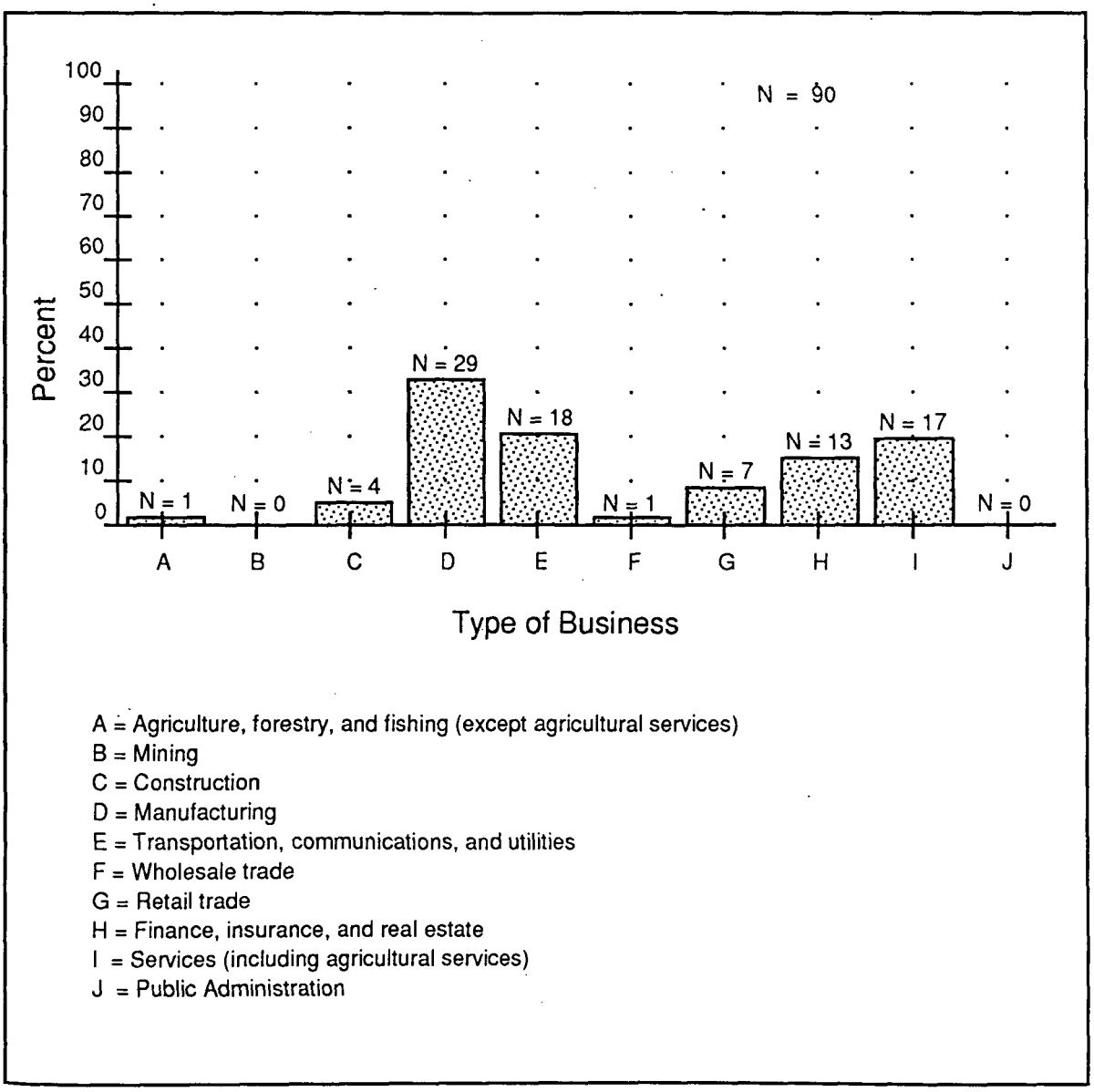

Figure 13. Types of businesses where respondents were employed

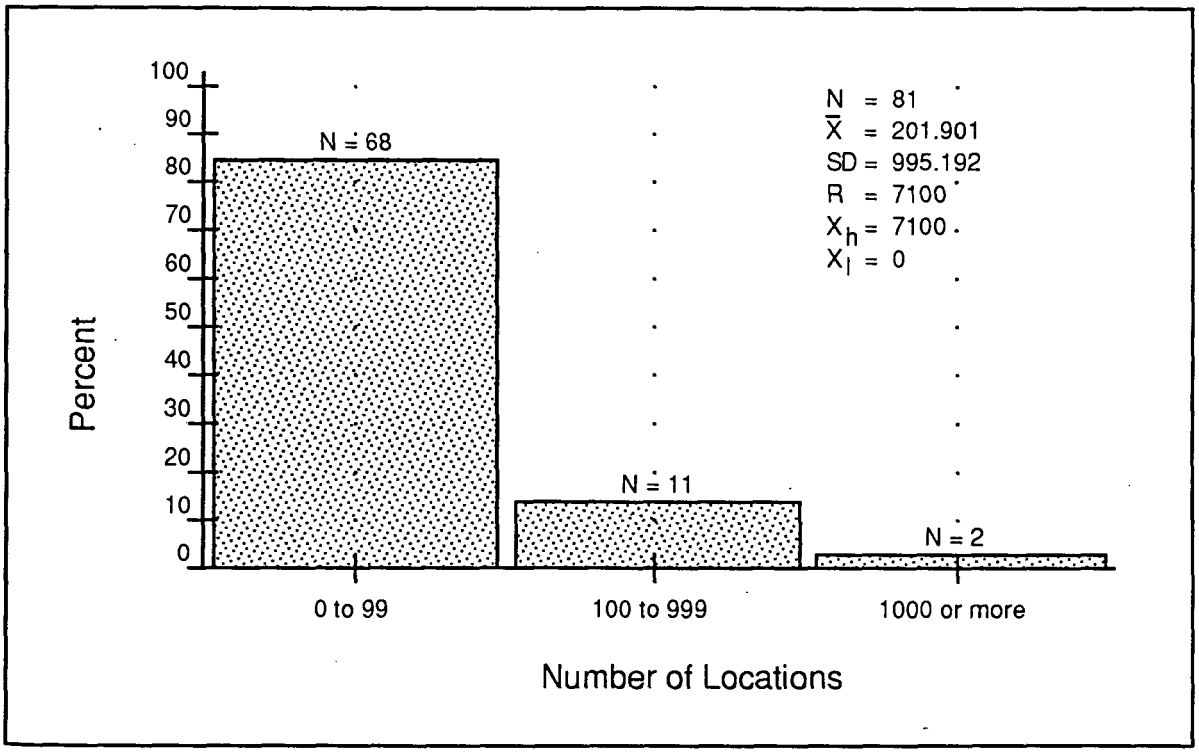

Figure 14. Number of company branch locations

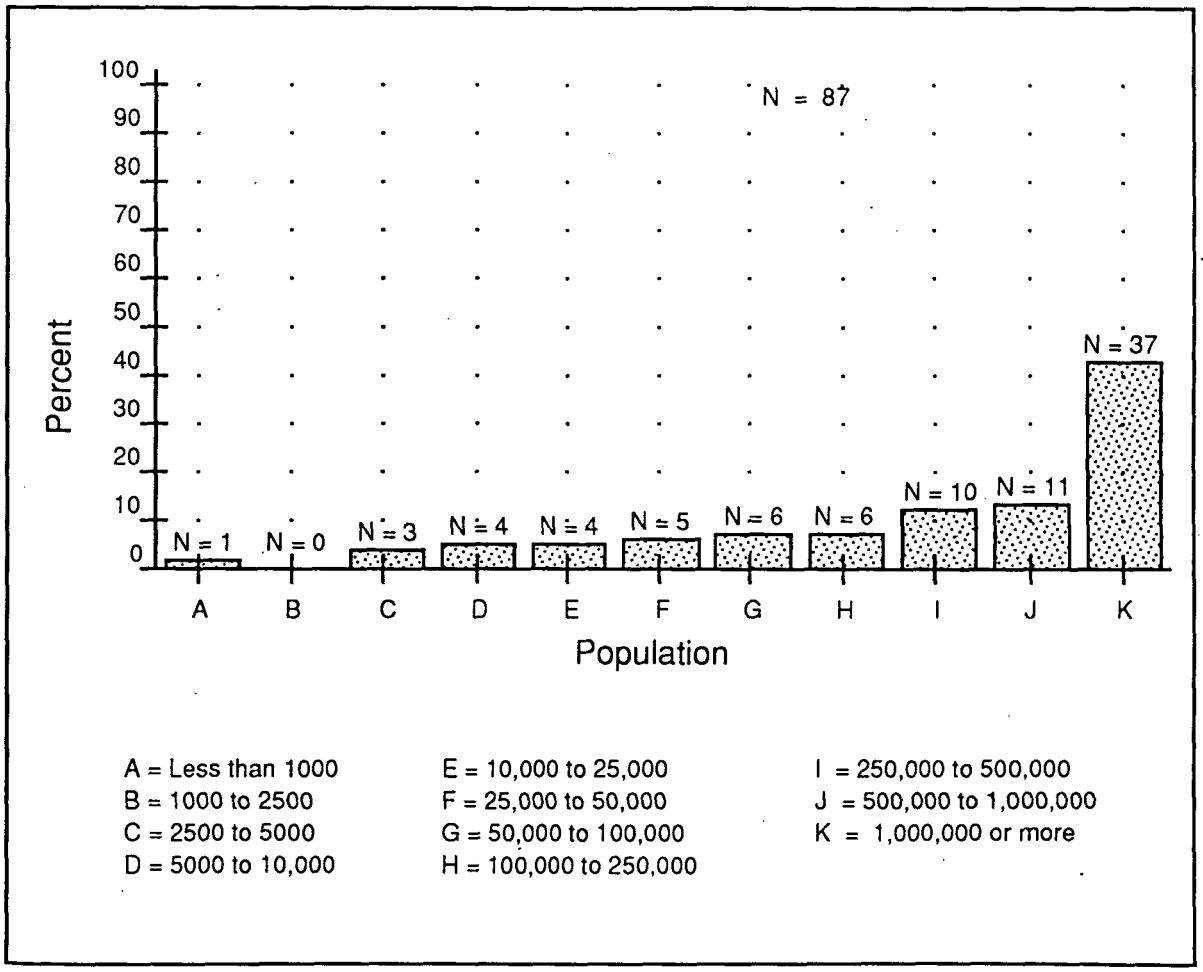

Figure 15. Populations of the towns/metro areas in which the companies were located

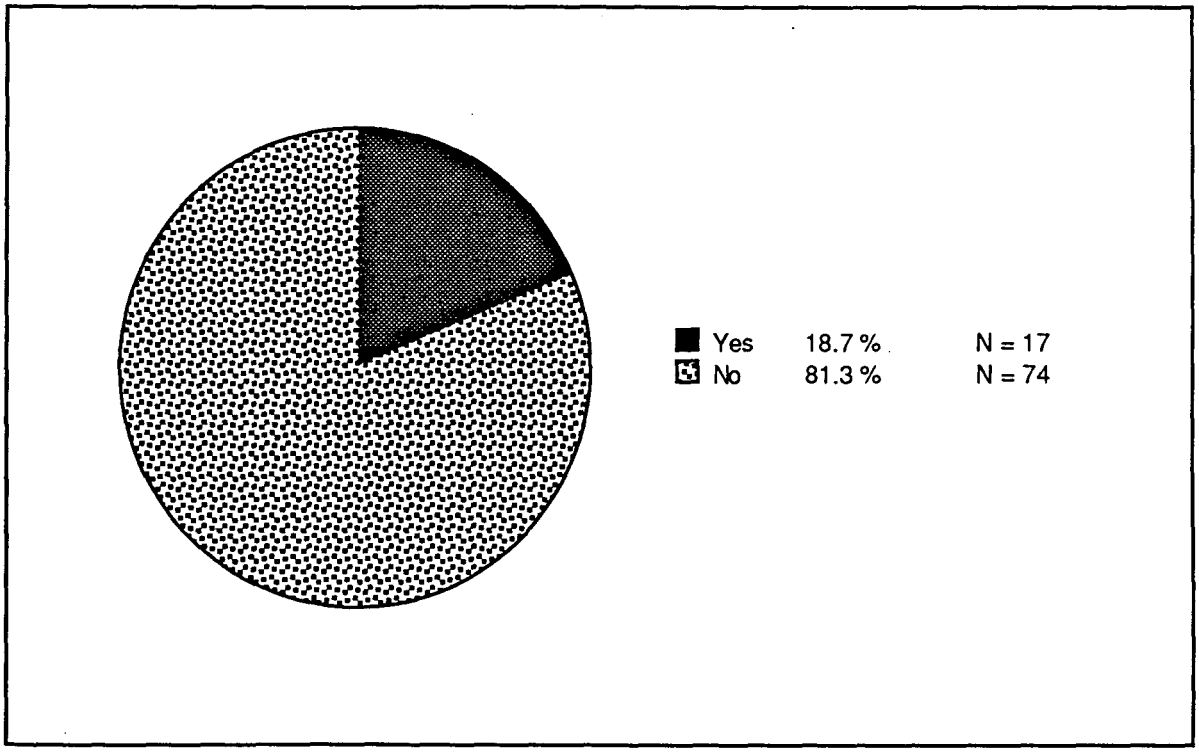

Figure 16. Respondent's company maintained an in-house television studio

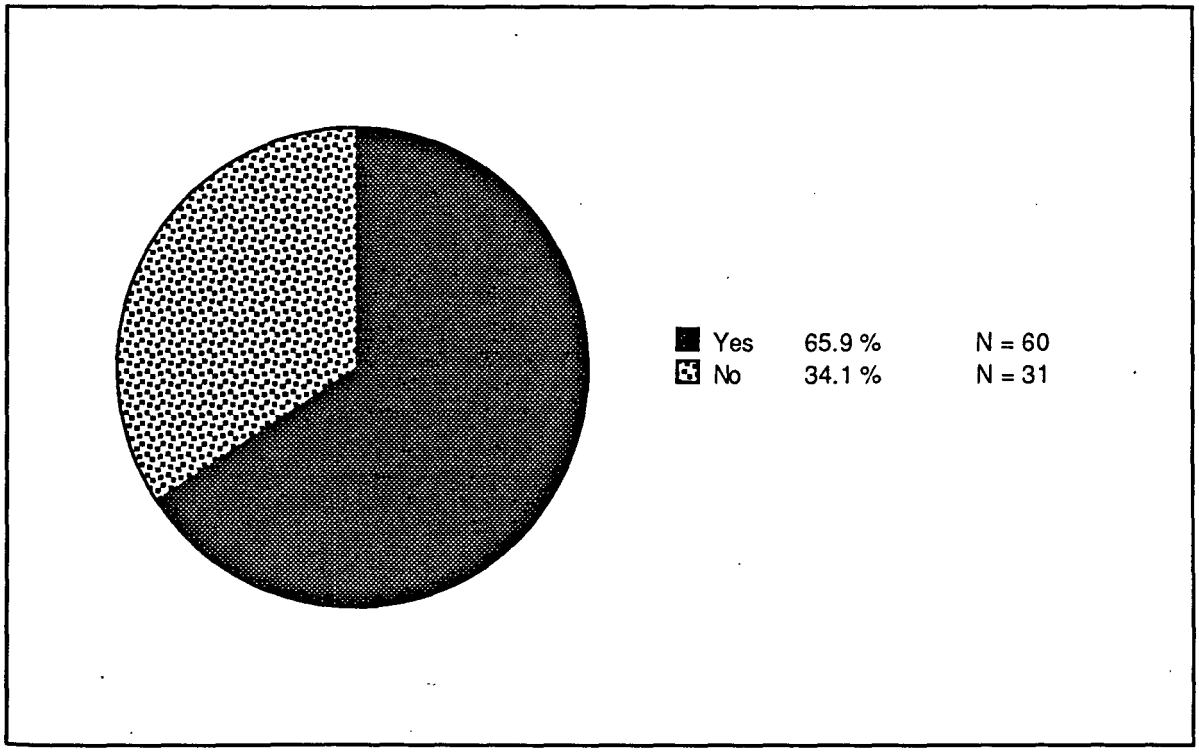

Figure 17. Respondent's company maintained video production equipment (video cameras and decks, camcorders, lights, etc.)

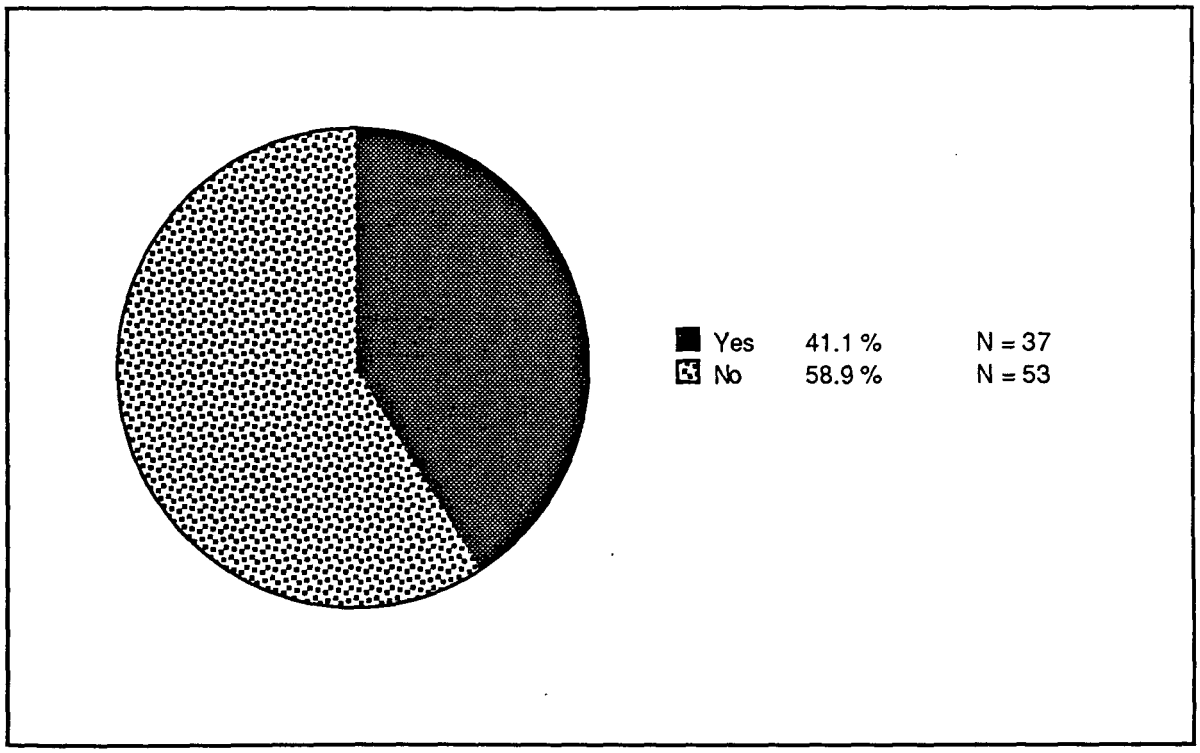

Figure 18. Respondent's company maintained video post-production equipment (video editing equipment, character generator, etc.)

