A STUDY OF TECHNOLOGIES AND ATTITUDES FOUND AT SMALL MARKET TELEVISION STATIONS AND COLLEGE BROADCASTING PROGRAMS

By

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Bachelor of Arts

Oklahoma State University

Stillwater, Oklahoma

1992

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 1996

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AT SMALL MARKET TELEVISION STATIONS

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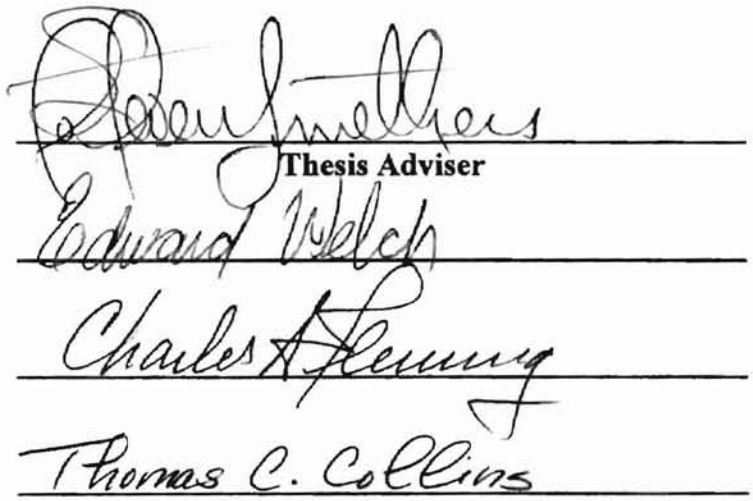

Thesis Adviser

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ACKNOWLEDGMENTS

I wish to express my sincere appreciation to my thesis adviser, Dr. Steven Smethers, for all his support, patience, and inspiration throughout this rather lengthy project. I don't think I could have completed it without him. I would also like to thank the other members of my committee, Dr. Charles A. Fleming and Dr. Edward M. Welch, for their guidance and support. More over, I wish to thank Dr. Maureen J. Nemecek for being such an excellent instructor in the field of mass communications, and that goes for the other faculty members I have mentioned as well.

I would also like to thank my girlfriend, Tressi, for understanding and supporting the sacrifices I had to make in order to complete this project.

Finally, my sincere gratitude to my parents, Kjell and Laila, for bringing me into this world, raising me in an environment of love, support and happiness, and for giving me the intelligence and stamina I needed to make it this far. This is for you.

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CHAPTER I

INTRODUCTION

Advances in television technology are likely to challenge the efforts of educators in broadcasting programs to produce students who are marketable in the television industry. The main reason for this is that production technology currently changes so quickly that practitioners even find it difficult to keep up. A common problem for educators and industry leaders is determining which direction technology is most likely to go, and, consequently, investing in that particular technology. For higher education broadcasting programs, however, there is also the age-old question of what to teach: hands-on training versus theory; trade school versus academia. Should colleges and universities even attempt to educate broadcasting students in the use of new television technologies, or should they strengthen their efforts toward providing students with a broad liberal arts education and leave the hands-on training to the television industry?

This study provides a review of current and future technological advances in the television industry, examines the current technological level of several television stations and college broadcasting programs, and surveys television practitioners' and broadcast educators' attitudes toward the technological skill level held by broadcast students. The study also surveys colleges and universities to determine how technological demands are being met by their broadcasting programs.

Theoretical background

The theory that is best suited to guide this research is the diffusion of innovation theory, set forth by Everett Rogers in 1962. Rogers defined diffusion in the following manner:

> Diffusion is the process by which an 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.[1]

According to Rogers, diffusion leads to social change because when new ideas are invented, diffused, and adopted or rejected, that leads to certain consequences, which in turn spur changes in society.

There are four elements in the diffusion process: (1) the innovation, (2) communication channels, (3) time, and (4) the social system.[2] The rate of adoption for any innovation is dependent on five variables: relative advantage, compatibility, complexity, trialability, and observability. According to Rogers, relative advantage is "the degree to which an innovation is perceived as better than the idea it supersedes."[3] Consequently, as new television production technologies are developed, it is important that users perceive the advantages of the new equipment over the existing apparatus available to broadcasters. Compatibility is "the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters."[4] Complexity is "the degree to which an innovation is perceived as difficult to understand and use."[5] Trialability refers to "the degree to which an innovation may be experimented with on a limited basis."[6] Finally, observability refers to "the

degree to which results of an innovation are visible to others. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt it."[7]

The second element of diffusion is the communication channels, which refers to "the means by which messages get from one individual to another."[8] This refers to mass media channels, as well as interpersonal communication. The more important of the two is interpersonal communication. According to Rogers "most people depend mainly upon a subjective evaluation of an innovation that is conveyed to them from other individuals like themselves who have previously adopted the innovation."[9] There are two concepts related to communication channels that should be discussed, namely homophily and heterophily. According to Rogers, homophily is "the degree to which a pair of individuals who communicate are similar."[10] Heterophily is the opposite of homophily. According to the diffusion of innovations theory, communication is more efficient between people who are homophilous, because they share common experiences and interests, often belong to the same group, have the same education level and social status, and so on. Homophily can, however, be a barrier to diffusion. According to Rogers, a high degree of homophily means that the individuals in a certain group interact mainly with each other. The innovation does not easily get communicated to other groups, which makes the adoption process slow.

The third element of the diffusion of innovations is time. Several factors influence the rate of which an innovation is adopted. The innovation-decision process is "the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to

adopt or reject, to implementation and use of the new idea, and to conformation of this decision."[11] Also, individuals and organizations fall into different adopter categories: (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards.[12] Innovators typically consist of about 2.5 percent of the population. They are characterized as being venturesome, cosmopolites, and financially resourceful risk takers, and this group is the first to adopt a given innovation. It should be mentioned that adopter categories are innovation-controlled: that is, an innovator who invests in one type of television equipment is not necessarily an innovator when it comes to other types of technology. Early adopters include about 13.5 percent of the population. They are described as being localites, opinion leaders, and respected by their peers. In matters of innovation adoption, they are considered by other potential adopters to be opinion leaders.[13] The early majority includes about 34 percent of the population, individuals who are likely to adopt and innovation earlier than others. Early majority members frequently interact with peers. According to Rogers, "they follow with deliberate willingness in adopting innovations, but seldom lead."[14] The late majority also make up about 34 percent of the population, and they are characterized as being skeptical and cautious, often subject to peer pressure which for them is necessary to adopt an innovation, and "their relatively scarce resources mean that most of the uncertainty about a new idea must be removed before the late majority feel that it is safe to adopt."[15] Finally, laggards consist of about 16 percent of the population. They are described as being localites, isolated and suspicious of innovations. Their limited resources make it absolutely necessary for them to be certain an innovation will not fail before they adopt it. The five

characteristics of innovations, relative advantage, compatibility, complexity, trialability, and observability, are also important factors in determining how fast an innovation is diffused into a social system.

The fourth and final element of the diffusion process is the social system, which is defined as a "set of interrelated units that are engaged in joint problem-solving to accomplish a common goal."[16] One of the most important factors operating within a social system is opinion leaders. Opinion leadership is "the degree to which an individual is able to influence other individuals' attitudes or overt behavior informally in a desired way with relative frequency."[17] According to Rogers, opinion leadership is not dependent on an individual's formal position or status, but is rather earned though technical competence, social accessibility, and conformity to a system's norms.[18] Opinion leaders are highly respected examples to other individuals in the system as far as innovation adoption is concerned. Some of the characteristics of typical opinion leaders include more exposure to external communications, above average social status, and more innovativeness. The most important characteristic of opinion leaders, however, is that they constitute the centers of interpersonal communication networks. Opinion leaders know and communicate with several different people, and they serve as information hubs in the social system.

Definition of the research problem

Advances in technology have the potential to revolutionize the future of the television industry, as they have in the past. Digitization, compressed video, desktop

video, satellite technology, and other innovations are common in the modern day lexicon. As the medium of television changes, television education must find a way to cope with the change. Educators are faced with the challenge of educating students to be able to deal with technological advances in a competent and responsible manner. The question is what is the best way of preparing students for the 'real world'; is it to give them more hands-on training on the latest, most technologically advanced television equipment, or will a broader liberal arts-based, theoretical education give students a better chance of success once they enter the television industry? And it is also important to consider what managers in the field require of freshly graduated college students. It is of little help to have the skills necessary for success if those skills are not marketable because television practitioners believe other skills are more important. If this were the case, it would be indicative of a problem with communication between television educators and television practitioners.

There are, in fact, examples that educators and television professionals don't see eye-to-eye in several areas of broadcast education. According to Feedback, a report by the Roper Organization published in 1987 concluded that executives in electronic media were generally dissatisfied with broadcast educational programs in the United States.[19] The report said that broadcast graduates had unrealistic career expectations, that they did not possess "adequate hands-on experience in the broadcast or cable industries," that colleges and universities failed to "provide practical knowledge for the real world," and that higher education needed to expose students more to professional people with experience in the real world.[20]

On the other hand, there are those who believe the opposite to be true. According to Paul F. Gullifor, "many of the broadcasting programs at universities around the country today are perceived as little more than hands-on, push-button programs which rarely challenge students intellectually."[21] Also, according to McCall:

> A purely skill-driven approach to media education diminishes the utility of the student both of the non-media, and eventually media-related careers. Media practitioners need the broad educational background that comes with understanding in expression, sociology, literature, business, etc.[22]

Kamalipour has the same opinion:

> In reality, no high-tech job is stable because technological tools, used to perform any particular function, can and do change rapidly - especially in the electronic media field. Hence, skills can become outdated quickly. However, theoretical knowledge or an understanding of the processes and influences - the ability to address the who, what, when, where, why, and how of each particular case, situation, action, or problem remains relatively constant. Such skills lead to adaptability, the essential survival technique for all working professionals.[23]

Technologies studied

Several production and news gathering technologies are important to the television industry. Some of them are just emerging, while others have been around for a long time. This study will ascertain the industry's use of, and expectations of college graduates' proficiency in using, non-linear editing systems, computer assisted analog editing systems, digital video effects, digital VTRs, digital audio, satellite news gathering, video toaster, and microwave technology.

Non-Linear Systems

According to Communication Technology Update 1993-94 (CTU), non-linear systems or 'desktop video' could have the "potential to change video production as much as desktop publishing revolutionized print in the 1980s."[24] What makes non-linear systems a possibility is computer technology. According to CTU, "a series of breakthroughs in the field of digital compression in the 1980s reduced the amount of memory required for video, enabling limited storage and processing of video on personal computers."[25] With the help of faster computers with more memory, it is now possible to convert an analog video signal into a digital file in the computer. According to CTU, desktop video gives a computer "the ability to merge video, audio, and computer graphics through a single platform."[26] This means that the editor can instantaneously access any point along the time-line of video footage, cut out the piece he or she wants, and insert it into the final product. Video tape will become a thing of the past. A non-linear editor can take the place of a video switcher, character generator, still-store, and many other devices used in video editing. There is a very good chance that non-linear systems are the future of the television industry.

Digital ENG cameras are also now available. These are disk-based, meaning that the dockable VCR has been replaced with a hard-drive. Everything the photographer shoots would be digitally stored in the camera. Back at the station, the data is transferred directly on to the non-linear editing system, and the camera's hard drive erased to ready it for the next field assignment.

According to CTU, there are currently dozens of desktop video systems available, most for less than $50,000.[27] This is a plus, especially for smaller television stations, which earlier may not have been able to afford some of the more expensive state-of-the-art digital television equipment, such as a digital effects generator. In the future, desktop video is likely to lead to the production of more small-budget films in the movie industry, while local TV-shows and locally produced commercials will become more professional in appearance.[28]

CNN Financial Network is one station that is entirely based on digital technology. The facility is located in CNN's Manhattan studios, and according to Broadcasting & Cable, all news editing is done nonlinearly, fed to a server, and then played on the air with the help of a digital player.[29] In addition to that, CNN uses digital production switchers, digital on-air effects, and a digital router.

Video forgery is a potential future problem associated with using desktop video, and a reason why this technology should be a concern for television educators and professionals alike. According to CTU, "once [desktop video] systems can operate in real time, it is conceivable that the evening news could be picked up by a computer hacker, the video and/or audio altered, and retransmitted almost instantaneously."[30] That would make it hard to verify the authenticity of television news and satellite feeds. Tomlinson shares the same concerns:

> Someday, the silicon chip will replace film and magnetic videotape as the method of storing visual images. When this occurs, there no longer will exist a non-digital original which might be examined to provide some evidence for or against a visual image having been manipulated."[31]

According to Tomlinson it is common practice at ABC-TV News to digitally manipulate news footage. ABC routinely "removes, digitally, any microphones which obstruct the clear view of an individual who addresses the news cameras.[32] And during the Reagan/Mondale elections, the network digitally changed the appearance of the candidates. Art Director of ABC-TV News, Ben Blank, said:

> If the head and shoulders are hunched up, we work on cleaning up the suit. Take Mr. Reagan: if he's hunched over, we can clean that up -- straighten out a shoulder. We do things like that. It's cosmetic. And we do it equally. What we did for Mr. Reagan, we also did for Mr. Mondale.[33]

It is not hard to imagine the ethical implications of such technology. The challenge lies with educators to provide students with the knowledge necessary to use digital technologies responsibly.

Computer assisted analog editing

The television industry uses many names to describe computer assisted analog editing. It is sometimes called multiple-source editing, match-frame editing, or A-B roll editing. What it is, according to Zettl, is a system consisting of two or more source VTRs, a computer assisted control unit, and a record VTR.[34] Systems like these have been used by the television industry since the early 1980s, and they are still considered to be the workhorse of post production. According to Zettl, "most often the multiple-source editing system is interfaced with a variety of production equipment, such as production switchers, multiple-track audiotape recorders, and special effects and signal-processing equipment."[35] This gives the editor access to a wide variety of transitions, such as

dissolves, wipes, or special effects. The editing control unit handles every aspect of any transition, such as the speed of the transition itself or the tape speed of the source VTRs. It also automatically stores each edit in its internal memory, so that the editor can go back, call up the edit, and make the necessary changes.

Digital video effects

Digital video effects are used by most television news stations today. It is an important tool for packaging news attractively. News packaging has become increasingly more important as effects have become more sophisticated and the competition between television stations more fierce. A digital video effects generator (DVE) can be used in live production as well as in post production. According to Zettl, the way a DVE works is that it can take any source of video that is fed to it, and convert it into digital information.[36] The DVE then has the capability to manipulate that information in a variety of ways. The split screen effect is often used in news. The DVE can split the screen into two or more areas, whereby different signals can be fed to each area. This allows a newscaster to conduct interviews with different subjects over long distances. Even though the interviewees are not physically present in the studio, it is possible for the audience to view both the newscasters and the interview subjects at the same time. The DVE also has the ability to crop pictures, change the aspect ratio, compress of expand pictures, position a compressed video signal anywhere on the screen, warp video signals to beyond recognition, and so on. DVE equipment is very versatile, and is limited almost only by the imagination of the operator.

