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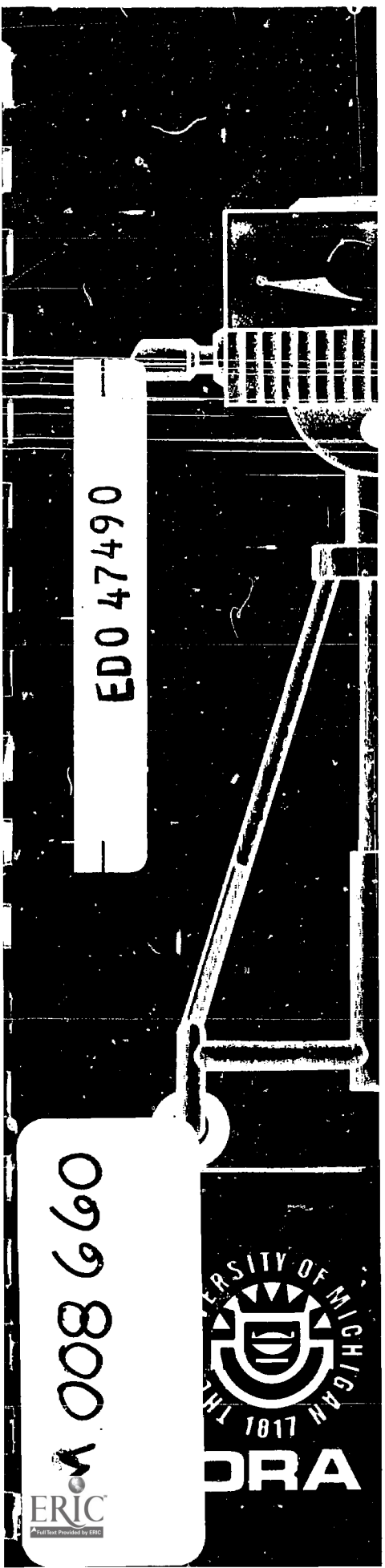
ABSTRACT

Fifteen industrial organizations were surveyed for their use of instructional television (ITV) in their educational programs for employees. The firms surveys included Xerox Corporation, RCA Corporation, General Electric Company, International Telephone and Telegraph, Lockheed Aircraft Corporation, International Business Machines Corporation, etc. The latter corporation, along with 18 other industrial organizations, is hooked up for television communication via microwave from Stanford University, receiving "live" ITV programs from Stanford. In all the industries studied, ITV was introduced no earlier than 1964. ITV programing appeared to be directed toward: orientation of new employees; updating professional employees; skill training in the human relations and communications areas for supervisory, sales, and personnel employees; and skill training for blue collar employees. Inter-communication between industries, concerning ITV is just now becoming evident. The study concludes that industry is an environment in which major adult educational activities are taking place, thatthe formal educational system is not responding to industry's needs and may be unable to do so, and that industry is proving to be a unique educational environment. (MF)



Instructional Television in Industry (ITVI): a survey

by EDWARD STASHEFF
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OFFICE OF RESEARCH ADMINISTRATION
THE UNIVERSITY OF MICHIGAN - 1971

Instructional Television in Industry (ITVI):

a survey

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Combustion Engineering, Incorporated, Combustion Division, Field Sales Department, Windsor, Connecticut

James C. Anderson--Coordinator of Training

RCA Corporation, Camden, New Jersey

Joseph M. Biedenbach--Director, Engineering Educational Programs

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[1]Mr. McGowan is President Pro-tempore of the Industrial Television Society (ITS).

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INTRODUCTION AND STATEMENT OF THE PROBLEM

The focus of this investigation is instructional television in industry (ITVI). The study will be descriptive in nature, and the industrial community will serve as the social setting and as the primary source of data.

The field of adult education reaches out into many areas and encompasses many learning techniques. One of the areas of adult learning activity is to be found in industry, and one of the teaching techniques acquiring prominence in that area is instructional television (ITV).

It is the purpose of this study to describe content areas in which industrial organizations are utilizing ITV to complement and supplement other methods or are using ITV as a total teaching mechanism.

It is not the primary purpose of this thesis to establish the fact that ITV, whether produced "live" or on videotape, is a superior overall technique for instruction in industry. The writers support the idea that for different instructional content areas other methods or media could serve the learning experience to as great or a greater degree than ITV. A few examples of other methods and media are: films, audiotapes, group discussions, seminars, programmed learning, computer aided instruction (CAI), learning carrels.

It is also not the intention of the writers to imply that ITV is generally being used by a majority of the big industrial or business organizations. No statistics in this regard are as yet available. The organizations discussed are considered by the writers to be representative of American industry because of their size in terms of number of employees and dollar investment.[1]

Background and Justification for the Study

Instruction in Industry

In March 1969 the labor force, male and female, employed by industry in the USA consisted of 66,848,000 people.[2] This figure represents approximately 33.5 percent of the total population.

There are indications that industry is playing an important role as a major source for adult learning, a fact which has not had the attention of experts in adult education until recently . . . "extraordinarily little attention is paid to the fact that two great educational agencies--the armed services and industry--have entered the field, and there is little awareness of the ways in which operations in these institutions are altering traditional education."[3]

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[1]Eleanor J. Tracy, "The Fortune Directory of the 500 Largest Industrial Organizations," Fortune (May 15, 1969), pp. 166-185.

[2]U.S., Department of Commerce, Statistical Abstracts of the United States, 90th Annual Edition, 1969, p. 222. (Chart No. 322, "Employed Persons, by Major Occupation Group and Sex: 1950-1969." This total excludes the "Service Workers" category, i.e., "Private Household Workers" and "Other Service Workers").

[3]Margaret Mead, "Thinking Ahead." Harvard Business Review. XXXVI (November-December 1958), 24.

While introductory orientation sessions in industry have been in existence for many years, only within the last decade has a mushrooming effect in all kinds of educational activities been observed in the industrial organization. "Educational budgets often rival those of good sized colleges."[1] According to conferences with corporation educational directors, "expenditures per student are not infrequently two and one-half or three times the national average for conventional institutions."[2] Thus, it would seem that industry is not only aware of its obligation for training, but is playing that role.

Some of the reasons generally given for the above mentioned phenomena are:

1. The problem of leadership in industry has become a pressing factor. As the industrial complex expands, there is a growing demand for personnel who are, primarily, dependable in their working habits and attitudes as well as personnel with responsible leadership ability to take up positions in industry. "Industry apparently believes that no longer can mere chance be relied upon for the discovery of leadership talent."[3]

2. There is a need for general upgrading and updating of personnel at all levels. The concept of "obsolescence" is being applied to professional employees as well as to machines. Public education

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[1]William H. Whyte, Jr., The Organization Man (New York: Simon & Schuster, Inc., 1956), p. 120.

[2]Harold Clark and Harold Sloan, Classrooms in the Factories (New York: New York University Press, 1958), p. 3, substantiated by Statistical Abstracts, 1968, p. 130.

[3]Ibid., p. 13.

institutions, even at the university level, are not meeting the specific demands of modern industry, nor perhaps, could they be expected to. The academic experiences are not completely relevant to business realities.

> The notion that education ends with a college degree is completely untenable in industry today . . . the pace [in industry] is so rapid that educational institutions removed even one step from reality of production are frequently lacking in both equipment and experience. Just as the center of research, during recent years, seems to have shifted from the universities to industry, so the trend in this more functional type of education appears to be in the same direction. The immediate objective is utility, whether it be the most effective method of selling, the most approved process of production or just getting along with co-workers.[1]

3. Industrial organizations must support their investment in tenured employees (engineers and technical personnel). Industry must therefore advance the technical knowledge and supplement deficiencies that might exist in prior education of the technical staff. Of equal and perhaps even more importance is the fact that through instructional programming, innovations arising from research and development programs, whether within or outside the corporate structure, can be infused into the industrial organization's system in an organized manner.

There is evidence that instruction in industry has become a lucrative business. Many companies are either investing in instructional facilities (hardware) or are buying vocational training schools outright. In an article called "Money in the Classroom" it is stated that:

> The nations biggest corporations are turning learning into earnings by becoming school masters to thousands of vocational students, . . . publicly sponsored vocational education in the U.S. is sadly lacking . . . high school seniors find themselves not structured for college and the real world isn't interested in them. These youngsters--maybe 50% of every high school class, plus drop-outs--are the

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[1] Ibid., pp. 9-10.

principal market for the more than 7,0 ocational schools that dot the countryside.[1]

Some industrial organizations (e.g., ITT Educational Services, Inc.) have developed a network of vocational training schools in a nationwide system that has an identical curriculum structure. This enables the student to start a course in one place and finish in another. The Forbes article mentions Bell and Howell and the Lear Siegler Education Co. as having similar systems.

Instructional Television in Industry (ITVI)

On April 14, 1952 "The Sixth Report and Order" of the Federal Communications Commission set aside 242 television channels for application by educational (noncommercial) television stations. Much of the initial financial support and a great deal of success in achieving this legislation was due to private foundations. Outstanding among these organizations is the Ford Foundation which has "made grants available in the neighborhood of $100 million to all phases of educational television, at first through the Fund for Adult Education for educational television, stations and programs and later through the Fund for the Advancement of Education to schools and colleges."[2]

Studies regarding the effect of pictorial and graphic techniques date back to the late 1920's when Eels (1926) Craxton, Stryken and Von Huhm (1927) "studied the relative merits of specific forms of graphic

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[1]"Money in the Classroom," Forbes (April 1969), pp. 70-73.

[2]Judith Murphy and Ronald Gross, Learning by Television (New York: The Fund for the Advancement of Education, 1966), p. 12.

data. These studies made it clear that various forms of pictorial and graphic presentations of data were more easily comprehended and retained than when such data were presented by narration or simple numbers."[1]

The military are in the vanguard of experimenting with educational innovation. The earliest study concerning teaching adults by the medium of TV was conducted by Rock, et al. (1951) in regard to Army and Navy Reservist training. "It was found that TV teaching was more effective than classroom instruction by local instructors for both officers and enlisted men."[2]

In other military reports[3] the "Summary of Instructional Television Research Reports" listed 27 findings in four categories.

Some of the findings are as follows:[4]

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[1]Edmund de S. Brunner, et al., An Overview of Adult Education Research (Chicago: Adult Education Association of the United States of America, 1959), p. 153.

[2]Ibid., p. 157.

[3]This refers to a group of seven reports under the heading, "Instructional Television Research Reports, NAVTRADEVCEN 20-TV-4," under contract with U.S. Naval Training Device Center, Human Engineering Department, Port Washington, L.I., N.Y., June 1956. The reports are as follows:

I. Experimental Studies: Technical Report 5DC-476-02-52, The Effectiveness of Television Instruction in Training Naval Air Reservists; Technical Report 5DC-476-02-53, A Study of Learning and Retention from Television Instruction Transmitted to Army Field Force Reservists; Technical Report 5DC-20-TV-1, Learning from Kinescopes and Films; Technical Report 5DC-269-7-42, Relative Effectiveness of Verbal Introductions to Kinescope Recordings and Training Films; Technical Report 5DC-20-TV-2, Visual Principles for Training by Television; Technical Report 5DC-269-7-38, Evaluation of Two Kinescopes.

II. Surveys: Technical Report 5DC-530-01-1, Surveys of Television Utilization in Army Training Fundamentals of Training by Television.

[4]Ibid., n.p. The numbers which follow the finding represents the technical report number.

LIVE INSTRUCTIONAL TELEVISION FOR THE CLASSROOM

1. Effectiveness. A television program can be at least as effective as comparable means of instruction (476-02-52,476-02-53).

3. Mass Training. Television is a feasible and effective means for instructing widely separated groups (476-02-52, 476-02-53).

6. Level of Instruction. All grades of personnel learned from television programs (476-02-53).

12. Applicability. A criteria check list has been developed to determine courses of instruction which are suited for television instruction (530-01-1).

15. Minimum Equipment Television. Experience has indicated that a minimum of equipment gives the greatest training per dollar expended for televising (530-01-1).

FOUR RECORDINGS OF TELEVISION PROGRAMS

1. Effectiveness. Film recordings of television programs (kinescopes) are very satisfactory for military training even though picture quality may be poor (20-TV-1, 476-02-52).

SPECIALIZED TELEVISION APPLICATIONS

1. Training Device Viewing. Training devices may be televised to a larger group than can normally see them (530-01-1). Thirty-one principles for improving visibility have been discovered (20-TV-2).