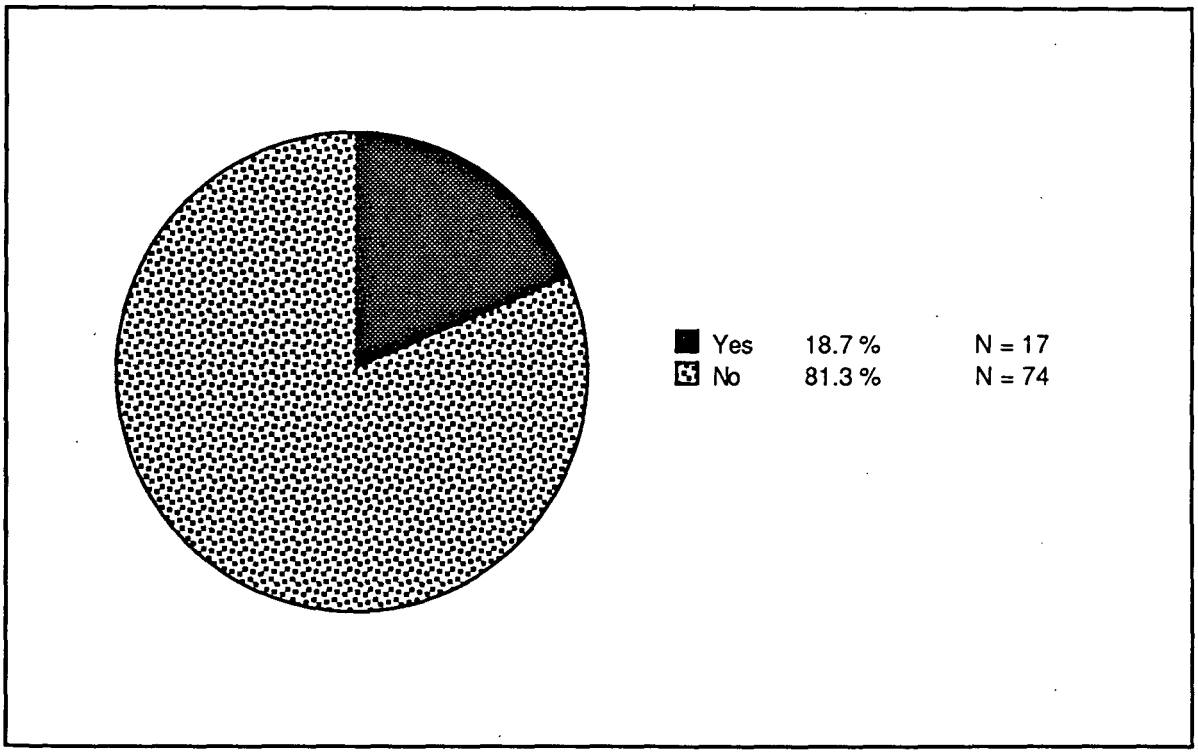

Figure 19. Uplink was available at respondent's facility

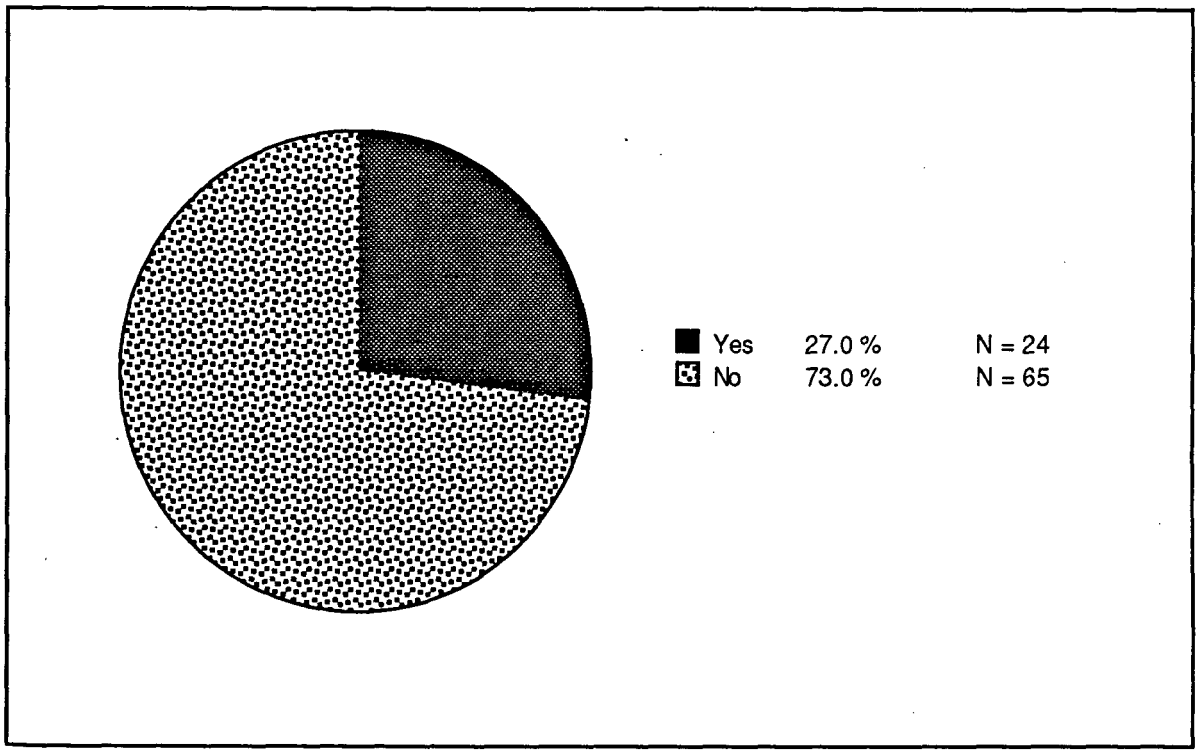

Figure 20. Uplink was available at company headquarters

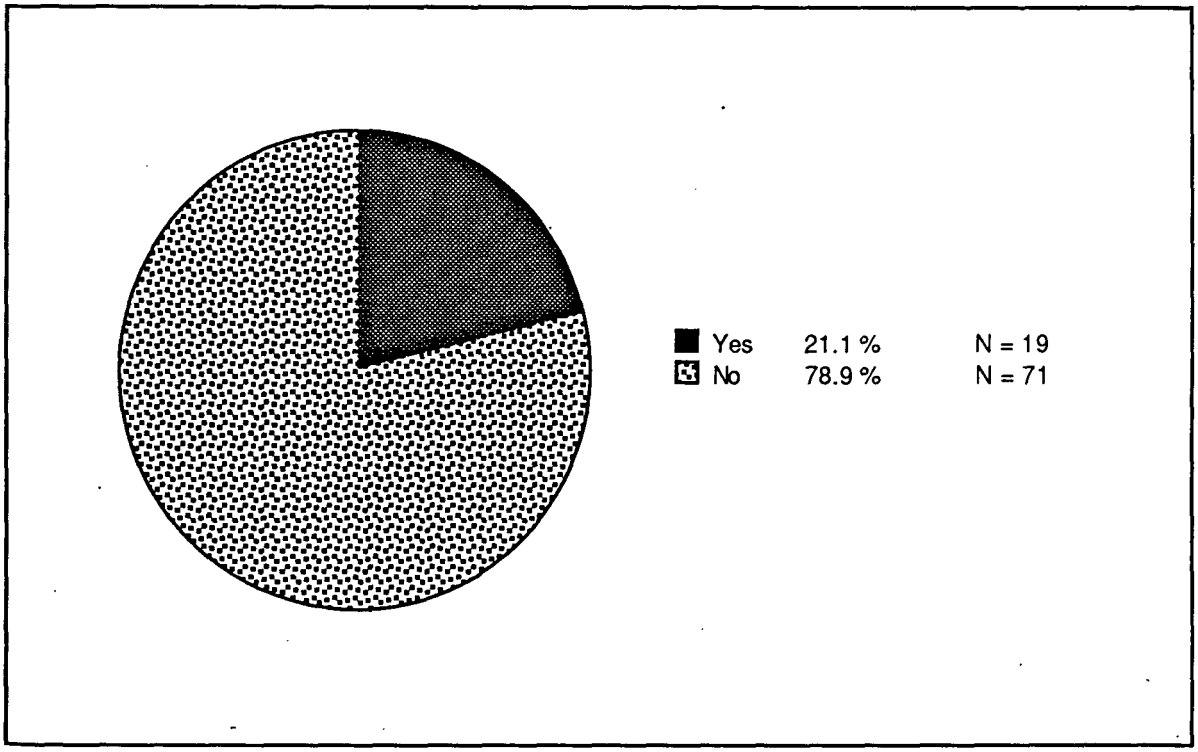

Figure 21. Downlink was available at respondent's facility

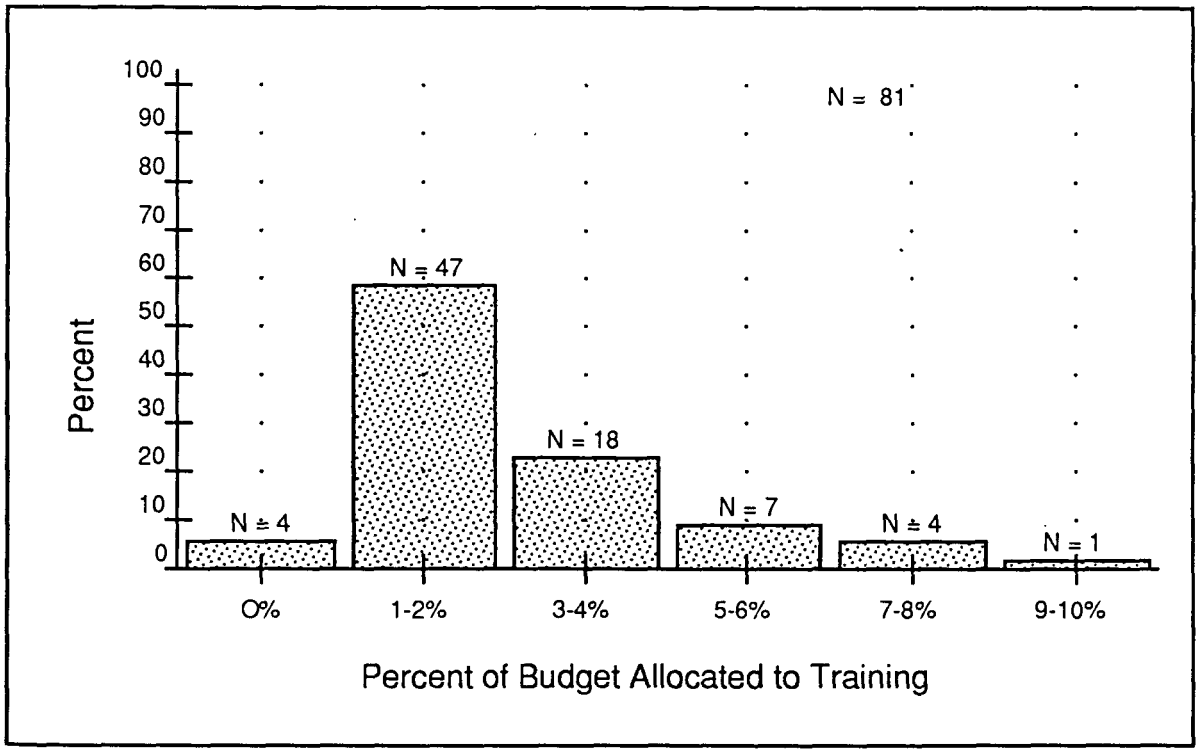

Figure 22. Percent of the annual corporate operating budget allocated to training

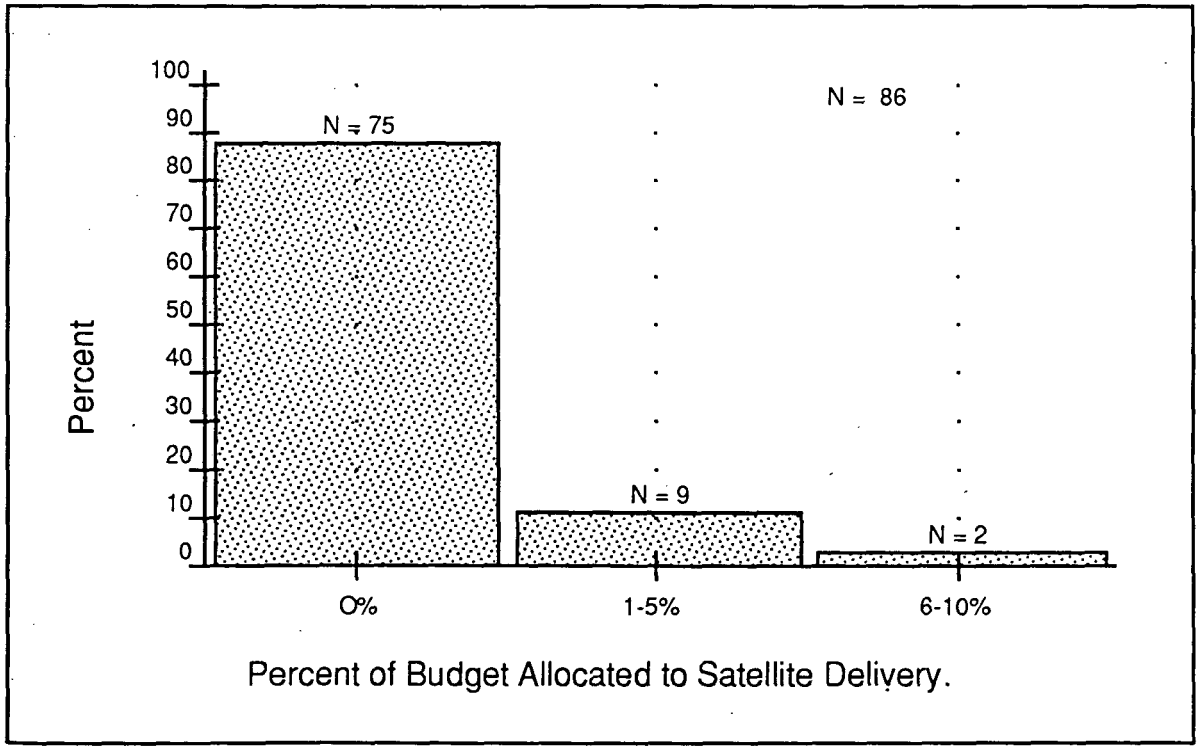

Figure 23. Percent of the annual training budget (or training resources) allocated to satellite-delivered, televised instruction for employees