Digital VTRs

Digital VTRs are tape machines that record and play back video signals digitally. Rather than operating with analog videotape, digital tape is used. Otherwise, the operation of a digital VTR does not differ significantly from that of an analog VTR. As digital VTRs are introduced to the television industry, efforts have been made to make the transition from analog to digital as smooth as possible. According to Broadcasting & Cable, Sony recently introduced a digital VTR that was compatible with current Betacam SP technology.[37] Sony's new tape deck could play analog as well as digital tape. According to the article, vice president of videotape recorders for the Sony corporation Christopher Golson said:

> The changing economics of the broadcast business have forced managers to be more frugal generally. They want equipment that will last many years and still meet their needs. Compatibility with the existing analog standards will allow broadcasters and others to enter the digital age at their own pace.[38]

So even though digital VTRs are not currently in widespread use in the television industry, there are indications that their use could become increasingly more common over the next few years.

Digital audio

Digital audio recording also has its advantages over analog systems. The most important advantage is its ability to make multi-track recordings without having to use the relatively expensive multi-track equipment associated with analog audio recording. Such equipment is usually found at music recording studios or audio production houses,

but it is less common for small television stations to have multi-track audio capabilities. With digital audio, on the other hand, the various audio tracks the editor wishes to mix together are converted to digital files in a computer, where they can be manipulated in a variety of ways. According to Zettl, "a big advantage of digital systems in audio production is the *control* they afford in the manipulation of the equipment and the sound itself, and their ability to interface (interconnect) with various other digital equipment in the television system."[39] In fact, there is almost no limit to how many different tracks of audio can be combined with a digital system, and at a fraction of the price of that required by multi-track analog recording studios. Another advantage to having audio tracks stored digitally is the instant random access offered by such systems. Live television production often involves music bites and sound effects. Without a digital storage and retrieval system for audio, the audio operator must often deal with stacks of audio carts, reels, and compact discs, and it is easy to get confused in the heat of the moment. With a digital storage system, one the other hand, all the different sounds needed are available with the touch of a button, and from a single source.

Video toaster

A Video Toaster may be seen as an inexpensive version of a non-linear system. It gives the editor access to a variety of digital effects and graphics, but the video output of the Toaster is somewhat inferior in quality to that of high-end digital systems. Yet, the Toaster is a fairly common piece of equipment, especially at corporate video production facilities, but also at small market television stations and college television production

labs. According to Inc., a Video Toaster gives the user access to "such studio devices as spins, whips, flips, tumbles, and warps."[40] According to the article, "the system includes hundreds of high-end broadcast-TV effects but fits a restricted budget."[41] The Toaster consists of an Amiga computer and software, with the appropriate interfaces, all for just around $4,600, considerably less than the $100,000 plus cost of a high-end non-linear system, but quality and hard-drive storage costs.

Microwave technology

Microwave relay equipment has for a long time been the easiest and most efficient way for ENG (electronic news gathering) crews to transmit an event live to the television station. This is often done with two or more microwave relays. According to Zettl, small, portable microwave transmitters can be mounted to an ENG camera or carried in a backpack.[42] This allows the ENG crew to send their signal back to a production vehicle, and the transmitters often have a range of several miles, giving the camera crew good mobility in the field. The signal is then transmitted from the production vehicle and back to the television station, often through a series of microwave relays. For a microwave signal to reach its destination, there must be a clear line of sight between the transmitter and receiver. In an urban setting, this is often difficult to achieve, which is why it is not uncommon for television stations in cities to have a permanent network of microwave relays installed in strategic positions throughout the coverage area. According to Zettl, if everything else fails, a helicopter can be used as a microwave relay station.[43]

Satellite News Gathering

Satellite technology has become an important part of the everyday operations of television news programming. According to Swearingen, "satellite news gathering (SNG) technology is changing the way local television stations report the news."[44] This is done by linking reporters and crews in the field with editors and news anchors in the studio, through communication satellites. This way, local television stations can report, even live, from geographically distant locations.[45] They are no longer solely dependent on network satellite feeds to supply them with news stories, and even more important "individual stations are able to customize the SNG reports to suit viewer needs and interests."[46]

Satellites, which are placed in stationary orbits around the earth, contain a series of transponders, each of which permit reception and retransmission of different signals back to earth.[47] With the help of parabolic antennas placed on production vehicles or specialized satellite trucks, it is possible for television stations to send live signals from virtually any location via satellite, and back to the studio. According to Swearingen, "satellites' transmission capability, coupled with microwave news vehicles and portable video cameras, facilitated news gathering and revolutionized television journalism."[48]

Satellite news feeds are easily available to all television stations for a subscription fee. Currently, the premier SNG company is Conus Communications, which has nine regional cooperatives, with 150 affiliate stations.[49] Services include sharing stories with other affiliates, in addition to eight national news feeds, and ready-made news stories by the All News Channel, which provides affiliated stations with fully anchored news

coverage.[50] CNN, ABC, CBS, and NBC provide similar services to their own affiliates.[51] A survey by Lacy, Atwater, and Powers in 1987, showed that 74 percent of all commercial broadcast stations in a nationwide sample subscribed to satellite news services.[52] 90 percent of those got at least one of their satellite feeds from either ABC, NBC, or CBS.[53] However, only 16.5 percent of the stations had access to SNG vehicles for their own news production, and those stations were mainly situated in large markets.[54]

According to the survey, "the results imply that the two types of satellite news gathering techniques (network feeds and SNG vehicles) are being used for different purposes. The satellite news networks are being used primarily for regional, national, and international coverage," while SNG vehicles are being used for local and state coverage.[55] Eighty-three percent of the responding stations that did employ satellite technology said that they thought the technology had improved the quality of their newscasts "either greatly or somewhat."[56] Clearly, it is important that students be prepared to use SNG technology in the real world, because it is here to stay.

There are certain problems and challenges that broadcasters face with regard to SNG. One problem is that a parabolic antenna gives a news station access to virtually all SNG signals, not only the ones that the station subscribes to. It is therefore easy to steal footage, and this is an ethical problem that probably should be dealt with in the classrooms. Another ethical problem is that live coverage of news events often go unchecked on the air. Because of the speed of the news coverage, ethical codes are more easily broken than if a whole process of editing and script writing was done before airing the news story.

In conclusion, with all the technological advances outlined above, it is clear that the nature of both television production and television reporting may change radically over the next couple of decades, and it will largely be the responsibility of educators to prepare their students for what lies ahead.

Research questions

The purpose of this study was to answer the following questions:

1. Is there currently a difference in the technological levels of television stations and college broadcasting programs, and will there continue to be a difference between the two within the next five years and the next ten years?

2. Which technologies are currently being employed by television stations and college broadcasting programs, and which technologies do they expect to employ within the next five years and the next ten years?

3. What are production directors' and broadcast educators' expectations of graduating college students with regard to how much they should know about the use and workings of specific electronic equipment, and do these expectations differ between the two groups?

4. How are colleges and universities currently addressing the issue of new television technologies, and how do they expect to address this issue within the next ten years?

5. What are the predictions of production directors and broadcast educators with regard to future technological developments, and do these predictions differ between the two groups?

Significance

Assuming that advances in television technology may significantly alter the nature of the television medium, it becomes critical that colleges and universities be prepared to educate television students who are capable of coping with technological advances in a competent and responsible manner. The significance of this study lies in coordinating the efforts of television practitioners and television educators, in order to improve the quality of future television students. If practitioners and educators do not communicate, it becomes difficult to determine the best way of preparing students for the "real world," especially a world that is in rapid change. This study aims to determine what skills television practitioners believe are important for students to possess in order to become effective employees in the future. This could provide valuable feedback to educators on how best to prepare students for their future tasks.

Organization of the study

Chapter I has discussed potential implications advancements in television technology may have with regard to broadcast education and the television industry itself. The chapter has also provided a review of current and potential future advances in

television technology, a statement of the research questions, and a statement of the significance of the study.

Chapter II provides the reader with a review of the literature related to television technology, attitudes of the television industry with regard to students of broadcasting and broadcasting programs, and attitudes of educators toward the implications television technology and the attitudes of television practitioners could have on teaching broadcasting.

Chapter III presents a methodology for studying the technological levels of both television stations and colleges and universities, the attitudes of both toward what broadcast students would be expected to know about advancements in television technology, and the thoughts of both television practitioners and educators with regard to the future of the television medium. The chapter will include a description of the population sample, the instrumentation, and the research design for the study.

Chapter IV reports the analysis of the data, and Chapter V contains the summary of the study, including conclusions and recommendations.

CHAPTER II

REVIEW OF THE LITERATURE

Much research has been conducted on the topic of how college and university broadcasting departments can better prepare their students for careers in the radio and television industry. The most common traits among the following studies is that they tend to measure the attitudes of either broadcasters or educators toward certain skills, college courses, or experiences obtained by broadcasting graduates during their time in school.

For the purpose of this chapter, the related research studies have been divided into two groups: Surveys of radio and television practitioners, and surveys of educators. The studies in each group are presented in chronological order from past to present.

Surveys of Radio and Television Practitioners

A study by Baskette in 1942 surveyed 200 managers of commercial radio stations in the US.[57] The purpose of the study was to determine what the managers wanted in college-trained radio workers. The results of the survey indicated that "the managers definitely desire college education for their workers but do not think that present college *courses* (including radio courses) are suited to the needs of radio."[58] The study concluded that what the managers wanted from its workers was (in order of priority): Practical

experience from other radio stations, "better training in speech," "more attention to commercial aspects of radio in college courses," and "more thorough grounding in liberal arts and business training, with emphasis on reading, pronunciation, grammar, journalism, music and drama and showmanship."[59] Although 176 of the 200 respondents agreed that a college education was of value to the workers, the general consensus was that colleges did a poor job in preparing them for *radio*.[60] One of the respondents wrote that "colleges have failed miserably to prepare their students for the grim reality of commercial radio."[61]

In 1947 George C. Biggar, a manager at WIBC, 'The Indianapolis News' station, said that he considered radio training at colleges as "rather impractical."[62] Biggar noted several criticisms that the radio industry had directed toward radio training by colleges and universities. First of all, he said that "instruction by men and women who have not had the benefit of station experience is a handicap to students."[63] He also criticized college radio instruction as being too theoretical: "Many of us [radio managers] have gained the impression that students are too frequently taught how radio *should be* from the educator's standpoint, rather than *as it is* at hundreds of stations."[64] Biggar recommended that students be taught "more emphasis on the everyday problems of programming commercial stations, and less on the theoretical and the artistic."[65] He noted that one solution could be to give students practical experience in production, announcing, and writing at either the college broadcast station or "in its absence, an arrangement for workshop programs on a neighboring commercial station."[66]

A study by Linton and Hyden in 1958 surveyed 316 radio and television stations in Kansas, Oklahoma, Missouri, Nebraska, and Colorado. Forty-seven radio managers and 13 television managers responded to a questionnaire that was designed to "bring forth confidential information concerning salaries and certain aspects of training."[67] The results of the study indicated that a majority of the respondents felt that the "broadcasting curriculum lacks breadth on the practical side."[68] Most of the respondents also preferred that college graduates had a well rounded, liberal education, while at the same time indicating a lack of confidence in university instructors.[69] The respondents especially felt that instructors had too little experience outside academia.[70]

Another study, by Guback, in 1960 surveyed 191 station managers, presidents, and owners of commercial radio and television stations in Illinois, Indiana, Wisconsin, and Iowa. Forty-two percent of the Illinois population and 34 percent of the survey population of the other three states responded to a questionnaire designed to "determine what broadcasters deem valuable when hiring non-technical personnel and what types of educational preparation are especially useful for people seeking careers in broadcasting."[71] The results of the survey indicated, first of all, that a college degree with commercial broadcasting experience proved to be the most desirable background for people seeking work in radio or television broadcasting.[72] Furthermore, when asked which liberal arts courses they considered to be the most useful for broadcasting students, respondents chose history, political science, and "rhetoric-composition" for broadcast news students, and theater and speech for students in production or directing.[73] Also, more television respondents than radio respondents thought that experience from a

college broadcasting station or internships were valuable.[74] Guback considered this evidence that "television broadcasters feel students should have more training and background."[75] Finally, the overall conclusion of the study was that "broadcasters do look toward colleges and universities for personnel trained in broadcasting" and that "broadcasters want personnel who are well-grounded in liberal arts and not merely trade school graduates."[76]

In 1963, Starlin reported on a study done by APBE and NAB in 1962 designed to "seek information from station managers related to difficulties encountered in securing qualified personnel."[77] Data gathered from the managers of 201 radio stations and 167 television stations nationwide indicated that in order to solve this problem colleges and radio-TV schools should "revise their courses, employ more modern techniques, and place more emphasis on the economic side of the industry."[78] Respondents also felt that better cooperation between teachers and the industry could be valuable. Among several suggestions were scholarships to outstanding students made available by the industry, internships, labs given by the industry to high schools for courses in radio and television, and assisting in teaching programs in radio-TV at colleges and schools.[79]

A study by Fang and Gerval in 1971 surveyed 364 news directors of commercial television stations nationwide. The questionnaire asked respondents to indicate, among other items, which backgrounds were most likely to result in the hiring of a job applicant, and what skills or qualities they looked for the most when considering an applicant for employment.[80] Given five choices of applicants' backgrounds, 176 of respondents would hire a reporter with two years experience and no college background, 165 would hire a

college graduate in broadcast journalism with no experience, 50 would hire a college graduate with another major and no experience, 24 would hire a local youth or junior college graduate with no experience, and 10 would hire a broadcasting trade school graduate with no experience.[81] The most desirable skills were (in order of importance) writing ability, on-air presentation, knowledge of photography, knowledge of film editing, and, finally, reporting skills.[82]

Another study by Taylor in 1974 surveyed 272 radio station managers and 201 television managers, in addition to 111 college and university departments offering majors in broadcasting or mass communication.[83] The questionnaires yielded a 30.5 percent response rate from radio managers, 31.8 percent from television managers, and 45.9 percent from colleges and universities. Each respondent was asked to assess the importance of a college education in obtaining a job in commercial broadcasting. The results indicated that the broadcast managers in most cases thought that practical on-the-job training was superior to a college degree.[84] "Because of the inadequacy of college mass communication training" the majority of the respondents preferred graduates with a degree including a broad liberal arts curriculum.[85] According to the study, "the general feeling among broadcasters seemed to be that idiosyncrasies of individual station operations simply can't be reproduced in the college classroom or laboratory."[86] Also, "the overriding concern of the station managers was that the educator is out of touch with the world of commercial broadcasting."[87] The respondents, furthermore, thought that educators overestimate the quality of what they teach, and that the teaching of

broadcasting should put less emphasis on production, performance, and programming, and more emphasis on marketing, advertising, and business management.[88]

In 1975, Weiser surveyed 75 commercial radio and television stations in Ohio. Forty-nine radio stations and six television stations responded.[89] The purpose of the study was to determine the opinion of broadcasters on the effectiveness of broadcast education to prepare students for jobs in the industry. The questionnaire was divided into six parts; general education, general knowledge of broadcasting, broadcast skills, extra or co-curricular experience, importance of a college degree, and qualities desired in job applicants.[90] The results of the study indicated that in general education, communication courses in public Speaking, journalism, and advertising were rated the most important, followed by written communication and communication theory.[91] Under general knowledge of broadcasting, respondents rated sales and a knowledge of programming to be the most important, followed by typing skills, concepts of broadcast journalism, and broadcast law.[92] The most important broadcast skills were thought to be sales skills, followed by performance, board operation, production, copywriting, continuity, and tape editing.[93] In part four of the study, respondents were asked to rate the importance of extra or co-curricular experiences. Board experience was rated the most important, followed by studio production, experience with audio and video tape, news reporting, radio sales, DJ work, telecine operation, and news presentation. Under part five, 20 percent of respondents thought a college degree to be essential for work in broadcasting, 55 percent thought a degree was desirable, 20 percent said good but not necessary, and three percent thought a degree was unessential.[94] Finally, the qualities respondents most desired in job

applicants were found to be (in order of importance) experience, personality, attitude toward the position, oral and written communication skills, and skills in the operation of broadcast equipment.[95]