3. Critical Factors. Television expense and labor can be more easily justified when the training situation is dangerous or mass training is essential (530-01-1).

2. Attitudes. Polls have shown a definite acceptance by civilians of programs dealing with book reviews, social problems, history, and lectures (530-01-1).

The area covered by this group of reports is the most comprehensive and in the writers' opinion, most important of any research findings about ITV uncovered by the writer. The reports are significant for the following reasons:

1. Although these reports were done between 1950 to 1955, the findings have definite bearing on today's experiences in ITV.

2. The training activities described are similar to those found in industry (i.e., skill training, leadership training for all levels of personnel).[1]

3. The reports draw attention to and offer conclusions concerning TV utilization and training fundamentals.[2]

4. The reports support the contentions of distinguished experts[3] and scholars[4] concerning the innovative activities of the military.

Colleges took up TV instruction. "Iowa State College Extension Service ran a series of programs called 'Make a Dress--TV 1953' for which more than 3,000 women registered, even though registration was not

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[1]Ibid., Technical Reports (530-01-1, 476-02-53).

[2]Ibid., Technical Reports (530-01-1).

[3]Robert S. McNamara, "The World's Largest School," Training in Business and Industry (August 1967), p. 21.

[4]Margaret Mead, "Thinking Ahead," Harvard Business Review (November-December 1958), pp. 23-170 (intermittently).

necessary." Husband (1952) and Mills (1954) taught psychology at Iowa State College and Western Reserve University respectively and "each found that home viewers got higher grades than did on-campus classes."[1] No information was given relative to age and previous education of viewers, which might have a bearing on these results.

Johnstone's[2] study of educational pursuits of American adults offers the information that in a survey of "Methods of Study in Adult Education Courses," less than 2 percent of the adults mentioned the fact that they learned via open-circuit television. However, of the other 98 plus percent, at least two of the "Method of Study" categories (i.e., "Attended Classes" and "On-the-Job-Training" which together represent 65 percent of the total adult learners) might have used ITV in the learning program. Johnstone points out that (1) "these figures in no way reflect on the size of audiences for general programming on educational television stations, since formal courses represent only a tiny fraction of the overall offerings of ETV stations,"[3] and (2) "there has not been as yet, at least to our knowledge, any systematic study of national exposure to educational courses on open-circuit television."[4] The Johnstone Study took place during the latter part of 1962 and the beginning of 1963. For some unaccountable reason, the whole aspect of ITVI

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[1]Edmond de S. Brunner, et al., An Overview of Adult Education Research (Chicago: Adult Education Association of USA, 1959), p. 157.

[2]John C. Johnstone and Ramon J. Rivera, Volunteers in Learning (Chicago: Aldine Publishing Co., 1965), Table 3.11, p. 53.

[3]Ibid., footnote 10, p. 54.

[4]Ibid., p. 54.

has been disregarded in major research studies, although there is some evidence of success in ITVI.

A significant example of ITVI is that of the commercial airplane division of the Boeing Company.[1] In November of 1964 the Seattle, Washington ETV station, KETS-TV, notified Boeing that it would broadcast the American Management Association (AMA) Television Lecture Series, which consisted of videotaped lectures and panels which discussed management problems. Boeing decided to give training credit to management personnel for a course based on viewing these lectures. Boeing knew that AMA did this series as a public service and not as a course of study. Therefore, the company assigned some of their chief personnel to review the programs and prepare supplementary written material and examinations. These materials were sent out to the participants of the course in Boeing before the TV program. The participant was thereby made aware of what to watch for in the TV program. After the program, the participant filled in the examination and sent it in to the program committee. The examination was then scored and returned to the participant with the next examination sheet. Multichoice tests were used.

At the end of the course, Boeing sent a response questionnaire to its participating employees. The employees were requested to answer the following questions:

1. How the employee would rate the overall value of the course to himself (excellent, good, adequate, poor).

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[1]Sam Clark and Russel Dore, "Boeing Trains Employees at Home by Broadcasting Industrial Courses Over Local TV Stations," Training in Business and Industry (March 1967), pp. 29-30.

2. Would the employee be willing to participate in other Boeing sponsored courses?

3. What subject matter is of interest to the employee?

4. What time period for the lessons is most suitable for the employee?

5. How helpful were the questionnaires?

According to the report by Boeing, the success of this program was overwhelming and stimulated the company to prepare other courses which included many diverse subjects (e.g., supersonic air travel, pest controls, fundamentals of modern mathematics, technical writing, production management, true position dimensioning (TPD), and others). These courses were directed toward all levels of employees.

A follow-up research analysis was done on TPD. TPD was a course previously taught during working hours to a number of employees. A new airplane program demanded immediate instruction of TPD to a very large number of employees. Anticipated enrollment was 1,000. So great was the interest among the employees that actual enrollment was 7,000. The previously programmed TPD course cost approximately $30.00 per student, conventionally taught. The ITV course costs were less than $1.00 per student, and this sum included the introduction of a new 65-page illustrated handbook adapted for the ITV series as well as the final examination sheets.

Thus was born one of the first comprehensive ITV utilization programs in industry. Boeing's experiments with ITVI were presented in cooperation with a local TV station; the TV content material was supplied by an outside source (AMA); the learning periods were in the

evening, after the work day; the utilization program was planned and executed by Boeing staff. The programs were directed toward technical, sales, and management personnel.

Another example of ITVI is discussed in an article by William N. Dehan.[1] The use of feedback via videotape recordings (VTR) on a closed circuit television (CCTV) set-up in small groups has provided an objective view of the inter-relationships of one's behavior, goals, and attitudes. As a training tool, authentic feedback of personal action and reaction can be studied because all the information has been accurately recorded. The opportunity to see yourself interacting with people as others see you is an experience through which a great deal can be learned. Split-second portions can be stopped or slowed to point out nuances of the individual's facial and bodily expressions which in essence are nonverbal communications that are observed and interpreted, rightly or wrongly, by others who are attempting to communicate with him. Through VTR, an instructor no longer is limited by his memory in outlining the learner's errors. VTR training for management, sales departments, and personnel departments, is greatly enhanced by this method of authentic confrontation by televised feedback on a realistic level.

Problems in the use of CCTV do exist. This fact is illustrated by an experiment at Warner-Chilcott Laboratories, a Division of Warner-Lambert Pharmaceutical Company, conducted by James H. DeMain, Manager of Sales Personnel Development.[2] The problem encountered here was which

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[1]William N. Dehan, "Self-confrontation Via TV," Training in Business and Industry (March 1967), pp. 21-22.

[2]James H. DeMain, "CCTV--A New Fad?" Training in Business and Industry (March 1967), p. 18.

equipment to buy? Mr. DeMain describes the procedures which his department followed in order to purchase CCTV equipment which was eventually used in a "self-confrontation" structure. At first he and his associates invited a franchised distributor of a brand-name system to demonstrate CCTV equipment.

> My two associates and I were impressed. . . . After a few meetings, we invited another franchised dealer in for a demonstration. This proved to be a wise move. It quickly taught us that each brand name offered quality, but the features and prices of each manufacturer ranged to the extremes. . . . We also learned that [for] a nominal fee . . . you can have the system of your choice to test and experiment with in training conditions. What we settled on is a medium-priced system which includes a camera with a viewing monitor, a video-recorder and a twenty-three inch playback monitor.[1]

The purchase of videotape recording (VTR) equipment and its utilization is the subject of a study by Thomas F. Stroh,[2] and a published interview by Richard A. Bumstead with Mr. Thomas Hatcher,[3] Manager of Learning Systems for Equitable's Life Insurance Agency Department.[4]

In another article[5] the following information was offered:

> In all, some 45,000 videotape systems are in use today according to the estimate of Ampex Corporation, which . . . remains the "Big Daddy" of commercial videotape recording.
>
> This growth in the market can be traced primarily to the enormous technological advance in the product over the past decade. The birth of the videotape recorder . . . (VTR) in the late 1950's and, more recently, the electronic videorecorder (EVR) has transformed television from essentially a medium of entertainment to

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[1] Ibid.

[2] Thomas F. Stroh, The Uses of Video Tape in Training and Development (New York: American Management Association, 1969).

[3] Mr. Hatcher is President of the National Industrial Television Association (NITA).

[4] Richard A. Bumstead, "Don't Kid Yourself, Hardware Comes First," Training in Business and Industry (February 1970), pp. 30-35.

[5] Neil A. Martin, "A New Message for the Medium," Dun's Review, XCVI (July 1970), 63-65.

> one of education and communication geared to the high-powered needs of large organizations.
>
> In 1963, when it first came on the market, video playback equipment cost as much as $15,000. Today, reliable units are available for as little as $1,500 . . . according to one industry source, it costs a company about $125 a minute to produce a taped television presentation, compared with $1,800 to $2,000 a minute for a 16-millimeter film.

According to the same article, United States and foreign manufacturers are marketing VTR equipment expected to cost $400 to $500.

Justification of the Study

This writers support the theory that there is a dynamic cyclic interaction between society's educational system and its social system. (As the social system changes, demands are made upon the educational system to meet the new specific needs. These needs are made known to the educational system, absorbed and responded to, and subsequently fed back into the society.)[1] The question can be asked, "Why then should the industrial community undertake the responsibility of educating and instructing its employees? (A premise which arises from this question is that the formal educational system is not responding to industry's needs nor perhaps can it.) As a result, industry is engaged in education and instruction, and one of the interesting phenomena is the growing prominence of ITV as a teaching method. There is a need for a descriptive survey of ITVI, since none has been done thus far.

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[1]This basic approach is similar to Katz and Kahn's "Open Systems Theory" (1966), which describes repeated cycles of input, transformation, output and renewed input in a dynamic framework, Daniel Katz and Robert L. Kahn, The Social Psychology of Organizations (New York: John Wiley and Sons, Inc., 1966).

A number of articles have been written about the use of ITVI,[1] and according to these sources, a great deal of success has been achieved by the use of this medium. Thus, two innovations in education have emerged:

1. Industry's rising role as an educational system, and
2. The emerging prominence of ITVI.

These factors can lead to interesting premises. Industry may prove to be a unique educational environment, and in lieu of adequate studies regarding the effectiveness and efficiency of the ITV learning experience in the environment, an analytical study should be undertaken.

The rationale for the proposed study is as follows:

1. As has been mentioned earlier, knowledge concerning ITVI can have important implications for the formal educational system (i.e., universities, community colleges, vocational schools) as a mass medium significantly influencing the learning process.

2. The ITV method, together with the practical approach of industry, may prove to have social implications as an environment for relevant learning experiences for the urban and rural poor that could significantly contribute to their ability to become economically and socially more amenable to present societal norms.

3. Possible insights of ITVI may lead to other areas where relevant studies in adult education can be made to benefit the society.

4. As has been mentioned above, the proposed investigation and

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[1] Sam Clark and Russel Dore, "Boeing Trains Employees at Home by Broadcasting Industrial Courses Over Local TV Station"; James H. DeMain, "CCTV--A New Fad"; and William Dehan, "Self-confrontation Via TV," Training in Business and Industry (March 1967).

subsequent analysis could be used as a model for new industries that wish to establish educational programs.

There is evidence that ITVI has been used and has been successful in fulfilling specific requirements,[1] namely:

1. Orientation for new employees.
2. Training people for positions of responsibility.
3. Use of new innovations, materials, and processes.
4. Upgrading and updating professionals.
5. Instant feedback technique for public relations and sales personnel.

These premises raise interesting questions. Why does industry make the great investment in instructional activities,[2] and why is ITV being used instead of conventional methods? Industry is known to invest in effective, efficient techniques to reach its objectives; it is therefore safe to assume that the results of ITVI are meeting expectations.

This leads to further premises: attributes of ITV recognized by such institutions as Michigan State University and Wayne State University, examples of the formal educational system, are also recognized by industry. These include:

1. Ease of Communication. The distance between the instructor and the viewer permits intimate and direct contact.

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[1] Ibid.

[2] "Education budgets [in industry] often rival those of good sized colleges," William H. Whyte, Jr., "The Organization Man," in Classrooms in the Factories (see Bibliography), "and expenditures per student [in industry] are not infrequently two and one-half or three times the national average for conventional institutions." From "Statistical Abstract of the United States," in Classrooms in the Factories.

2. Spreading Expertise. Instructors with the greatest expertise can be brought on to the viewing screen, thereby doing away with low-aptitude instructors, a situation which has been recognized as a problem in education today.[1]

3. A Sense of Reality. Careful planning permits the use of people and material under the most ideal conditions relative to the real situation which is usually beyond the capacity of the classroom teacher.