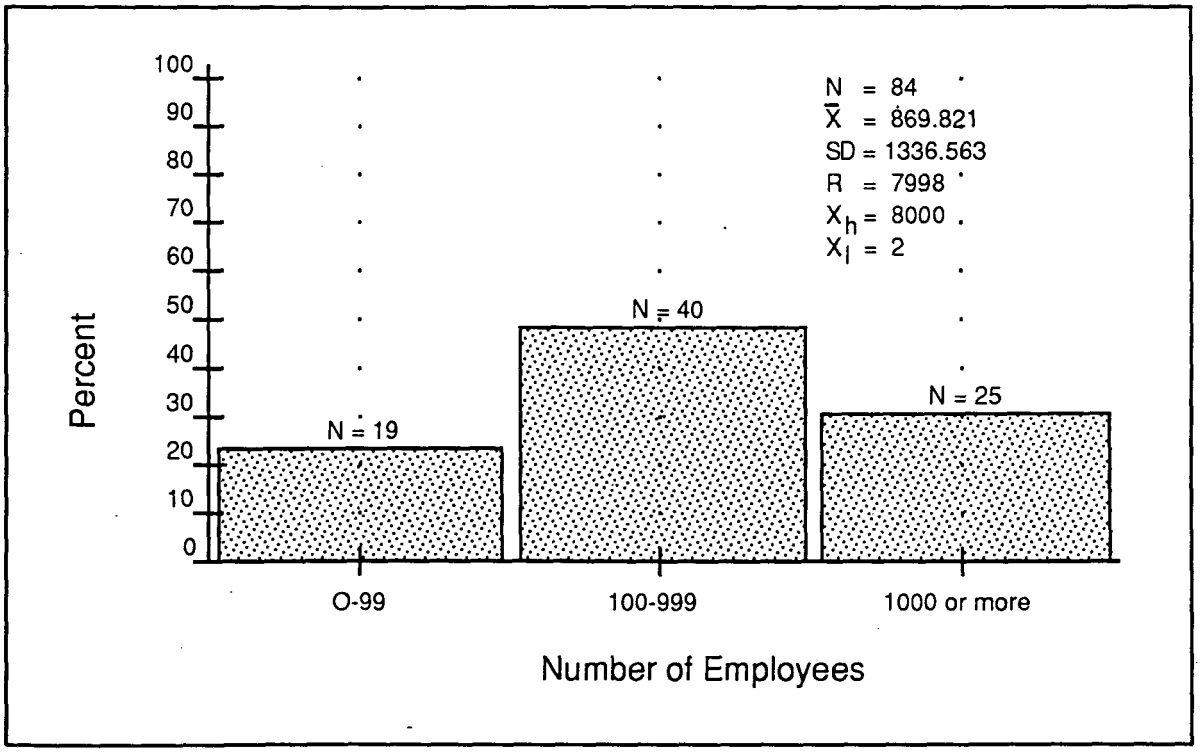

Figure 24. Number of employees at respondents' facilities

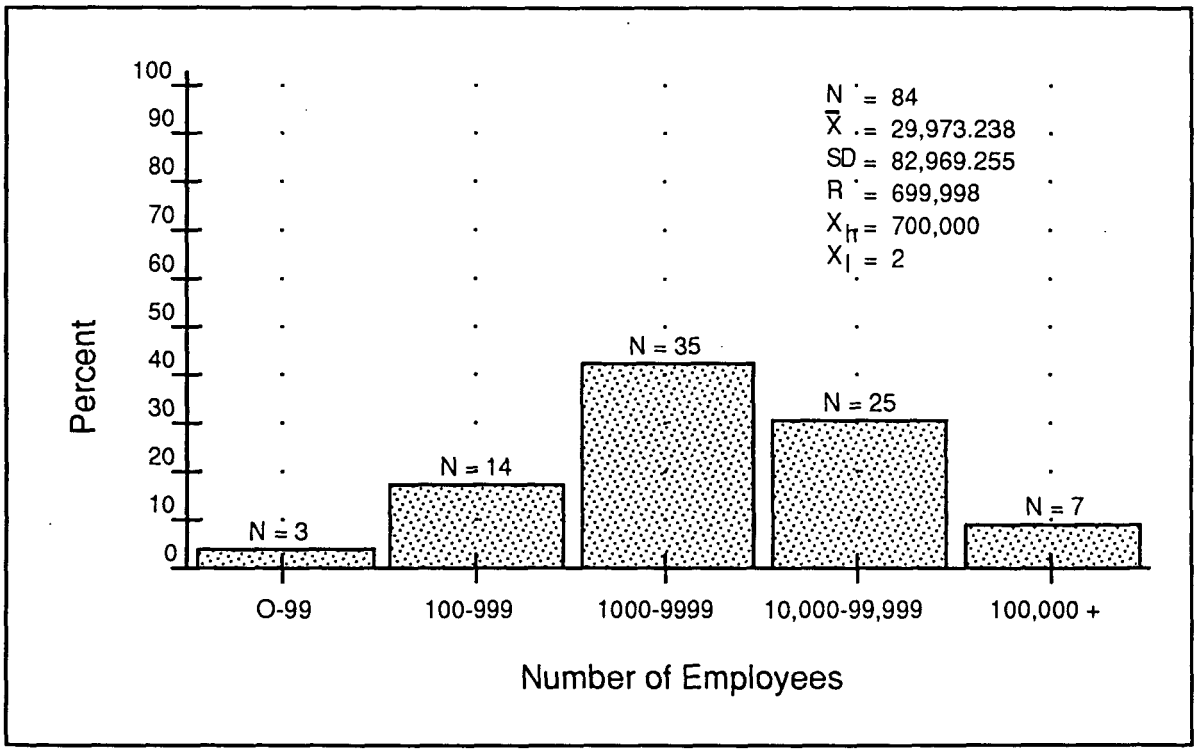

Figure 25. Number of company employees world-wide

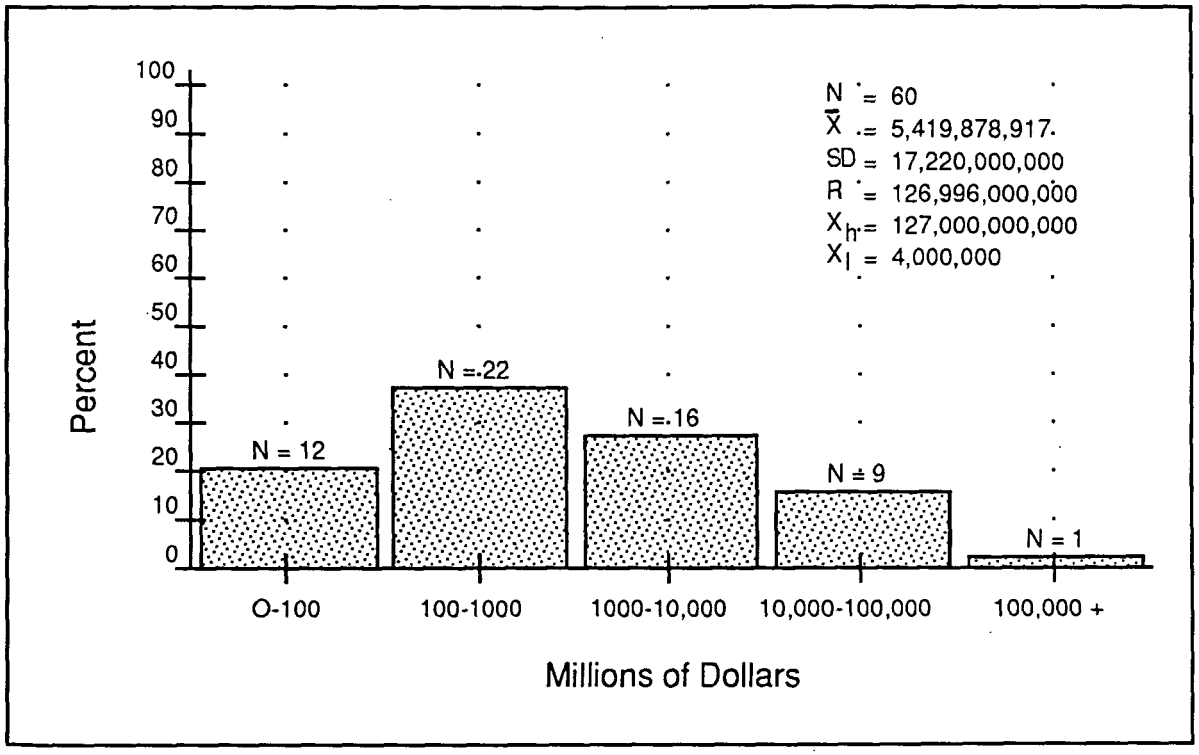

Figure 26. Value of the respondents' companies

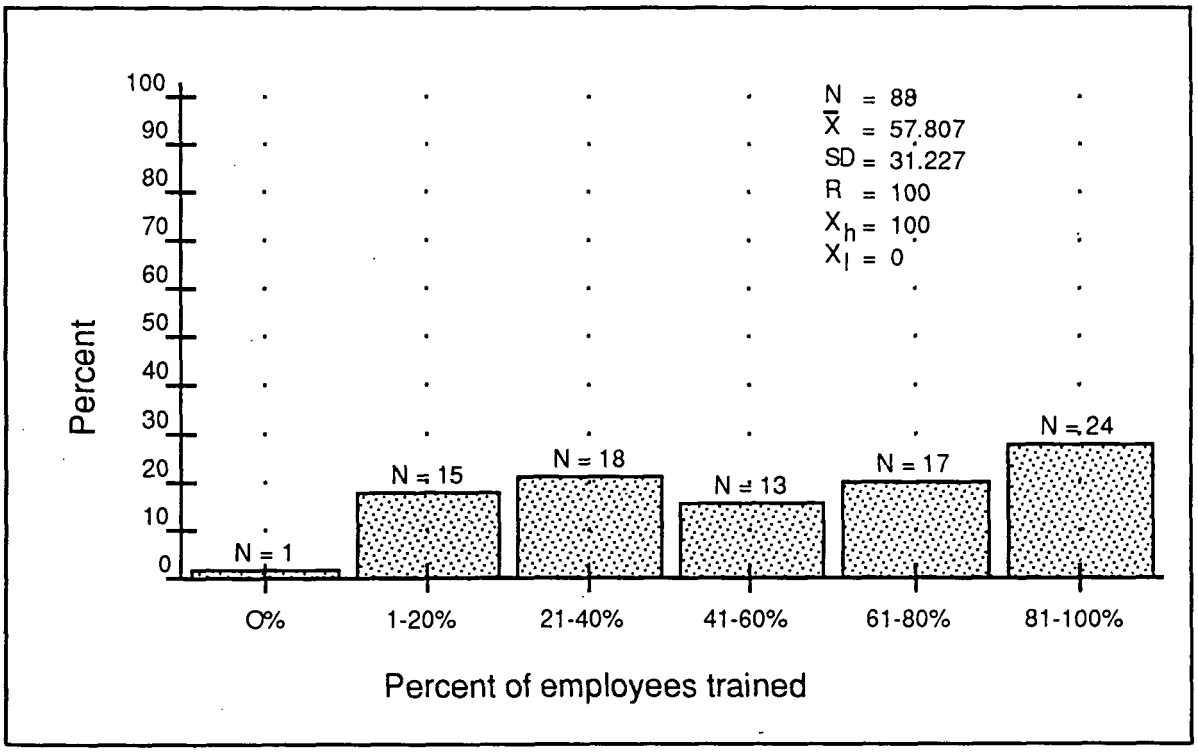

Figure 27. Percent of company employees that participated in some form of training

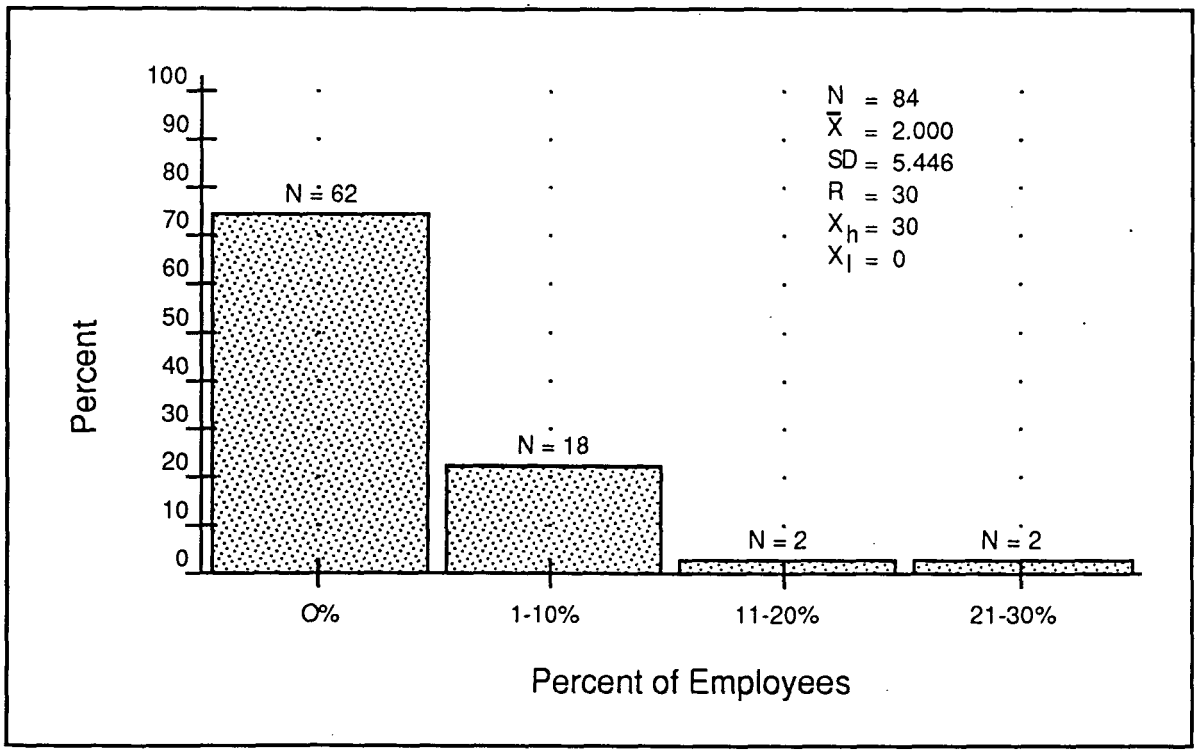

Figure 28. Percent of company employees trained via satellite

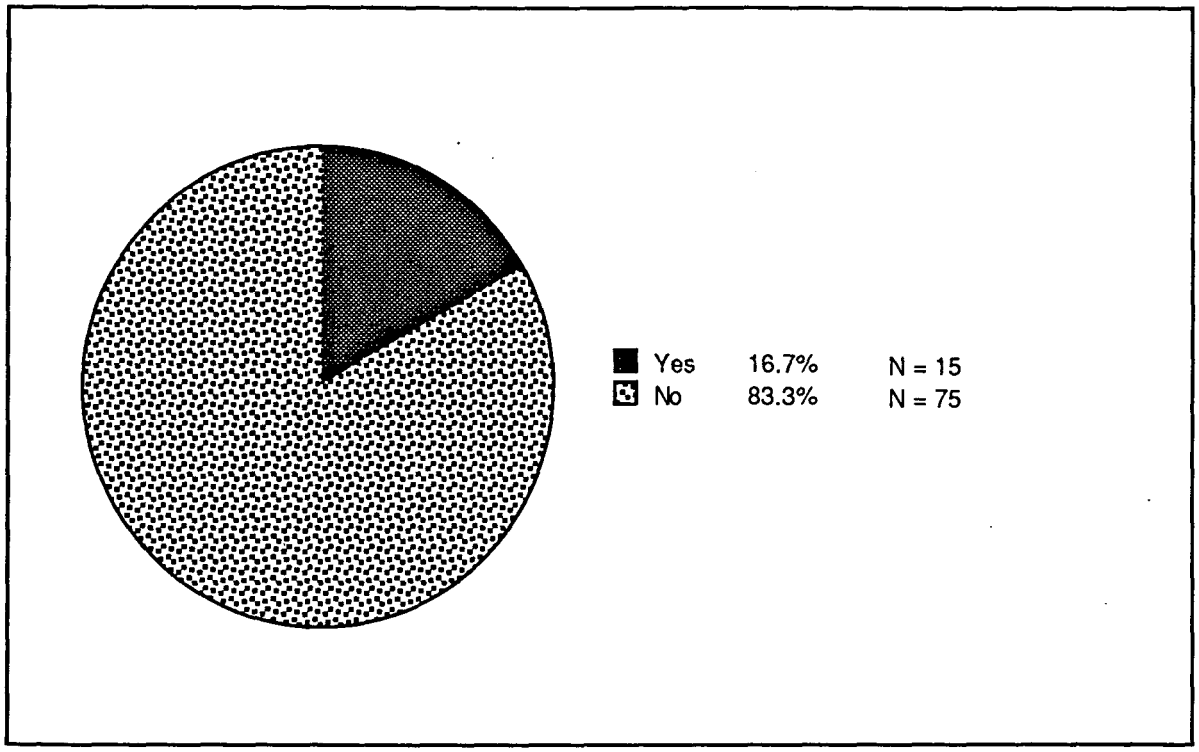

Figure 29. Company used satellite-delivered instruction for employee training

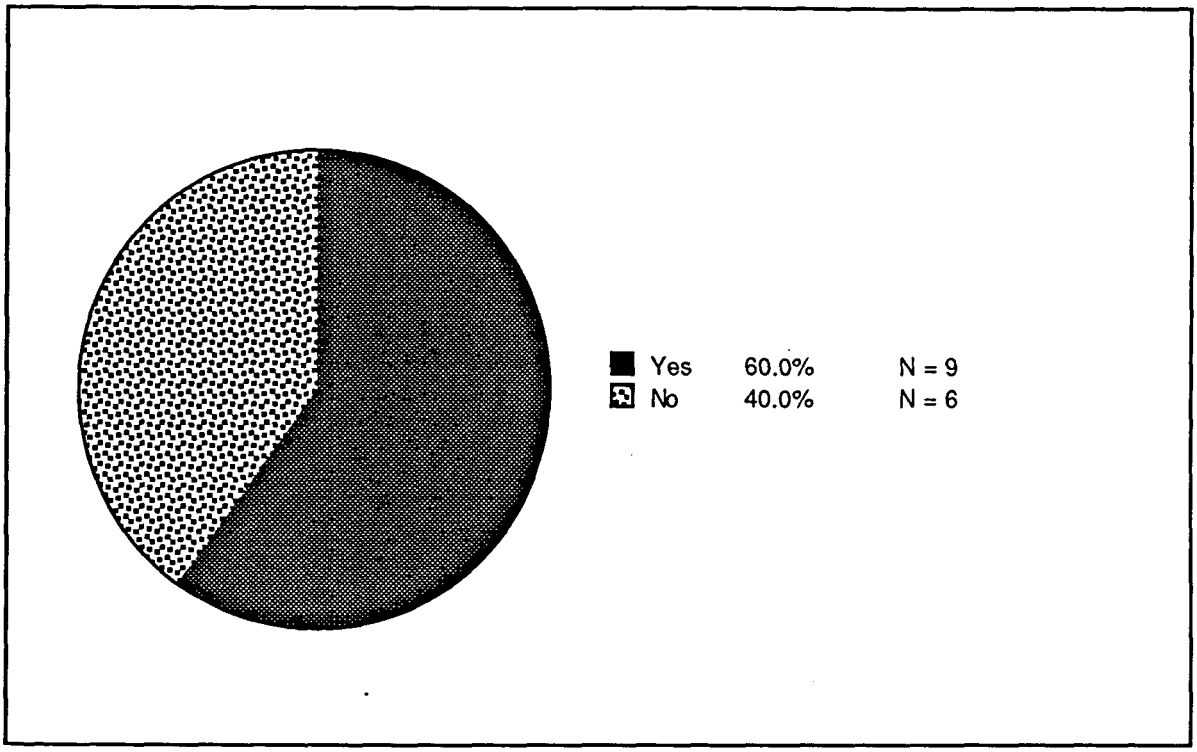

Figure 30. Respondent's facility received satellite-delivered instruction for employee training

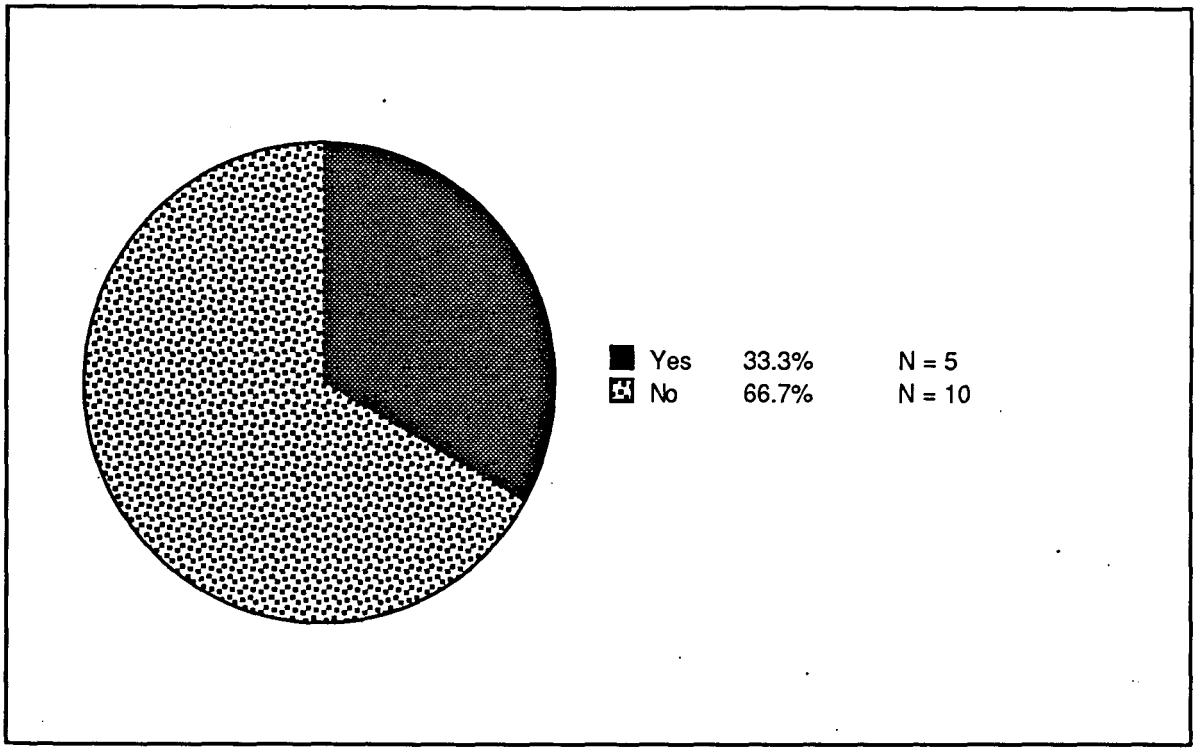

Figure 31. Respondent's facility created satellite-delivered instruction for employee training in distant facilities

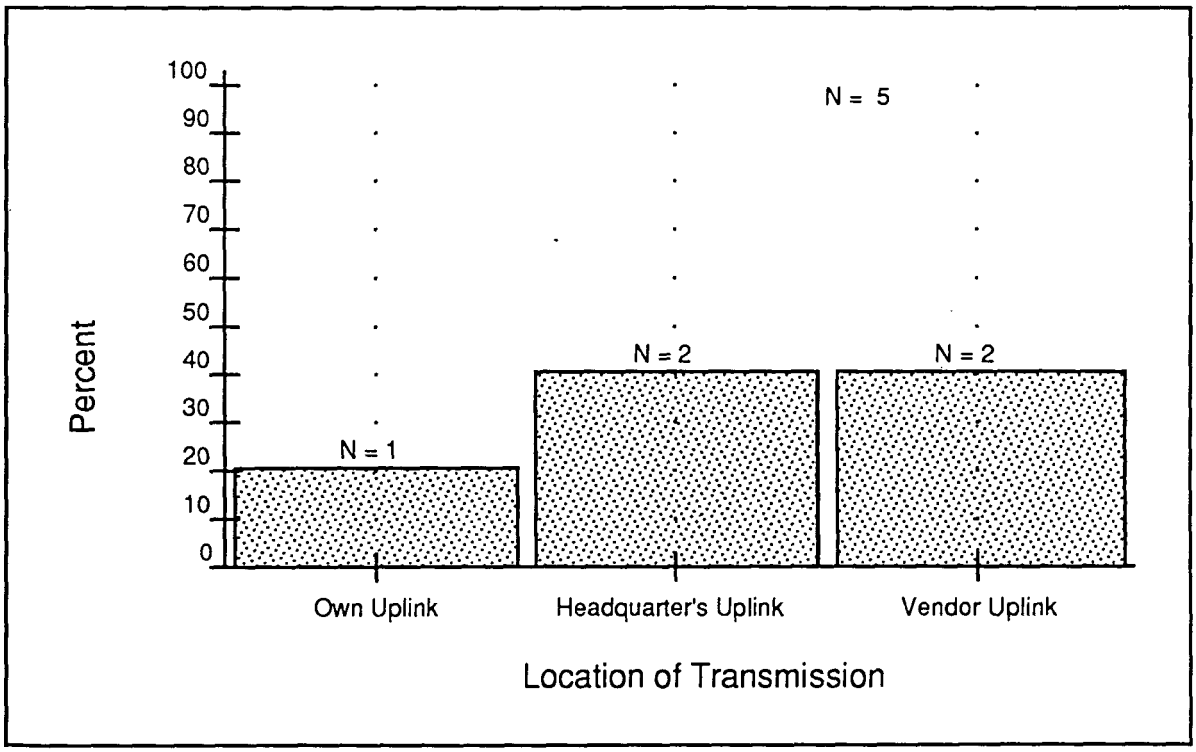

Figure 32. Location of satellite transmission for companies that created instruction for satellite delivery