Another study by Abel and Jacobs in 1975 surveyed 1,168 radio station managers about their attitudes toward broadcasting graduates, and achieved a 74.5 percent response rate.[96] The study found that overall, managerial attitudes toward college graduates and college broadcasting departments tended to be relatively unfavorable.[97] The study did, however, discover that "managers in the top 10 markets were significantly more favorable toward college broadcasting departments than managers in other market categories."[98] This was generally true for managers of larger market stations compared to managers in smaller markets.[99] Furthermore, nearly 70 percent of the respondents thought that experience from a college campus radio was valuable for potential on-air personnel, and 75 percent felt that "there is no substitute for previous commercial radio experience."[100] When asked to respond to the open-ended question "how can college broadcasting students better prepare themselves for radio careers?" managers mostly referred in some way to commercial experience, obtained through internships and summer and part-time employment.[101] Other suggestions included "knowledge of the commercial industry," "strong desire," and "good attitude."[102]

A 1975 study by Darrell E. Wible found that radio and television practitioners had a positive attitude toward college education.[103] The study surveyed more than 300 radio and television station managers and employees in Indiana, and results of the survey indicated that "some 88 percent of managers and 86 percent of employees claim 'some'

to 'great' benefit from college."[104] The respondents did, however, have less respect for college radio and television academic programs. Sixty-three percent of respondents rated their college RTV programs as 'fair' to 'very poor.'[105] According to the study, radio and television practitioners thought that "RTV programs are generally poor in providing practical experience," and "RTV programs are doing a poor job in dealing with sales, the business of broadcasting, and FCC rules and regulations."[106] The study recommended that college courses and course content be reviewed, and that advice should be taken from "those who are in position to employ -- from those with experience. Seek not from the disillusioned, the bitter, the unsuccessful, but the enthusiastic, the successful!"[107] The author believed that there were unlimited opportunities for improvement in radio-TV-film academic programs, and it was his hope that his study could be a factor in improving the relationship between broadcasting and higher education.[108]

A relatively high level of cooperation between broadcasters and educators was found in a 1977 study by Stone and Hoyt. The researchers collected data from news directors at 415 television stations and 330 radio stations, as well as from 32 broadcast educators.[109] The results showed that 80 percent of television news directors and 50 percent or radio news directors or another newsperson at their station had spoken to a class of students at least once in the year preceding the survey.[110] Furthermore, practically all news directors said that they would accept an invitation to speak to a class in their market area.[111] Also, "30 of the 32 responding educators said they normally invited professional broadcast journalists to talk to their classes, and 28 said the invitations were normally accepted."[112] The study also found that "newsrooms were only half as likely to

be visited by educators as newspersons were to visit classrooms."[113] Additionally, 64 percent of the television stations and 35 percent of the radio stations reported having internship programs available to students.[114] Finally, when asked "what is the main way in which broadcast journalism educators could better serve news operations like yours?" news directors essentially replied: "Professors can best serve the profession by keeping an up-to-date working knowledge of broadcast news and passing this along to their students."[115] However, the question "in general, do you think broadcast journalism educators keep in close touch with the 'real world' of broadcast news?" resulted in an answer of 'no' from 85 percent of television news directors and 74 percent of radio news directors.[116]

A study by Fisher in 1978 surveyed radio and television broadcasting stations in Ohio, and collected data from 90 news broadcasters, in addition to data from personal interviews with 42 news directors and editors.[117] The purpose of the study was to determine "what experienced news broadcasters perceive to be the most important and useful career preparation."[118] The study discovered that "respondents overwhelmingly supported college preparation for work in broadcast news."[119] In fact, more than 92 percent thought potential broadcasters should get a college education.[120] Among broadcast skills courses taught by educators, respondents thought that writing and editing news was the most important, followed by writing to tape or film, straight news reporting, broadcast announcing, and writing features and documentaries.[121] Radio and television production technique was ranked ninth, film/tape editing tenth, and handling portable and studio equipment 11th and 12th respectively.[122] Among liberal arts courses, respondents

chose history and current affairs as the most important, followed by creative writing, political science, rhetoric/speech, and economics.[123] From these results the researcher concluded that:

> Skills courses should give priority to teaching effective writing and editing of news, actualities, features, and documentary materials, to straight and investigative reporting and to news delivery. In general, too, training in journalistic skills should be stressed more heavily than broadcast production techniques.[124]

Yet, another study by Oliver and Haynes in 1978, collected data from 292 managers of radio and television stations nationwide.[125] The purpose of the study was "to tap the attitudes of commercial radio managers and television managers toward the present programs of study in colleges and universities."[126] They found that, in general, "managers seemed to believe the curriculum was designed unrealistically and was ill equipped for training commercial broadcasters."[127] They also concluded that the respondents generally agreed that "broadcasting departments were 'not doing a good job preparing students' and that college training in broadcasting was 'probably not contributing significantly to the improvement of the broadcasting industry.'"[128] Furthermore, the study found indications that broadcast managers wished for a closer relationship with broadcast educators:

> The executives seemed to believe that they should be consulted on matters of curriculum, should work directly with educators and students, and should help train students at their stations.[129]

In general, broadcasters wanted broadcast educators to be "more responsive to their needs."[130] Oliver and Haynes recommended broadcast educators place more emphasis on the practical side of broadcasting, especially in production, sales, and the

business aspects of the industry.[131] Furthermore, they recommended that educators "establish and maintain strong ties with commercial broadcasting," while stressing the importance of internship programs.[132] Finally, the researchers recommended that educators be better at ascertaining the needs and preferences of the broadcasting industry in their own regions.[133]

In a 1980 survey by Hudson, 266 commercial broadcast news employers (235 radio and 31 television) in 45 states identified "entry-level employment opportunities and broadcast news skills and areas of knowledge preferred for broadcast news graduates."[134] The findings indicated that, generally, "broadcast news employers prefer employee skills in gathering, writing and reporting news"; "broadcast news respondents want employees who understand the liberal arts in areas of government, history, economics, business law and legal processes"; and "a college degree in broadcasting is preferred by radio and television news employers."[135]

A study by Parcells in 1981 collected data from 375 radio station managers in Illinois, Indiana, Iowa, Missouri, and Wisconsin.[136] The purpose of the study was to determine entry-level skills, characteristics of long-term success, ascertain employment hiring considerations, and seek advice for persons wanting a successful career in radio.[137] The results of the study indicated that the entry-level skills most sought after by radio broadcasters for persons wanting to become announcers were on-air delivery, followed by the ability to operate broadcast equipment, and production technique.[138] For news employees, the most important entry-level skills were on-air delivery, followed by newswriting and news gathering.[139] The study also found that station managers "give

serious consideration to a college degree when interviewing applicants," however, they "give no more consideration to a broadcast degree than to any other type of college degree."[140] Furthermore, "professional experience (emphasizing professional radio work but including internships and campus radio work) is considered more important than a college broadcast degree by station managers."[141] Characteristics necessary for long-term success in radio broadcasting included quality of on-air delivery, responsibility and dependability, initiative and dedication, and newswriting ability.[142] Parcells concluded:

> The challenge to apply performance expectations to radio curriculum and instruction and meet the industry demands is now upon broadcast educators. Skill-based broadcast education is essential, but knowledge or mere skills is quite useless without understanding of the personal characteristics essential for long-term employment.[143]

Parcells also surveyed 375 radio station managers in different size markets in the midwest in 1982, to establish radio station managers' specific vocational needs, determine important entry-level skills and determine characteristics of long-term success for individuals in the radio industry.[144] The study found that radio managers in both small, medium, and large markets thought that newswriting and on-air delivery were the most important entry-level skills for news personnel.[145] Managers also considered news gathering and interviewing technique as fundamental skills.[146] The ability to operate broadcast equipment, and production technique received further mention.[147] For announcers, on-air delivery, the ability to operate broadcast equipment, and production technique were considered the vital entry level-skills.[148] The most important characteristics determining the long-term success for news personnel were: Responsibility/dependability, initiative/dedication, on-air delivery, and newswriting.[149]

Similarly, the most important characteristics for announcers appeared to be on-air delivery, responsibility/dependability, and initiative/dedication.[150] And, importantly, all the radio station managers believed that production technique and the ability to operate broadcast equipment were important skills for long-term success in the radio industry.[151] The study also found that station managers consider a college degree useful for job applicants in the radio industry, but the type of degree was of little importance.[152] According to Parcells, an individual desiring to succeed in radio should:

> Get a liberal arts background in college with concentrations in marketing and broadcasting and gain experience at a commercial radio station while in school. Formulate a definite career plan with specific goals and begin by learning skills in all areas of radio in a small market and then moving to bigger radio stations. Always be conscientious, dedicated, and willing to learn on the job.[153]

The researcher concluded that:

> An assumption underlying all implications of this study for broadcast higher education is the importance of the development of a good rapport between commercial radio station managers and broadcast higher educators. This is a challenge to both parties to move beyond past dilemmas and to work together in creating an effective educational program for individuals seeking careers in broadcasting.[154]

In 1985, Wible published an update of his 1975 study under the title: "The Indiana Report II. A Telecommunications Curriculum Recommended by Indiana Broadcasters." The purpose of the study was "to develop a curriculum in telecommunications for university undergraduate students, including course content, as recommended by commercial broadcasters in Indiana."[155] Wible collected data from 71 respondents through questionnaires distributed at the Indiana Broadcasters Association Conference, 21 of which were station managers, 18 sales managers, 17 production employees, and 14 news employees.[156] The results of the study showed that broadcasters

thought internships was the most important course for college students to take, and that internships should be number one on the list of required courses for broadcast students.[157] Other courses that were considered important included "news, writing, law, radio production, radio sales, and audience research.[158] The respondents also felt that the broadcast curriculum needed to be broader to "teach the basic skills of communications, economics, accounting, personnel management, advertising, computer technology, business and commercial law."[159] Furthermore, "writing, production, and on-air performance were nearly even in importance, and interviewing ranked highest among skills."[160]

A study by Steinke conducted in 1993 surveyed 51 radio and television station managers in Tennessee. The survey results indicated that most managers (70.59%) preferred employees who majored in a communications field in college.[161] However, 60.78 percent of the broadcasters thought that "new employees lack professional level skills," end eleven managers stated that "broadcast graduates need to more fully develop their professional broadcast skills before leaving college.[162] Also, 70.59 percent of the respondents said that hands-on experience acquired in college had been a factor that influenced the managers' decisions to hire graduates.[163]

Another 1993 study by Hilt and Lipschultz surveyed 179 general managers and news directors at commercial radio and television stations in Iowa and Nebraska about their attitudes toward broadcast education.[164] The results of the study indicated that managers valued oral communication skills, self-motivation, and writing skills as the most important, while a college education, the quality of the audition tape, and physical

appearance were considered the least important.[165] Also, the respondents thought that "hands-on skills, internships, and a liberal arts education helped prepare broadcast students for their careers."[166] Furthermore, managers questioned "whether students received adequate preparation and hands-on training in college."[167]

Surveys of Broadcast Educators

The earliest survey of broadcasting educators that could be found was conducted by Charnley in 1942. He collected data from 33 'Class A' schools and 55 'Class B' schools offering classes in radio.[168] The purpose of the study was to "ascertain the existing relationship of education for radio to professional education for journalism, both in practice and in principle."[169] Among the findings of the study was that Class A and Class B schools both agreed that radio education should be based on a "broad background," with courses in radio constituting only a minor share of the total courses required for a degree.[170] As the director of one Class B school said:

> Our students expecting to enter radio take the same broad, thorough course required of others for the B.S.J. degree. Only well-educated persons will be able to serve the public best through radio programs.[171]

The study also found that among radio courses offered by the participating schools, classes in radio news processing and broadcasting were the most common, followed by radio script writing courses and courses in radio advertising.[172] The study furthermore discovered that more than half of the polled schools and departments had practice studios or other lab facilities available to students.[173] According to the study, "about a fifth are in institutions with their own broadcasting stations; nearly half have

working arrangements with commercial radio stations whereby radio students may get practical experience; about a fifth have no broadcasting facilities whatsoever."[174] The purpose of a 1958 study by Summers was to "call attention to the extent in which programs of instruction in radio and television differ from one another, in various major universities."[175] Summers chose 25 universities "on a more or less arbitrary basis," considering both geographical distribution and departmental organization of instruction.[176] The findings of the study indicated that of all broadcasting courses offered approximately 30 percent dealt with 'theoretical' aspects of broadcasting, with 70 percent consisting of studio practice or writing courses.[177] Also, courses in production, "including workshops and other types of experience," made up more than one third of all broadcasting classes offered.[178] Furthermore, of the 25 participating universities, seven operated their own television stations, and seven others had "active television production centers which provide live or filmed programs for educational or commercial stations."[179] Nineteen schools operated either AM or FM radio stations, or both.[180] Also, according to the study, at practically all the participating schools, "opportunities for students to gain practical experience in broadcasting are excellent."[181] In eight of the schools, FM radio stations were operated with station staffs made up primarily or in some cases entirely of students.[182] Additionally, at schools with television stations, television production centers, or AM radio stations, "a considerable number of advanced undergraduate students are used as part-time employees of these university stations or production centers."[183] Also, 24 out of the 25 responding schools reported that on the average, 27 percent of all radio-TV students worked for commercial broadcasters either part time

during the school year, or full time during the summer.[184] Another sign of good relations between educators and commercial broadcasters was evident in the fact that at 22 of the participating institutions, 77 of the 131 full-time instructors in radio and television had accumulated "two years of more experience as members of staffs of commercial stations or networks, or in fields directly connected with commercial broadcasting."[185] And in all but one of the responding schools "instructors in radio-TV courses regularly visit commercial stations in their several areas, both to keep alive their contacts with commercial broadcasters and to observe production techniques used on local commercial stations."[186] The researcher observed that too much attention may have been given to program production, and not enough to other aspects of broadcasting. He said:

> Apparently our universities are providing ample training for work in program production - an aspect of broadcasting in which opportunities for employment are certainly not unlimited - but often at the expense of broad, general training in other aspects of radio and television, in which professional opportunities may be greater. Perhaps the time has come when universities generally might profit by a reappraisal of their objectives in offering courses in radio and television, and a modification of their course offerings in the broadcasting field, more effectively to meet the actual needs of their students.[187]

In 1972, Tom Ball, in developing evaluation criteria for broadcasting programs at community colleges, proposed several criteria for sound teaching in broadcasting. He suggested that faculty needed a "blend of higher education and a wide range of broadcast industry work experience."[188] He wrote:

> When hiring faculty to teach production courses, if a choice must be made between emphasis on education beyond the baccalaureate degree or emphasis on extensive industry work experience, the latter should receive strong consideration.[189]

Ball also suggested that appropriate facilities were needed, such as "a large, open room with a smooth floor and a high ceiling to use as a studio," and electronic equipment "of modern vintage and as similar to that used in local industry as economically possible."[190] Finally, Ball underlined the need for organized internships.[191]

A 1973 study conducted by Dary surveyed 115 members of the Association for Education in Journalism, with the purpose of ascertaining their "professional and academic backgrounds, their present professional contacts, and some of their attitudes toward the profession of Broadcast Journalism."[192] His findings indicated that 94 percent of the respondents had had full-time professional experience in broadcast news or a related area of mass media.[193] In looking at broadcast facilities, 61 out of the 70 educators that answered that part of the questionnaire, reported that they did "at least part of their laboratory teaching in realistic surroundings."[194] According to the survey 51 percent made use of commercial stations for teaching, 65 percent used school-owned educational stations, and 48 percent used closed-circuit/campus only stations.[195] Twelve percent reported having access to none of the above.[196] In rating professionals in commercial broadcasting, respondents thought network television news was doing a 'good' job, network radio news was rated only 'fair to good,' local radio news 'poor to fair,' and local television news only 'fair.'[197]

A study by Metallinos in 1978 collected data from 175 colleges and universities "offering at least one course in TV production," nationwide.[198] One of the conclusions reached by the survey was that "TV production-oriented courses involve the students with similar TV production program formats as those found in network, public, and closed-

circuit television."[199] The opinion of the researcher, however was that too much emphasis was being put on program formats such as interviews and newscasts. Such formats, according to the researcher, did not stimulate students' creativity sufficiently, while, on the other hand, the use of dramatic scenes was justified because:

> Dramatic scenes taken from plays automatically offer the script, the text, the characters, indications of scenery, props, lighting, staging, and even the editing to be employed; they allow the student to visualize, interpret, and vivify the thoughts of the playwright; and they provide a good learning experience in all aspects of TV studio production.[200]

The study furthermore concluded that expensive productions, productions requiring sophisticated equipment, technical personnel, or experienced production crews or talent were not encouraged.[201] Also, according to the study, "TV production courses and/or assignments within courses dealing with video experimentation (in both its narrative and electronic form) are lacking in our broadcast curricula."[202] Furthermore, educational programs did not seem to be a program format that received much encouragement.[203] And, finally, according to the study, "graduate production courses in television are absent from the majority of our broadcast education curricula."[204] In conclusion, the researcher wrote:

> There is ... sufficient evidence to suggest that TV production curricula in American colleges and universities are inadequate and unrealistic compared with the technological advancements and the socioeducational needs of our time.[205]

A paper by Elmore, presented in 1981, discussed the "media student's need to receive a good general education in areas other than communication and the need for opportunities to receive specific production-management training in non-broadcast media."[206] Elmore wrote:

> Although production is central to curricula in telecommunications, students need opportunities to supplement primary interests with courses in management, technical subjects, and performance.[207]

He also noted that students that are most marketable in the media industry are those with practical experience. According to the paper, "practicum courses, where students receive academic credit for practical work experience gained on campus, are helpful when listed on the resume. But better still is a professional practices program or internship which entails full-time work experience with a qualified cooperating off-campus organization."[208] Elmore concluded his paper with the notion that "the most marketable telecommunications graduate is one who has received the best possible liberal arts education and whose specific telecommunications training included practical skills development in non-broadcast television and other institutional media.[209]

A survey of 209 colleges and universities in the United States, conducted by Elmore in 1983, sought to compare different types of departments offering undergraduate degrees in radio-television-film. The study looked for differences in objectives and philosophy, faculty backgrounds, and moneys invested in equipment and training facilities, to name a few, between broadcasting departments, communication departments, journalism departments, mass communication departments, and speech departments.[210] Of the 131 responding schools, there was a clear tendency in departmental objectives to say that "their curriculum balanced practical skills training with a general liberal arts education."[211] The study did not find a significant difference between departments as far as years of experience in the media industry was concerned, but the mean for all departments combined was found to be 7.15 years.[212] In looking at dollar amounts

invested in radio-television-film facilities and equipment, it was clear that broadcasting departments by far invested the most, with a mean of almost $1.1 million, twice as much as the next highest mean, which was communication departments at $540,333.[213]

A 1988 study by Meeske investigated internship programs in a nationwide survey of 319 four-year schools that were members of the Broadcast Education Association.[214] The findings suggested that 99 percent of the 207 replying schools had a formal broadcasting internship program in their curriculum.[215] The study further concluded that more than half of broadcast students intern with radio and television stations, 20 percent with other media, such as cable television systems, corporate video (17 percent), and "broadcast related businesses such as advertising agencies and non-profit organizations (8 percent)."[216] Other findings discovered that at the majority of schools, internships are not required for a degree, that only a few schools practice paid internships for students, and that most educators do not believe that "internships exploit students as cheap labor."[217]

In a 1989 paper, McCall criticized an industry-sponsored Roper Organization study that suggested colleges and universities did not provide enough hands-on training for students to become marketable in the broadcast industry. According to McCall, "there is an apparent schizophrenia among broadcast professionals as to what they expect colleges to deliver. While providing lip service to the liberal arts education perspective, broadcasters continue to seek new hires based largely on practical experience."[218] As an example of this, he mentioned an ad for a photojournalist who could "shoot, edit, and drive a stick shift."[219] This mentality, McCall wrote,

> confronts the very mission of higher education. Mission statements of virtually every institution deal first with educating the 'whole student.' Students are educated to think, to reason, and to express themselves in a variety of content

> areas. The liberal arts educational approach, supposedly endorsed by broadcast professionals, makes no assumptions of career paths.[220]

"But broadcasters," McCall continued, "all too often only consider students with practical skills. With this approach, it is little wonder that broadcasters are not getting the best and brightest students out of the universities."[221] On the other hand, McCall pointed out the positive outcome of the Roper study that indicated a willingness on the part of broadcasters to help support the development of media education. He wrote that "it is important, however, that broadcaster efforts be directed in a useful fashion, and not in demanding that their agenda for more practical training be met as a condition to participation."[222] In his conclusion, McCall recommended that professional broadcasters should attempt to make broadcast employment more attractive for top students by creating "work opportunities the equal of those found in fields competing for the same prospects," and working to "improve conditions and salaries. This is an era where college graduates have certain compensation expectations, and they will gravitate to those opportunities that meet those expectations."[223] He also wrote:

> Academics can also better appreciate the pressures of daily media production and media economics. Broadcasters, on the other hand, can learn to better understand the role of the university as not being a vocational clearinghouse.[224]

A study by Porter and Szolka conducted in 1991 set out to answer the question "what do students think about a liberal arts orientation in university communication programs?"[225] The researchers collected data from 118 students in the Department of Communication at the University of Missouri-Columbia. One of the findings of the study was that 74 percent of the students gave an affirmative answer to the question: "Your degree from the Department of Communication is a liberal arts degree as opposed to a

technical or professional degree program. Do you see any advantages or benefits to your education because you are in a liberal arts degree program?"[226] On the other hand, some of the students also noted the importance of having "some 'hands-on experience' to prepare them for their first job."[227] When students were asked if they would prefer to be in a professional degree program, only 37 percent answered "yes."[228] However, almost 20 percent of the students who preferred to be in a liberal arts program also wanted a professional degree.[229] When asked to indicate the importance of certain subjects and attributes important for employment, students scored "technical training" and "liberal arts education" second to last and last respectively, after "enthusiasm," which scored number one, followed by "initiative," "oral communication skills," "flexibility," "written communication skills," "professional experience," and "appearance."[230] It is interesting to note that students thought appearance was more important for landing a job than both technical training and education. The researchers concluded that the school needed to "do a better job of communicating to our majors and potential majors the importance of the liberal arts education.[231] They wrote:

> Our goal should not be just to "train" them for entry level skills but instead, to educate them, in the broadest sense of the term, and to prepare them for a life-long experience of learning. We will help them to learn how to think, how to problem-solve, how to analyze, how to integrate and use data. We do this by focusing on the communication theories which drive our discipline.[232]

Yet another study by Robinson and Kamalipour, conducted in 1991, surveyed 204 college broadcast programs with the purpose of identifying practices and characteristics in the academic field.[233] According to the results of the study, all respondents reported having production capabilities on campus, either radio, television, or both.[234] The

majority of respondents reported having a campus broadcast radio station, and more than 60 percent "reported the existence of broadcast/cable TV stations as part of their programs." [235] However, only a little more than half of those programs allowed students to use the station for coursework.[236] When asked about what technical format they used, programs with television production capabilities answered that three-quarter inch U-Matic was the format used the most (about 70%), while about half of the respondents also used half inch VHS format.[237] Other choices, such as half inch SVHS, half inch Beta, and one inch Type C formats were used by less than 10 percent of college broadcast programs.[238] Beta is the universal choice of the television industry. Also, 84.31 percent of the responding schools reported possessing EFP/ENG cameras with separate VCRs, 63.73 percent had camcorders, 82.35 percent had portable lighting capabilities, and 16.67 percent reported owning remote vans.[239] Furthermore, internship credit was available within 97.55 percent of the programs surveyed.[240]

Summary

The plethora of studies and papers outlining opinions and attitudes from professional broadcasters, broadcast educators, and students, seems to indicate that there are differences in the attitudes of industry practitioners and broadcast educators with respect to the kinds of skills college graduates in the field of broadcasting should possess when they leave school. It would seem that most educators feel that a liberal arts education is the best way of preparing students for careers in the "real world." The general consensus appears to be that it is not the role of colleges and universities to

provide students with the technical abilities often demanded by the professional industry for graduates seeking entry-level positions.

On the other hand, most professional broadcasters feel that, while they value a liberal arts education for potential employees, a certain level of hands-on knowledge is absolutely necessary to become a useful member of a professional broadcasting staff. This is also a valid position, since it may not be economically viable for professional broadcasters to train entry-level employees.

The specific value of this study, in comparison to the other studies discussed in this chapter, comes from differences in several areas. First of all, the majority of the industry manager surveys discussed above tended to focus on radio managers rather than television managers. This is an important point because there are definite differences between the organization and operation of television stations as compared to radio stations. Second, many of the studies mainly focused on skills not directly related to the technical and creative production of television programming, such as reporting skills, journalistic skills, on-air delivery, advertising, sales, and so on. Third, most of the previously cited studies investigated some aspect of the value of a college education, as opposed to pure practical experience. Few of them, however, focused specifically on classes and skills obtained by students in college. Finally, none of the studies cited here directly compared the attitudes of educators and managers.

This study, on the other hand, focuses on skills related purely to the understanding and operation of specific equipment germane to modern television technology, which is a much narrower focus than the majority of the studies referred to in

this chapter. The study does compare directly the attitudes of television practitioners and broadcast educators toward the skills levels of college graduates. It compares the technological levels of television stations and academic programs, an approach taken by none of the studies cited in this chapter. Finally, none of the studies referred to focused on emerging television production technologies, which is an important part of this study.

CHAPTER III

METHODOLOGY

The primary issues investigated in this study included the technological sophistication of television stations and four-year colleges in Oklahoma, Texas, Arkansas, Missouri, Kansas, and New Mexico. The study focused on specific pieces of electronic television production and news gathering equipment and compared practitioners' and broadcast educators' expectations of the technical expertise of college graduates in learning the operation of the new technology. Furthermore, the study sought to investigate the predictions of managers and educators with regard to developments in television technology.

Specifically, the questions guiding this research were:

1. Is there currently a difference in the technological levels of television stations and college broadcasting programs, and will there continue to be a difference between the two within the next five years and the next ten years?

2. Which technologies are currently being employed by television stations and college broadcasting programs, and which technologies do they expect to employ within the next five years and the next ten years?

3. What are production directors' and broadcast educators' expectations of graduating college students with regard to how much they should know about the use and

workings of specific electronic equipment, and do these expectations differ between the two groups?

4. How are colleges and universities currently addressing the issue of new television technologies, and how do they expect to address this issue within the next ten years?

5. What are the predictions of production directors and broadcasting educators with regard to future technological developments, and do these predictions differ between the two groups?

Correspondingly, the null hypotheses tested in this study were:

1. There is currently no difference in the technological levels of television stations and college broadcasting programs.

2. There will not continue to be a difference in the technological levels of television stations and college broadcasting programs within the next five years, according to the predictions of production directors and broadcast educators.

3. There will not continue to be a difference in the technological levels of television stations and college broadcasting programs within the next ten years, according to the predictions of production directors and broadcast educators.

4. There is no difference in the expectations of production directors and broadcast educators toward college graduates and how much they should know about the use and workings of electronic equipment.

Selection and description of the subjects

The subjects chosen for this study, included 67 production directors at small market stations with news departments in Oklahoma, Texas, Arkansas, Missouri, Kansas, and New Mexico, as well as 56 instructors of television production classes at four year colleges in the same area. The researcher chose to survey schools in the same area where the television stations were located, since that is where graduating seniors from those schools are likely to seek their first television jobs.

A "small-market" station was defined by Eastman as having a Nielsen market ranking of between 101 and 210.[241] The reason that only small stations were included in the survey was that small stations are more likely to hire fresh college graduates than are stations in large markets. Also, the selection was limited to ABC, NBC, CBS, and Fox affiliates because network affiliates normally have news departments, and stations with news departments most likely provide an environment for routine television production tasks, such as shooting and editing news packages, editing teasers, live on location production, as well as live studio programming. Once these parameters were defined, all television stations fitting the above description in the designated six-state area were chosen as subjects for the survey. A list of the chosen stations was obtained from Broadcasting and Cable Yearbook 1994-95, which included mailing addresses for all the stations as well as their phone numbers. Telephone calls were placed to all the stations to identify their "person in charge of production," which produced the final list of 67 names. These subjects' titles, however, varied greatly. For example, people in charge of production at some stations were designated production managers, some were station

managers, while other stations called such executives "directors of creative services." For the sake of convenience, these subjects will henceforth be referred to as just production directors, even though such a designation may not be their actual job titles.

The four-year colleges included in the survey were selected through the Association for Education in Journalism and Mass Communication's (AEJMC) directory.[242] All four-year schools with a mention of television facilities and/or offering classes in television production in the six-state region were included. There were a total of 56 schools selected, and survey instruments were addressed to the department head at each school, with the request that he or she forward the questionnaire to an instructor teaching either television production, television news, or any other hands-on television lab kind of class.

Data collection procedures and survey instrument

Survey methodology was used in this study. Data used were collected through two mailings. The first mailing yielded 33 returns from educators at the four-year colleges, and 31 returns from production directors, for return rates of 59 and 46 percent respectively. The follow-up mailing yielded another seven responses from educators and 15 from production directors, for final response rates of 71 percent for the school survey, and 69 percent for the station survey. Two different cover letters were used for each mailing (see Appendices A and B).

The survey instruments mailed to educators and television managers were developed by the researcher under supervision of his thesis adviser. The questionnaires

(see Appendix C) were designed to provide answers to the research questions previously mentioned in this chapter.