4. Timeliness. The speed of technological progress often leaves the textbook behind the times. TV permits the presentation of the latest developments in order to keep the learning material up-to-date.

5. Motivation. The illustrated word has an effect of stimulating the imagination and tends to capture the viewer's attention in a manner that textbooks and lectures sometimes are unable to achieve.

6. Virtually Limitless Boundaries. As a mass medium, TV can bring all the above characteristics to an almost unlimited audience at one and the same time, regardless of geographic location.

7. Individual Review. Uses of videotape recordings (VTR) and similar systems can permit review of past lessons, individual progress in an organized learning situation, or permit self-directed learning.

The lessons learned from the application of ITVI may well have an influence on new and innovative methods of bringing education into the home for people of all ages, which would be in keeping with the theory that education is a lifelong process and that greater numbers of the population would participate if the opportunity would be more available.

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[1]Robert S. McNamara, "The World's Largest School," Training in Business and Industry (August 1967), p. 21.

Summary

During the last decade, all kinds of educational activities have been observed in industrial organizations. The reasons indicated for these activities are:

1. Industry's need for personnel with responsible leadership ability.

2. The failure of current practices in institutions of formal education (i.e., community colleges and universities) to meet industry's specific needs.

3. The general need for upgrading and updating personnel at all levels.

One of the most important ITV research reports to date has been made by the U.S. Navy. The reports were concerned with effectiveness, acceptance, applicability, mass training, learning retention, methods, and attitudes relating to ITV.

Among the first industrial organizations to experiment with ITV was the Boeing Aircraft Corporation. According to Boeing's report, the success of the program was overwhelming.

Another example of ITV describes the utilization of videotape recordings (VTR) as a feedback mechanism for sales and personnel department employees of a pharmaceutical company.

There is evidence that when purchasing CCTV equipment, each of the name brand suppliers offer quality but the features of the equipment and prices range to extremes. Cost comparisons for producing a VTR program and a 16 millimeter film are more than ten to one in favor of VTR.

The rationale for the study is that knowledge concerning ITV and the practical approach of industry can have important implications for both the formal educational system and the social problems of the disadvantaged. There is a need for this study because as yet there is no descriptive survey of ITVI.

There is evidence that ITV has been successful in fulfilling specific needs in industry because of recognized attributes of the TV medium.

Objectives, Scope, and Limitations of the Study

The objectives of this study are as follows:

1. Generally, to define and describe instructional television in industry (ITVI).

2. To define and describe models of program development and evaluation in different industrial organizations which have used and are using ITV in their training programs, in order that this information may be available to industries developing similar projects.

3. To gather data that can serve as basic information for further studies of adult educational activities in industry.

This study is not statistical. It is limited to acquiring insights in ITVI activities which are common to most of the organizations, and to highlight clearly unique and innovative applications of the medium. Examples of the parameters studied are: Who are the recipients of ITV? Why are they receiving the instruction? How are they receiving the instruction? What is the structure of the learning experience? From what sources are the instructional programs coming?

Survey of Related Literature

As has been previously stated, no comprehensive and descriptive study concerning ITVI has been made. The following studies illustrate an attempt by the writers to bring together some research that alludes to ITV as an adult education activity but not necessarily in an industrial environment. This offers further proof for the need for this study.

Johnstone and Rivera[1] wrote a comprehensive study of adult education activities in the United States. Although the book presents data relating to educational television (ETV), no mention of ITVI is included.

Brunner, et al.[2] wrote an overview of nonvocational adult education. A short reference is made which describes ITV in the military services.

Dubin and Hedley[3] wrote a study that relates to three analytical comparisons of ETV and other teaching techniques in the university setting.

Schroeder and Sapienza[4] wrote a study of training programs of

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[1]John C. Johnstone and Ramon J. Rivera, Volunteers for Learning (Chicago, Ill.: Aldine Publishing Company, 1965).

[2]Edmund de S. Brunner, David S. Wilder, Corinne Kirchner, and John S. Newbury, Jr., An Overview of Adult Education Research (Chicago, Ill.: Adult Education Association of the U.S.A., 1959).

[3]Robert Dubin and Alan R. Hedley, The Medium May Be Related to the Message (Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1969).

[4]Wayne L. Schroeder and Dunnovan L. Sapienza, Adult Education Activities of Florida's Businesses and Industries (Tallahassee, Florida: The Department of Adult Education, College of Education, Florida State University, 1968).

Florida's industry and business. Training techniques are not specifically studied, and ITV is not mentioned.

Robinson and Barnes[1] wrote a book based on papers and discussions which review research of modern industrial training principles and methods, including ITV. It considers all employee strata in British industrial organizations.

Stroh[2] wrote a research study of VTR applications for management level employees. Emphasis is centered upon purchase of VTR equipment and utilization of VTRs in training.

Mendelsohn[3] made a study of communications techniques for the disadvantaged. Televised instruction was used to bring particular kinds of information to the urban poor. Eight thirty-minute TV programs represented eight different categories of information regarded by the research team as important. Two of these TV programs were concerned with employment.

Chu and Schramm[4] wrote a broad study and review of research on ITV in formal educational institutions. Some of the findings are relevant to the industrial environment.

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[1]John Robinson and Neil Barnes (eds.), New Media and Methods in Industrial Training (London, England: BBC Publications, 1968).

[2]Thomas F. Stroh, The Uses of Video Tape in Training and Development (New York: American Management Association, Inc., AMA Research Study 93, 1969).

[3]Harold Mendelsohn, Operation Stop-gap: A Study of the Application of Communication Techniques in Reaching the Unreachable Poor, Vol. II (Denver, Colorado: U.S. Department of Health, Education and Welfare, Office of Education Bureau of Research, 1969).

[4]Godwin C. Chu and Wilbur Schramm, Learning from Television: What the Research Says (Washington, D.C.: National Association of Educational Broadcasters, 1967).

Summary

The studies described above refer to adult learning, training in industry, VTR application for management level employees, and TV teaching techniques in universities. None of the studies mentions ITVI as one of the instructional methods used for all categories of employees in the industrial setting.

Conceptual Definitions Used in This Study

Audiovisual (A-V). Pertains to hearing and seeing.

Audiovisual Media. Anything that helps the learning process through hearing and seeing (e.g., films, film strips, slides, videotape recordings).

Closed Circuit Television (CCTV). A privately owned, maintained, and operated system whose transmission equipment is linked by coaxial cable, microwave relay, or telephone lines.

Community Antenna Television (CATV). A system of receiving broadcast signals from the airwaves, strengthening the signal, and transferring it to the viewer via coaxial cable. Originally used in areas where reception was difficult due to terrain.

Conventional Instructional Methods. Methods of teaching other than through audiovisual techniques (e.g., lectures, demonstrations, textbooks, etc.)

Core-content. The central theme of the learning experience.

Corporation. An organization of a number of plants and/or divisions whose activities are directed by a board of directors.

Course. One or a series of directed study periods in sequence whose

core content deals with learning one subject (e.g., machine operation, communication skills, and human relations skills).

Disadvantaged. Those people of the urban ghettoes or rural poor who have been left out of the main-stream of the economy, whether they lacked rudimentary training or education, had prison or drug addiction records, have given up hope of getting a decent job, or lack behavior traits or positive work attitudes needed in order to retain employment.[1]

Educational Television (ETV). Televised programs without order or structure addressed to the general public, largely adult, for cultural enrichment and enlightenment.

Employees, Blue Collar. Industrial production and assembly line employees, who fall into the following mutually exclusive categories:

a. operators--production and assembly line operators

b. craftsmen--tool and die makers, and pattern makers

c. line foremen--production and assembly line supervisors

Employees, White Collar. Industrial office employees, who fall into three mutually exclusive categories:

a. managers, supervisors, and executives

b. professional and technical employees

c. personnel department and sales department employees

Hands-on Training. A practical method for a new employee to acquire the skill and knowledge needed to use or operate the tools that

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[1]Paraphrased from an article by Allen T. Demoree, "Business Picks Up the Urban Challenge," Fortune Magazine (April 1969), pp. 103-104.

eventually will be used by him. The training does not necessarily take place at the actual place of employment.

Human Relations Skill Training. Learning skills and techniques in human interaction, behavior, and communication.

Industrial Rank-level or Strata. The task-oriented differentiation of positions of employees in the industrial organization, where each rank level has specific task-assigned functions for the purpose of achieving stated goals. The strata define social position in the organization as a function of the reward system as well as authoritarian rank.

In-house. Within the unit.

Instruction in Industry. A definite goal-directed program in which knowledge and/or skills are taught according to some predetermined content plan and method, and in which learning achievement can be measured.

Instructional Programming (IP). The designing, executing, and evaluating of one course or an integrated series of courses directed toward complementing and supplementing the body of knowledge and/or skill proficiency of an employee for specific and particular end results.

Instructional Television (ITV). Televised programs in chronological order, which possess structure relative to scope and sequence, and which are intended for a specific audience with defined goals.

Instructional Television Fixed Services (ITFS). A fixed station operated by an educational organization, transmitting educational material to one or more fixed receiving locations.

ITV Total Teaching. A form of ITV in which all the teaching comes from

the screen and the presence of a trained teacher in the viewing room is not necessary.

Kinescope Recording. An A-V film recording (usually 16 mm.) photographed directly from the face of a TV picture tube. The resulting film can be replayed from a film projector.

Learning Evaluation. A process of measuring the change and progress of an employee after a learning experience.

Microwave Relay. A carrier system used to transmit closed circuit audio-video signals by directional, line of sight radio beams.

On-the-job Training or Learning. The same as hands-on, except that the process takes place at the employee's work station and with the tools eventually used.

Open Circuit Television (TV). Regular home broadcast transmission of very high frequency (VHF) and ultra high frequency (UHF) television channels assigned by the Federal Communications Commission (FCC) to commercial operators and educational institutions who present programs for "public interest, convenience, and necessity."[1]

Plant or Division. A single, autonomous unit of a corporation.

Self-confrontation. Part of Human Relations Skill Training, utilizing the videotape recorder as an instant feedback mechanism for the learner's self-evaluation when seeing himself interacting with people as others see him.

Television Utilization. The interaction of the classroom teacher and the studio teacher (on the TV screen) which permits a teacher-learner

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[1]Federal Communications Commission, Section 307, became law with the establishment of the FCC, Communication Act of 1934.

feedback system, and makes maximum classroom use of the television material.

TV Monitor. A term used to designate a TV receiver in a control room or a closed circuit receiving room.

Unit. The local organization (whether corporate headquarters or a division) to which the interview respondent belongs.

Videotape. A spool of magnetic tape of standard width that is capable of storing audiovisual information.

Videotape Recorder (VTR). An electronic instrument capable of recording or playing back a videotape.

Summary

There are indications that industry is playing an important role as a major source of adult learning. One of the teaching techniques being developed and acquiring prominence in this area is ITV. The purpose of this study is to describe content areas in which industrial organizations are utilizing ITV to complement and supplement other teaching methods or are using ITV as a total teaching mechanism. The survey's objectives are to describe ITVI, models of instructional programs, and other data, that can serve as basic information for further studies of adult education activities in industry.

A survey of related literature draws attention to the fact that while studies have been made regarding instructional programs in industry, no studies have been done regarding ITVI for all strata of industrial employees. Articles in different periodicals refer to having achieved success by the use of ITV and emphasize the fact that two innovations in instructional programming have emerged:

1. Industry's rising role in adult education, and
2. The emerging prominence of ITV.

The fact that the industrial community is undertaking the responsibility of educating and instructing its employees can have important implications for the formal educational system. The ITV method, together with the practical approach of industry, may have social implications for some portions of the society (e.g., making learning available to the urban poor industrial employee).

CHAPTER II

ANALYSIS OF DATA

Guidelines for Data Analysis

The procedure for data gathering was generally as follows:

1. Preparing the groundwork for the interviews.

2. The actual collecting of information using the interview questionnaire as a basis for the interview.

Some guidelines used in writing Chapter II are as follows:

1. In order to help acquire continuity and perspective in the uses of ITVI, some of the questions asked of the respondents pertained not only to ITV in particular, but to instructional programming (IP) in general.

2. When an organization's name is mentioned as exemplifying different types of activities, it does not necessarily mean that other organizations are not doing the same kind of activity either generally or specifically. It simply means that the named organization either made this information available, or gave the writers clear examples of the described activity.