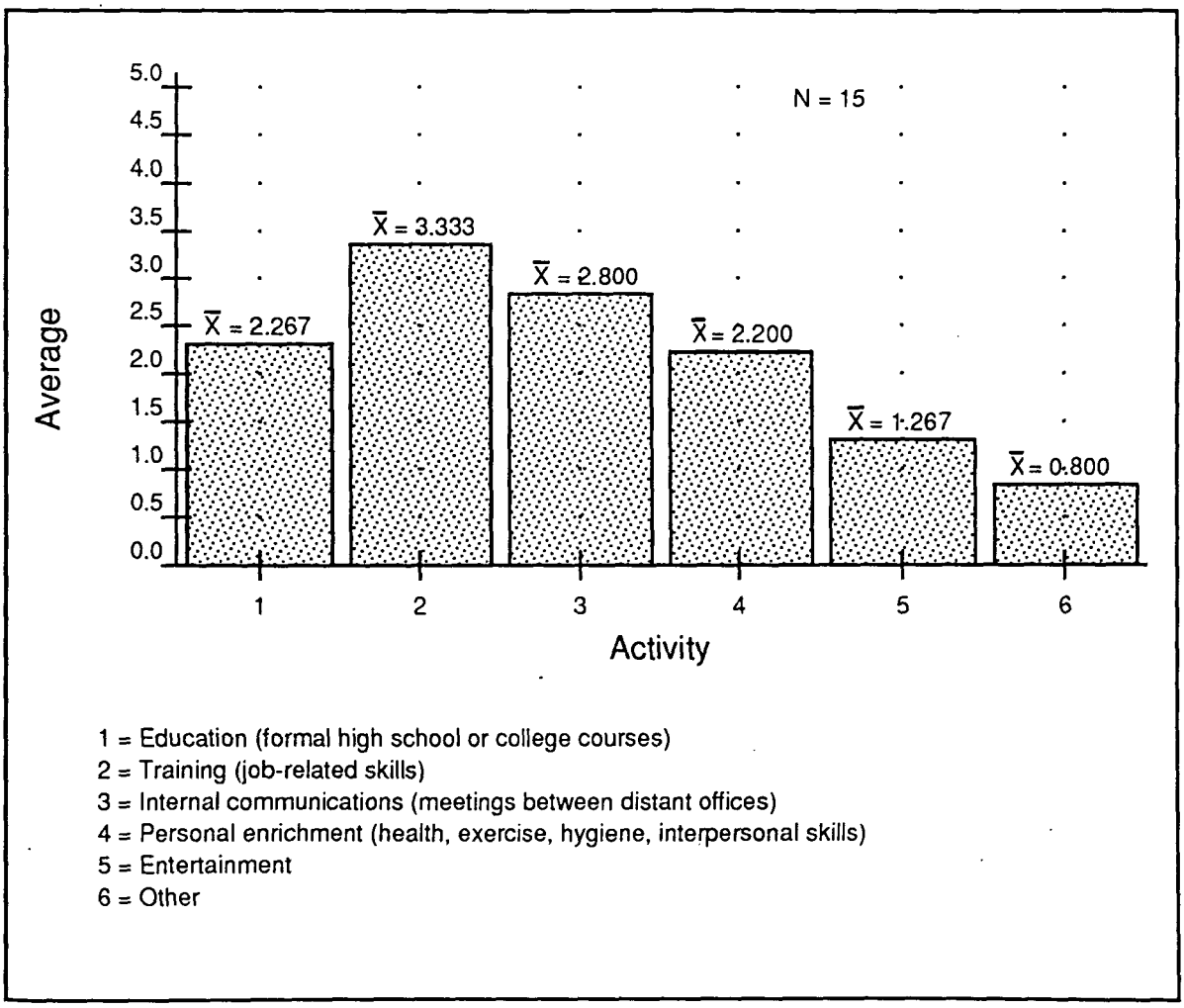

Figure 33. Degree to which satellite delivery was used for various types of activities within the respondents' companies (ranked from 1 to 5 where 1 = not at all, and 5 = extensively)

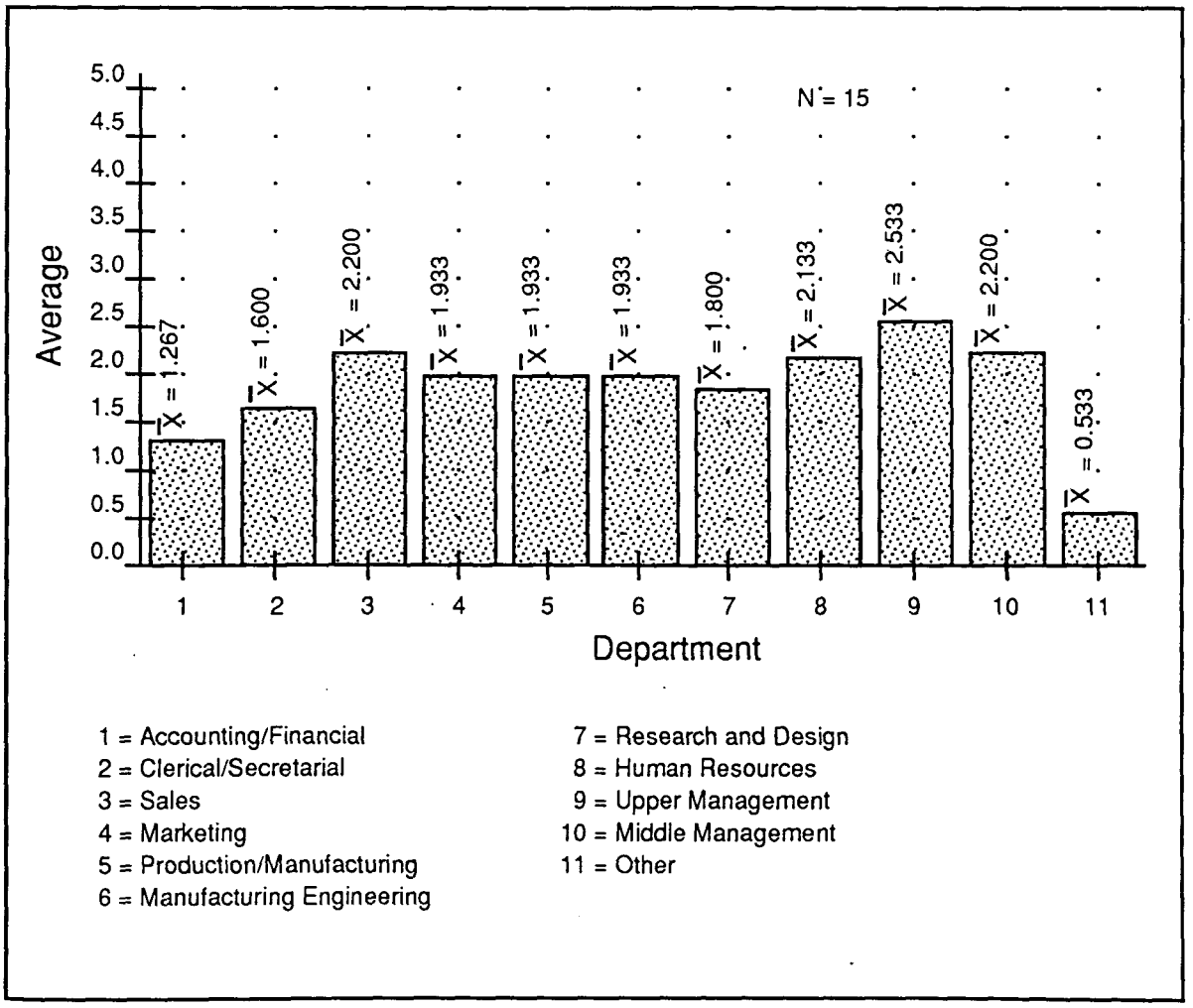

Figure 34. Degree to which satellite technology was used for training by various departments within the respondents' companies (ranked from 1 to 5 where 1 = not at all, and 5 = extensively)

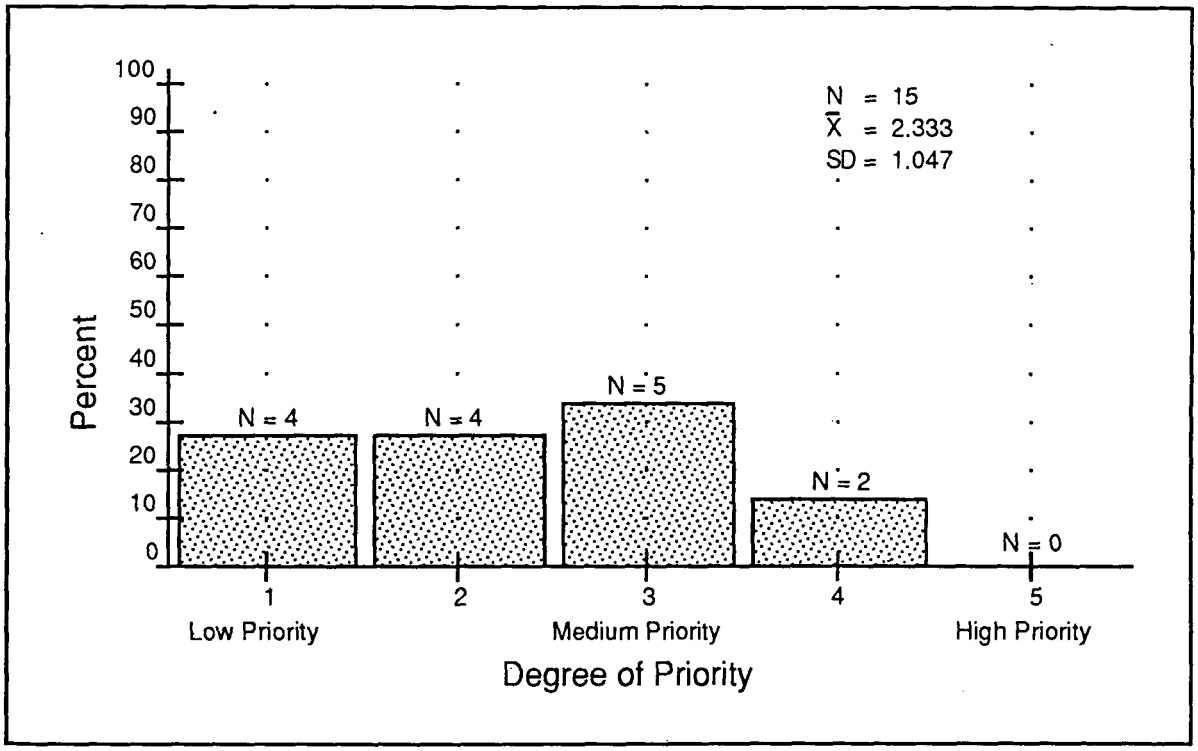

Figure 35. Respondent's rating of the extent to which the use of satellite-delivered, televised instruction was a priority goal within the company

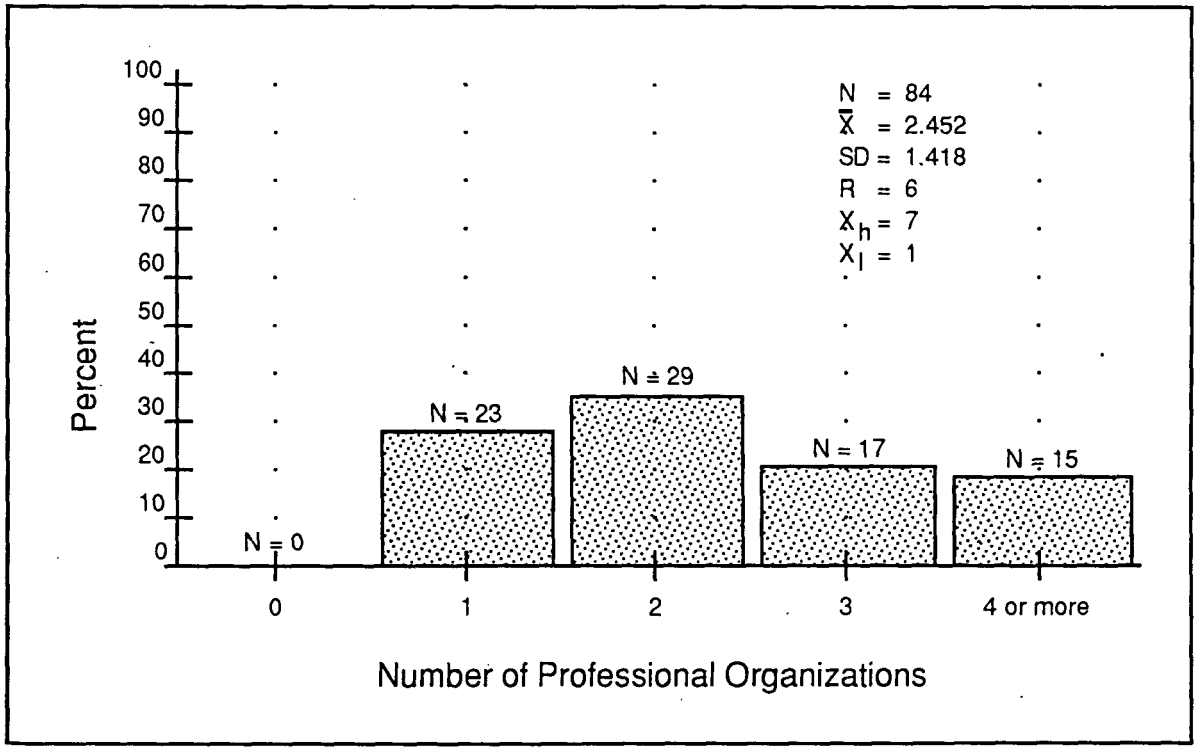

Figure 36. Number of professional organizations to which the respondent/training department belonged

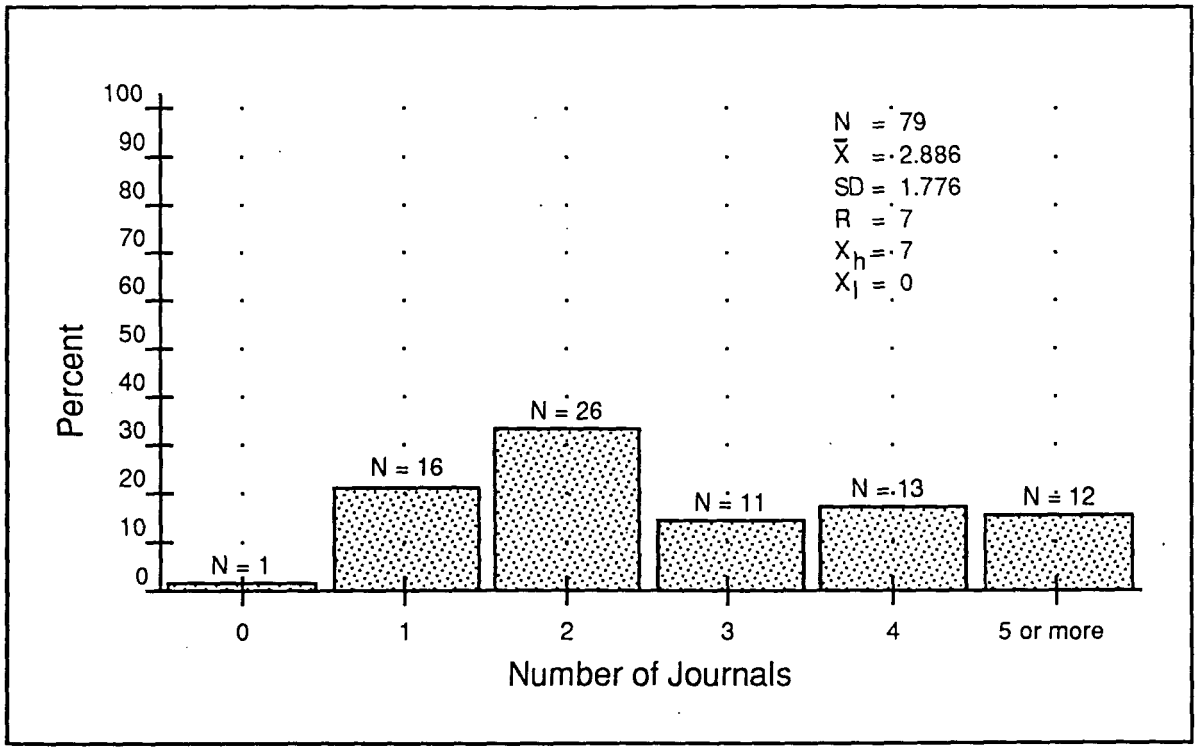

Figure 37. Number of professional or trade journals to which the respondent's training department subscribed

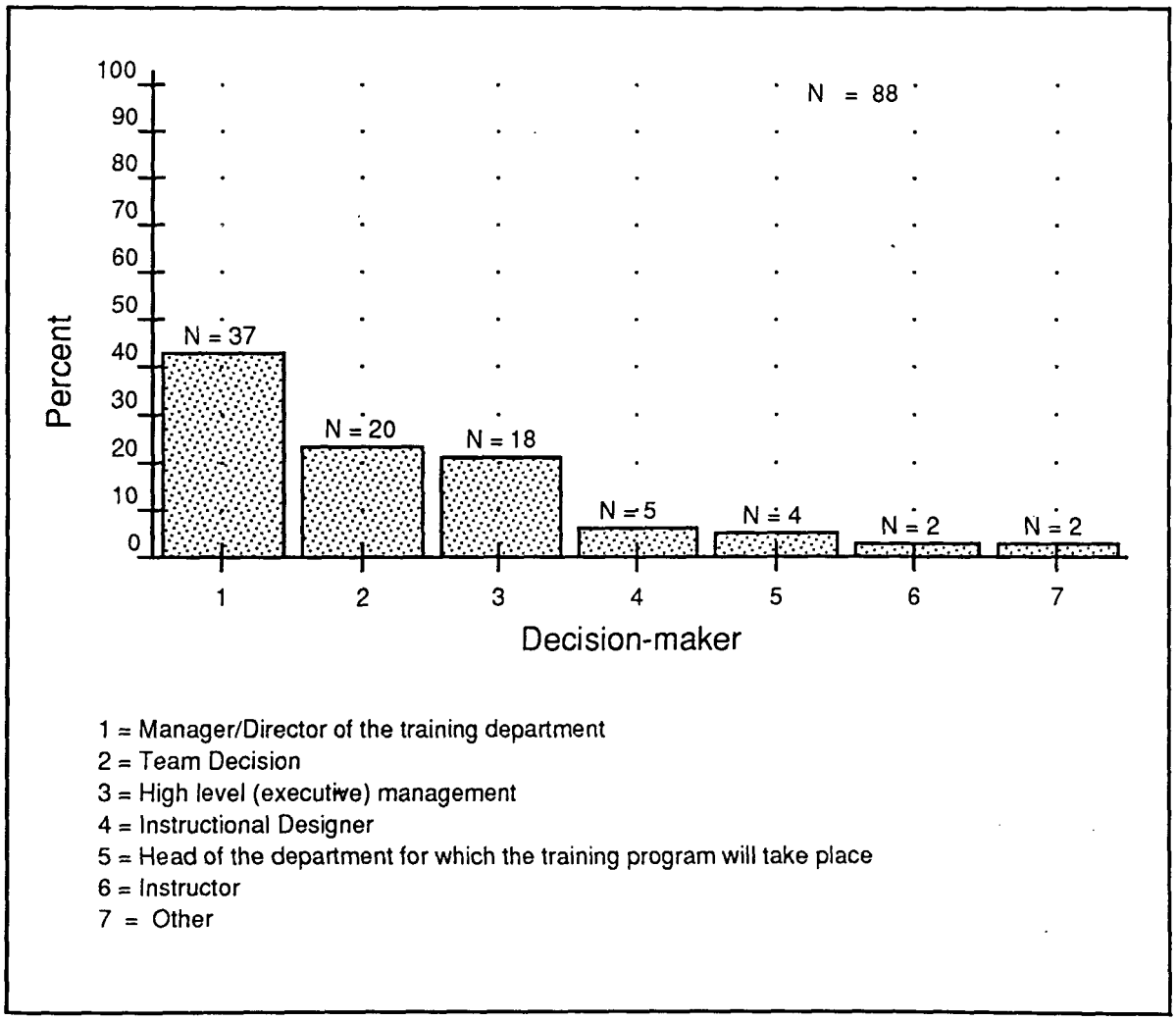

Figure 38. Individual within the respondent's company who was responsible for making decisions regarding which delivery system to use for a training program

Table 1. Type of delivery system used for employee training

Type of delivery system	Frequency of Ranking					Point
	1	2	3	4	5	total[a]
Traditional Classroom/Lecture	72	12		1		410
Film/Videotape	8	53	16	7		314
Computer		14	23	20	4	169
Audio-cassette		1	29	20	5	136
Computer-based Interactive Video (videotape)	1		8	7	10	53
Closed circuit television		1	2	2	4	18
Satellite-delivered television (Two-way audio, one-way video)				2	11	15
Computer-based interactive video (laser disc)		1	1	2	3	14
Broadcast television				1	3	5
Satellite-delivered television (Two-way audio, two-way video)		1				4
Other	4	2	3		1	38

N = 85

[a] In order to present the response data of the ranking questions, a point system was used. Each "1" response was valued at five points, "2" at four points, "3" at three points, "4" at two points, and "5" at one point. Using this point system, a total point value was calculated for each of the possible responses to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response.