The first two questions were essentially identical for both questionnaires. Question one asked respondents to check all technologies and electronic television equipment currently in use at either their station or school. Subjects were given a list of nine items; (1) non-linear editing, (2) computer assisted analog editing, (3) digital video effects, (4) digital VTRs, (5) digital audio, (6) satellite truck, (7) video toaster, (8) microwave transmitter/receiver, and (9) other. The educators and production directors were also asked to check all the technologies they expected to be using within the next five years and the next ten years.

Question two asked the subjects to indicate on a Likert scale their level of agreement with seven statements regarding how much college graduates should know about the technologies listed in question one. One example would be: "College graduates should know how to operate a non-linear editing system." Answers would range from "strongly disagree" to "strongly agree" through a seven-point Likert scale.

An extra question was included in the questionnaire aimed at educators. This question asked subjects to check all the technologies they were teaching students to operate or understand both currently and within the next ten years. The list of items included was identical to the one provided for question one. The reason to include this question was that the researcher suspected there might be a difference between the level of technology held by schools, and the technologies educators were actually teaching

students about. Possession of a particular technology does not automatically mean that the technology is included in the curriculum.

Both questionnaires contained the same open-ended question: "How do you envision that technological developments will affect the television industry in the future?" Additionally, production directors were asked to identify their own job titles, as well as the Nielsen market rankings of their stations. Educators were asked to indicate whether or not their academic programs were accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC). This was done under the assumption that since accreditation requires a certain standard of technology, there might be differences in technology levels and attitudes between accredited schools and schools without accreditation. According to the ACEJMC Training Manual for 1993-94, in order for schools to retain their accreditation, they "must have facilities and equipment in sufficient quantity and quality to carry out [their] stated educational objectives."[243]

Statistical analysis

T-tests, anova tests, and descriptive statistics were used in an attempt to provide answers to the five questions guiding this research. Independent t-tests allowed the researcher to compare two different sets of data to see if there was a statistically significant difference between the two. An example would be comparing the current level of technology between colleges and television stations. Anova tests, on the other hand, allowed the researcher to detect differences between three or more sets of data. One example, would be to see if there was a statistically significant difference in technology

level between three groups of stations located in differently sized markets (see chapter 4). The researcher used descriptive statistics, like simple means and percentages to describe the differences in usage between educators and production directors regarding specific pieces of electronic equipment.

The independent variables reported on included production directors, educators, station market size, accredited schools, and non-accredited schools.

CHAPTER IV

FINDINGS

The primary focus of this study was to examine the difference in the technological levels of television stations and academic broadcasting programs. It was also the purpose of the study to look for possible differences in the attitudes and predictions of production directors and broadcast educators toward what college graduates should know about television technology.

Five research questions constituted the basis of the study:

1. Is there currently a difference in the technological levels of television stations and college broadcasting programs, and will there continue to be a difference between the two within the next five years and the next ten years?

2. Which technologies are currently being employed by television stations and college broadcasting programs, and which technologies do they expect to employ within the next five years and the next ten years?

3. What are production directors' and broadcast educators' expectations of graduating college students with regard to how much they should know about the use and workings of specific electronic equipment, and do these expectations differ between the two groups?

4. How are colleges and universities currently addressing the issue of new television technologies, and how do they expect to address this issue within the next ten years?

5. What are the predictions of production directors and broadcast educators with regard to future technological developments, and do these predictions differ between the two groups?

Findings

Research question 1:

Is there currently a difference in the technological levels of television stations and universities, and will there continue to be a difference between the two within the next five years and the next ten years?

The corresponding null hypotheses were:

1. There is currently no difference in the technological levels of television stations and college broadcasting programs.

2. There will not continue to be a difference in the technological levels of television stations and college broadcasting programs within the next five years, according to the predictions of production directors and broadcast educators.

3. There will not continue to be a difference in the technological levels of television stations and college broadcasting programs within the next ten years, according to the predictions of production directors and broadcast educators.

In order to get an answer to this question, survey respondents were asked to select from a list of nine items the television technologies that were currently being employed by their station or academic program, the number of additional items they expected to be using within the next five years, and the number of additional items they expected to be using within the next ten years. Table I shows the mean number of items selected by both broadcast educators and production directors for all three time references.

For the first time reference, respondents selected the number of technologies they were currently employing. Production directors selected on the average 3.7 items out of nine possible, while broadcast educators selected on the average 2.9 items. The researcher performed an independent t-test on the these two means and found a statistically significant difference on the 0.05 level. This would seem to indicate that small television stations in the area surveyed do currently possess a higher level of technology than that of college broadcasting departments in the same area. Consequently, null hypothesis one was rejected.

Table I:
Research question 1 - technology level.
IV: Academic programs and television stations.
DV: Technology level

	# items currently used (mean score)	# within 5 years (mean score)	# within 10 years (mean score)
Academic programs (N=40)	2.900	2.300	0.925
Television stations (N=46)	3.674	2.935	0.413

Production directors and broadcast educators also selected the number of technologies they expected to be employing within the next five years. The researcher did not find a statistically significant difference between the two groups for that time reference. The same held true for the last time reference as well. There was no statistically significant difference between the numbers of items selected by respondents for the technologies they expected to be employing within the next ten years. This indicates that the two groups foresee acquiring the approximate same number of additional technologies within the next ten years. It should be noted, however, that the technologies acquired by the two groups in the future need not be the same ones. Null hypotheses two and three were both rejected.

Another independent variable examined for level of technology was that of accredited academic programs versus programs without accreditation. The reason for examining these two groups was that the researcher suspected that there could be differences in technology level between the two. The results are shown in table II.

Table II:
Research question 1 - technology level.
IV: Accredited schools and non-accredited schools.
DV: Technology level.

	# items currently used (mean score)	# within 5 years (mean score)	# within 10 years (mean score)
Accredited programs (N=13)	2.692	2.077	1.231
Non-accredited programs (N=26)	2.808	2.423	0.769

By performing independent t-tests on each pair of mean scores for each of the three time frames, no statistically significant differences were found. This indicates that accredited academic programs currently possess the same level of technology as do non-accredited programs, and the level of technology between the two groups is expected to stay the same for the next ten years.

Even though the television stations included in the survey all were defined as being "small market" stations, the researcher suspected that there could be differences in the levels of technology held by the stations in the largest and smallest markets within this group. The survey responses from production directors were therefore divided into three approximately equal groups; stations with a market ranking from 101 to 119, stations in markets between 120 and 148, and stations in markets from 149 to 200. The first two categories contained 15 respondents each, and the last category 14 respondents. There were only 44 useable responses, because two production directors failed to indicate the market size of their stations' service areas. Table III shows the mean scores for each size category and time frame.

Table III:
Research question 1 - technology level.
IV: Television station market size.
DV: Technology level.

	# of items currently used (mean score)	# within 5 years (mean score)	# within 10 years (mean score)
Market size 101-119 (N=15)	3.467	2.733	0.467
Market size 120-148 (N=15)	3.667	2.800	0.467
Market size 149-200 (N=14)	4.000	3.143	0.214

In performing an analysis of variance (anova) on the three means for each time frame, no statistically significant differences were found on the 0.05 confidence level. That would seem to indicate that there were currently no differences in technology level between the three market sizes, a situation that could be expected to remain unchanged for the next 10 years.

Research question 2:

Which technologies are currently being employed by television stations and universities, and which technologies do they expect to employ within the next five years and the next ten years?

As previously mentioned, question one on the questionnaires sent to both production directors as well as broadcasting educators contained a list of nine items. Those items were: Non-linear editing, computer assisted analog editing, digital video effects, digital VTRs, digital audio, satellite truck, video toaster, microwave transmitter/receiver, and other. Table IV shows the distribution of current and expected usage of each of the first eight items for production directors and broadcasting educators for the three time frames.

Non-linear editing: As can be seen from Table IV, 37 percent of the stations surveyed are currently using some kind of non-linear editing system. The remaining 63 percent expected to acquire such a system within the next five years, meaning that all the stations surveyed could be using non-linear editing within the next five years from now.

As far as four-year colleges are concerned, 50 percent of the educators indicated that they were currently using some kind of non-linear editing system, 37.5 percent expected to be using non-linear editing within the next five years, and five percent within the next ten years, meaning that 92.5 percent of the schools surveyed could be using non-linear editing within the next ten years. The remaining three schools (7.5%) did not expect to be using any kind of non-linear editing system within the next ten years.

Table IV:
Research question 2 - Technology use.
Use of eight different technologies by stations and schools.

	# of respondents currently using item		# within 5 years		# within 10 years		Total within 10 years	
	stat. N=46	scho. N=40	stat. N=46	scho. N=40	stat. N=46	scho. N=40	stat. N=46	scho. N=40
Non-linear editing	17 37.0%	20 50.0%	29 63.0%	15 37.5%	0 0.0%	2 5.0%	46 100%	37 92.5%
Computer assisted analog editing	30 65.2%	17 42.5%	12 26.1%	14 35.0%	0 0.0%	0 0.0%	42 91.3%	31 77.5%
Digital video effect	42 91.3%	19 47.5%	4 8.7%	16 40.0%	0 0.0%	2 5.0%	46 100%	37 92.5%
Digital VTRs	3 6.5%	2 5.0%	31 67.4%	21 52.5%	5 10.9%	11 27.5%	39 84.8%	34 85.0%
Digital audio	11 23.9%	22 55.0%	30 65.2%	10 25.0%	4 8.7%	4 10.0%	45 97.8%	36 90.0%
Satellite truck	6 13.0%	4 10.0%	17 37.0%	1 2.5%	8 17.4%	13 32.5%	31 67.4%	18 45.0%
Video toaster	9 19.6%	20 50.0%	5 10.9%	4 10.0%	2 4.3%	0 0.0%	16 34.8%	24 60.0%
Microwave transmitter/receiver	40 87.0%	8 20.0%	5 10.9%	7 17.5%	0 0.0%	6 15.0%	45 97.8%	21 52.5%

In conclusion, these numbers indicate that non-linear editing will become one of the most important technologies used in the television industry within the next five years.

Computer assisted analog editing: Table IV shows that 65.2 percent of the stations surveyed are currently using some kind of computer assisted analog editing system. Furthermore, 26.1 percent of the managers surveyed expected to possess such equipment within the next five years, for a total of 91.3 percent. The remaining four managers (8.7 percent) did not expect their stations to acquire any such equipment within the next ten years. As for four-year colleges, results of the survey show that 42.5 percent currently use some kind of computer assisted analog editing system. Furthermore, 35.0 percent expected to get such equipment within the next five years, for a total of 77.5 percent. The remaining 22.5 percent did not anticipate making an investment in that area within the next ten years. In conclusion, computer assisted analog editing systems are still very much in use in the television industry and college programs alike, and will most likely continue to be for some time to come. It is important to note, however, that non-linear editing systems, once they become the norm, make computer assisted analog editing systems obsolete.

Digital video effects (DVE): Almost all the television stations surveyed (91.3 percent) were currently in possession of DVE equipment. The remaining four stations (8.7 percent) expected to get such equipment within the next five years. This result is not surprising because the DVE has become almost invaluable for local news operations in the way they package the news. Among broadcasting educators, 47.5 percent reported presently using DVE equipment, 40 percent thought they would get DVE equipment within the next five years, and an additional 5.0 percent expected it within ten years, for a

total of 92.5 percent. The remaining 7.5 percent did not expect acquiring such equipment within the next ten years. In conclusion, this would seem to indicate that digital video effects equipment is, and will continue to be, important for use in the television industry at least during the foreseeable future. One reason for this could be that there is currently no replacement for this technology when it comes to live television. Non-linear editing systems will probably be able to perform the same functions in pre and post, but not in live production.

Digital VTRs: Only 6.5 percent of the production directors reported using digital VTRs at their stations, but an additional 67.4 percent expected to be using them within the next five years, and 10.9 percent thought they would own such equipment within the next ten years. This means that 84.8 percent of the stations surveyed could be using digital VTRs within the next ten years. The remaining seven stations (15.2 percent) did not anticipate investing in digital VTRs anytime during the next ten years. Similarly, only two of the responding schools reported having digital VTRs, but 52.5 percent thought they would get such equipment within the next five years, and 27.5 percent expected it to happen within ten years, for a total of 85.0 percent. The remaining six schools (15.0 percent) did not expect to own digital VTRs anytime within the next ten years. In conclusion, digital VTRs are not being used much by neither television stations nor broadcasting educators, but the majority of both groups expect that this technology will become more important during the next five years.

Digital audio: Digital audio appeared to be more used than digital VTRs did. Among production directors, 23.9 percent reported presently using digital audio at their stations. Another 65.2 percent expected to be using this technology within the next five years, and 8.7 percent within ten years. This means that within the next ten years, 97.9 percent of the stations surveyed could be employing digital audio. Only one production director (2.1 percent) did not expect to be using digital audio anytime within the next ten years. Among the schools surveyed, 55.0 percent reported possessing digital audio technology at the present time. Another 25.0 percent expected to get it within the next five years, and 10.0 percent within the next ten years, for a total of 90.0 percent. The remaining 10 percent did not expect to be employing digital audio technology anytime in the next ten years. In conclusion, since 97.9 percent of television stations and 90.0 percent of colleges expect to be using digital audio within the next ten years, it appears that this technology will continue to grow in importance with time.

Satellite truck: Satellite trucks were currently being employed by only 13.0 percent of the television stations surveyed. Another 37.0 percent indicated that they might acquire a satellite truck within the next five years, and 17.4 percent thought they may get one within the next ten years. This means that 67.4 percent of the stations surveyed could possess satellite trucks within the next ten years. The remaining 32.6 percent did not believe their stations would invest in a satellite truck anytime within the next ten years. Among four-year colleges, 10.0 percent of the educators surveyed indicated that their schools currently possessed one or more satellite trucks, only 2.5 percent thought they

would get such equipment within the next five years, 32.5 percent within the next ten years, for a total of 45.0 percent. The remaining 55.0 percent did not think their schools would acquire a satellite truck anytime within the next ten years. In conclusion, current ownership of satellite truck technology appears to be surprisingly low, at least as far as television stations are concerned. One reason for this could be that all the stations surveyed fell within the 'small' category, and might not typically own such equipment to the same extent as stations in larger markets. Also, it seems to be a fairly usual practice for network affiliates to rent satellite uplink services whenever they need them, rather than owning the equipment themselves.

Video toaster: Video toasters were currently being used at only 19.6 percent of the television stations surveyed. Another 10.9 percent thought they might buy such equipment within the next five years, 4.3 percent within the next ten years, for a total of only 34.8 percent. The majority (65.2 percent) did not think they would acquire video toasters anytime within the next ten years. On the other hand, 50.0 percent of the schools surveyed currently used video toasters, with another 10.0 percent planning to get such equipment within the next five years. The remaining 40.0 percent did not anticipate buying a video toaster anytime within the next ten years. In conclusion, the low usage of video toasters among television stations indicates that broadcasters prefer non-linear editing systems over video toasters. Also, video toasters are considered by many as being incapable of matching the technical quality of more sophisticated non-linear systems. The relatively higher usage of video toasters exhibited by four-year colleges could be due to

the fact that video toasters are relatively inexpensive and an excellent tool for teaching students how to use graphics in television production. It would also seem, however, that the video toaster is rapidly becoming obsolete.