This fact may also account for some seemingly brief descriptions given concerning activities of some of the organizations where further

data may have seemed redundant. A choice obviously had to be made.

3. Finally, it is not the intention of the writers to make value judgments of the work done by the organizations in terms of one organization being superior or inferior to another. Rather it is the purpose of the writers to indicate in this chapter certain uses of ITVI which are common to most of the organizations and to highlight clear applications in the uses of the medium.

Findings from the Interviews

Some of the organizations interviewed appeared, in the opinion of the writers, to be doing some unique and innovative work or offered specific information regarding a format for procedures and methods, instructional design, and equipment and classroom facilities. The organizations interviewed are listed in geographical order from the eastern United States to the west coast with the local organization first. Some of these activities, formats, and facilities will now be described using examples from specific organizations.

1. Michigan Credit Union League (MCUL), Southfield, Michigan

MCUL is a service organization for the approximately 200 credit unions in Michigan. The IP is directed toward personnel and sales department employees, managers, supervisors, and executives; all are voluntary participants coming to the MCUL facilities from member credit union offices throughout Michigan. Although VTRs and kinescope recordings are available, the "live" TV programs are the most widely used. ITV programs or "TV Clinics" are designed to provide for self-confrontation, maximum self-evaluation, and improvement exercises. MCUL has reported great success in the "TV Clinic," which utilizes role playing

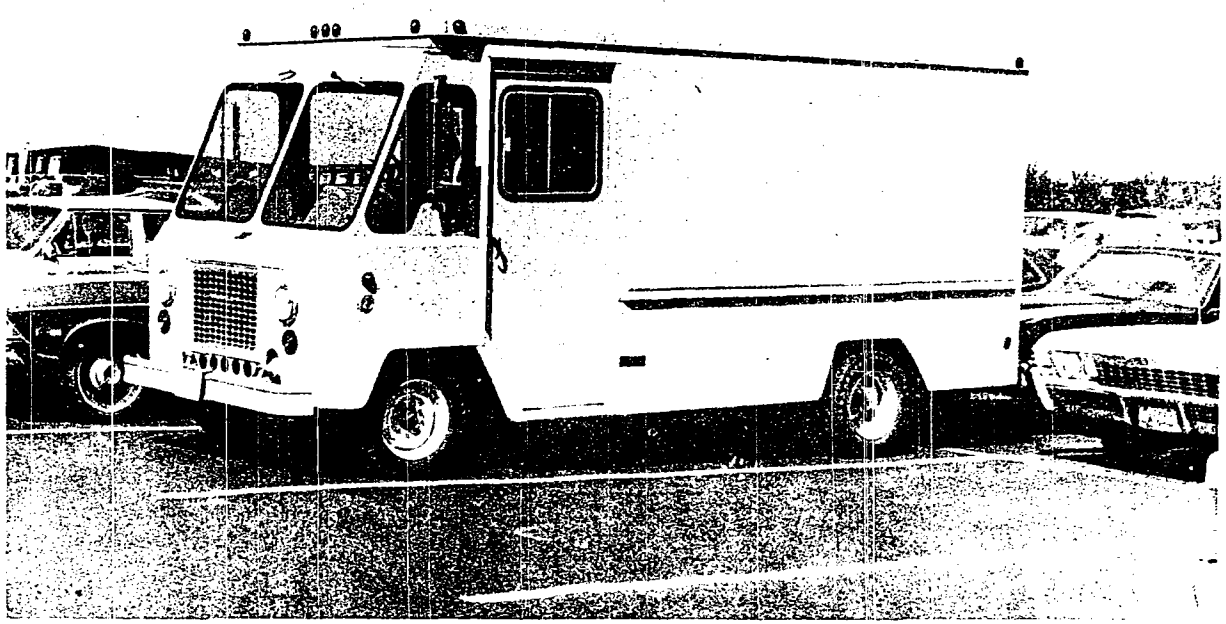

Fig. 1.--Mobile TV Unit (Michigan Credit Union League, Southfield, Michigan)

sessions by the learners where a "real live situation" in his area of activity is simulated and recorded on VTR. The "situation" may deal with communication with a client or a group of employees. The learner is then "confronted" with himself by replay of the VTR. He observes himself as others observe him, in an atmosphere of positive criticism, noting his verbal (i.e., how he speaks), and nonverbal (i.e., how he acts and gestures with his hands, face, and body) communication as he interacts with others. The critique may be made by the instructor, the participant's peers, or by the participant himself. With this information, the participant is videotaped again for further self-evaluation. As a result of the "clinics," both the participants and their immediate supervisors have reported better on-the-job performance.

MCUL provides the "TV Clinic" and other programs in outlying areas as well, via a mobile unit. The mobile unit is supplied with TV cameras and monitors, videotape recorders, videotapes, slides and slide projectors, films and film projectors, and learning guides, leader's guides, and other available printed materials.

The fee for the IP is offered at "cost" to the participants and includes all the leaders' and learners' guides and public relations material. All the printed materials (i.e., guides and pamphlets) as well as TV graphics are supplied by the MCUL graphic department.

Other facts of interest are:

a. MCUL has approximately $27,500 invested in ITV facilities.

b. There are eight full-time employees on the IP staff. Some of the staff have participated in TV production schools offered by manufacturers of TV equipment as well as by private commercial institutions.

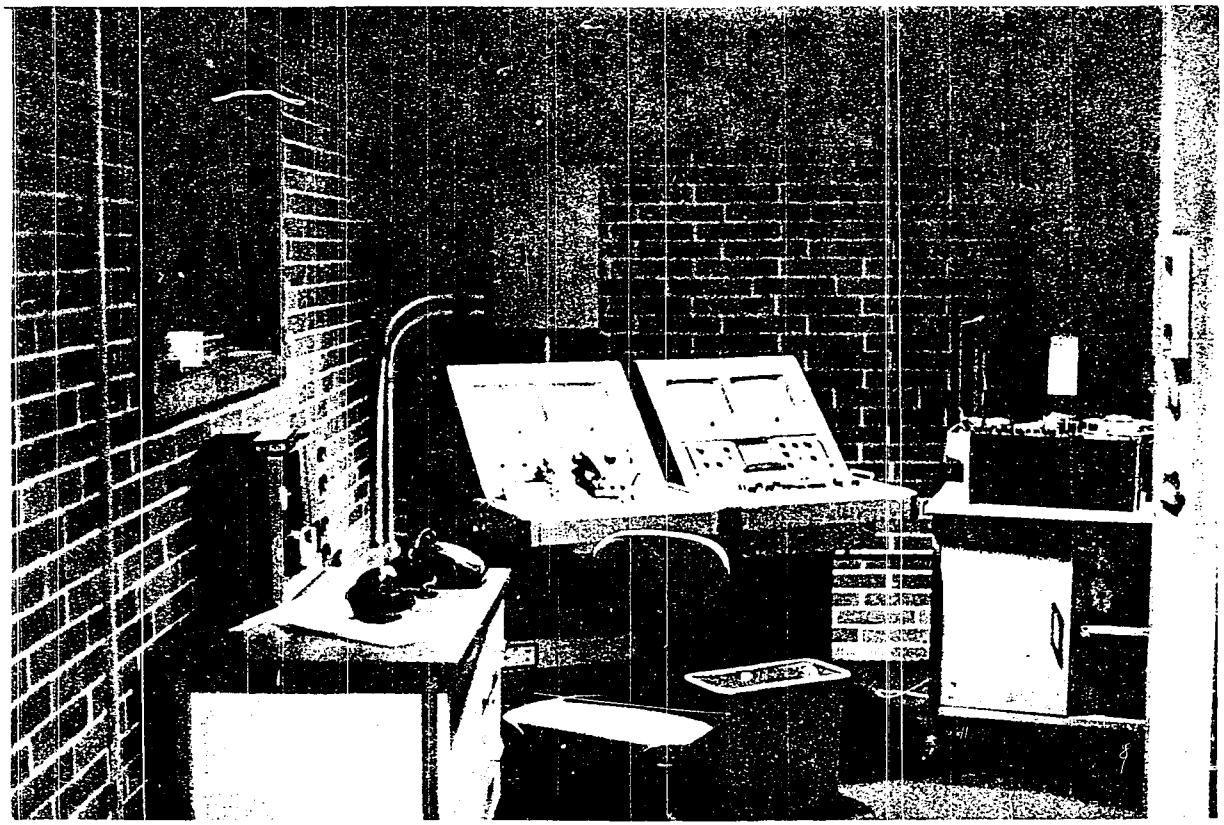

Fig. 2.--
TV Control
Room Niche
(Michigan
Credit Unio
League,
Southfield,
Michigan)

c. A videotape library is available to MCUL members. Some of the selections deal with the history and philosophy of the credit union, others deal with customer complaints and such subjects as: how to buy a house or a car; borrowing money; and what is a credit union. These videotapes are available to member credit unions for their use with customers.

2. Black and Decker Manufacturing Company, Towson, Maryland

Black and Decker manufactures a great variety of power tools. ITV was introduced primarily because of the desire by management to find new and better methods for training. The TV medium has been found helpful in leadership development and human relations training programs (e.g., communications and interpersonal relations, sales and personnel skills).

There is a corporate instructional programming (IP) plan which provides the mechanism for corporate continuity at all Black and Decker divisions. One of the programs is called JET (Job Entry Training) which is a prerequisite for all new employees both blue and white collar. The JET programs utilize ITV. Corporate IP are supplemented by local, in-house instruction. The programs originate from the corporate training center with the aid of line and staff employees, considered to have expertise in their own fields, from all over Black and Decker. Those experts are brought to the corporate training center and, together with multimedia specialists, develop training programs.

Other than those taking the required JET program, the learning participants for subsequent training are generally chosen by their immediate supervisors according to specifically defined needs.

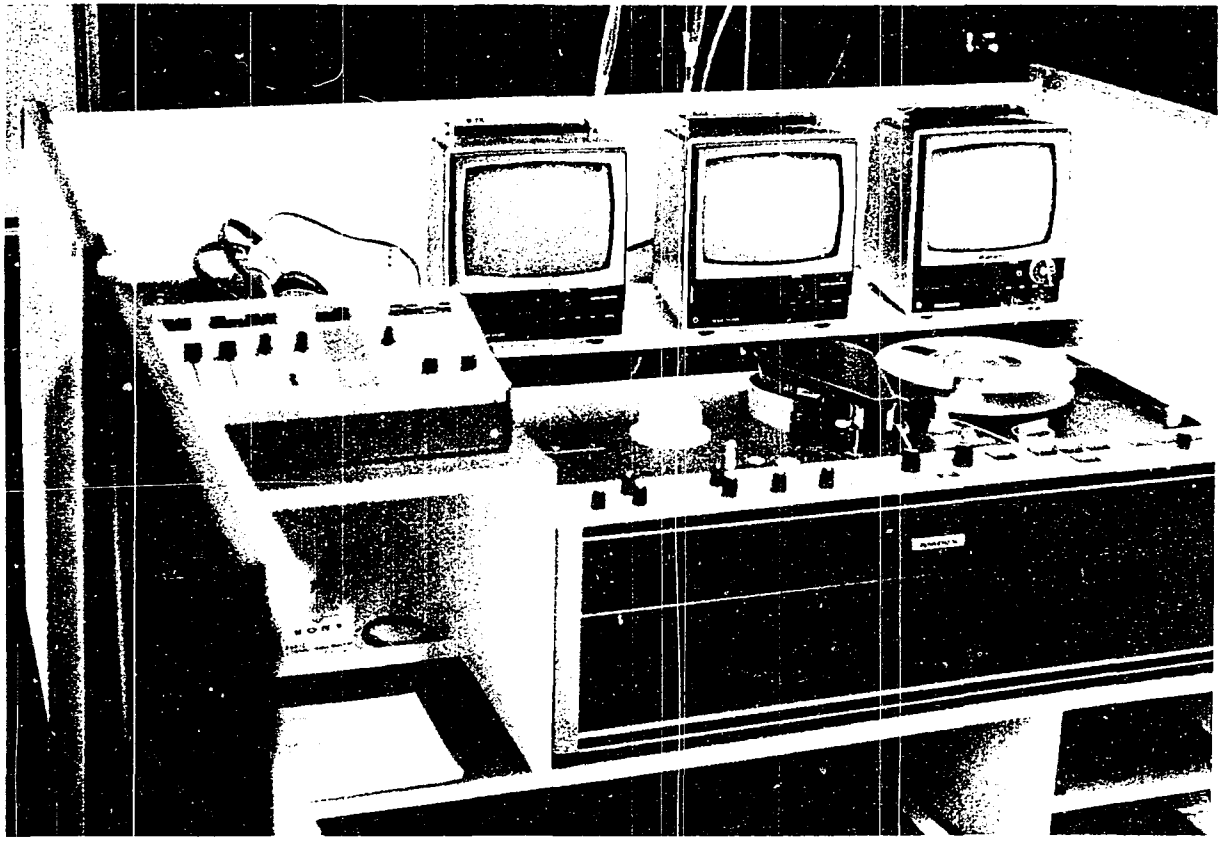

Fig. 3.--
Portable Control
Console (Black
and Decker
Manufacturing
Company, Towson,
Maryland)

Blue collar training is accomplished by multimedia capsule lessons. An example might deal with machine operation. By a combination of slides, presentations on film or VTR, the machine operator will learn what the machine looks like, what it does and how it does it. He is further aided by graphic explanations (i.e., charts and diagrams).