Table 2. Factors that influenced companies' decisions to use satellite-delivered instruction

Factor	Frequency of Ranking					Point
	1	2	3	4	5	total[a]
Cost-effectiveness of this type of instruction	8	4	3			35
Educational effectiveness of this technology	4	5	3			25
Availability of on-site facilities	3	3	2			17
Uniqueness/Innovativeness of this technology		1	2			4
Previous successes with this technology			3			3
Availability of personnel from within the company to teach via satellite		1	1			3
Audience		1				2
Other			1			1

N = 15

[a] In order to present the response data of the ranking questions, a point system was used. Each "1" response was valued at five points, "2" at four points, "3" at three points, "4" at two points, and "5" at one point. Using this point system, a total point value was calculated for each of the possible responses to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response.

Table 3. Factors that influenced companies' decisions to not use satellite-delivered instruction

Factor	Frequency of Ranking					Point
	1	2	3	4	5	total[a]
High initial investment cost for equipment	31	9	6	3	1	216
Cost of designing and producing courses	5	21	7	6	3	145
Unsure of cost-effectiveness of this technology	7	8	20	4	6	141
Unsure of educational effectiveness of this technology	4	5	7	12	4	89
Unnecessary--quality training can be achieved without this technology	7	4	6	4	6	83
Unavailability of information about using satellite technology for training	3	3	3	9	5	59
Unaware of its use for training purposes	7	3	1	1	2	54
Difficulties producing 'interactive' courses with this technology		1	3	8	4	33
Unavailability of satellite uplink facility		3	3	3	5	32
Knowledge of difficulties or failed attempts with this technology by colleagues in other companies		2	1		2	13
Other	5	2			1	34

N = 69

[a] In order to present the response data of the ranking questions, a point system was used. Each "1" response was valued at five points, "2" at four points, "3" at three points, "4" at two points, and "5" at one point. Using this point system, a total point value was calculated for each of the possible responses to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response.

Table 4. Obstacles that most often interfered with the companies' development of interactive, satellite-delivered, televised training programs

Obstacle	Frequency of Ranking					Point
	1	2	3	4	5	total[a]
Difficulty obtaining a budget appropriate for interactive satellite-delivered instruction	3	2	2	1		31
Difficulty staying within development budget	1	1	1	1		14
Difficulties designing 'interactive' programs		1	2	1	1	13
High initial hardware costs	1	1		1	2	12
Unavailability of uplink facility	2				1	11
Lack of advanced planning		1		1	1	7
Difficulty choosing appropriate treatment		1			1	5
Lack of understanding about design techniques for interactive, satellite-delivered instruction by instructional designer	1					5
Failures of project management			1	1		5
Hardware selection problems		1				4
Hardware maintenance problems			1			3
Lack of formative evaluation				1		2
Unavailability of production facility				1		2
Difficulty determining audience learning style					1	1
Lack of professional and technical skills available					1	1
Lack of development time					1	1
Difficulty with scheduling content expert						0
Lack of teamwork	1		1			0
Other						8

N = 9

[a] In order to present the response data of the ranking questions, a point system was used. Each "1" response was valued at five points, "2" at four points, "3" at three points, "4" at two points, and "5" at one point. Using this point system, a total point value was calculated for each of the possible responses to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response.

Table 5. Obstacles that most often interfered with the companies' implementation of interactive, satellite-delivered, televised training programs

Obstacle	Frequency of Ranking					Point
	1	2	3	4	5	total[a]
Difficulty staying within program budget	3	1	1			22
High initial hardware costs	2	2				18
Lack of knowledge about interactive, satellite-delivered instruction by training staff	1	1	1	1	2	16
Lack of knowledge about interactive, satellite-delivered instruction by trainees	1	1		1	1	12
Lack of downlink equipment at reception sites	2				1	11
Unavailability of uplink facility	1		1	1	1	11
Constantly changing technology		1	2			10
Hardware problems at reception sites		2				8
Lack of advanced planning		1		1		6
Lack of personnel to facilitate at reception sites		1		1		6
Unavailability of production facility			1		1	4
Failures of project management				1		3
Hardware maintenance problems				1		3
Lack of summative evaluation				1		3
Lack of professional and technical skills					1	2
Lack of teamwork					1	2
Difficulty with scheduling transponder time						0
Mistakes made by the satellite vendor						0
Satellite transmission problems						0
Other		1	1	1		12

N = 11

[a] In order to present the response data of the ranking questions, a point system was used. Each "1" response was valued at five points, "2" at four points, "3" at three points, "4" at two points, and "5" at one point. Using this point system, a total point value was calculated for each of the possible responses to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response.

Table 6. Sources from which respondents were likely to get information about interactive, satellite-delivered, televised instruction

Obstacle	Frequency of Ranking					Point
	1	2	3	4	5	total[a]
Interaction with colleagues, other professionals	4	1	2	2		34
Trade/Professional Journals	1	3	2	2	1	28
Professional Association meetings, conferences, or workshops		5	2		1	27
Work with hired professional consultants	2		1	2	2	19
Formal college courses	1		2	2	2	17
Popular magazines					2	2
News media						0
Other	2					10

N = 11

[a] In order to present the response data of the ranking questions, a point system was used. Each "1" response was valued at five points, "2" at four points, "3" at three points, "4" at two points, and "5" at one point. Using this point system, a total point value was calculated for each of the possible responses to the question. Comparing the point totals gives an indication of the relative importance that the respondents placed upon a response.

Table 7. Point at which respondent would most likely decide which medium/delivery system to use when designing a training program

Obstacle	Frequency	Percent
After audience demographics and learning styles have been determined	1	1.2
During the need analysis phase	9	10.6
After the need analysis phase	11	12.9
Before the learning objectives have been written	1	1.2
During development of learning objectives	9	10.6
After learning objectives have been written	7	8.2
During the development of the course content	17	20.0
After the course content has been determined	5	5.9
After the cost/benefit analysis	7	8.2
After the trial and testing	1	1.2
Based on the client's choice	2	2.4
Based on market demand	2	2.4
According to budget	10	11.8
Other	3	3.5

N = 85

Table 8. Instructional design system respondent was most likely to use when designing a training program

Obstacle	Frequency	Percent
I don't normally follow an instructional design methodology.	35	45.5
Mager, R. F. *Goal Analysis*	11	14.3
Gagne', R. M., & Briggs, L. J. *Principles of Instructional Design*	7	9.1
Kemp, J. E. *Instructional Design: A Plan for Unit and Course Development*	2	2.6
Dick, W., and Carey, L. *The Systematic Design of Instruction*	1	1.3
Briggs, L. J., & Wager, W. W. *Handbook of Procedures for the Design of Instruction*	1	1.3
Davies, I. K. *Competency Based Learning: Technology, Management, and Design*	1	1.3
Levine, E. R. *Everything You Always Wanted to Know about Job Analysis*	1	1.3
Kaufman, R., & English, F. W. *Needs Assessment: Concepts and Application*	1	1.3
Miller, R. B. *Task Description and Analysis*	0	0.0
Davis, R. H., Alexander, L. T., & Yelon, S. L. *Learning System Design*	0	0.0
Romiszowski, A. J. *Designing Instructional Systems*	0	0.0
Fleming, M. L., & Levie, W. H. *Instructional Message Design*	0	0.0
Other	17	22.1

N = 77

Table 9. Correlation matrix: Degree of relationship between respondent characteristics; company characteristics; satellite-delivered, televised instruction usage; and sources of information

	Age of Respondent	Years of Experience	Number of Employees World-Wide	Company Value	Number of Branch Locations
Age of Respondent		.397***	.075	-.215	.071
Years of Experience in Corporate Training			-.028	-.105	-.053
Number of Employees World-wide				.932***	.119
Company Value					.009
Number of Branch Locations					
Number of Times Satellite-Delivered Instruction was Used					
First Year Satellite-Delivered Instruction was Used					
Number of Professional Organizations					
Number of Professional Journals Subscribed					

* Significant at .05 level
** Significant at .01 level
*** Significant at .001 level

Table 9. (continued)

	Number of Times Sat.-Del. Inst. was Used	First Year Sat.-Del. Instruction was Used	Number of Professional Organizations	Number of Journals Subscribed
Age of Respondent	.497	.493	.163	.166
Years of Experience in Corporate Training	.524	-.182	.056	.076
Number of Employees World-wide	-.004	.085	-.104	-.061
Company Value	-.093	-.148	-.197	-.115
Number of Branch Locations	.908**	-.635*	-.096	-.144
Number of Times Satellite-Delivered Instruction was Used		.767**	-.196	-.384
First Year Satellite-Delivered Instruction was Used			.301	-.088
Number of Professional Organizations				.451***
Number of Professional Journals Subscribed				

* Significant at .05 level
** Significant at .01 level
*** Significant at .001 level

Table 10. Correlation matrix: Degree of relationship between respondent rankings of factors that influenced the use of satellite-delivered instruction and obstacles that interfered with its development and implementation

	Satellite-delivery used for training	Priority goal of company	High equip. investment
Extent satellite-delivery was used for training		.658**	--
Extent to which satellite training was a priority goal of the company			--
Extent to which high equipment investment was a reason for not using satellite-delivery			
Extent to which cost of designing & producing courses was a reason for not using satellite			
Extent to which previous successes influenced decisions on satellite use			
Extent to which availability of on-site facilities influenced decisions on satellite use			
Extent to which difficulties staying within budget interfered with satellite instruction development			
Extent that difficulty obtaining appropriate budget interfered with satellite instruction development			
Extent that lack of professional and technical skills interfered with satellite instruction development			
Extent to which unavailability of a production facility interfered with development			
Extent to which high initial hardware costs interfered with satellite instruction development			
Extent to which constantly changing technology interfered with satellite instruction implementation			
Extent to which unavailability of a production facility interfered with implementation			
Extent to which high initial hardware costs interfered with satellite instruction implementation			

** Significant at .01 level *** Significant at .001 level

Table 10. (continued)

	Cost of design & production	Previous Successes	Availability of on-site facilities
Extent satellite-delivery was used for training	--	-.294	.261
Extent to which satellite training was a priority goal of the company	--	-.165	.092
Extent to which high equipment investment was a reason for not using satellite-delivery	.383***	--	--
Extent to which cost of designing & producing courses was a reason for not using satellite		--	--
Extent to which previous successes influenced decisions on satellite use			.120
Extent to which availability of on-site facilities influenced decisions on satellite use			
Extent to which difficulties staying within budget interfered with satellite instruction development			
Extent that difficulty obtaining appropriate budget interfered with satellite instruction development			
Extent that lack of professional and technical skills interfered with satellite instruction development			
Extent to which unavailability of a production facility interfered with development			
Extent to which high initial hardware costs interfered with satellite instruction development			
Extent to which constantly changing technology interfered with satellite instruction implementation			
Extent to which unavailability of a production facility interfered with implementation			
Extent to which high initial hardware costs interfered with satellite instruction implementation			

** Significant at .01 level *** Significant at .001 level

Table 10. (continued)

	Difficulties staying within dev. budget	Difficulty obtaining a budget	Lack of skills
Extent satellite-delivery was used for training	-.042	-.574	.007
Extent to which satellite training was a priority goal of the company	.090	-.467	-.420
Extent to which high equipment investment was a reason for not using satellite-delivery	--	--	--
Extent to which cost of designing & producing courses was a reason for not using satellite	--	--	--
Extent to which previous successes influenced decisions on satellite use	-.466	.425	.105
Extent to which availability of on-site facilities influenced decisions on satellite use	-.805**	.153	.056
Extent to which difficulties staying within budget interfered with satellite instruction development		-.647	.195
Extent that difficulty obtaining appropriate budget interfered with satellite instruction development			-.156
Extent that lack of professional and technical skills interfered with satellite instruction development			
Extent to which unavailability of a production facility interfered with development			
Extent to which high initial hardware costs interfered with satellite instruction development			
Extent to which constantly changing technology interfered with satellite instruction implementation			
Extent to which unavailability of a production facility interfered with implementation			
Extent to which high initial hardware costs interfered with satellite instruction implementation			

** Significant at .01 level *** Significant at .001 level

Table 10. (continued)

	Unavailability of production facil./ development	High initial hardware cost/ development	Constantly changing technology
Extent satellite-delivery was used for training	-.125	-.071	.018
Extent to which satellite training was a priority goal of the company	-.575	-.175	-.003
Extent to which high equipment investment was a reason for not using satellite-delivery	--	--	--
Extent to which cost of designing & producing courses was a reason for not using satellite	--	--	--
Extent to which previous successes influenced decisions on satellite use	.661	.069	-.374
Extent to which availability of on-site facilities influenced decisions on satellite use	.229	-.222	-.288
Extent to which difficulties staying within budget interfered with satellite instruction development	-.308	-.054	.885**
Extent that difficulty obtaining appropriate budget interfered with satellite instruction development	.281	.260	-.688*
Extent that lack of professional and technical skills interfered with satellite instruction development	.444	-.342	.347
Extent to which unavailability of a production facility interfered with development		.453	-.259
Extent to which high initial hardware costs interfered with satellite instruction development			-.136
Extent to which constantly changing technology interfered with satellite instruction implementation			
Extent to which unavailability of a production facility interfered with implementation			
Extent to which high initial hardware costs interfered with satellite instruction implementation			

** Significant at .01 level *** Significant at .001 level

Table 10. (continued)

	Unavailability of production facil./ implementation	High initial hardware cost/ implementation
Extent satellite-delivery was used for training	-.376	.144
Extent to which satellite training was a priority goal of the company	-.581	-.284
Extent to which high equipment investment was a reason for not using satellite-delivery	--	--
Extent to which cost of designing & producing courses was a reason for not using satellite	--	--
Extent to which previous successes influenced decisions on satellite use	.752**	-.010
Extent to which availability of on-site facilities influenced decisions on satellite use	.395	.019
Extent to which difficulties staying within budget interfered with satellite instruction development	-.454	-.161
Extent that difficulty obtaining appropriate budget interfered with satellite instruction development	.414	.289
Extent that lack of professional and technical skills interfered with satellite instruction development	.213	-.089
Extent to which unavailability of a production facility interfered with development	.811**	.531
Extent to which high initial hardware costs interfered with satellite instruction development	.187	.813**
Extent to which constantly changing technology interfered with satellite instruction implementation	-.281	-.087
Extent to which unavailability of a production facility interfered with implementation		.264
Extent to which high initial hardware costs interfered with satellite instruction implementation		

** Significant at .01 level *** Significant at .001 level

Table 11. Correlation matrix: Degree of relationship between respondents' experiences with and responsibilities for satellite-delivered instruction, company use of satellite-delivered instruction, and company possession of satellite and television equipment

	Participated in job training	Participated in formal educ.	Facilitated instruction	Purchased instruction
Participated in job training via satellite		.374***	.469***	.456***
Participated in formal education via satellite			.478***	.482***
Facilitated satellite-delivered instruction				.733***
Purchased satellite-delivered instruction				
Designed satellite-delivered instruction				
Produced satellite-delivered instruction				
Possessed a TV studio				
Company Headquarters Possessed an uplink				
Possessed a downlink				
Used satellite-delivered instruction				

* Significant at .05 level
** Significant at .01 level
*** Significant at .001 level

Table 11. (continued)

	Designed instruction	Produced instruction	Possessed a TV studio	HQ Possessed an uplink
Participated in job training via satellite	.233*	.392***	.210*	.258*
Participated in formal education via satellite	.313**	.486***	.328**	.243*
Facilitated satellite-delivered instruction	.588***	.835***	.285**	.293**
Purchased satellite-delivered instruction	.357***	.566***	.313**	.340**
Designed satellite-delivered instruction		.713***	.327**	.241*
Produced satellite-delivered instruction			.256*	.292**
Possessed a TV studio				.413***
Company Headquarters Possessed an uplink				
Possessed a downlink				
Used satellite-delivered instruction				

* Significant at .05 level
** Significant at .01 level
*** Significant at .001 level

Table 11. (continued)

	Possessed a downlink	Used satellite-del. instruction
Participated in job training via satellite	.409***	.521***
Participated in formal education via satellite	.354**	.447 **
Facilitated satellite-delivered instruction	.561***	.649 ***
Purchased satellite-delivered instruction	.554***	.646 ***
Designed satellite-delivered instruction	.408***	.359 ***
Produced satellite-delivered instruction	.469***	.542 ***
Possessed a TV studio	.376***	.470 ***
Company Headquarters Possessed an uplink	.512***	.571 ***
Possessed a downlink		.498 ***
Used satellite-delivered instruction		

* Significant at .05 level
** Significant at .01 level
*** Significant at .001 level

CHAPTER V. CONCLUSIONS

This chapter presents 1) a brief summary of the study, 2) a discussion of the results reported in Chapter IV, 3) recommendations for future research, and 4) a conclusion.

Summary

The purpose of the present study was to question a sample of corporate training developers in U.S. corporations to ascertain the extent to which satellite-delivered instruction was used, how satellite-delivered instruction was used, and what factors influenced the organization's decisions to use this technology. This study was an investigation that used descriptive statistics to identify trends and implications, and to determine areas where further statistical research would be appropriate.

A survey questionnaire, Interactive, Satellite-delivered, Televised Instruction in Corporate Training: A Survey of Corporate Training Professionals (ISTICT), was prepared by the researcher and sent to 228 corporate training professionals in companies throughout the United States. The overall return rate was 49.09% after three mailings. The responses from the questionnaire provided descriptive information about the characteristics of corporate training professionals and the companies they represented, and about their use of satellite technologies for the delivery of live, interactive instruction for the corporations' employees. Statistical analyses of the data gathered from this survey were performed to 1) provide a descriptive profile of the respondents, 2) provide a descriptive profile of the respondents' companies, 3) provide a profile of the use of satellite-delivered, televised instruction among the respondents' companies, and 4) determine relationships between variables described in the study.

Discussion of the Results

A telephone call follow-up of non-respondents was conducted to determine if there were differences between the respondents and non-respondents. Two of the individuals telephoned were no longer with the company, one person had been on medical leave during the time of the survey, one didn't recall receiving the survey, and one could not be contacted, even after many telephone calls. The results of this type of phone call follow-up can not be conclusive. However, if these five randomly selected non-respondents reflect the other non-respondents, then it appears that the non-respondents, in general, were either no longer with the company, away for medical reasons, or extremely busy people without the time to respond to a survey. Furthermore, having examined the lists of respondents and non-respondents, it is the subjective opinion of the researcher that there was no obvious difference between the types, sizes, or geographic locations of the companies in each list.