Microwave transmitter/receiver: Microwave technology was being employed by 87.0 percent of the television stations surveyed, with another 10.9 percent planning to acquire such technology within the next five years. This means that 97.9 percent of the stations surveyed could be using this technology within the next five years. Only one of the 46 managers surveyed did not think his/her station would invest in microwave technology anytime during the next ten years. The use of microwave technology among schools was much lower, with only 20.0 percent currently owning such equipment. Another 17.5 percent thought they might by such equipment within the next five years, 15.0 percent within the next ten years, for a total of 52.5 percent. The remaining 47.5 percent of the broadcasting educators surveyed did not think their schools would acquire such technology anytime within the next ten years. In conclusion, the high level of usage among television stations is not surprising, since microwave technology has been the easiest way to transmit video and audio signals from the field back to the station since television's earliest days. The relatively low use among schools is not surprising either. Schools would not have very much use for such equipment, since they are not normally in the business of reporting live news events to the public.

Research question 3:

What are production directors' and broadcasting educators' expectations of graduating college students with regard to how much they should know about the use and workings of specific electronic equipment, and do these expectations differ between the two groups?

Null hypothesis: There is no difference in the expectations of production directors and broadcast educators toward college graduates and how much they should know about the uses and workings of electronic equipment.

In order to provide an answer to this question, respondents were asked to indicate their level of agreement with seven different statements on a seven point Likert scale ranging from "strongly disagree" to "strongly agree." In this case, a response of "strongly disagree" would result in a score of one, while "strongly agree" would be worth a score of seven.

Statement 1: The first statement read: "College graduates should know how to operate a non-linear editing system." Table 5 shows the different mean scores for respondents divided into several different subgroups, such as school accreditation and television station market size. Once again the survey responses from production directors were divided into three approximately equal groups; stations with a market ranking from 101 to 119, stations in markets between 120 and 148, and stations in markets from 149 to 200.

As can be seen from Table V, all respondents indicated a fairly strong level of agreement with the statement, meaning that they for the most part thought college graduates should know how to operate a non-linear editing system. By performing an independent t-test on the overall scores of schools and stations, the researcher did not find a statistically significant difference at the 0.05 level of confidence. This would seem to indicate that there was no significant difference in the expectations of production directors and broadcasting educators with respect to whether or not college graduates should know how to operate a non-linear editing system. In fact, both groups expressed a fairly high level of agreement that college graduates should indeed possess this knowledge. Consequently, as far as non-linear editing is concerned, the null hypothesis was supported.

Table V:
Research question 3.
"College graduates should know how to operate a non-linear editing system."

	Schools overall (N=40)	Stations overall (N=46)	Schools accredited (N=13)	Schools not accredited (N=26)	101-119 stations (N=15)	120-148 stations (N=15)	149-200 stations (N=14)
Item 1 (mean)	5.775	5.522	5.615	5.808	5.800	5.533	5.143

Furthermore, no statistically significant differences were found between the mean scores of accredited colleges and colleges without accreditation. This was true for the three different size groups of television stations as well. They all indicated a fairly high level of agreement with the statement that college graduates should know how to operate a non-linear editing system.

Statement 2: The second statement read: "College graduates should know how to operate a computer-assisted analog editing system." Table VI shows the different mean scores for respondents divided into several different subgroups, such as school accreditation and television station market size.

Table VI shows that all respondents indicated a fairly high level of agreement with the statement, which means that the respondents, for the most part, thought college graduates should know how to operate a computer assisted analog editing system. However, no statistically significant differences were found between the scores of any of the groups listed in Table VI. This would seem to indicate that all the respondents basically had the same level of agreement with the statement. The null hypothesis was supported.

Table VI:
Research question 3.
"College graduates should know how to operate a computer-assisted analog editing system."

	Schools overall (N=40)	Stations overall (N=45)	Schools accredited (N=13)	Schools not accredited (N=26)	101-119 stations (N=15)	120-148 stations (N=14)	149-200 stations (N=14)
Item 2 (mean)	5.250	5.622	4.923	5.346	5.467	5.286	6.071

Statement 3: The wording of the third statement was: "College graduates should know how to operate a digital video effects generator (DVE)." Table VII shows the distribution of means for the different groups in response to the third statement.

Table VII:
Research question 3.
"College graduates should know how to operate a digital video effects generator (DVE)."

	Schools overall (N=40)	Stations overall (N=46)	Schools accredited (N=13)	Schools not accredited (N=26)	101-119 stations (N=15)	120-148 stations (N=15)	149-200 stations (N=14)
Item 3 (mean)	5.200	5.848	4.769	5.346	5.733	5.933	5.714

As Table VII indicates, all respondents reported a general level of agreement with the statement, which would seem to indicate that they for the most part thought college graduates should know how to operate a DVE. The researcher did, however, not find any statistically significant differences between the scores of any of the groups listed. This would seem to indicate that all the respondents had the approximate same level of agreement that college graduates should know how to operate a DVE. The null hypothesis was supported.

Statement 4: The fourth statement read: "College graduates should know how to operate a video toaster." Table VIII shows the distribution of means for the different groups in response to the fourth statement.

Table VIII:
Research question 3.
"College graduates should know how to operate a video toaster."

	Schools overall (N=39)	Stations overall (N=45)	Schools accredited (N=12)	Schools not accredited (N=26)	101-119 stations (N=15)	120-148 stations (N=15)	149-200 stations (N=14)
Item 4 (mean)	4.282	3.711	3.250	4.654	3.867	3.267	3.929

As table VIII shows, the mean scores for statement 4 appeared to be quite a bit lower than for the first three statements. In fact, the overall mean score for statement 4 was 3.997, which would indicate a very weak level of disagreement with the statement. A score of 4.000 would be neutral, indicating neither agreement nor disagreement. No statistically significant difference was found between production directors and broadcast educators in response to statement 4. Therefore, the null hypothesis was supported. However, an independent t-test on the mean scores of accredited schools and schools without accreditation revealed a statistically significant difference between the two groups. The mean score for accredited schools in response to statement 4 was 3.250, indicating a weak level of disagreement with the statement. The mean score for schools without accreditation was 4.654, indicating a weak level of agreement with the statement. No differences were found in expectations between the different market sizes of television stations.

Statement 5: Statement 5 on the questionnaire read: "College graduates should know how to operate a digital VTR." Table IX shows the distribution of mean scores for the different groups in response to this statement.

Table IX:
Research question 3.
"College graduates should know how to operate a digital VTR."

	Schools overall (N=39)	Stations overall (N=45)	Schools accredited (N=13)	Schools not accredited (N=25)	101-119 stations (N=15)	120-148 stations (N=15)	149-200 stations (N=14)
Item 5 (mean)	4.538	4.733	4.538	4.440	4.800	4.600	4.643

Table IX shows a weak level of agreement with the statement for all the groups listed, which means that respondents for the most part thought college graduates should know how to operate digital VTRs. The researcher did, however, not find any statistically significant differences between any of the scores, meaning that production directors and broadcasting educators alike were on the same level of agreement concerning their attitudes toward statement 5. The null hypothesis was supported. Likewise, no differences were detected between the two groups of schools or the three groups of stations.

Statement 6: The sixth statement read: "College graduates should know how to operate a digital audio system." Table X shows the distribution of mean scores in response to this statement.

Table X:
Research question 3.
"College graduates should know how to operate a digital audio system."

	Schools overall (N=39)	Stations overall (N=45)	Schools accredited (N=13)	Schools not accredited (N=25)	101-119 stations (N=15)	120-148 stations (N=15)	149-200 stations (N=14)
Item 6 (mean)	5.513	4.889	5.462	5.480	4.933	4.733	4.857

As can be seen from Table X, all respondents indicated a general level of agreement with the statement, meaning that there was a general consensus that college graduates should know how to operate a digital audio system. The researcher found no statistically significant differences between the scores for any of the groups, meaning that

they were all essentially on the same level of agreement with the statement. The null hypothesis was supported.

Statement 7: The last statement read: "College graduates should understand the concept of satellite news gathering (SNG)." Table XI shows the distribution of mean scores in response to this statement.

As Table XI would seem to indicate, all respondents expressed a relatively high level of agreement with the statement that college graduates should understand the concept of SNG. The researcher did, however, not find any statistically significant differences between any of the groups listed, which means that they were all in approximately equal agreement with the statement. The null hypothesis was supported.

Table XI:
Research question 3.
"College graduates should understand the concept of satellite news gathering (SNG)."

	Schools overall (N=40)	Stations overall (N=45)	Schools accredited (N=13)	Schools not accredited (N=26)	101-119 stations (N=15)	120-148 stations (N=15)	149-200 stations (N=14)
Item 7 (mean)	5.850	5.911	6.308	5.577	5.933	5.467	6.286

In conclusion, respondents did for the most part indicate some level of agreement with all the statements, with the exception of statement 4, which read: "College graduates should know how to operate a video toaster." Also, there were no differences in attitudes between production directors and broadcasting educators toward any of the statements.

Furthermore, there were no differences in attitudes between television stations in the three differently sized markets investigated toward any of the statements. And finally, there were no differences in attitudes between accredited schools and schools without accreditation toward any of the statements, with the exception of statement 4. Schools without accreditation indicated a weak level of agreement that college graduates should know how to operate a video toaster. Accredited schools indicated a weak level of disagreement with the same statement. Table XII ranks the seven statements in order from the most agreed with to the least agreed with.

Table XII:
Research question 3.
Statements ranked by level of agreement.

Statement rank	Overall mean score
1. Satellite news gathering	5.881
2. Non-linear editing	5.649
3. Digital video effects (DVE)	5.524
4. Computer-assisted analog editing	5.436
5. Digital audio	5.201
6. Digital VTRs	4.636
7. Video toaster	3.997

Research question 4:

How are colleges and universities currently addressing the issue of new television technologies, and how do they expect to address this issue within the next ten years?

In order obtain an answer to this question, the researcher asked educators to check off on a list of nine items the technologies they were in fact currently teaching students to operate or understand. The educators were also asked to check off on the same list of items the technologies they expected to be teaching students about within the next ten years. The items in question were: Non-linear editing, computer assisted analog editing, digital video effects, digital VTRs, digital audio, satellite news gathering, video toaster, microwave transmitter/receiver, and other. Table XIII shows the number of positive responses obtained for each of the first eight items.

Table XIII:
Research question 4.
Technologies taught by broadcast educators.

Item	# of respondents currently teaching item (N=39)	# within ten years (N=39)	# total current and within ten years (N=39)
1. Non-linear editing	24 (61.5 %)	14 (35.9 %)	38 (97.4 %)
2. Computer assisted analog editing	20 (51.3 %)	11 (28.2 %)	31 (79.5 %)
3. Digital video effects	24 (61.5 %)	12 (30.8 %)	36 (92.3 %)
4. Digital VTRs	7 (17.9 %)	26 (66.7 %)	33 (84.6 %)
5. Digital audio	26 (66.7 %)	10 (25.6 %)	36 (92.3 %)
6. Satellite news gathering	20 (51.3 %)	9 (23.1 %)	29 (74.4 %)
7. Video toaster	20 (51.3 %)	4 (10.3 %)	24 (61.5 %)
8. Microwave transmitter/receive	14 (35.9 %)	10 (25.6 %)	24 (61.5 %)

As Table XIII shows, 61.5 percent of the educators were currently teaching students to operate or understand non-linear editing. Another 35.9 percent indicated that

they would be doing so within the next ten years. This means that a total of 97.4 percent of the educators surveyed thought they would be teaching students to operate or understand non-linear editing before ten years had passed. In conclusion, this would seem to be a strong indication that the educators surveyed thought non-linear editing to be an important technological development.

The proportion of educators currently teaching students to operate or understand computer assisted analog editing was 51.3 percent, with another 28.2 percent intending to do so within the next ten years. Concurrently, 79.5 percent of the educators surveyed thought they would be teaching students about computer assisted analog editing before ten years had passed.

When it came to digital video effects, 61.5 percent of the educators surveyed indicated that they were currently teaching students to operate or understand this technology. An additional 30.8 percent thought they would be doing so within the next ten years, for a total of 92.3 percent. This would seem to indicate that educators believe digital video effects to be a technology they would continue to put emphasis on.

Only 17.9 percent of the educators, however, said they were currently teaching students to operate or understand digital VTRs. On the other hand, 66.7 percent of them believed they would be doing so within the next ten years. The total proportion was 84.6 percent. This would seem to indicate that while digital VTRs are not predominant in the curriculum today, educators believe that they will be within the next ten years.

Digital audio was currently being taught to students by 66.7 percent of the educators surveyed, with another 25.6 percent intending to teach it within the next ten

years (92.3 percent total). This result would appear to indicate that digital audio is included in the curriculum at a majority of schools, and will continue to be for some time.

Satellite news gathering was being taught by 51.3 percent of the educators surveyed, with another 23.1 percent believing they would teach it within the next ten years. That means that a total of 74.4 percent of educators may be teaching students about satellite news gathering before ten years have passed.

For the video toaster the numbers were 51.3 percent, and 10.3 percent (61.5 percent total). This would seem to indicate that while this equipment is still relatively important to educators, it may cease to be in the future.

The operation or understanding of microwave technology was currently being taught to students by only 35.9 percent of the educators surveyed, with 25.6 percent believing they would do so within the next ten years. That resulted in a total of 61.5 percent. Consequently, it would appear that this technology were not being considered particularly important by the educators surveyed.

In conclusion, the technologies that appeared to be the most predominant in teaching by the educators surveyed were non-linear editing, digital video effects, and digital audio. The least taught of the technologies on the list were video toaster and microwave technology.

The researcher also set out to see if there was a difference between accredited schools and schools without accreditation as far as the teaching of developing television technologies is concerned. Table XIV shows the mean number of items checked by both groups for both the current time frame and within ten years. The researcher did not find

any statistically significant differences between the two groups for either of the two time frames.

Table XIV:
Research question 4.
IV: Accredited programs and non-accredited programs.
DV: Technologies taught.

	# of items currently taught (mean score)	# within ten years (mean score)
Accredited programs	4.000	2.917
Non-accredited program	4.148	2.222

Research question 5:

What are the predictions of production directors and broadcast educators with regard to future technological developments, and do these predictions differ between the two groups?

In order to shed light on this query, survey respondents were asked to verbalize their visions by answering an open-ended question: "How do you envision that technological developments will affect the television industry in the future?"

Thirty-five production directors and 29 broadcast educators chose to respond to the question. The survey responses could essentially be divided into six broad categories:

1. Responses indicating that the future of television will depend on digital, non-linear, tapeless technologies or in some other way depend on computers.

2. Responses indicating that the future would bring more specialization and automation, and, as a consequence, less need for personnel on the technical side of television production.

3. Responses indicating that television production would become better, easier, faster, more creative or less expensive as a result of new technologies.

4. Responses indicating that the introduction of new formats, such as High Definition Television (HDTV) would radically change the industry.

5. Responses indicating that the basic principles of good television, such as writing, journalistic skills, editing, shooting, and so on, would not change as a result of a change in technologies. In other words, basic knowledge is more important than technical knowledge.

6. Responses indicating that the future involves the "Information Superhighway," with cable, phone lines, and databases integrated, creating video on demand, interactive television, and so on.

Table XV shows the distribution of answers under each category for both production directors and broadcast educators.