White collar programming employs ITV in human relations training in self-confrontation exercises. The ITV technique used is a "programmed or incremental" learning procedure which Black and Decker feels gives immediate feedback reward. The participant in self-confrontation, while analyzing and criticizing himself, refers to himself in the third person. This accomplishes a number of objectives:

a. The learner is less inhibited in criticizing himself.

b. He feels less anxiety and threat.

Both of these objectives are considered by the group leaders to be extremely important to the teaching philosophy. All of the evaluations are carried out in a supportive, nonderisive atmosphere of the whole group trying to help each other.

While there is a full-time Director of Organization, Planning, and Manpower Development, the supervisor of IP is rotated. Some of the reasons for this are the fact that:

a. Each supervisor provides fresh input to the training program in terms of his own area of expertise (e.g., sales, personnel, administration).

b. The supervisor acquires a better perspective of Black and Decker policy and areas of activity.

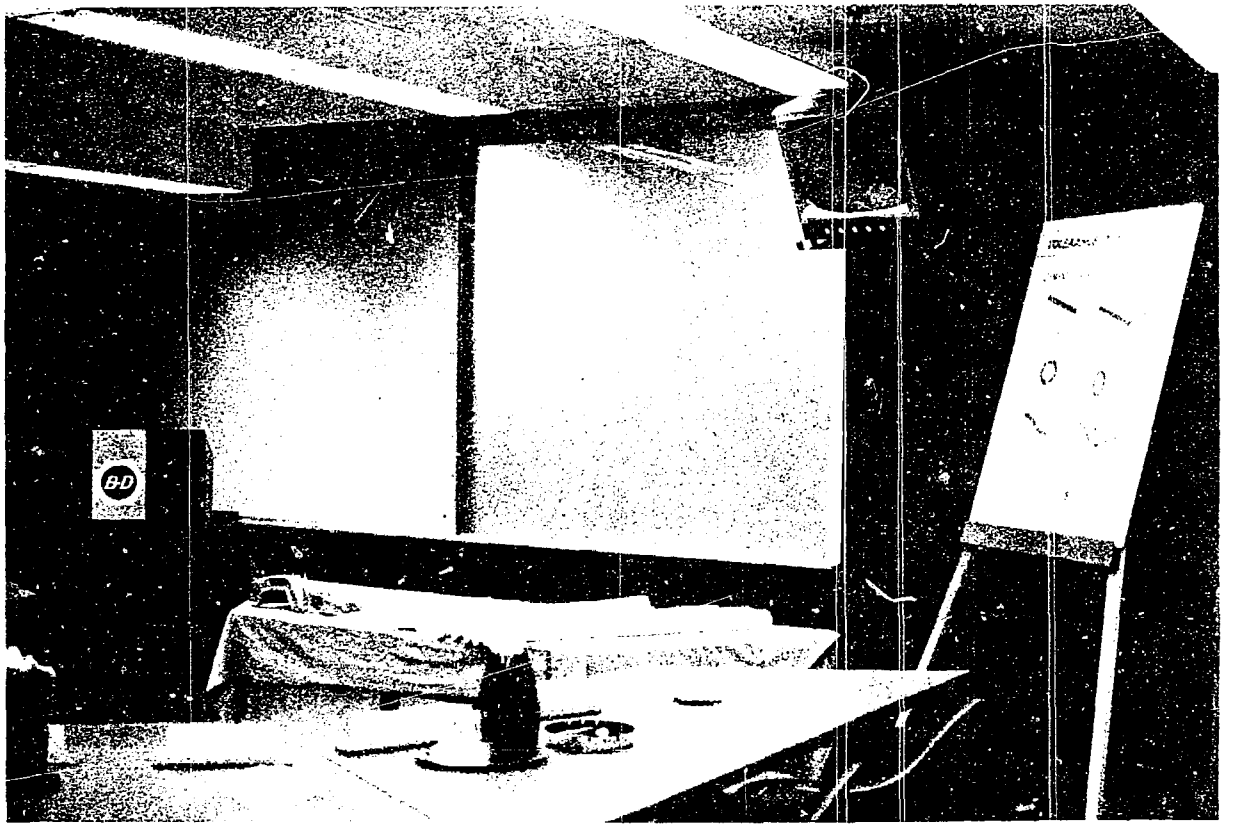

Fig. 4.--Combined Conference and Classroom (Black and Decker Manufacturing Company, Towson, Maryland)

c. The supervisor is usually a candidate for an upper-management position.

The Black and Decker Company provides its salesman-distributors with ITV training seminars which deal with sales methods for new programs and products. A customer-salesman discussion is simulated (sometimes using professional actors as the customers) in which the customer may be hostile to the salesman. The VTR is stopped at the point where the salesmen, who themselves are professionals, must respond to the customer's objections. The participants then enter into a discussion about possible responses. As a result, salesmen are literally armed with high level responses which result from such sessions which do not necessarily come from the VTR itself but from their colleagues. The discussion sessions also serve as a feedback mechanism for VTR updating.

Other facts of interest are:

a. Black and Decker corporate headquarters has approximately $30,000 invested in ITV equipment.

b. There is an investment of approximately $500,000 in VTRs, slides, films and written materials.

c. A problem observed at Black and Decker refers to the breakdown of TV equipment, and time expenditure for editing and copying VTR programs.

d. Personal involvement through group discussion in IP sessions is considered to be very important for the success of the learning experience.

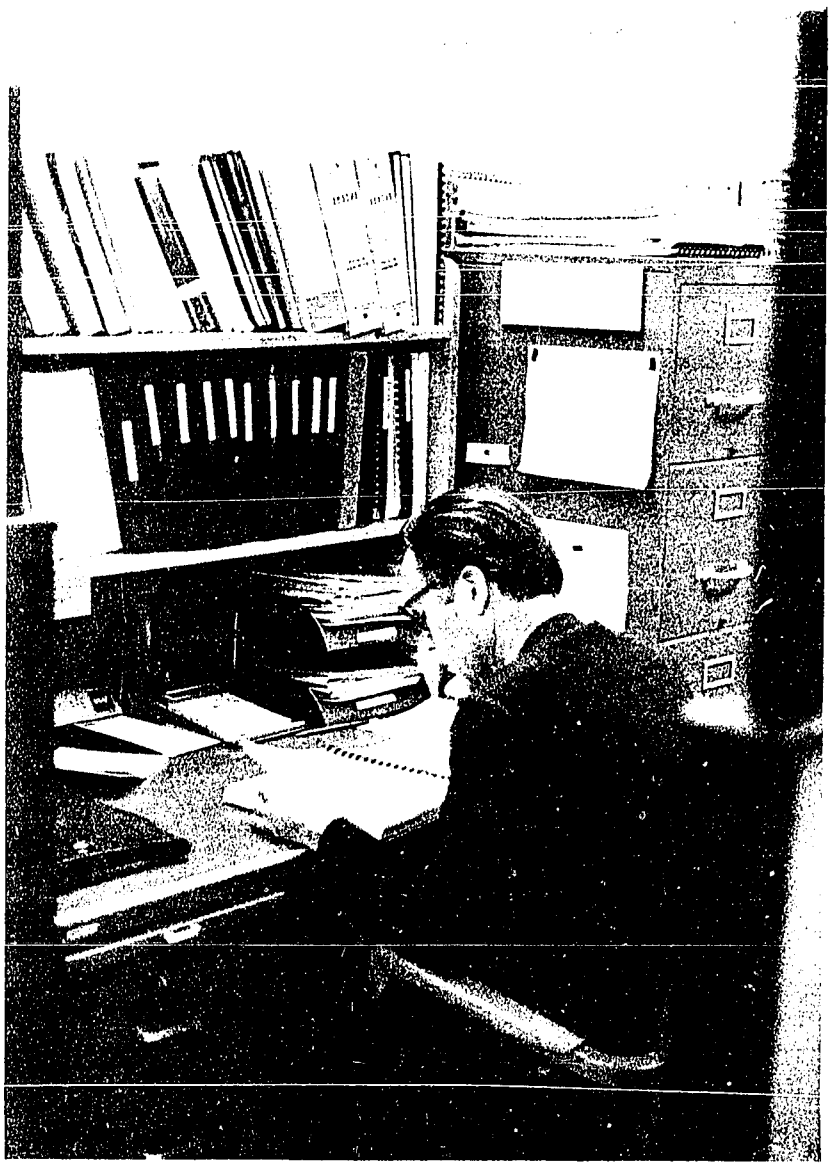

Fig. 5.--Instructor's Preparation Carrel
(RCA Computer Systems Division/Field
Engineering Technical Education,
Camden, New Jersey)

3. York/Borg-Warner Corporation

The York division will eventually produce all ITV programming for Borg-Warner Corporation for distribution in the United States and overseas. ITV programs will be designed for all divisions upon their specific requests and relative to their particular applications. Although orientation and training ITV programs are in progress, and are similar in scope to those already mentioned, the York Division TV Department is being restructured to undertake the corporate role.

4. RCA, Computer Systems Division/Field Engineering

The Technical Education Center of Field Engineering is an instructional institution which provides technical skills training for RCA Computer Service Representatives.[1] Participants are enrolled at the Center by the District Manager for a resident training program. The program may be for a duration of from one to thirteen weeks. A person entering this division of RCA will take part in a one-week New Employee Orientation Program prior to resident training. This is a comprehensive indoctrination schedule which introduces him to the customer, his job, his fellow workers, RCA policies and procedures. The orientation package also includes three self-study texts on technical material which must be learned before starting resident training. The student is provided with transportation to the school and lodging while there.

The Center employs some 200 full-time staff members of which approximately eighty are instructors. The staff includes a full-time educational psychologist who has a number of assistants.

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[1] IP is decentralized in RCA. Each division is completely responsible for its own training facility.

Fig. 6.--Certificate for Completion of Training
(Courtesy RCA Computer Systems Division/Field
Engineering Technical Education)

All resident training programs are designed by the Curriculum and Evaluation Group in conjunction with the operations personnel. Resident training is required for all new products and new employees. "The Systems approach to instructional design has been used to develop the resident programs based on a detailed task analysis, establishment of relevant and measurable objectives, and development of instructional strategies to achieve the objectives."[1]

A Media Development activity produces the course documentation which is generated by instructors and course analysts. Various forms are used: texts, audiotapes, videotapes, thirty-five millimeter slides, and sixteen millimeter films. The instructors are experienced teachers and multi-media specialists. Skill training is emphasized in the school. Progress reports evaluate the student's ability in the areas of the skill training and behavioral performance. New employees who do not meet the requirements are terminated. Tenured employees with learning problems are usually given special help and in some cases are "re-cycled" in the IP. A "Certificate for Completion of Training" is awarded to participants who successfully complete the program.

Self-paced programs are available to employees in the field. These programs are mostly concerned with equipment that has been in use for some time. The employee will progress at his own rate, using VTR equipment and study tapes. A proctor is available to answer questions. Self-paced programs (usually programmed texts) serve the purpose of an introductory prerequisite at the local field office prior to coming to

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[1]Quoted from a pamphlet called "Welcome to RCA Information Systems Division."