Characteristics of the respondents

Research Question 1: What are the demographic characteristics of the respondents?

Based on frequency distributions computed for each question, the corporate training developers responding to the ISTICT survey could be described as follows:

1) A narrow majority of the respondents were male (54.4%).
2) The average age of the respondents was 39.9 years, and almost eighty percent (79.1%) were from 30 to 49 years of age.
3) Forty-four percent (44.0%) had earned a master's degree or beyond.
4) The largest percentage of the respondents (37.4%) had worked in corporate training for only 1 to 5 years. As the number of years experience in corporate training increased, the percentages of respondents grew progressively smaller.

5) Relatively few (45.1%) of the respondents had any personal experience with satellite-delivered instruction in their backgrounds.

6) Of the respondents who were involved in satellite-delivered instruction in their companies, 9.9% indicated that they were involved in *purchasing* satellite-delivered instruction for their companies. Fewer respondents indicated that they *facilitated* (7.7%), *designed* (6.6%), or *produced* (5.5%) satellite-delivered instruction for their companies.

7) Thirty-four percent (34.4%) of the respondents indicated that they were "Somewhat Knowledgeable" about satellite-delivered, televised instruction, although a majority of the respondents (60%) indicated that they were less than somewhat knowledgeable or "Not Knowledgeable" about it.

In general, the respondents were fairly evenly distributed between males and females, averaging just under 40 years of age, and well educated. They had, however, spent very few years as professionals in the field of corporate training. Only 45.1% of the respondents had had any experiences with satellite-delivered instruction, and even fewer were personally involved in any way with satellite-delivered instruction within their companies.

Characteristics of the companies

Research Question 2: What are the characteristics of the companies represented by the respondents?

Based on frequency distributions computed for each question, the ISTICT survey respondents' companies could be described as follows:

1) The respondents' companies represented a wide range of business types, including agriculture, forestry, and fishing; manufacturing; transportation, communications, and utilities; wholesale trade; retail trade; finance, insurance and real estate; and service

industries. The largest percentage of respondents' companies, however, fell into the "Manufacturing" category (32.2%).

2) A large majority (83.9%) of the companies operated less than one hundred branch facilities.

3) A majority of the companies (55.1%) were located in towns/metro areas with populations of 500,000 or more.

4) A majority (65.9%) of the companies possessed some video production equipment, but only 18.7% operated a television studio.

5) Twenty-seven percent (27.0%) of the respondents' companies possessed satellite uplink equipment either in their own facility or at their company headquarters, but only 21.1% had a downlink at the facility in which they worked.

6) A majority of the respondents' companies (58.0%) allocated just 1-2% of their annual operating budgets to employee training. And 10.5% of the companies allocated from 1 to 5% of that training budget towards satellite-delivered instruction.

7) The average number of employees was nearly 870 people at the respondents' facility, and in excess of 21,000 people world-wide.

8) The average value of the respondents' companies was approximately $5 1/2 billion. The distribution, however, was positively skewed because of one extraordinarily large and valuable company, valued at $127 billion. Excluding this company from the distribution would give an average company value of $2.37 billion.

9) On the average, approximately 58% of a company's work force will have participated in some form of job training during 1991.

10) Nearly seventy-four percent (73.8%) of the responding companies indicated that none of their employees would participate in satellite-delivered job training during 1991. Of the 26.2% of the companies reporting that some of their employees would receive

satellite-delivered training, they indicated, on average, that 7.6% of their work force would receive satellite-delivered job training during 1991.

In general, the companies operated fewer than one hundred branch facilities, were located in cities of 500,000 thousand or more, possessed some video production capabilities, trained over half of their work force yearly, were valued at approximately $2.37 billion, and had an training budget of 1 to 2% of the corporate operating budget. The average company employed approximately 870 people locally, with over 21,000 world-wide. Slightly over one-quarter of the companies (27.0%) had access to uplink facilities within their company, and only 21.1% had a downlink at their facility. One-quarter of the companies (26.2%) reported that some of their employees would participate in satellite-delivered instruction during 1991. The responses from these companies indicated that 7.6% of their employees would receive job training delivered via satellite.

In 1985, training executives reported that 38% of their work forces participated in some form of training ("Employee Training," 1986). According to the respondents of this study, an average of 57.8% of the companies workers will have received job training during 1991. This corroborates previous statements that corporate training is continuing to grow in the United States, ("Employee Training," 1986; Lusterman, 1985). Along with this increase in employee training has evolved an increase in the use of new technologies for training, (Rumble, 1986).

Use of interactive, satellite-delivered, televised instruction

Research Question 3: What types of instructional delivery systems do the companies use for employee training?

The traditional classroom lecture method was by far the most frequently used type of instructional delivery system. It was followed closely by the use of film/videotape. The

remaining delivery systems, in order of most frequently used, were the computer, audio cassette, computer-based interactive video with videotape, closed circuit television, satellite-delivered television (two-way audio, one-way video), computer-based interactive video with laser disc, broadcast television, and satellite-delivered television (two-way audio, two-way video).

This finding corroborates a 1986 finding ("Employee Training") that the most frequently used delivery systems were the traditional media forms, such as lectures and films. The least frequently used delivery systems included the newer, high-tech media, computer-assisted instruction, interactive video, and teleconferencing. In that study, fourteen percent of the training executives surveyed stated that they used audio or video teleconferencing in some facet of training. Gordon (1986) found that 23.9 percent of U.S. organizations with 50 or more employees used some form of audio or video teleconferencing. These studies, however, did not provide data regarding the specific use of video teleconferencing for interactive, employee training.

Over sixteen percent (16.7%) of this study's respondents stated that they used interactive, satellite-delivered, televised instruction for personnel training, although all such training was not necessarily completed within the respondent's own facility. A larger figure (26.2%) was indicated under Research Question 2, where 26.2% of the respondents indicated that some of their companies' employees would participate in satellite-delivered instruction during 1991. The larger number, 26.2%, refers to the whole company and could take into account those who anticipated becoming involved in satellite training by the years end, or those who sent employees outside the company to receive satellite-delivered instruction. The smaller number, 16.7%, indicated the number of respondents that were using satellite-delivered instruction in their companies at the time of the survey.

Of the 16.7% (N = 15) of the respondents whose companies used satellite-delivered instruction for employee training, a majority (64.2%) had begun doing so since 1986, and most of the companies had used this technology fewer than 30 times. Furthermore, the more branch locations a company had, the more times it was likely to have used satellite-delivered instruction, ($r = .908$), $p < .01$. This is a twist to Rogers' (1983) positive correlation between company size and innovativeness; not only is innovativeness generally positively correlated with company size, but also, in this case, with the number of company branch locations. With an innovation that is used for *distance* instruction, this was an expected correlation.

Nine of the respondents indicated that their facility *received* the satellite-delivered instruction, whereas five created instruction to be delivered via satellite to distant facilities. Because there were fifteen companies that used satellite-delivered instruction and only nine receiving it on-site, at least one, and perhaps as many as six, of the respondents must have sent their employees elsewhere--to a downlink station outside their immediate facility to receive the instruction.

Respondents whose companies *received* satellite-delivered instruction were likely to have had background experience participating in a business meeting delivered via satellite ($\phi = .866$), $p < .001$. Similarly, respondents whose companies used satellite-delivered training were likely to have had personal job training via satellite ($\phi = .521$), $p < .001$. Another positive correlation ($\phi = .447$) was found between whether the respondent had ever participated in a formal education course delivered via satellite and whether the company was involved in satellite-delivered training, $p < .01$.

Of the five respondents that said they created satellite-delivered instruction, one transmitted it from its own uplink facility, two from their company headquarter's uplink facility, and two from a third-party vendor's uplink facility. It is interesting to note that while

18.7% (N = 17) of the respondents facilities and 27% (N = 24) of the respondents' headquarters offices possessed satellite uplink equipment, only three of the companies involved in the creation and transmission of satellite-delivered training possessed their own uplink equipment. Two respondents' companies used vendor uplink facilities outside their companies to transmit instruction. Similarly, while 21.1% (N=19) of the respondents' facilities possessed a satellite downlink dish, only 16.7% of the respondents facilities were using satellite-delivered instruction.

Other correlations found that whether the company maintained a television studio was positively correlated ($\phi = .470$) with whether the company used satellite-delivered training, $p < .001$. A positive, and obvious, correlation ($\phi = .571$) was found between whether a company's headquarters had an uplink and whether that company participated in satellite-delivered training. Another obvious, positive correlation ($\phi = .498$) was found between whether the company maintained their own downlink and whether they used satellite-delivered training, $p < .001$.

Research Question 4: For what types of activities do the companies use satellite delivery?

The types of activities delivered by satellite, in the order of most frequently used, were training, internal communications, education, personal enrichment, and entertainment. Departments within the company that used satellite delivery for employee training were, in order of most frequently used, upper management, middle management, sales, human resources, production/manufacturing, manufacturing engineering, marketing, research and design, clerical/secretarial, and accounting financial. Overall, it can be concluded that satellite technologies are most frequently used for training by upper and middle management and sales. Additionally, the activity "Training" was positively correlated ($\rho = .658$) with the

extent to which the use of satellite-delivered instruction was a priority goal of the company/training department, $p < .01$.

Research Question 5: What factors influence the companies' decisions to use interactive, satellite-delivered, televised instruction?

Of the fifteen companies using satellite-delivered instruction, 86.6% (N = 13) indicated that the use of satellite-delivered, televised instruction was only a low to medium priority in their companies. None noted it as a high priority.

Cost-effectiveness, educational effectiveness, and the availability of on-site facilities were the three factors most highly ranked by respondents as factors that influenced their company's decisions regarding whether or not to use satellite delivered instruction for a particular training program. It was not obvious whether the respondents viewed them as positive or negative factors.

Of the seventy-six companies that did not use satellite-delivered instruction, the three most highly ranked factors that influenced their companies' decisions *not* to become involved were "High initial investment cost," "Cost of designing and producing courses, " and "Unsure of cost-effectiveness of this technology." A Pearson correlation showed that respondent rankings of "High initial investment cost" were positively correlated ($\rho = .383$) with their rankings of "Cost of designing and producing courses," $p < .001$. It is obvious that there was a perception among these respondents that the costs of becoming involved in creating satellite-delivered instruction was high.

The cost of adopting new technologies is noted often in the literature as a major concern of training developers, (Black, 1984; Brown and Fortosky, 1986; Lusterman, 1985; Rogers, 1983; Rumble, 1986; Weatherall, 1988). Any form of training can be a large investment. Training can incur expenses for the trainer; for employees who are not at their

jobs, but in the classroom; and for distances traveled by the trainer and/or employees. However, the costs incurred for satellite-delivered instruction, which can be received simultaneously at any number of sites across the country, can be relatively expensive or inexpensive depending upon the number of learners served (Black, 1984; Brown and Fortosky, 1986; Rumble, 1986).

Research Question 6: What are the major problems or obstacles a corporate training developer encounters when developing and implementing satellite-delivered, televised instruction?

During the *development* of interactive, satellite-delivered instruction, the three most frequently cited obstacles were "Difficulty obtaining a budget appropriate for interactive, satellite-delivered instruction," "Difficulty staying within development budget," and "Difficulty designing 'interactive' programs." During the *implementation* of interactive, satellite-delivered instruction, the three most frequently cited obstacles were "Difficulty staying within program budget," High initial hardware costs," and "Lack of knowledge about interactive, satellite-delivered instruction by training staff."

Four significant and important correlations were found regarding the rankings of obstacles to the development and implementation of interactive, satellite-delivered instruction. 1) "Lack of professional and technical skills available" was less likely to be ranked highly as a development obstacle among those who ranked "Difficulty obtaining a budget appropriate for interactive satellite-delivered instruction" highly, ($\rho = -.909$) $p < .001$. 2) Those who highly ranked "Difficulty staying within development budget" as a development obstacle were likely to rank "Constantly changing technology" highly as an implementation obstacle ($\rho = .885$), $p < .01$. 3) Those who ranked "High initial hardware costs" highly as a development obstacle were likely to rank "High initial hardware costs" highly as an

implementation obstacle ($\rho = .813$), $p < .01$. 4) Those who ranked "Unavailability of production facility" highly as a development obstacle were likely to rank "Unavailability of production facility" highly as an implementation obstacle ($\rho = .811$), $p < .01$.

From these results it is clear that during both the development and implementation stages, the costs involved in, and the lack of knowledge about, interactive, satellite-delivered instruction were perceived by training professionals to be the primary obstacles to using this technology. Not only was the cost of satellite-delivered instruction perceived to be high by corporate training developers (Research Question 5), but it appeared to be a real problem among those who created it.

Research Question 7: How do corporate training developers obtain in-depth information about satellite-delivered, televised instruction?

Companies were most likely to get information about satellite-delivered instruction in three ways: from interaction with colleagues, trade/professional journals, and professional association meetings, conferences, and workshops. A moderate, positive correlation ($r = .451$) was found between the number of professional organizations to which the respondents belonged, and the number of professional/trade journals to which they subscribed, $p < .001$. The average respondent belonged to 2.452 professional associations and subscribed to 2.886 professional or trade journals.

Research Question 8: Who is responsible for making decisions regarding the use of a particular delivery system for training?

In most cases (42.0%) the manager/director of the training department was responsible for making decisions about which medium to use for a training program. Less frequently the

decisions were made by high level (executive) management (20.5%) or project teams (22.7%).

Research Question 9: When developing instruction, when does the corporate training developer decide which medium/delivery system to use?

Few respondents appeared to have an understanding of any formal instructional design process, or an appropriate idea of when media selection should take place in the development of instruction. According to 20.0% of the respondents, the most appropriate time to select the delivery system was during the development of the course outline/script. When asked which instructional design model they were most likely to follow when designing instruction, 45.5% responded that they did not normally follow any instructional design methodology. However, among those who did follow a design methodology, R. M. Gange' and L. J. Briggs' *Principles of Instructional Design* was most frequently selected (Table 8). Several respondents indicated that they were likely to follow Mager's *Goal Analysis* when designing instruction, yet Mager's model is not really an instructional design model, but a goal analysis model.

Research on the acceptance and use of new technologies tends to support Rogers' Diffusion of Innovation Theory (Rogers, 1983). According to Rogers, an innovation will diffuse more rapidly through a user group if it is perceived to have the following characteristics: 1) a relative advantage over what it is replacing, 2) compatibility with the user's existing values, past experiences, and current needs; 3) ease of use; 4) ability to be examined on a trial basis; and 5) easily observable results.

The innovation that was the subject of this study was the use of interactive, satellite-delivered, televised instruction for corporate distance training. The results of this

study indicate that the innovation may not be perceived by the majority of respondents as having Roger's necessary characteristics. There were clear indications, among corporate training professionals, that the use of satellite-delivered, televised instruction, lacked the perceived positive characteristics necessary for rapid diffusion:

1) Among the factors that influenced companies' decisions not to use this technology, the reason "Unnecessary--quality training can be achieved without this technology" received the fifth highest ranking out of ten, indicating that this innovation was not perceived to have a relative advantage over other delivery systems.

2) There was also an indication that this innovation lacked compatibility with the respondents past experiences, in that 72.5% of the respondents had no personal experience with satellite-delivered instruction. Correlations showed that corporate training developers who lacked personal experiences with meetings, job training, or formal education courses delivered via satellite, were less likely to be involved in satellite-delivered instruction in their companies.

3) There was a perception that it was difficult to design *interactive* training programs. This reflects on the "ease of use" characteristic, indicating that corporate training developers may not use satellite-delivered instruction, because they perceive it as being difficult to incorporate interaction between the trainer and the learners.

4) Among the factors that influenced companies' decisions not to use satellite technology for instruction, the two highest ranked reasons, the perception that large capital investments

were required, and that large design and production budgets were required indicated that there was a perception that this innovation could not easily "be examined on a trial basis."

5) Rogers' characteristic, "Easily observable results" was not directly addressed in this study.

Many factors were found to have influenced the decisions of corporate training professionals regarding whether or not to use satellite technology for the delivery of training. Among the factors were cost-effectiveness, educational-effectiveness, and the availability of on-site facilities from which to develop and implement the satellite-delivered instruction. Additional factors included a lack of awareness among the training professionals about the use of this technology for training, a perception that it was difficult to produce *interactive* training courses with satellite technology, and a perception that this technology lacked advantages over other delivery systems.

The small number of respondents and companies incorporating the use of interactive, satellite-delivered, televised instruction into their training programs indicated that its use may still be in early stages of diffusion and adoption. According to Rogers (1983), the diffusion of innovations tends to follow the Diffusion of Innovations Theory, discussed in chapters I and II. According to that theory, innovation adopters are classified into five groups. *Innovators* are the first 2.5% of the total market to adopt an innovation, followed by the next 13.5%, known as *early adopters*, followed by the *early majority*, *late majority*, and finally, the *laggards* (see page 8). The data collected in this study indicated that the 16.7% of respondents/companies were using satellite technology for the delivery of interactive,

televised instruction. This percentage would fit into Roger's classification scheme and include *innovators, early adopters*, and a small part of the *early majority.*

Recommendations for Future Research

The results of this study indicated that more research is needed in the areas of innovation diffusion and distance training, specifically in the use of satellite technology for the delivery of employee training in organizations. Many respondents wrote comments on the questionnaire expressing their concerns about the lack of information available on the subject of interactive, satellite-delivered, televised instruction for corporate training. Several expressed their concern for the lack of research in this area and requested the results of this study.

If the use of satellite-delivered instruction is to continue to diffuse and to be used to its potential, more research should address the resistance to change that exists within the social system/corporate training professionals. For example, research might more closely link how the adoption of this innovation is affected by individuals' perceptions of its characteristics, its advantages, and its disadvantages.

One such perception is the inhibitive expense of becoming involved in the use of satellite-delivered instruction for employee training. There is a need for more indepth research into the perceived and actual costs of satellite-delivered instruction. According to Black (1984), the costs incurred for satellite-delivered instruction, which can be received simultaneously at any number of sites across the country, can be relatively expensive or inexpensive depending upon the number of learners served. If the perceived high costs are found to have little basis in reality, then research into how these perceptions can be changed might be in order.

The respondents in this study identified several obstacles that interfered with their development and implementation of satellite-delivered instruction. High costs, budget constraints, design difficulties, lack of knowledge, and lack of equipment were often cited in the present study as interfering with the respondents' development and/or implementation of satellite-delivered instruction. Future research could be conducted that looks more closely at these obstacles and identifies means of overcoming them.

Research could also look into the communication channels, as described by Rogers (1983), through which information and innovative ideas are spread. For example, research could be conducted to determine how the use of training innovations in companies is related to corporate training developer participation in professional organizations, journal reading, and colleagial communication. Research could also address what roles these communication channels play in the dissemination of information regarding the use of satellite-delivered, televised instruction in corporate training. Once these roles are understood, the communication channels can be better used to provide information and influence opinions about satellite-delivered instruction and other innovations.

In addition, more research could be conducted in the area of appropriate design techniques and methodologies for satellite-delivered instruction. The perception among respondents that it was difficult to design *interactive* training programs may be related to their concerns over the lack of information available on the development and implementation of satellite-delivered instruction.

Interactive, satellite-delivered, televised instruction appears to be taking hold in corporate America, but more descriptive and empirical data are needed before it can be used to its potential. Continued research could help provide direction for corporate training developers in their efforts to provide high quality, cost-effective training to company employees through the use of interactive, satellite-delivered, televised instruction.

Conclusion

The purpose of the present study was to survey a sample of corporate training developers in U.S. corporations to ascertain the extent to which satellite-delivered instruction was used, how satellite-delivered instruction was used, and what factors influenced the organization's decisions to this technology. Nine research questions were formulated to address the purpose of the study, and the survey questionnaire, Interactive, Satellite-delivered, Televised Instruction in Corporate Training: A Survey of Corporate Training Professionals (ISTICT), was developed to provide answers to those research questions.