As Table XV shows, nearly half of the production directors who responded to the open-ended question (49 percent), thought that the industry was going digital and non-linear. Only nine (31 percent) of the broadcast educators thought the same. As one production manager put it: "All equipment will very soon be digital. Therefore it is imperative that all college graduates be computer literate as well as production wise to all

forms of production." One educator wrote "digital will revolutionize the industry," and another wrote "everything will be non-linear in five to seven years."

Table XV:
Research question 5 - predictions for the future.

Response category	Production directors (N=35)	Broadcast educators (N=29)
1. The future of television will depend on digital, non-linear, tapel technologies or in some other way depend on computers.	17 (49 %)	9 (31 %)
2. More specialization and automation; less need for personnel on t technical side of television production.	3 (9 %)	4 (14 %)
3. Television production to become better, easier, faster, more crea or less expensive as a result of new technologies.	6 (17 %)	3 (10 %)
4. The introduction of new formats, such as High Definition Televi (HDTV) might radically change the industry.	3 (9 %)	0 (0 %)
5. The basic principles of good television, such as writing, journali skills, editing, shooting, and so on, would not change as a result of change in technologies. Basic knowledge is more important than technical knowledge.	4 (11 %)	3 (10 %)
6. The future involves the "Information Superhighway," with cabl phone lines, and databases integrated, creating video on demand, interactive television, and so on.	0 (0 %)	8 (28 %)
Could not be categorized	2 (6 %)	2 (7 %)

Nine percent of the production directors believed that the future would bring more specialization and automation, and thus a lesser need for personnel on the technical side of television. Fourteen percent of the broadcast educators agreed with this assessment. "More advanced technology will require fewer but more technically sophisticated employees to operate a television station, news department or production company. Computer training is a must for those entering the work place." This was the response given by a director of creative services.

Nearly twice as many production directors than broadcast educators (17 vs. 10 percent) believed that television production could become better, easier, faster, more creative, or less expensive in the future. As one educator put it: "[Television will take] the same path print has taken - less expensive, higher quality, desktop - 'audio/video in a box.'" One production manager said: "The non-linear technology will generate different presentation concepts. Creativity with the non-linear format should increase with the public's desire for better-looking programs. The public is going to want more Hollywood type effects on their TV." Another production manager had similar thoughts: "Non-linear editing will greatly increase the public's perception of what is a quality program or commercial. Hollywood style video effects will soon become a common practice in the television industry, whether involved in a large or small market. Content will always be first, but the slick packaging will soon be available to all TV markets."

Three of the production directors (nine percent) thought that the introduction of new formats, such as High Definition Television (HDTV) would revolutionize the industry. None of the broadcast educators shared the same view. As one operations manager put it: "The advent of HDTV will practically re-invent much of broadcasting. Non-linear and tapeless systems for news gathering and production will eventually become the norm."

A nearly equal percentage of production directors and broadcast educators (11 and 10 percent respectively) thought that the basic principles of good television, such as writing, journalistic skills, editing, shooting, and so on, would not change as a result of a change in technologies. They all indicated that they thought basic knowledge was more

important than technical knowledge. One manager said: "It is more important to me that people understand the theories and fundamentals of TV equipment (inpoints, outpoints, video before audio, proper audio levels, *how to shoot*, and how to create for a purpose), the technology anyone can get used to." Another manager response was: "Technological advancements are happening so fast that stations themselves are having difficulty keeping up let alone the college ranks have updated facilities to teach it. I think most stations feel college graduates should have basic knowledge and be trainable in the industry." One broadcast educator had a similar opinion: "Although the technology will bring technical changes, the fundamentals of producing an effective program will not change. Therefore, it is important to teach new technologies but not lose the sight that what students need to learn is effective audio/visual communications. The technology will make the performance of the craft easier, but not necessarily effective."

In the last category, 28 percent of the broadcast educators who replied to the open-ended question, believed that the future would involve the "Information Superhighway," where a person's cable, television, telephone, and personal computer becomes one single appliance, with the capabilities for video on demand, interactive television, and so on. As one broadcast educator said about the future of television: "It will become more *interactive*." None of the production directors indicated that they considered this scenario a possibility.

Finally, there were two responses from each group of production directors and broadcast educators that defied categorization. One production manager wrote: "Digital satellite (DSS) is big today and will continue to be in the future, so broadcast will have to

get up to the same quality to compete." Another production manager wrote: "Phone lines will be the primary medium for news stories, not satellites." Furthermore, one of the educators wrote: "All current technology will be replaced in ten years." Finally, the last educator said: "Breakdown of traditional divisions within the industry is already taking place, and will be accelerated in the future."

Table XVI:
Research question 5.
Open-ended answers ranked by popularity.

Response category	Television managers Category rank	Broadcast educators Category rank
1. The future of television will depend on digital, non-linear, tapel technologies or in some other way depend on computers.	1	1
2. More specialization and automation; less need for personnel on technical side of television production.	4	3
3. Television production to become better, easier, faster, more cre or less expensive as a result of new technologies.	2	4
4. The introduction of new formats, such as High Definition Television (HDTV) might radically change the industry.	4	6
5. The basic principles of good television, such as writing, journali skills, editing, shooting, and so on, would not change as a result of change in technologies. Basic knowledge is more important than technical knowledge.	3	4
6. The future involves the "Information Superhighway," with cabl phone lines, and databases integrated, creating video on demand, interactive television, and so on.	6	2

In conclusion, it would appear that a lot of production directors, as well as broadcast educators agree that the industry is going digital and non-linear. Another interesting finding was that one fourth of the broadcast educators thought that the medium of television would end up being merged with other media, such as telephones

and personal computers, and made accessible in an interactive on-line environment. Not even one of the production directors saw this as a possibility. Table XVI ranks the response categories in order of popularity from one to six for both groups of respondents.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter will briefly summarize the methodology and findings of this study, and draw conclusions based on those findings. Weaknesses and limitations of the study, recommendations to the television industry and college broadcasting departments, as well as recommendations for further research, will also be discussed.

Summary

Methodology

The research method for this study was a survey, and subjects chosen to participate included 67 production directors, and 56 instructors of television production classes. The production directors all works at small market television stations in Oklahoma, Texas, Arkansas, Missouri, Kansas, and New Mexico, and the instructors are all teaching at four-year colleges in the same area. The same area was used for both groups, because graduating seniors from the schools in question are likely to seek employment at television stations nearby. Two separate mailings were sent to each of the two groups, yielding final return rates of 69 percent for the station survey and 71 percent for the school survey.

The survey instrument asked subjects to indicate which types of electronic television equipment were currently being employed by either television stations or college broadcasting programs. Subjects were also asked what type of equipment they were expecting to use within a five and a ten year period. Subjects were furthermore asked whether or not they thought college graduates should know how to use different types of television equipment. The survey instrument also included an open-ended question asking subjects how they expected new technologies would affect the future of the television industry. In addition, broadcast educators were asked what types of equipment they were currently teaching students how to use, how equipment and skill levels would likely change within the next ten years. Television station production directors were further asked to indicate the market rankings of their stations, and broadcast educators were asked to indicate whether or not their academic programs were accredited.

T-tests, anova tests, and descriptive statistics were used to look for differences between the two groups of subjects, as well as to look for differences between a variety of subgroups derived from the market size data and accreditation data.

Findings

The findings reported on in this study were based on five research questions. The first question was: Is there currently a difference in the technological levels of television stations and college broadcasting programs, and will there continue to be a difference between the two within the next five years and the next ten years?

The researcher did indeed find a difference in the technological levels of small market television stations and college broadcasting programs. Small market television stations currently possess a higher level of technology than college broadcasting programs. This was not expected to change anytime within the next ten years.

The researcher also examined differences between various subgroups, and found no difference in level of technology between accredited academic programs and programs without accreditation. This was not expected to change anytime within the next ten years. The television stations surveyed were divided into three equal groups; stations with a market ranking from 101 to 119, stations in markets between 120 and 148, and stations in markets from 149 to 200. There was no difference in technological level between any of the three groups, and that, according to respondents, is also expected to remain unchanged for the next ten years.

Research question two was: Which technologies are currently being employed by television stations and college broadcasting programs, and which technologies do they expect to employ within the next five years and the next ten years?

In order to answer this question, subjects were asked to select the technologies they are using from a list of eight items: (1) non-linear editing, (2) computer assisted analog editing, (3) digital video effects, (4) digital VTRs, (5) digital audio, (6) satellite truck, (7) video toaster, and (8) microwave transmitter/receiver. The researcher discovered that the item employed by the most television stations is digital video effects, followed by microwave transmitter/receiver, and computer assisted analog editing. These items are all used by the majority of the stations surveyed. Among the items used by only

slightly above one third of the stations, non-linear editing is the most used, followed by digital audio, video toaster, satellite truck, and finally digital VTRs.

The one item used by the most college broadcasting programs is digital audio, followed by non-linear editing, video toaster, digital video effects, and computer assisted analog editing. Among the items little used by the schools are microwave transmitter/receiver, satellite truck, and digital VTRs.

Within the next five years, the two items expected to be used by 100 percent of the television stations surveyed, were non-linear editing and digital video effects. Next in expected usage was microwave transmitter/receiver, computer assisted analog editing, digital audio, digital VTRs, satellite truck, and video toaster. Within the next ten years, the list of expected usage was still topped by non-linear editing and digital video effects, followed by digital audio, microwave transmitter/receiver, computer assisted analog editing, digital VTRs, satellite truck, and video toaster.

Among college broadcasting programs, the items expected to become the most used within the next five years were non-linear editing and digital video effects. Those items were followed by digital audio, computer assisted analog editing, video toaster, digital VTRs, microwave transmitter/receiver, and satellite truck. Among the items expected to be the most used within the next ten years, non-linear editing and digital video effects were still at the top of the list, followed by digital audio, digital VTRs, computer assisted analog editing, video toaster, microwave transmitter/receiver, and satellite truck.

Research question three asked: What are production directors' and broadcast educators' expectations of graduating college students with regard to how much they should know about the use and workings of specific electronic equipment, and do these expectations differ between the two groups?

In order to answer this question, subjects were asked to indicate their level of agreement to a number of statements on a seven point scale. An example of a statement could be: "College graduates should know how to operate a non-linear editing system." Overall, production directors and broadcast educators both agreed that students should understand the concept of satellite news gathering (SNG), and that was the highest level of agreement obtained for any item. The subjects also agreed strongly that students should know how to operate a non-linear editing system. Next in level of agreement came digital video effects, followed by computer assisted analog editing, digital audio, digital VTRs, and video toaster. The video toaster was the only item that scored a level of disagreement. Overall, subjects thought students did not need to know how to operate a video toaster.

The researcher did not find any differences in expectations between production directors and broadcast educators, or between any of the subgroups investigated, with one exception. Educators at schools without accreditation indicated a weak level of agreement with the statement saying that college graduates should know how to operate a video toaster. Educators at accredited schools indicated a weak level of disagreement with the same statement.

Research question four read: How are colleges and universities currently addressing the issue of new television technologies, and how do they expect to address this issue within the next ten years?

In order to obtain an answer to this question, educators were asked to select from a list of eight items the technologies they are currently teaching students to operate or understand. The researcher found that the item selected by the most educators was digital audio, followed by non-linear editing and digital video effects. Thereafter, computer assisted analog editing, satellite news gathering, and video toaster were being taught by an equal number of educators. Microwave transmitter/receivers and digital VTRs were the two items the least taught by educators. The same list, but representing what educators were expecting to teach students within the next ten years, was topped by non-linear editing, followed by digital audio and digital video effects. Digital VTRs came in number four, followed by computer assisted analog editing, satellite news gathering, video toaster and microwave transmitter/receiver. There was no difference between accredited schools and schools without accreditation.

The last research question read: What are the predictions of production directors and broadcast educators with regard to future technological developments, and do these predictions differ between the two groups?

Subjects were asked to respond to the following open-ended question: "How do you envision that technological developments will affect the television industry in the future?" Answers to this open-ended question were sorted into six broad categories. The most answers from production directors fit the category "the future of television will

depend on digital, non-linear, tapeless technologies or will in some other way depend on computers." This was also the most important category for broadcast educators. The second most popular category for production directors was: "Television production will become better, easier, faster, more creative or less expensive as a result of new technologies." This category was only rated number four by broadcast educators. The third most important category for production directors was: "The basic principles of good television, such as writing, journalistic skills, editing, shooting, and so on, would not change as a result of a change in technologies. Basic knowledge is more important than technical knowledge." This category was also only ranked number four by broadcast educators. The next two categories were equal in importance for production directors: "More specialization and automation, and less need for personnel on the technical side of television production" and "the introduction of new formats, such as High Definition Television (HDTV) might radically change the industry." The former of the two were ranked third by broadcast educators, and the latter was ranked last. The least important category for production directors was: "The future involves the 'Information Superhighway,' with cable, phone lines, and databases integrated, creating video on demand, interactive television, and so on." This category was the second most important for broadcast educators.

Conclusions

It was not surprising to find that the television stations surveyed do indeed possess a higher level of television technology than the academic programs included in

the study. It is, however, a little surprising that the difference is not greater than the results indicated. According to the results, television stations checked, on the average, less than one piece of equipment more than academic programs. This would seem to indicate that academia is a lot technologically closer to television industry in the equipment race than this researcher expected. Of course, one reason for this result could be that only small market television stations were surveyed. The difference in technology levels between academic programs and large market television stations could be expected to be greater.

One of the most surprising findings of the study, however, was that there is no difference in the expectations of production directors and broadcast educators toward what they think students should know about television technology. The literature review suggested to the researcher that the television industry and academia should be further apart on this issue, but that does not appear to be the case. The answers of production directors and broadcast educators followed each other very closely for each of the seven items reported on under research question three.

It is also surprising to see that production directors and educators both agree rather strongly that college graduates should understand satellite news gathering, yet very few of the television stations, and even fewer of the academic programs actually have SNG vehicles in their possession. One reason for this could be that television stations routinely hire outside satellite uplink providers, because it is more economically viable than owning the equipment themselves. Also, even though educators strongly agreed that

students should understand SNG technology, only about half of then were currently teaching it to their students, which was also rather surprising.

One of the most important finding of this study, although not surprising, is that production directors and broadcast educators alike agree that the industry is rapidly adopting digital and non-linear production equipment. Except for satellite news gathering, the most important technology for graduates to know, according to the respondents, is non-linear editing. The notion that the future of television will depend on digital, non-linear, tapeless technologies was also supported by the data collected through the open-ended question on the questionnaire. This was the most frequent category for both production directors and broadcast educators.

It is also surprising to find that academic programs have more heavily invested in non-linear editing equipment than have television stations. One half of the schools surveyed reported having such equipment, while only about a third of the stations could say the same thing. The reason for this could be that academic programs may be more likely to invest in less expensive, low-end systems, while television stations require the good quality that can only be obtained with higher prices equipment. Television stations may simply be biding their time, waiting for the cost to go down, or for one particular brand to dictate an industry standard. It was interesting to note that production director included here expects their stations to invest in non-linear systems within the next five years.

Another interesting finding was that more than half of the academic programs reported having digital audio capabilities, while only less than one quarter of the

television stations reported the same. Broadcast educators might, however, have included equipment used in their radio labs or at their campus radio stations, where the use of such equipment is more common than in television production situations.