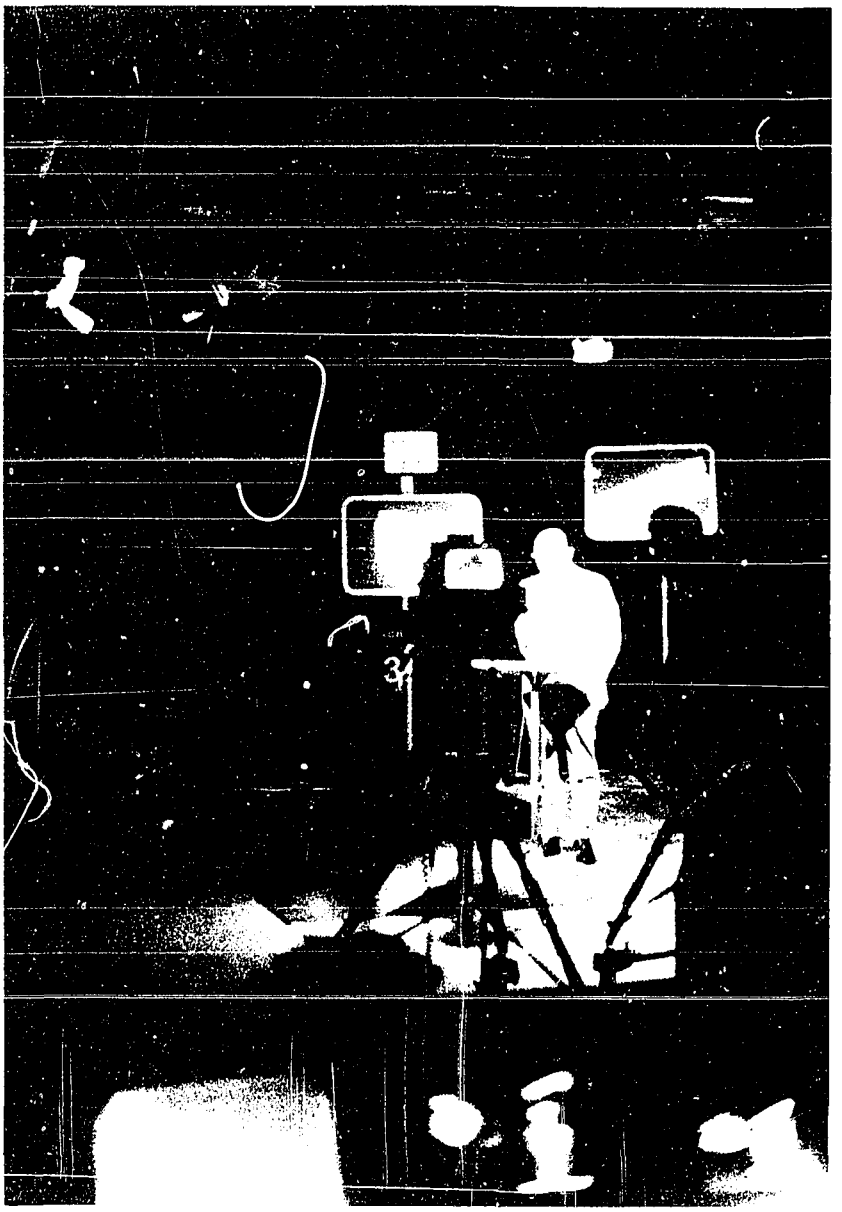

Fig. 7.--"Live" Program in Progress. Note rear projection screens, with adjustable height in background. (RCA-Computer Systems Division/ Field Engineering Technical Education, Camden, New Jersey)

the resident course. Both time and money are thus saved. Instructors are sometimes sent into the field where RCA computer equipment is available for hands-on training. Hands-on training occupies approximately 50 percent of all training programs.

A comparative analysis was made by the Center between teaching a particular program by ITV and by conventional methods. Two groups of employees with similar characteristics, in areas that were important to the study, were observed. The conclusions were that all of the employees using self-paced VTR kept pace with the conventional class and some finished the course approximately 40 percent faster. The ITV trained employees were faster in problem solving than those employees conventionally taught. The instructors were the same for both groups.

Other facts of interest are:

a. About $125,000 is invested in TV equipment which is mostly made by RCA.

b. A separate graphics department handles all visual aids.

5. United States Army Signal Center and School-Television Division, Office of the Director of Instruction

The Television Division (TVD) produces instructional programming for teaching army personnel in subjects ranging from basic electronics to satellite communication. TVD does not formulate instruction but designs ITV programs for the agency requiring the instruction. There are more than 650 TV monitors throughout the classroom complex. IP is carried on in three shifts. There are some 10,000 enlisted personnel and 1,700 officers participating in programs taught by 1,200 instructors.

The unique feature about the Signal School program concerns the approach to IP in general and the students in particular, and also

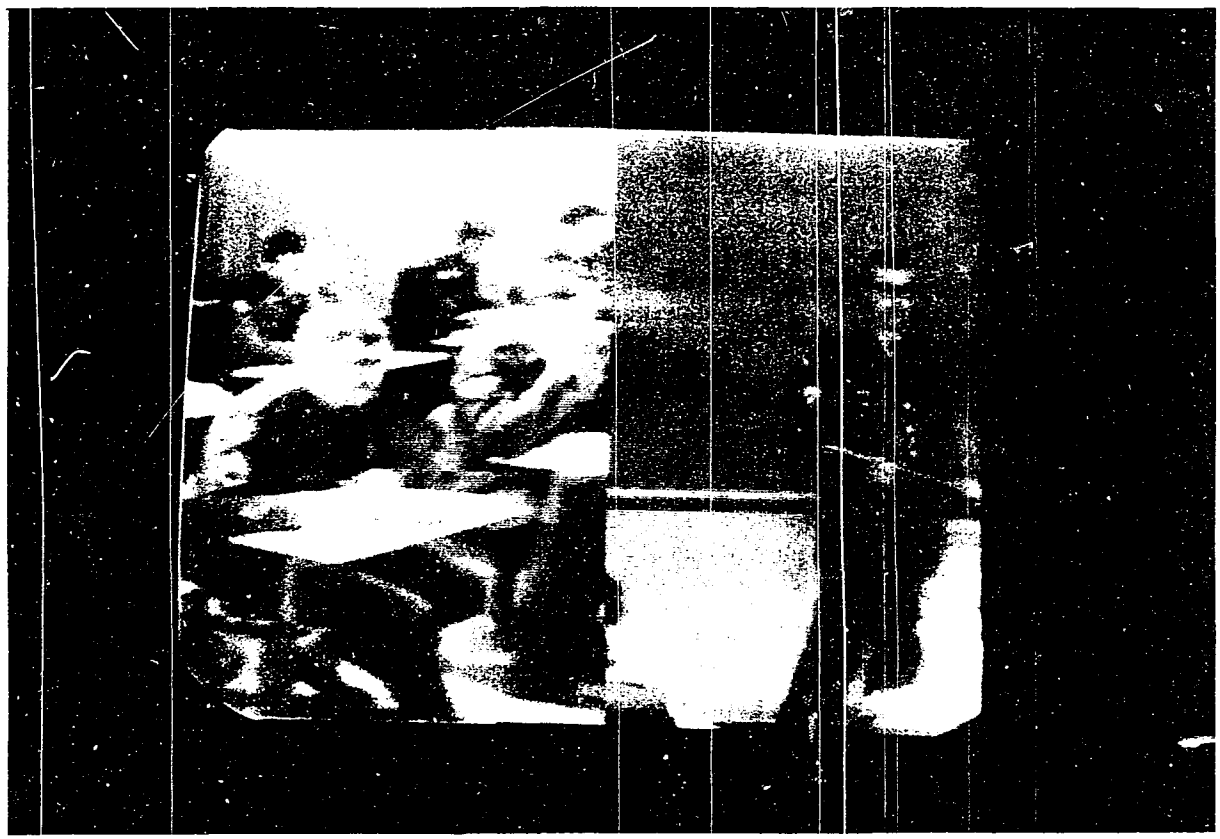

Fig. 8.--"Self-confrontation Lesson for Instructor. Split screen not only shows the instructor how he appears but also learners' responses to his presentation. (U.S. Army Signal Center and School, Fort Monmouth, New Jersey)

technical aspects of the use of TV as an instructional tool.

Televised lessons show a minimum of the instructor's face unless absolutely necessary. The TV presentation is a maximum visual learning experience while the instructor speaks. The visual aids are either charts, diagrams, or equipment. The action shown is a point-by-point explanation of a chart, a drawing, or a diagram, or of a step-by-step operation, and the repair of a piece of equipment.

Self-confrontation exercises are offered to instructors for their own edification. The procedure here is similar to that mentioned in other companies with one addition. The instructor sees himself in a teaching situation but on a split screen he also sees the student reaction to his presentation. This adds another dimension to self-evaluation.

New people on the TVD staff who have had prior TV experience are retrained to the more exacting rigors required for instructional technology. The directors of ITV must be experts in timing. When a subject or object is vocally presented, it must also be visually presented. Clarity is most important.

One of the problematic aspects of the IP in the Signal School is the fact that the participants are a captive audience. They are captive in the sense that they are mostly draftees, and once they are at the school, they must take part in the IP. As a result, many of the participants are hostile to everything and anything they encounter. The hostility is also directed toward ITV.

The TV Division recognizes the fact that the hostility exists. The hostility is not fought actively but responded to through an

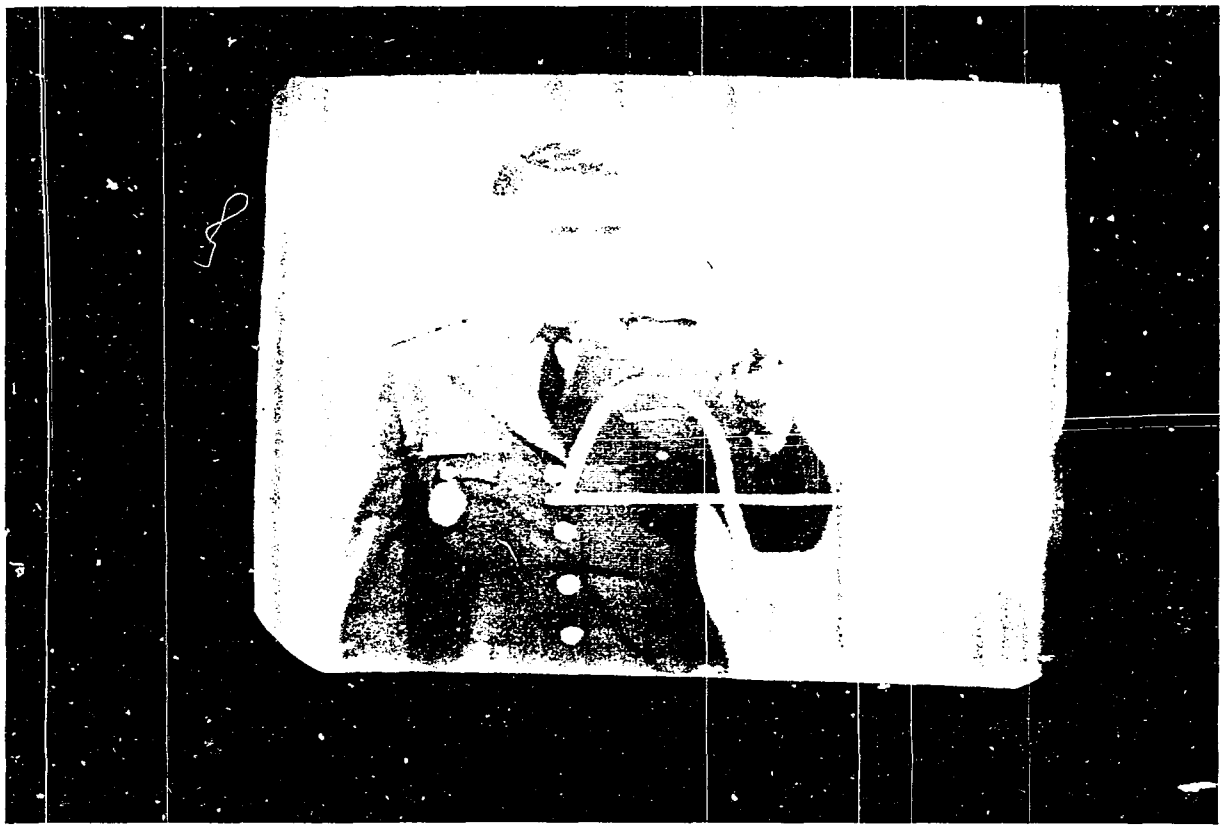

Fig. 9.--"Chalk-talk" on a Transparent Chalkboard. Using "reverse sweeps" on camera makes it appear that the instructor is writing backwards. (U.S. Army Signal Center and School, Fort Monmouth, New Jersey)

understanding of the problem and a positive approach and attitude toward the participants by the ITV staff. This asserts itself by using "in" type presentations to help stimulate and "reach" the young soldiers.