The ISTICT questionnaire was sent to 228 corporate training professionals in U.S. companies. The responses from the questionnaire were used to calculate descriptive information about the characteristics of corporate training professionals and the companies they represented, and their use of satellite technologies for the delivery of live, interactive instruction for the corporations' employees. Statistical analyses of the data gathered in this survey were performed to 1) provide a descriptive profile of the respondents, 2) provide a descriptive profile of the respondents' companies, 3) provide a profile of the use of satellite-delivered, televised instruction among the respondents, and 4) determine possible relationships between variables described in the study.

In the opinion of the researcher, the study revealed three major findings and several additional, important findings. First, this study found that the innovation--interactive, satellite-delivered, televised instruction use in corporate training--may not be perceived by a vast majority of respondents as having the characteristics that Roger's (1983) claimed are necessary for an innovation to diffuse rapidly through a user group. It was not perceived to have a relative advantage over other delivery systems. It lacked compatibility with the respondents' past experiences. It was perceived to be difficult to design *interactive*

satellite-delivered training programs, reflecting on the "ease of use" characteristic. And the perception of it's high costs indicated that the innovation could not easily "be examined on a trial basis." Each of these perceptions, whether they have basis in fact or not, do influence corporate training developers' decisions about whether or not to use satellite technology for training programs.

Second, this study found that an average of 57.8% of company employees will receive job training during 1991. This is an increase from 38% in 1985 ("Employee Training"). However, very few company employees will receive *satellite-delivered* training.

Third, this study found that over 45% of respondents used no generally accepted, systematic, instructional design methodology when designing instruction.

Additional findings included the following: 1) traditional classroom delivery methods were used far more frequently than "high-tech" delivery systems; 2) only 45.1% of the respondents had any personal, past experiences with satellite-delivered instruction; 3) over 16% of respondents used satellite-delivered instruction for corporate training; 4) satellite-delivered instruction was most frequently used a) for training purposes, and b) by Upper and Middle Management, and Sales; 5) among those companies that indicated that some of their employees would participate in satellite-delivered instruction, respondents anticipated that only 7.6% of company employees would train via satellite; and 6) the three most highly ranked factors reported to have influenced corporate training developers' decisions to not become involved in satellite-delivered instruction, all involved the perceived high costs of doing so.

This study was an investigation into the uses of satellite technologies for the delivery of corporate training. It used descriptive statistics to identify trends and implications, and to determine areas where rigorous statistical research would be appropriate. Interactive, satellite-delivered, televised instruction appears to be taking hold in corporate America, but

more descriptive and empirical data are needed before it can be used to its potential. It is the hope of the researcher that this study will be followed by others that will provide direction for corporate training developers in their efforts to provide high quality, cost-effective training to company employees through the use of innovative ideas and technologies.

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ACKNOWLEDGMENTS

I wish to thank my major professor, Dr. Michael Simonson, for his advice and encouragement along the way. I also wish to express my appreciation to my committee members, Dr. Thomas Andre, Dr. Alyce Fanslow, and Dr. John Dugger, for their interest and helpful suggestions.

In addition, I would like to thank Dr. Roger Volker, Dr. Ann Thompson, Jane Elsberry, Denise Schmidt, and the rest of the IRC gang, past and present, who provided me with opportunities to learn, to teach, and to experiment with new ideas and technologies. You have made my graduate years fun as well as valuable. It has been a time that I will always remember.

I give my deepest thanks to a very special friend, Dale, for her never-ending support and encouragement. Her cheerful smile, helpful advice, and quiet presence during our long study sessions together inspired me. Thank you, Dale.

And thanks to my parents who have always encouraged me in my endeavors. They have been a constant source of strength for me, and my successes are due, in no small part, to them. This thesis is dedicated to you, Mom and Dad.

APPENDIX A. COVER LETTER AND QUESTIONNAIRE

The University of Iowa
Iowa City, Iowa 52242

1847

Doug Lonowski
Systems Analyst
The University Libraries

January 5, 1991

Dear

As a part of my graduate work in Instructional Technology at Iowa State University in Ames, Iowa, I am conducting research under the supervision of Dr. Michael R. Simonson. My study concerns itself with the uses of satellite technology in corporate and industrial training. Regardless of whether you use satellite technology for training, your participation in this study will be valuable and appreciated.

The purpose of my research is to examine the uses of interactive, satellite-delivered, televised instruction in corporate training. It is designed to ascertain the extent to which satellite-delivered instruction is used, the ways in which it is used, and what factors influence decisions regarding its use. I believe that a study of current instructional practices, as well as the perceptions of practicing training professionals like yourself toward the use of this technology, will provide information that will have significant implications for improving future corporate distance training programs.

An identification number has been assigned to the survey sent to you. The number will allow me to check your name off the mailing list when the questionnaire is returned. Your responses will be kept in strict confidence; no survey will be associated with your name, and no names will be published. The completed surveys will be destroyed immediately after the data have been tallied. And your responses will only be used as a part of group averages.

The survey can be conveniently completed within 10-15 minutes; however, it is your option to abstain from participating in this research study. Please return the survey in the postage paid envelope within a week, whether you choose to complete the survey or not. Before you begin the survey, you may want to refer to the inside front and back covers for more information on interactive, satellite-delivered, televised instruction. A postage-paid return envelope is provided for your convenience.

I feel my research can make a significant contribution in the area of interactive, satellite-delivered, televised instruction and its use in corporate training. The responses you express are highly valued and appreciated. I would be pleased to furnish you with additional information at your request.

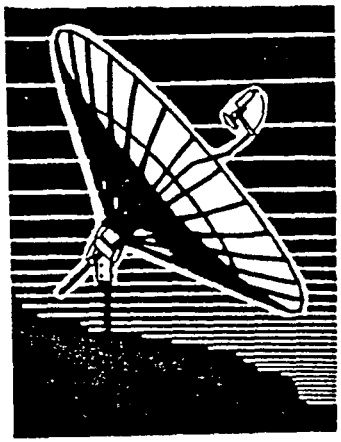
Respectfully,

Doug Lonowski
Graduate Student

Michael R. Simonson,
Professor of Education
Iowa State University

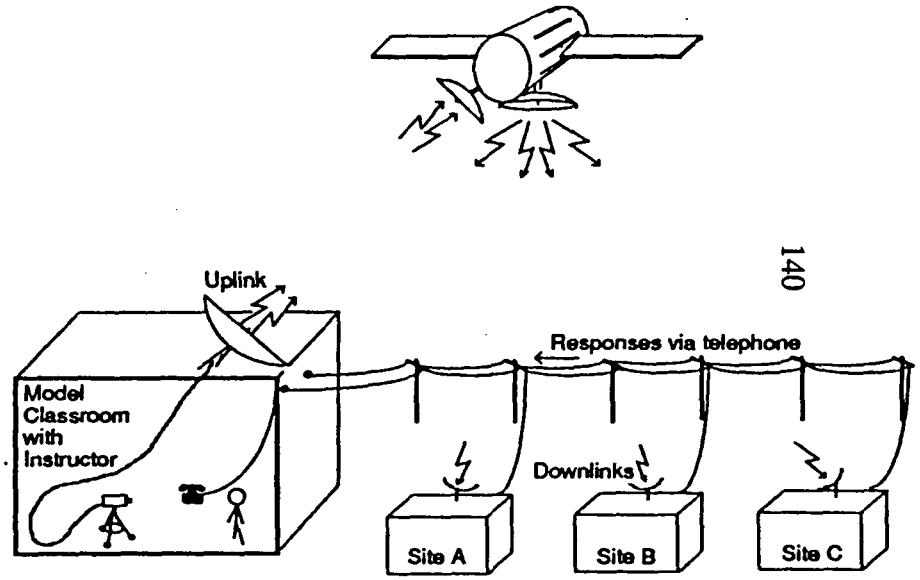
INTERACTIVE, SATELLITE-DELIVERED, TELEVISED INSTRUCTION IN CORPORATE TRAINING

A Survey of Corporate Training Professionals



DOUG LONOWSKI
IOWA STATE UNIVERSITY
319/335-5287

BACKGROUND INFORMATION
Satellite Delivery of Instruction



Background Information: For more background information on satellite delivery of instruction, refer to inside of back cover.

BACKGROUND INFORMATION
Satellite Delivery of Instruction

Operation of the System:

Trainees in facility A share an instructor with Trainees in Facilities B, C, and D. Lectures are given live from a classroom that also serves as a television studio. The session is broadcast using an uplink dish to a satellite. Then it is retransmitted to downlink stations. Any facility with a receiving dish can be a downlink station.

Learners at these sites would watch the live broadcast and respond by telephone or other electronic means to ask questions of the teacher. In many instances, the learners are also in a television studio/classroom, where their actions are being transmitted back with an uplink dish for the instructor to see and hear. Thus the critical element of instructor/learner interaction is maintained and is a key to the success of such courses.

Courses are conducted in a manner similar to a traditional class, except that the instructor and learners are separated—instructor at the broadcast site and learners scattered around a wide region. The learner classroom is supervised by a trainer or media specialist. Tests can be given live by the teacher and collected by the supervisor. A variety of audio-visual aids, learning materials, or lab equipment can be used, and assignments or other documents, when necessary, can be mailed between the instructor and learners.

Definitions of Terms

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Corporate Training Developers are those individuals in business or industrial settings who are responsible for planning, designing, developing, managing, and/or implementing personnel training programs.

Interactive identifies live communications with two-way audio and one- or two-way video. This provides for question-and-answer interaction between the instructor and learners.

Satellite-delivered Televised Instruction refers to the use of satellite technologies for the delivery of instruction. It is a point-to-multipoint transmission system, providing program audio and video to many users over diverse geographic locations simultaneously. Such instruction includes the transmission of both two-way audio and one- or two-way video. This type of interactive instructional delivery provides video and audio transmission of the instructor to the learners, and allows immediate student feedback and interaction with the instructor.

A STUDY OF COMMUNICATION SATELLITE USES IN CORPORATE TRAINING

Your responses will be kept confidential and will only be used in group averages. All surveys will be destroyed after the data have been recorded.

Directions: Please circle the letter of the most appropriate answer or write your answer in the blank space provided. Please try to answer all questions.

PART 1: Background Information
Section 1: About You

1. What is your gender?
   a. Male
   b. Female

2. What is your age? ____

3. What is your highest level of formal education?
   a. H.S.
   b. AA/Technical (2 yr)
   c. AA/Technical (2 yr) +
   d. BA/BS
   e. BA/BS +
   f. MA/MS
   g. MA/MS +
   h. EdD/PhD
   i. EdD/PhD +
   j. Other _____

4. How many years of experience have you had in corporate/industrial training?
   _____

5. Have you ever attended/participated in a meeting via satellite teleconferencing?
   a. Yes
   b. No

6. Have you ever attended a job-related training session delivered via satellite?
   a. Yes
   b. No

7. Have you ever attended a formal education course or multi-session workshop delivered via satellite?
   a. Yes
   b. No

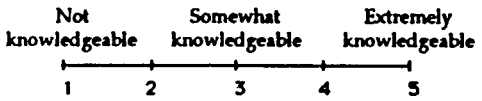
8. Are you currently involved in facilitating satellite-delivered, distance instruction for your company?
   a. Yes
   b. No

9. Are you currently involved in purchasing satellite-delivered, distance instruction for your company?
   a. Yes
   b. No

10. Are you currently involved in designing satellite-delivered, distance instruction courses for your company?
    a. Yes
    b. No

11. Are you currently involved in producing satellite-delivered, distance instruction for your company?
    a. Yes
    b. No

12. What is your perception of your level of knowledge regarding satellite-delivered, televised instruction?



Section 2: About your Company

13. Which of the following terms best describes your business' main orientation? (Circle one answer that most closely fits)
    a. Agriculture, forestry, and fishing (except agricultural services)
    b. Mining
    c. Construction
    d. Manufacturing
    e. Transportation, communications, and utilities
    f. Wholesale trade
    g. Retail trade
    h. Finance, insurance, and real estate
    i. Services (including agricultural services)
    j. Public administration

14. How many branch locations does your company have? _____

15. What is the size of the town/metropolitan area in which you work?
    a. Less than 1000 inhabitants
    b. 1000 to 2500
    c. 2500 to 5000
    d. 5000 to 10,000
    e. 10,000 to 25,000
    f. 25,000 to 50,000
    g. 50,000 to 100,000
    h. 100,000 to 250,000
    i. 250,000 to 500,000
    j. 500,000 to 1,000,000
    k. 1,000,000 or more

16. Does your company maintain an in-house television studio for the production of training materials/programs?
    a. Yes
    b. No

17. Does your company maintain in-house video production equipment (Video cameras and decks, camcorders, lights) for the production of training materials/programs?
    a. Yes
    b. No

18. Does your company maintain in-house video post-production equipment (Editing equipment, character generator, etc.) for the production of training materials/programs?
    a. Yes
    b. No

19. Does your facility maintain a satellite uplink (satellite transmission dish)?
    a. Yes
    b. No

20. Does your main office or headquarters maintain a satellite uplink?
    a. Yes
    b. No

21. Is the facility in which you work also your company's main office or headquarters?
    a. Yes
    b. No

22. Does your facility have its own downlink (satellite reception dish)?
    a. Yes
    b. No

23. Approximately what percentage of the corporation's annual operating budget is allocated to training?
    a. 0%
    b. 1 - 2%
    c. 3 - 4%
    d. 5 - 6%
    e. 7 - 8%
    f. 9 - 10%
    g. 11% or more – please specify _____%

24. Approximately what percentage of your training budget and/or training resources is allocated to satellite-delivered televised instruction?
    a. 0%
    b. 1 - 5%
    c. 6 - 10%
    d. 11 - 15%
    e. 16 - 20%
    f. 21 - 25%
    g. 25% or more – please specify _____%

25. Approximately how many people are employed in your branch facility?
    _____

26. Approximately how many people are employed by your company world-wide?
    _____

27. What is the approximate value of your company? (Value of production, sales, payroll, receipts, or revenues per year) Example: $10 million sales per year.
    $_____ per year

28. Approximately what percentage of your company's employees will have participated in some form of training this year? _____%

29. Approximately what percentage of your company's employees will have participated in satellite-delivered training this year? _____%

Additional Directions: On *ranking* questions, select the five most appropriate answers and rank order them from 1 to 5 as directed, leaving the remaining answers blank.

PART 2: Satellite-Delivered Televised Instruction
Section 1: Types of delivery systems

30. What five delivery systems are most frequently used by your company for personnel training? (Rank order from 1 to 5, where 1 = most frequently used.)
    ___ Traditional classroom/lecture
    ___ Audio-cassette
    ___ Film/videotape
    ___ Computer
    ___ Computer-based interactive video (videotape)
    ___ Computer-based interactive video (laser disc)
    ___ Broadcast television
    ___ Closed-circuit television
    ___ Satellite-delivered television (two-way audio, one-way video)
    ___ Satellite-delivered television (two-way audio, two-way video)
    ___ Other: _____

31. Does your company use satellite-delivered instruction for training personnel?
    a. Yes — *If "Yes," go to question #33* (skip #32)
    b. No — *If "No," go to question #32*

32. What five factors most influenced your company's decision not to become involved in interactive satellite-delivered instruction? (Rank order from 1 to 5, where 1 = most influential.)
    ___ Unaware of its use for training purposes
    ___ High initial investment cost for equipment (production facilities, satellite dishes, etc.)
    ___ Unavailability of satellite uplink facility
    ___ Cost of designing and producing courses
    ___ Difficulties producing "interactive" courses with this technology
    ___ Unsure of cost-effectiveness of this technology
    ___ Unsure of educational effectiveness of this technology
    ___ Knowledge of difficulties or failed attempts with this technology by colleagues in other companies
    ___ Unavailability of information about using satellite technology for training
    ___ Unnecessary – quality training can be achieved without this technology
    ___ Other: _____
    —*Go to Question # 45* (skip #33-44)

Section 2: Types of activities

NOTE: Answer questions #33-44 only if you answered "Yes" to question #31.

33. What was the first year that you used interactive, satellite-delivered, televised instruction? _____

34. Approximately how many times since then have you used interactive, satellite-delivered, televised instruction? _____

35. Does your facility receive satellite-delivered instruction for personnel training?
    a. Yes
    b. No

36. Does your facility create instruction to be delivered via satellite to distant company facilities?
    a. Yes
    b. No

37. If so, is this instruction most frequently transmitted via: (circle one)
    a. your facility's satellite uplink?
    b. your home office's satellite uplink?
    c. a third-party vendor's satellite uplink?
    d. Other: _____

38. To what extent does your company use satellite-delivery for the following activities?

	Not at all 1	2	3	4	Extensively 5
a. Education (formal high school or college courses)					
b. Training (job-related skills)					
c. Internal communication (meetings between distant offices)					
d. Personal enrichment (health, exercise, hygiene, interpersonal skills)					
e. Entertainment					
f. Other: _____					

39. To what extent do the following areas of your organization use satellite delivery for employee training? (relative to each other)

	Not at all 1	2	Moderately 3	4	Extensively 5
a. Accounting/Financial					
b. Clerical/Secretarial					
c. Sales					
d. Marketing					
e. Production/Manufacturing					
f. Manufacturing Engineering					
g. Research and design					
h. Human Resources					
i. Upper management					
j. Middle management					
g. Other: _____					

Section 3: Factors that influence

40. What three of the following factors most influence your company's decisions about whether or not to use interactive, satellite-delivered, televised instruction for a training program? **(Rank order from 1 to 3, where 1 = most influential.)**
    ___ Cost-effectiveness of this type of instruction
    ___ Educational effectiveness of this technology
    ___ Previous successes with this technology
    ___ Uniqueness/innovativeness of this technology
    ___ Availability of personnel from within the company to teach via satellite
    ___ Availability of on-site facilities
    ___ Audience
    ___ Other: _____

41. To what extent is the use of interactive, satellite-delivered, televised instruction a priority goal of your company/training department?