One of the biggest surprises in this study is that there is no difference in the level of technology between accredited programs and programs without accreditation. The researcher expected accredited programs to be better technologically equipped than non-accredited programs because of the technological standards required to obtain accreditation. This, however, did not turn out to be the case. It is possible that a certain level of technology is required to attract students, and that level could be close to the standard required for accreditation.

The most surprising result of this study was the way respondents answered the open-ended question. The literature review led the researcher to expect academic programs to put more emphasis on the basic skills of broadcasting, such as writing, journalistic skills, editing, shooting, and so on. However, only about one out of ten educators indicated that basic skills should be considered more important than technical skills. About the same number of broadcasters thought the same. This finding is surprising, because the researcher expected to see more such answers from educators than from broadcasters, but once again, educators and broadcasters appear to be more similar in their utility and practicality of various equipment and production skills than the basic assumption of this study would suggest.

Finally, it was interesting to note that the least important category for production directors on the open-ended question was: "The future involves the 'Information

Superhighway,' with cable, phone lines, and databases integrated, creating video on demand, interactive television, and so on." This category was the second most important for broadcast educators. One reason for this difference could be that the "Information Superhighway," if it becomes the reality some predict, could facilitate the end of television as we know it. Production directors may therefore not be willing to admit that such a possibility could exist. According to Time, one of the changes that could take place is that viewers could get a virtually unlimited choice of programming: "virtually everything produced for the medium, past or present, plus a wealth of other information and entertainment options, stored in computer banks and available instantly at the touch of a button."[244] According to the article, "as interactive technology fully kicks in, the very concept of channels will start to disintegrate. Virtually everything will be instantly accessible to home viewers hooked into the new 'full service' (TV, computer, and telephone) network."[245] This would mean that TV schedules would lose their meaning. The consumer, rather than the network would decide what is shown on 'prime time.' "TV viewing becomes akin to browsing through a huge library and making a selection."[246] This could have consequences for local television stations. One of local television stations' main functions is to rebroadcast network and syndicated television shows. In the future such services could become obsolete. The only function left to local television stations would be production of local news and other community programming, which would then have to be laid out on the "Information Superhighway," for local viewers to browse through at their own leisure. That would indeed be a reality far from how television stations operate today.

The diffusion of innovations theory appears to have been supported by this study at least in some ways. The characteristics of innovations, as discussed by Rogers (see Chapter 1), could very well be consistent with new television technologies. Those characteristics are: relative advantage, compatibility, complexity, trialability, and observability.[247] Television stations and academic programs invest in new equipment because it has a relative advantage over preceding technologies. If non-linear editing equipment, for example, did not have any advantages compared to analog videotape editing, it is doubtful if the television industry or college broadcasting programs would adopt the new technology. Some new technologies are also compatible with old equipment, which makes adoption easier and more economically viable. On the other hand, if emerging television technologies are perceived by the industry as not being user friendly or appearing too complex for employees to readily understand and use, the adoption process is likely to be slow. Trialability is also an important characteristic of television technologies, which is understood by the big equipment manufacturers. New technologies are usually presented at industry trade shows, where representatives from the television industry or college broadcasting programs may physically operate new equipment to see if it would meet their needs. Observability also plays a role in the diffusion of television technologies. New innovations often result in a visible improvement of picture quality, better graphics, more sophisticated effects, and so on. Since these improvements are broadcast to television screens everywhere, it is not difficult for others in the industry or at college broadcasting programs to see the advantages of certain innovations.

Limitations:

One of the flaws of this study lies in the data concerning the future expectations of subjects. It might have been easy for subjects to say or even wish that their station or academic program would invest in a variety of new television equipment, but they did not really have any way of knowing whether or not it would happen. Consequently, any predictions about the future levels of technology at television stations and academic programs is based on subjects' speculations. More accurate predictions could have been made by looking at past spending patterns of television stations and schools.

Also, the technological items referred to in the study are by no means an exhaustive list of the technologies used in television production. Items may have been included that should not have been, and items that should have been included may have been left out. In retrospect, video toasters should have been left out, while digital cameras, character generators, or other computer graphics equipment could have been included.

Another limitation to this study may have been the limited geographical area included. The results obtained in this study may differ from results that might have been obtained in other regions of the country. Also, the rather limited number of subjects made it more difficult to obtain statistically significant results that may or may not have been present in a larger sample.

Recommendations

Broadcasting and television production students should immediately start to learn everything they can about non-linear editing and other digital technologies. The television industry is clearly moving in that direction, and television stations are already starting to require that prospective employees have non-linear experience.

Academic programs need to keep up the good work, and try to move forward as the television industry moves forward. All the production directors surveyed reported that they thought their stations would invest in non-linear editing equipment in the next five years. Academic programs need to do the same. This is not unfeasible, because academic programs need not invest in expensive state-of-the-art non-linear systems. They could buy inexpensive low-end equipment as teaching tools, because the difference in operation between state-of-the-art and low-end systems is small.

Television practitioners should try to be more open to the possibility that the industry may go through a revolution that could redefine the roles of both television stations and the people who work for them. If, for example, interactive television and video-on-demand becomes reality, local stations could disappear completely.

Further research

In order to be able to make more accurate conclusions and predictions, this study should be conducted on a nationwide basis. Also, the results obtained in this study were rather surprising. Television practitioners and broadcast educators are not as far apart as

expected, and that illustrates the need for ongoing research in this area. This type of research could be done annually to keep the pulse on the issue. A deeper probe, at least, is necessary, to confirm or reject the results of this study.

This type of research could be expanded to include other mass communications fields as well, such as radio production, broadcast sales, public relations, advertising, and publishing. The tools of other fields are also becoming more technologically advanced, and that may subject those fields to similar conditions as those investigated in this study.

A separate study should be conducted for digital technologies. It would be interesting to see exactly which characteristics of these new technologies television practitioners and broadcast educators value the most. Do requirements differ between the two groups, and who are the leading players on the equipment side?

Concluding comment

It has been the premise of this research that advances in television technology have the potential to revolutionize the medium. What is happening to the television industry right now, with advancements in digital technologies, is nothing less than a revolution. The industry last saw a revolution when magnetic video tape was introduced. All of a sudden, television programming did not need to be all live anymore. Tape editing and post production became reality, and with those came fantastic improvements in creative control. Now that the age of video tape is about to end, and the age of hard drives and disk storage is about to begin, the industry will witness another revolution in creativity. Things never though possible in tape editing, will become reality with systems

where random access to anything is the norm, and creativity is only limited to the imagination of the operator.

Notes

[1] Everett M. Rogers, Diffusion of Innovations, 4th ed. (New York, NY: Free Press, 1995), 5.

[2] Ibid.

[3] Ibid., 15.

[4] Ibid., 15

[5] Ibid., 16.

[6] Ibid.

[7] Ibid.

[8] Ibid., 18.

[9] Ibid.

[10] Ibid., 286.

[11] Ibid., 20.

[12] Ibid.

[13] Ibid.

[14] Ibid., 265.

[15] Ibid.

[16] Ibid.

[17] Ibid., 27.

[18] Ibid.

[19] Yahya R. Kamalipour, "Broadcast Education Vs. Vocational Education: Punctuating the Debate," Feedback Vol. 33 No. 1 (Winter 1992).

[20] Ibid., 2

[21] Ibid.

[22] Jeffrey M. McCall, "Beyond the Roper Report," Feedback Vol. 31 No. 3 (Summer 1990), 9,10.

[23] Yahya R. Kamalipour, "Broadcast Education Vs. Vocational Education: Punctuating the Debate," Feedback Vol. 33 No. 1 (Winter 1992), 3.

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APPENDIX A

Kjetil Lauritsen
Telecommunications Ctr.
Oklahoma State University
Stillwater, OK 74078-0585
Phone: (405) 744-5960
E-mail: kjetil@okway.okstate.edu

Stillwater, March 20 1996

Name, title
Station

RE: University study on television technology

Dear Name

I am a researcher at Oklahoma State University doing a survey on how colleges and universities deal with new advancements in television technology, as far as that relates to the education of broadcasting students.

The purpose of the study is to determine what television practitioners expect college graduates to know about advancements in television technologies, so that educators can better prepare students for the real world.

Having a television market ranking of 100 or higher, your television station is one of only about 70 chosen for participation in this study. The stations were chosen on that criteria because smaller market stations are more likely to hire new college graduates than major market stations and would therefore have a more valuable input. The stations chosen are all located in Texas, Oklahoma, Arkansas, Missouri, Kansas, and New Mexico.

Since the sample of stations is so small, it is very important to us that you take time to complete the questionnaire accompanying this letter. The questionnaire is very short and simple, and should not take you more than five minutes to complete. A self-addressed, postage-paid envelope has been provided for your convenience. We would appreciate if you could reply within one week of receiving this letter.

We think that this study is an important one, and we hope you think so too. Your response will be kept anonymous, and will not be used for any other purpose than for this particular research. The number on the questionnaire is there to identify non-respondents for second mailing purposes only, and will be removed before the data is compiled.

If you have any questions or comments, please do not hesitate to contact me at the above telephone number, address or E-mail.

On behalf of Oklahoma State University, we extend our sincere appreciation for your cooperation.

Sincerely Yours

Kjetil Lauritsen

Kjetil Lauritsen,
Telecommunications Ctr.
Oklahoma State University,
Stillwater, OK 74078-0585
Phone: (405) 744-5960
E-mail: kjetil@okway.okstate.edu

Stillwater, March 20 1996

Name, Title
Department

RE: University study on television technology

Dear Name

I am a researcher at Oklahoma State University doing a survey on how colleges and universities prepare to meet the challenges of new advancements in television technology, as far as that relates to the education of broadcasting students.

Since it was difficult to obtain a list of instructors teaching television production or television news, it is my wish that you forward this letter and the accompanying questionnaire to a person on your staff that teaches either television production, television news, or, any other hands-on television lab kind of class.

The purpose of the study is to determine how colleges and universities are keeping up with technological advancements in the television industry, and to compare that with the demands of the real world.

The colleges and universities that have been chosen for this study, are four-year schools in Texas, Oklahoma, Arkansas, Missouri, Kansas, and New Mexico.

Your school is one of only 56 chosen to participate in this survey. Since the sample of schools is so small, it is very important to us that you take the time to complete the questionnaire accompanying this letter. The questionnaire is short and simple, and should not take you more than five minutes to complete. A self-addressed, postage-paid envelope has been provided for your convenience. We would appreciate if you could reply within one week of receiving this letter.

We think this study is an important one, and we hope you think so too. Your response will be kept anonymous, and will not be used for any other purpose than for this particular research. The number written on the questionnaire is there to identify non-respondents for second mailing purposes only, and will be removed before the data is compiled.

If you have any questions or comments, please do not hesitate to contact me at the above telephone number, address or E-mail.

On behalf of Oklahoma State University, we extend our sincere appreciation for your cooperation.

Sincerely Yours

Kjetil Lauritsen

APPENDIX B

QUESTIONNAIRE

1. Please check all the technologies and technical equipment currently in use by your station (C), the technologies you expect to be using within the next five years (5), and the technologies you expect to be using within the next ten years (10).

C	5	10		C	5	10	
☐	☐	☐	Non-linear editing	☐	☐	☐	Digital Audio
☐	☐	☐	Computer assisted analog editing	☐	☐	☐	Satellite truck
☐	☐	☐	Digital video effects	☐	☐	☐	Video toaster
☐	☐	☐	Digital VTRs	☐	☐	☐	Microwave transmitter/ receiver
☐	☐	☐	Other (please specify)				

_____

2. What are your expectations about college graduates' knowledge of developments in television technology? Indicate your level of agreement with the following statements by circling the appropriate number on the scale from one to seven.

College graduates should know how to operate a non-linear editing system.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a computer-assisted analog editing system.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a digital video effects generator (DVE).

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a video toaster.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a digital VTR.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a digital audio system.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should understand the concept of satellite news gathering (SNG).

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. How do you envision that technological developments will affect the television industry in the future? Please answer below.

4. What is the ranking of the television market your station is located in?

_____

5. What is your position (job title) at the station? Please answer below.

_____

QUESTIONNAIRE

1. Please check all the technologies and technical equipment currently (C) in use in teaching at your school, the technologies you expect to be using within the next five years (5), and the technologies you expect to be using within the next ten years (10).

C	5	10		C	5	10	
☐	☐	☐	Non-linear editing	☐	☐	☐	Digital Audio
☐	☐	☐	Computer assisted analog editing	☐	☐	☐	Satellite truck
☐	☐	☐	Digital video effects	☐	☐	☐	Video toaster
☐	☐	☐	Digital VTRs	☐	☐	☐	Microwave transmitter/ receiver
☐	☐	☐	Other (please specify)				

_____

2. What are your expectations about college graduates' knowledge of developments in television technology? Indicate your level of agreement with the following statements by circling the appropriate number on the scale from one to seven.

College graduates should know how to operate a non-linear editing system.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a computer-assisted analog editing system.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a digital video effects generator (DVE).

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a video toaster.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a digital VTR.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should know how to operate a digital audio system.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

College graduates should understand the concept of satellite news gathering (SNG).

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. Are you currently teaching students to operate or understand any of the following, and do you expect to teach students to operate or understand any of the following within the next ten years? Please check the appropriate boxes both for currently (C) and for the next ten years (10)

C	10		C	10	
☐	☐	Non-linear editing	☐	☐	Digital audio
☐	☐	Computer assisted analog editing	☐	☐	Satellite news gathering
☐	☐	Digital video effects	☐	☐	Video toaster
☐	☐	Digital VTRs	☐	☐	Microwave transmitter/ receiver
☐	☐	Other (please specify			

_____

4. How do you envision that technological developments will affect the television industry in the future? Please answer below.

5. Is your program accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC)? Please answer 'yes' or 'no'. _____

APPENDIX C

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 04-16-96 **IRB#:** AS-96-065

Proposal Title: A SURVEY OF TELEVISION MANAGERS AND UNIVERSITY EDUCATORS ON ADVANCEMENTS IN TELEVISION TECHNOLOGY

Principal Investigator(s): Steven Smethers, Kjetil Lauritsen

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

COMMENTS:

Please forward a copy of the cover letter to be sent with the questionnaire to the IRB office (305 Whitehurst) for your file. Thank you.

Signature: John F. Wyatt Date: April 23, 1996

Chair of Institutional Review Board

VITA

Kjetil Rodland Lauritsen

Candidate for the Degree of

Master of Science

Thesis: A STUDY OF TECHNOLOGIES AND ATTITUDES FOUND AT SMALL MARKET TELEVISION STATIONS AND COLLEGE BROADCASTING PROGRAMS

Major Field: Mass Communications

Biographical:

Personal Data: Born in Aarnes, Norway, On February 5, 1967, the son of Kjell and Laila Lauritsen.

Education: Graduated from Drammen High School, Drammen, Norway in June 1986; received Bachelor of Arts in Radio-TV-Film from Oklahoma State University, Stillwater, Oklahoma in May 1992.
Completed the requirements for the Master of Science degree with a major in Mass Communications at Oklahoma State University in December 1996.

Experience: Employed full time and part time by several Norwegian news papers, including Sondag/Sondag and Dagbladet 1987-1994. Employed by Oklahoma State University part time as news editor for The Daily O'Collegian Spring 1994. Employed by Educational Television Services as a production assistant 1995 to present.