They are attuned to commercial television, so many of the programs lean toward a commercial type of presentation. For example, an ITV program can be presented in a "news" type of format complete with commercials. The commercial break will "sell" such things as U.S. Bonds, dental health, character guidance, and special services. This not only breaks the monotony of the learning session, but gets across important information to the participant.

Young programmers are given guidelines for ITV by the supervisor. Programmers who show creative abilities are given more responsibility in TV direction.

All programs have a classroom proctor or instructor. The participants all receive work sheets or study guides. After each lesson there is a review, either by the classroom instructor or through a question and answer session which is part of the VTR presentation. For example, after the question is asked on the TV monitor, there is a pause for the participants to answer. After the pause, the answer is not only verbally given but visually shown where possible.

There are some TV instructors who feel insecure without a piece of chalk and a blackboard which they can use as a psychological "crutch." Chalk and blackboard ITV is called a "chalk talk." The TV producer's response to this problem is one of innovative presentation. The instructor will give his "chalk talk"; however, his blackboard will be a transparent glass surface which is between himself and the viewer and he will

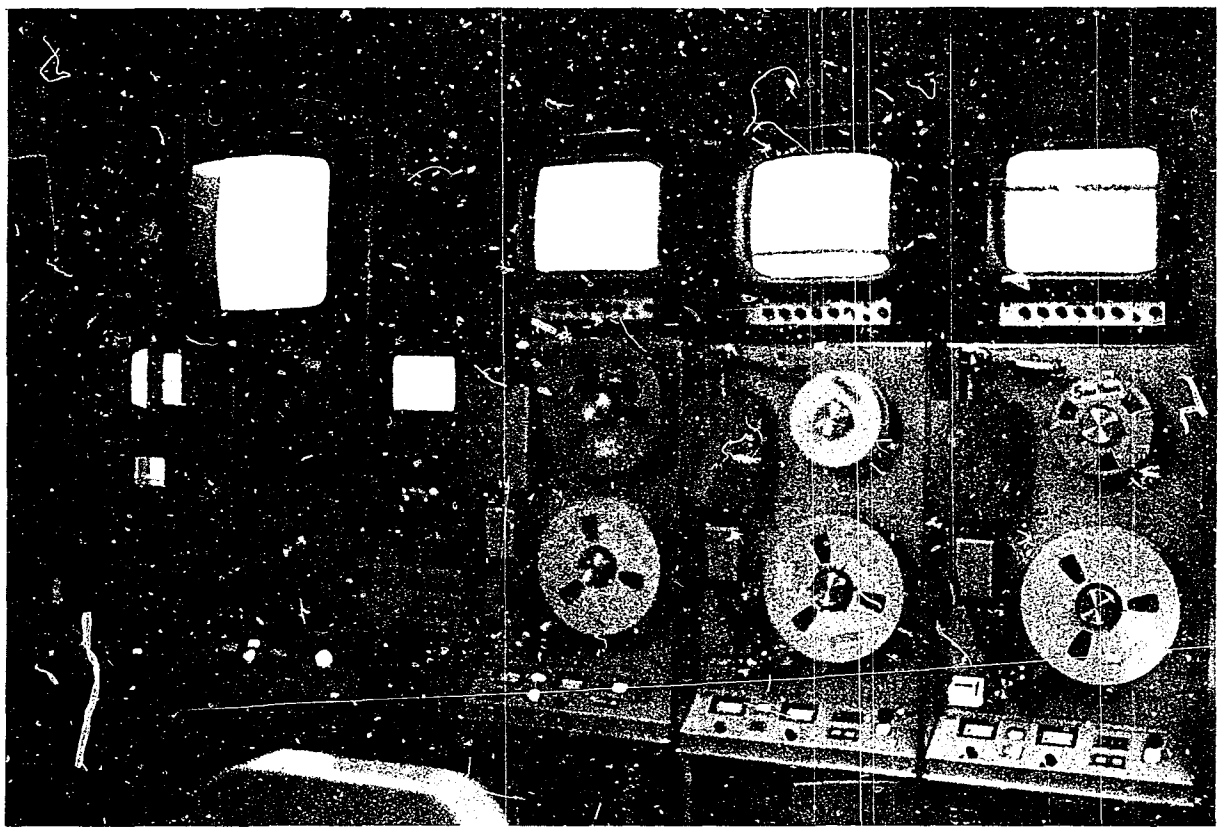

Fig. 10.--Videotape Bank (U.S. Army Signal Center and School, Fort Monmouth, New Jersey)

write on the glass with clown-white stick make-up.[1] By reversing the TV electronic "sweeps," it appears as if the instructor is writing to the viewer, when he is actually writing to himself in a conventional manner. The instructor is therefore always facing his audience and the camera can "see" his face through the transparent chalkboard. The "reverse sweep" will cause all elements to be reversed (i.e., a name-plate will read backwards, a right-handed person will appear left-handed).

The TV Division endeavors to give the impression that the ITV material is current or "in." This is accomplished by a number of different methods. For example, most ITV sessions have light background music or light theme music. This music is changed frequently in order that the latest song hits are used. Production experts believe this has a positive affect on the participants' attitudes. Another example is the "jump-cut" technique, whereby rapid changes in content are made on the viewing monitor. Multiscreen images (more than one subject on the screen at one time) are also used. "In" material for program interest may also mean the type of dialogue used as in "Get Smart" for a basic lesson on batteries (e.g., "the old cables-on-the-battery trick").

Many ideas are taken from TV commercials because some of them are considered very creative. Ideas are even triggered from "underground" films.

The philosophy is, "Who says that education or instruction has to be dull? If we can create or learn a better and more innovative way of instructing, we will use it."[2]

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[1]Clown-white stick make-up is water soluble and adheres to smooth surfaces such as glass or acrylic plastic and does not scratch.

[2]Quoted from interview.

6. Burlington Industries Incorporated, Greensboro, North Carolina

Instructional Programming (IP) at Burlington Corporate Headquarters is under the supervision of the Educational Media Department. The IP is structured for emphasis in two areas.

a. Blue collar employee training and updating which includes:

1) Orientation for new employees

2) Skill training on the production line

3) Updating and retraining tenured production employees

b. White collar personnel training in areas such as:

1) Systems education--data processing including technical skills and managerial training in the data processing areas

2) Personnel--generally management and supervisory training skills

3) Industrial Engineering--technical retraining for new engineers in areas and methods appropriate to the specific needs of Burlington

ITV is used actively for all the above objectives. IP is offered by a combination of the following institutions:

a. The overall responsibility for IP is carried out by a corporate instructional planning unit for all divisions. This unit coordinates IP activities, gives consulting services both technical and instructional, is a liaison for outside services, produces programs relating to corporate continuity and policy, and serves other Burlington divisions.

b. The local division is responsible for its own in-house training.

c. Outside professional instructional educational facilities and agencies are working cooperatively with Burlington in program

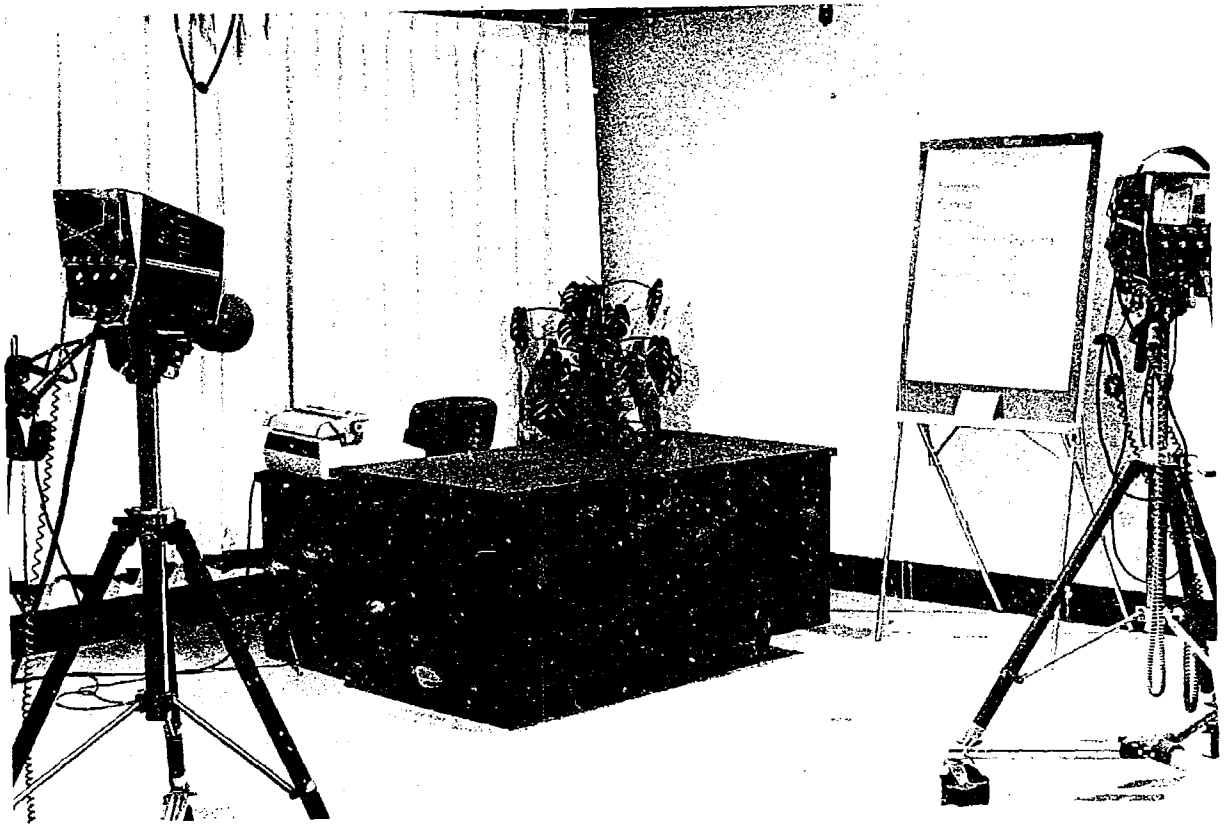

Fig. 11.--Studio Set (Burlington Industries Incorporated, Greensboro, North Carolina)

presentations. In the Greensboro area, for example, the ETV station of the University of North Carolina gives ITV programs for participants from Burlington.

d. Commercially produced VTRs are also used by Burlington.

ITV has been used successfully for training new employees and retraining tenured blue collar employees. With new employees, overhead cameras follow the instructor's activity as he operates production equipment. The new employee sees the activity from the operator's perspective, which is exactly as he himself would see it. The method of teaching is much more effective and efficient than the over-the-shoulder method previously used.

Burlington uses an incentive pay rate system for some production operations. The corporation makes "self-confrontation" VTR and playback equipment available to tenured employees on an individual basis. An employee is videotaped at his work station and then the videotape is played back for the employee in order to permit him to see his performance and learn to improve his efficiency. This use of self-confrontation and evaluation has been found to be effective by both the employees and the corporation.

Burlington has established performance indexes which have made evaluations of the effectiveness of ITV as compared with traditional instructional methods. In the areas such as blue collar skill training and white collar data processing training, ITV has been more efficient relative to time expenditure and skill proficiency.

Other facts of interest are:

a. Burlington is investigating the possibility of organizing a corporate training facility as an independent autonomous division.

If such a division is formed, training tapes and programs produced by Burlington will be made available for purchase by other companies.

b. The library facilities contain learning carrels with audio-visual equipment utilizing VTR, eight millimeter films, and cartridges for skill training and programmed instruction.

c. Burlington also is active in IP for the disadvantaged. In cooperation with the National Alliance of Businessmen a program was inaugurated called "Burlington Education and Skill Training (BEST)." The recipients of BEST come from the poor of the rural community. Four programs are offered for a total of 160 hours. Of this sum, forty hours deal with "The World of Work," programs teaching work attitudes and interpersonal relations. The remaining 120 hours include learning safety habits, reading, writing, mathematics, and money management. There is a child care facility for working mothers, and Burlington also offers medical and dental aid to the BEST participants.

d. Approximately $50,000 is invested in ITV equipment.