Low Priority 1	2	Medium Priority 3	4	High Priority 5

Section 4: Obstacles encountered

42. What five problems or obstacles most interfere with your **development** of interactive, satellite-delivered, televised training programs? **(Rank order from 1 to 5, where 1 = most frequent.)**

___ Difficulty choosing appropriate treatment
___ Difficulty in designing "interactive" programs
___ Difficulty determining audience learning style
___ Difficulty obtaining a budget appropriate for interactive satellite-delivered instruction
___ Difficulty with scheduling and availability of content expert
___ Difficulty staying within development budget
___ Failures of project management
___ Hardware selection problems
___ Hardware maintenance problems
___ High initial hardware costs
___ Lack of advanced planning
___ Lack of development time
___ Lack of understanding about design techniques for interactive, satellite-delivered instruction by instructional designer
___ Lack of formative evaluation
___ Lack of professional and technical skills available
___ Lack of teamwork
___ Unavailability of production facility
___ Unavailability of uplink facility
___ Other: _____
___ Other: _____

43. What five problems or obstacles most interfere with your **implementation** of interactive, satellite-delivered, televised training programs? **(Rank order from 1 to 5, where 1 = most frequent.)**

___ Constantly changing technology
___ Difficulty with scheduling transponder time
___ Difficulty staying within program budget
___ Failures of project management
___ Hardware maintenance problems
___ Hardware problems at reception sites
___ High initial hardware costs
___ Lack of advanced planning
___ Lack of downlink equipment at potential reception sites
___ Lack of knowledge about interactive satellite-delivered instruction by training staff
___ Lack of knowledge about interactive satellite-delivered instruction by trainees
___ Lack of personnel to facilitate at reception sites
___ Lack of professional and technical skills available
___ Lack of summative evaluation
___ Lack of teamwork
___ Mistakes made by the satellite vendor
___ Satellite transmission problems
___ Unavailability of production facility
___ Unavailability of uplink facility
___ Other: _____
___ Other: _____

Section 5: Obtaining information

44. How do your instructional developers obtain in-depth information about satellite-delivered, televised instruction? (Rank order from 1 to 5, where 1 = most frequently used.)
    - ___ Trade/Professional Journals
    - ___ News Media
    - ___ Popular magazines
    - ___ Interaction with colleagues, other professionals
    - ___ Professional Association meetings, conferences, or workshops
    - ___ Formal college courses
    - ___ Work with hired professional consultants
    - ___ Other: _____

45. To what professional organizations do you/your training department belong?
    - a. _____
    - b. _____
    - c. _____
    - d. _____
    - e. _____
    - f. _____
    - g. _____

    -Please write out full names of organizations

46. To what trade/professional journals or magazines do you/your training department subscribe?
    - a. _____
    - b. _____
    - c. _____
    - d. _____
    - e. _____
    - f. _____
    - g. _____

Section 6: Making decisions

47. Who determines whether or not to use a certain medium/delivery system for a training program? (Circle one)
    - a. High level (executive) management
    - b. Head of department for which training program will take place
    - c. Manager/director of the training department
    - d. Instructional designer/technologist
    - e. Instructor
    - f. Team Decision: (List titles of those involved) _____
      _____
    - g. Other: _____

Section 7: Developing instruction

48. In your company, when is the selection of an appropriate media/delivery system for a training program made? (Circle one)
    - a. After audience demographics and learning styles have been determined
    - b. During the need analysis phase
    - c. After the need analysis phase
    - d. Before the learning objectives have been written
    - e. During development of learning objectives
    - f. After learning objectives have been written
    - g. During the development of the course content outline/script
    - h. After the course content has been determined
    - i. After the cost/benefit analysis
    - j. After the trial and testing
    - k. Based on the client's choice
    - l. Based on market demand
    - m. According to budget
    - n. Other: _____

49. Which one of the following instructional design models, if any, are you most likely to follow or refer to when designing instruction?
    - a. Dick, W., and Carey, L. *The Systematic Design of Instruction*
    - b. Gagne, R. M., & Briggs, L. J. *Principles of Instructional Design*
    - c. Davis R. H., Alexander, L. T., & Yelon, S. L. *Learning System Design*
    - d. Levine, E. R. *Everything You Always Wanted to Know About Job Analysis*
    - e. Kaufman, R., & English, F. W. *Needs Assessment: Concepts and Application*
    - f. Mager, R. F. *Goal Analysis*
    - g. Miller, R. B. *Task Description and Analysis*
    - h. Kemp, J. E. *Instructional Design: A Plan for Unit and Course Development*
    - i. Romiszowski, A. J. *Designing Instructional Systems*
    - j. Fleming, M. L., & Levie, W. H. *Instructional Message Design*
    - k. Briggs, L. J., & Wager, W. W. *Handbook of Procedures for the Design of Instruction*
    - l. Davies I. K. *Competency based learning: Technology, Management, and Design*
    - m. Other: _____
    - n. I don't normally follow an instructional design methodology.

50. What concerns do you have for live video as a medium for instruction as opposed to face-to-face instruction?

51. What do you think needs to happen within business and industry and with satellite technologies in order for satellite delivery of instruction to reach its potential?

Thank you for completing this research survey. A self-addressed, stamped envelope is enclosed for convenient return of the survey.

Doug Lenkowski
Systems Analyst
University of Iowa Libraries
University of Iowa
Iowa City, IA 52242

319/335-5287

APPENDIX B. HUMAN SUBJECTS APPROVAL DOCUMENTATION

Last Name of Principal Investigator Lonowski

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. [X] Letter or written statement to subjects indicating clearly:
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. [ ] Consent form (if applicable)

14. [ ] Letter of approval for research from cooperating organizations or institutions (if applicable)

15. [X] Data-gathering instruments

16. Anticipated dates for contact with subjects:

First Contact	Last Contact
9/1/90	10/5/90
Month / Day / Year	Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

11/1/90
Month / Day / Year

18. Signature of Departmental Executive Officer | Date | Department or Administrative Unit

[signature] | 8/17/90 | Professional Studies

19. Decision of the University Human Subjects Review Committee:

X Project Approved ___ Project Not Approved ___ No Action Required

Patricia M. Keith | 8/24/90 | [signature] | ___

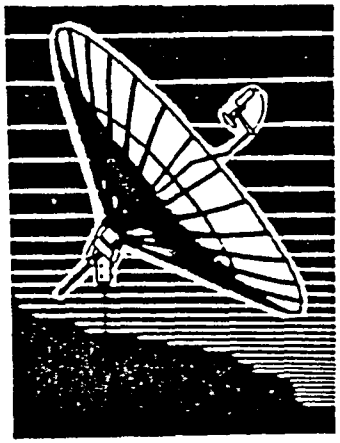
Name of Committee Chairperson | Date | Signature of Committee Chairperson

GC:1/90

APPENDIX C. RESPONSE RATES FOR SURVEY QUESTIONS

INTERACTIVE, SATELLITE-DELIVERED, TELEVISED INSTRUCTION IN CORPORATE TRAINING

A Survey of Corporate Training Professionals



DOUG LONOWSKI
IOWA STATE UNIVERSITY
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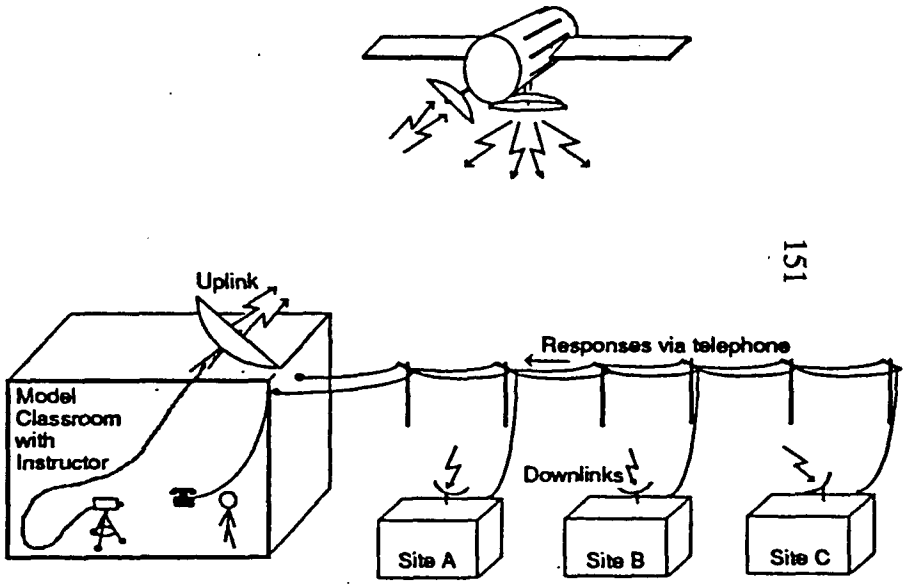
Satellite Delivery of Instruction



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PART 1: Background Information
Section 1: About You

1. What is your gender? N= 90
   a. Male
   b. Female

2. What is your age? ____ 86

3. What is your highest level of formal education?
   a. H.S. 91
   b. AA/Technical (2 yr)
   c. AA/Technical (2 yr) +
   d. BA/BS
   e. BA/BS +
   f. MA/MS
   g. MA/MS +
   h. EdD/PhD
   i. EdD/PhD +
   j. Other _____

4. How many years of experience have you had in corporate/industrial training?
   _____ 91

5. Have you ever attended/participated in a meeting via satellite teleconferencing?
   a. Yes 91
   b. No

6. Have you ever attended a job-related training session delivered via satellite?
   a. Yes 91
   b. No

7. Have you ever attended a formal education course or multi-session workshop delivered via satellite? 91
   a. Yes
   b. No

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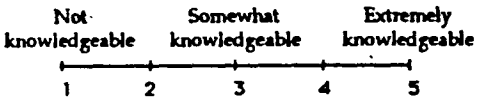
8. Are you currently involved in facilitating satellite-delivered, distance instruction for your company? 91
   a. Yes
   b. No

9. Are you currently involved in purchasing satellite-delivered, distance instruction for your company? 91
   a. Yes
   b. No

10. Are you currently involved in designing satellite-delivered, distance instruction courses for your company? 91
    a. Yes
    b. No

11. Are you currently involved in producing satellite-delivered, distance instruction for your company? 91
    a. Yes
    b. No

12. What is your perception of your level of knowledge regarding satellite-delivered, televised instruction? 90



Section 2: About your Company

13. Which of the following terms best describes your business' main orientation? (Circle one answer that most closely fits) 90
    a. Agriculture, forestry, and fishing (except agricultural services)
    b. Mining
    c. Construction
    d. Manufacturing
    e. Transportation, communications, and utilities
    f. Wholesale trade
    g. Retail trade
    h. Finance, insurance, and real estate
    i. Services (including agricultural services)
    j. Public administration

14. How many branch locations does your company have? _____ 81

15. What is the size of the town/metropolitan area in which you work? 87
    a. Less than 1000 inhabitants
    b. 1000 to 2500
    c. 2500 to 5000
    d. 5000 to 10,000
    e. 10,000 to 25,000
    f. 25,000 to 50,000
    g. 50,000 to 100,000
    h. 100,000 to 250,000
    i. 250,000 to 500,000
    j. 500,000 to 1,000,000
    k. 1,000,000 or more

16. Does your company maintain an in-house television studio for the production of training materials/programs? 91
    a. Yes
    b. No

17. Does your company maintain in-house video production equipment (Video cameras and decks, camcorders, lights) for the production of training materials/programs? 91
    a. Yes
    b. No

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18. Does your company maintain in-house video post-production equipment (Editing equipment, character generator, etc.) for the production of training materials/programs? 90
    a. Yes
    b. No

19. Does your facility maintain a satellite uplink (satellite transmission dish)? 91
    a. Yes
    b. No

20. Does your main office or headquarters maintain a satellite uplink? 89
    a. Yes
    b. No

21. Is the facility in which you work also your company's main office or headquarters? 91
    a. Yes
    b. No

22. Does your facility have its own downlink (satellite reception dish)?
    a. Yes
    b. No 90

23. Approximately what percentage of the corporation's annual operating budget is allocated to training? 81
    a. 0%
    b. 1 - 2%
    c. 3 - 4%
    d. 5 - 6%
    e. 7 - 8%
    f. 9 - 10%
    g. 11% or more -- please specify _____%

24. Approximately what percentage of your training budget and/or training resources is allocated to satellite-delivered televised instruction? 86
    a. 0%
    b. 1 - 5%
    c. 6 - 10%
    d. 11 - 15%
    e. 16 - 20%
    f. 21 - 25%
    g. 25% or more -- please specify _____%

25. Approximately how many people are employed in your branch facility?
    _____ 84

26. Approximately how many people are employed by your company world-wide?
    _____ 84

27. What is the approximate value of your company? (Value of production, sales, payroll, receipts, or revenues per year) Example: $10 million sales per year.
    $_____ per year 60

28. Approximately what percentage of your company's employees will have participated in some form of training this year? _____% 88

29. Approximately what percentage of your company's employees will have participated in satellite-delivered training this year? _____% 84

Additional Directions: On *ranking* questions, select the five most appropriate answers and rank order them from 1 to 5 as directed, leaving the remaining answers blank.

PART 2: Satellite-Delivered Televised Instruction
Section 1: Types of delivery systems

30. What five delivery systems are most frequently used by your company for personnel training? (Rank order from 1 to 5, where 1 = most frequently used.) 85
    ___ Traditional classroom/lecture
    ___ Audio-cassette
    ___ Film/videotape
    ___ Computer
    ___ Computer-based interactive video (videotape)
    ___ Computer-based interactive video (laser disc)
    ___ Broadcast television
    ___ Closed-circuit television
    ___ Satellite-delivered television (two-way audio, one-way video)
    ___ Satellite-delivered television (two-way audio, two-way video)
    ___ Other: _____

31. Does your company use satellite-delivered instruction for training personnel?
    a. Yes — *If "Yes," go to question* #33 (skip #32) 90
    b. No — *If "No," go to question* #32 154

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32. What five factors most influenced your company's decision <u>not</u> to become involved in interactive satellite-delivered instruction? (Rank order from 1 to 5, where 1 = most influential.) 69
    ___ Unaware of its use for training purposes
    ___ High initial investment cost for equipment (production facilities, satellite dishes, etc.)
    ___ Unavailability of satellite uplink facility
    ___ Cost of designing and producing courses
    ___ Difficulties producing "interactive" courses with this technology
    ___ Unsure of cost-effectiveness of this technology
    ___ Unsure of educational effectiveness of this technology
    ___ Knowledge of difficulties or failed attempts with this technology by colleagues in other companies
    ___ Unavailability of information about using satellite technology for training
    ___ Unnecessary -- quality training can be achieved without this technology
    ___ Other: _____
    —*Go to Question* # 45 (skip #33-44)

Section 2: Types of activities **NOTE: Answer questions #33-44 only if you answered "Yes" to question #31.**

33. What was the first year that you used interactive, satellite-delivered, televised instruction? _____ 14

34. Approximately how many times since then have you used interactive, satellite-delivered, televised instruction? _____ 10

35. Does your facility receive satellite-delivered instruction for personnel training? 15
    a. Yes
    b. No

36. Does your facility create instruction to be delivered via satellite to distant company facilities? 15
    a. Yes
    b. No

37. If so, is this instruction most frequently transmitted via: (circle one) 5
    a. your facility's satellite uplink?
    b. your home office's satellite uplink?
    c. a third-party vendor's satellite uplink?
    d. Other: _____

38. To what extent does your company use satellite-delivery for the following activities?

	Not at all / Moderately / Extensively (1 2 3 4 5)
a. Education (formal high school or college courses)	
b. Training (job-related skills)	
c. Internal communication (meetings between distant offices)	
d. Personal enrichment (health, exercise, hygiene, interpersonal skills)	
e. Entertainment	
f. Other: _____	

15

39. To what extent do the following areas of your organization use satellite delivery for employee training? (relative to each other) 15

	Not at all / Moderately / Extensively (1 2 3 4 5)
a. Accounting/Financial	
b. Clerical/Secretarial	
c. Sales	
d. Marketing	
e. Production/Manufacturing	
f. Manufacturing Engineering	
g. Research and design	
h. Human Resources	
i. Upper management	
j. Middle management	
g. Other: _____	

15

Section 3: Factors that influence

40. What three of the following factors most influence your company's decisions about whether or not to use interactive, satellite-delivered, televised instruction for a training program? (Rank order from 1 to 3, where 1 = most influential.) 15
    ___ Cost-effectiveness of this type of instruction
    ___ Educational effectiveness of this technology
    ___ Previous successes with this technology
    ___ Uniqueness/innovativeness of this technology
    ___ Availability of personnel from within the company to teach via satellite
    ___ Availability of on-site facilities
    ___ Audience
    ___ Other: _____

41. To what extent is the use of interactive, satellite-delivered, televised instruction a priority goal of your company/training department? 15

Low Priority / Medium Priority / High Priority (1 2 3 4 5)

Section 4: Obstacles encountered

42. What five problems or obstacles most interfere with your <u>development</u> of interactive, satellite-delivered, televised training programs? **(Rank order from 1 to 5, where 1 = most frequent.)**

___ Difficulty choosing appropriate treatment
___ Difficulty in designing "interactive" programs
___ Difficulty determining audience learning style
___ Difficulty obtaining a budget appropriate for interactive satellite-delivered instruction
___ Difficulty with scheduling and availability of content expert
___ Difficulty staying within development budget
___ Failures of project management
___ Hardware selection problems
___ Hardware maintenance problems
___ High initial hardware costs
___ Lack of advanced planning
___ Lack of development time
___ Lack of understanding about design techniques for interactive, satellite-delivered instruction by instructional designer
___ Lack of formative evaluation
___ Lack of professional and technical skills available
___ Lack of teamwork
___ Unavailability of production facility
___ Unavailability of uplink facility
___ Other: _____
___ Other: _____

43. What five problems or obstacles most interfere with your <u>implementation</u> of interactive, satellite-delivered, televised training programs? **(Rank order from 1 to 5, where 1 = most frequent.)**

___ Constantly changing technology
___ Difficulty with scheduling transponder time
___ Difficulty staying within program budget
___ Failures of project management
___ Hardware maintenance problems
___ Hardware problems at reception sites
___ High initial hardware costs
___ Lack of advanced planning
___ Lack of downlink equipment at potential reception sites
___ Lack of knowledge about interactive satellite-delivered instruction by training staff
___ Lack of knowledge about interactive satellite-delivered instruction by trainees
___ Lack of personnel to facilitate at reception sites
___ Lack of professional and technical skills available
___ Lack of summative evaluation
___ Lack of teamwork
___ Mistakes made by the satellite vendor
___ Satellite transmission problems
___ Unavailability of production facility
___ Unavailability of uplink facility
___ Other: _____
___ Other: _____

Section 5: Obtaining information

44. How do your instructional developers obtain in-depth information about satellite-delivered, televised instruction? (Rank order from 1 to 5, where 1 = most frequently used.) 11
    ___ Trade/Professional Journals
    ___ News Media
    ___ Popular magazines
    ___ Interaction with colleagues, other professionals
    ___ Professional Association meetings, conferences, or workshops
    ___ Formal college courses
    ___ Work with hired professional consultants
    ___ Other: _____

45. To what professional organizations do you/your training department belong? 84
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____
    f. _____
    g. _____

    -Please write out full names of organizations

46. To what trade/professional journals or magazines do you/your training department subscribe? 79
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____
    f. _____
    g. _____

Section 6: Making decisions

47. Who determines whether or not to use a certain medium/delivery system for a training program? (Circle one) 88
    a. High level (executive) management
    b. Head of department for which training program will take place
    c. Manager/director of the training department
    d. Instructional designer/technologist
    e. Instructor
    f. Team Decision: (List titles of those involved) _____
    _____
    g. Other: _____

Section 7: Developing instruction

48. In your company, when is the selection of an appropriate media/delivery system for a training program made? (Circle one) 85
    a. After audience demographics and learning styles have been determined
    b. During the need analysis phase
    c. After the need analysis phase
    d. Before the learning objectives have been written
    e. During development of learning objectives
    f. After learning objectives have been written
    g. During the development of the course content outline/script
    h. After the course content has been determined
    i. After the cost/benefit analysis
    j. After the trial and testing
    k. Based on the client's choice
    l. Based on market demand
    m. According to budget
    n. Other: _____

49. Which one of the following instructional design models, if any, are you most likely to follow or refer to when designing instruction? 77 157
    a. Dick, W., and Carey, L. *The Systematic Design of Instruction*
    b. Gagne, R. M., & Briggs, L. J. *Principles of Instructional Design*
    c. Davis R. H., Alexander, L. T., & Yelon, S. L. *Learning System Design*
    d. Levine, E. R. *Everything You Always Wanted to Know About Job Analysis*
    e. Kaufman, R., & English, F. W. *Needs Assessment: Concepts and Application*
    f. Mager, R. F. *Goal Analysis*
    g. Miller, R. B. *Task Description and Analysis*
    h. Kemp, J. E. *Instructional Design: A Plan for Unit and Course Development*
    i. Romiszowski, A. J. *Designing Instructional Systems*
    j. Fleming, M. L., & Levie, W. H. *Instructional Message Design*
    k. Briggs, L. J., & Wager, W. W. *Handbook of Procedures for the Design of Instruction*
    l. Davies I. K. *Competency based learning: Technology, Management, and Design*
    m. Other: _____
    n. I don't normally follow an instructional design methodology.

50. What concerns do you have for live video as a medium for instruction as opposed to face-to-face instruction?

51. What do you think needs to happen within business and industry and with satellite technologies in order for satellite delivery of instruction to reach its potential?

Thank you for completing this research survey. A self-addressed, stamped envelope is enclosed for convenient return of the survey.

Doug Lonowski
Systems Analyst
University of Iowa Libraries
University of Iowa
Iowa City, IA 52242

319/335-5287