7. Aluminum Company of America (ALCOA), Pittsburgh, Pennsylvania

The Corporate Education and Training Department (CETD) fulfills the role of a consulting agency to all the divisional training units. The instructional programming is decentralized in that each separate autonomous division of the company controls and is responsible for its own in-house instructional needs. The corporate unit helps train IP staff, suggests equipment purchases and serves as a clearing agency for programs concerning corporate continuity[1] in all areas.

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[1]The phrase "corporate continuity," in this context, refers to policy and procedure.

One of the projects undertaken by the Corporate Education and Training Department concerned VTR evaluation. Its objectives were "to gain the knowledge and experience needed to recommend an effective and economically feasible program utilizing videotape for training and communication within Alcoa."[1] By listing instructional activities applicable to VTR, the corporate unit decided to videotape a number of programs that could be utilized throughout the company. Through a mutually cooperative effort with other departments and divisions (the Corporate Education and Training staff assumed responsibility), a number of VTRs were made. The subjects of the VTR were:

a. Sales and marketing techniques

b. Management communications

c. Orientation sessions for administration and job evaluation

d. Recruiting and training

e. Standards for aluminum metallurgy.

As the project progressed, certain deficiencies were noted and resolved. For example, some more sophisticated equipment was needed and acquired; some of the staff did not have the technical "know-how" for operating the equipment and producing the desired programs. Outside agencies were investigated which offered not only the required training, but also gave services such as kinescope recording, lighting and production techniques, duplicating and editing VTR, TV engineering, commercially-made VTRs, and demonstrating new equipment by TV manufacturers.

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[1] Videotape Evaluation Project Report, Education and Training Department, Alcoa, Pittsburgh Office, September 1968, p. 1.

The response to the project's findings and IP productions was favorable and has led to recommendations for greater activity in ITV.

A problem encountered by Alcoa in using TV equipment relates to the proper environment for operation. Televising had to be accomplished in places where there were high temperatures, dust, and abrasives. The TV equipment could not cope with these factors which are an inevitable part of the required areas for ITV programming. To this problem, as yet the IP unit has not found a solution.

8. Texas Instruments, Incorporated, Digital Systems Division

The Field Service Department is responsible for training service employees in outlying areas around the United States. The IP is similar to other organizations who must keep their service representatives up-to-date. However, Field Service has cut down costs by taking the instruction to field offices via VTR. A self-instruction format is used during periods of servicing inactivity. The training during this period is advantageous from three standpoints:

a. The service employee is using his time efficiently.

b. He is updating himself.

c. He is not costing the company money in terms of travel to an IP center, which would mean time away from the job and subsistence costs.

New Field Service employees are sometimes trained in groups in outlying areas by sending instructors with ITV equipment.

Field Service does have an in-house training program for its employees and sells instructional packages (including on-the-job training) to outside agencies.

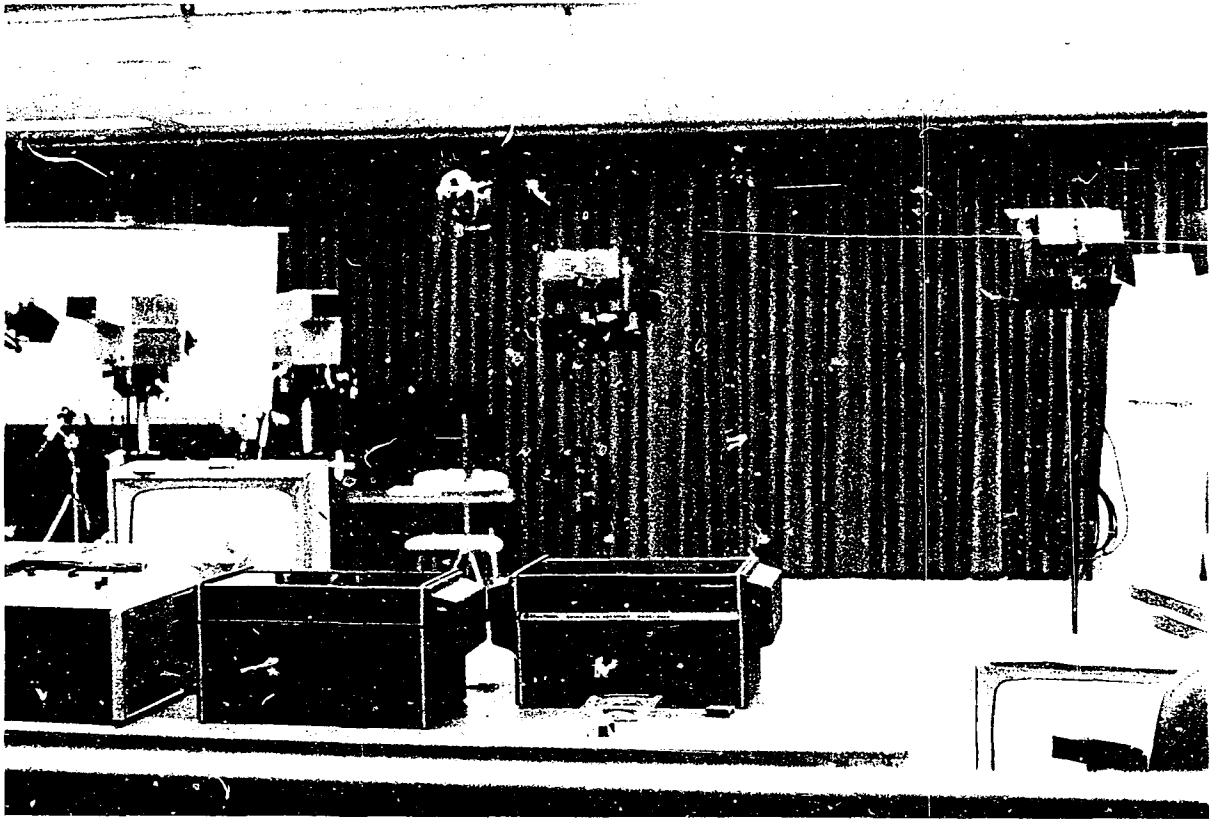


Fig. 12.--
TV Studio
(Humble Oil
and Refining
Company,
Houston,
Texas)

9. Humble Oil and Refining Company

The main objective of ITV at Humble Oil is to eliminate large costs accrued by bringing in people for instruction, not only from the United States but also from overseas. However, there are technical training schools operated by the company. Some of the programs in these schools deal with geology research, logging, technical research, structural work, and engineering as continuing education. VTRs and films as well as study guides and books are used to teach the courses. Participation in IP is considered an "honor" by the employees.

Each facility updates its own VTRs, which is accomplished as needs dictate (i.e., through research or discovery).

One of the ITV programs called "the Structural Geology School," produced for young professional geologists, was played in nine American cities and seven foreign countries. The program contained a series of sixty VTRs and it was considered outstandingly successful according to professional participants and the instructors' opinions and evaluations.

Humble hires consultants to help decide the best communication method (i.e., seminar or A-V presentation) for a given course. Local TV experts are also consulted for technical help.

10. The Boeing Company, Commercial Airplane Group

The two major production sections at Boeing in Seattle, Washington are the Commercial Airplane Group and the Aerospace Group. Each group has two separate departments: Employee Training for Boeing Staff at all levels (blue and white collar), and Customer Service Training. Each department has different and unique training requirements, and the departments have specialists in their own areas. For this report,

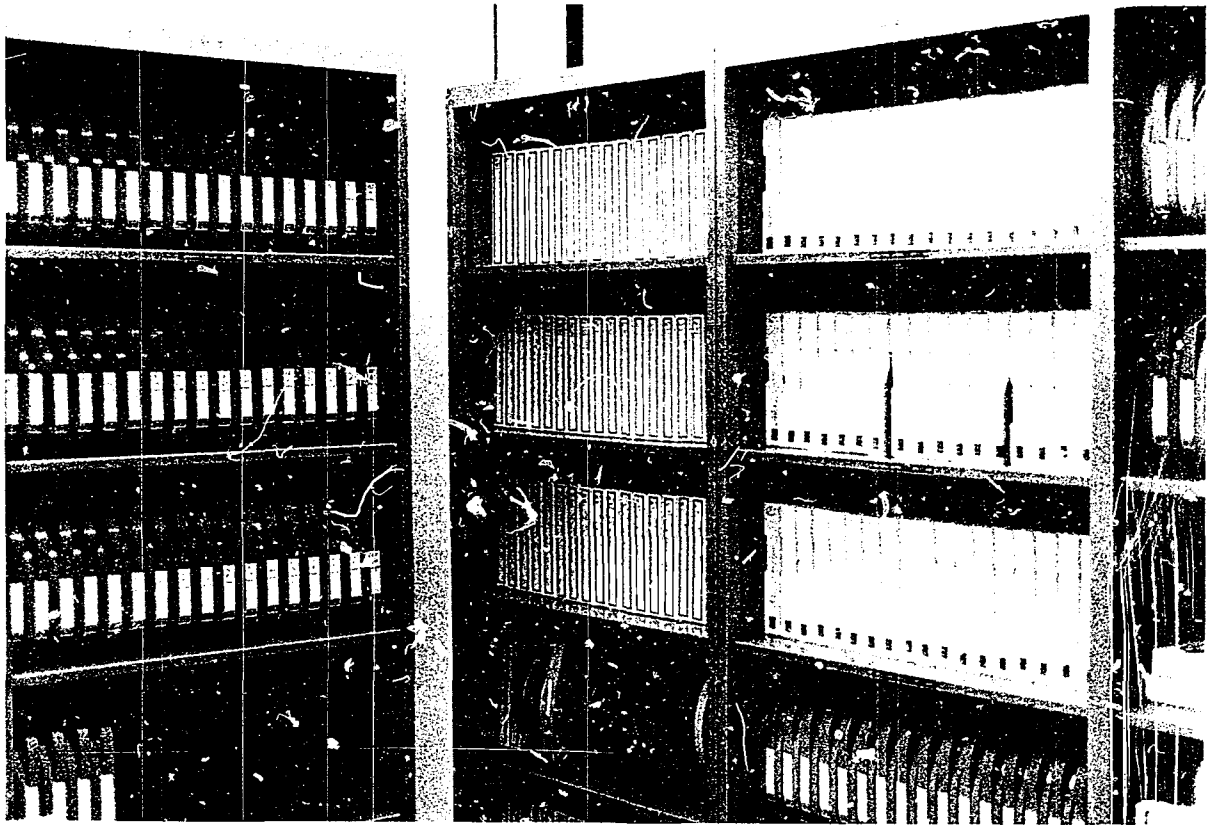


Fig. 13.--Section of Videotape Recording Library (Humble Oil and Refining Company, Houston, Texas)

the Commercial Airplane Group Employee Training Department was interviewed.

Normally about 36,000 employees participate in instructional programming in this department during a twelve-month period. The ratio of training personnel to employees varies from 1:1,000 during slow periods and approximately 1:500 during a manpower buildup. The ratio depends upon the types of skills needed, the rate of increase, and the availability of skilled manpower in the area. Training staff members who work in the ITV area have had previous commercial television experience. Many of the instructors have been educators with teaching certificates from high schools or universities, who have joined Boeing in one capacity or another (i.e., engineers, technicians) and are drawn upon when needed for instructional staff duties. Some of these employees also become instructors for Boeing's Continuing Education Program which is conducted after the work day. Boeing also supports employee graduate study programs, which are considered job related. The employee will have his tuition in the university paid by Boeing upon satisfactory completion of his studies.

ITV was started at Boeing in order to give "uniform" instruction to the employees. One of the problems encountered was that there may be four or five instructors teaching the same course, using the same outline, but the end result of the learning experience was different. It was important to Boeing that the employees function alike on the production line. It was found that TV skill training accomplished this requirement. All ITV is viewed with a classroom instructor present. Another attribute of ITV was that it cut down employee participation time

(although the training staff's time involvement became greater) which reduced trainee costs considerably.

Curriculum format is designed through a methodological procedure which Boeing calls, "Event Logic Network for Course Planning and Development."[1] The planning is accomplished through a cooperative effort of three Boeing agencies or "Involved Organizations." The procedure is as follows:

Phase 1. Definition and Analysis

The training needs and objectives are identified by the Benefiting Organization (BO), which is comprised of the trainee and the production management. The Training Organization (TO), which includes training administration and the instructional staff, will review the needs and objectives of the BO, assign responsibilities for preparing the courses necessary, and specify course objectives which are approved by the Benefiting Organization.

The Support Organization (SO), which includes internal (other Boeing instructional sections) and external (outside learning institutions) agencies will also review the Benefiting Organization's needs and objectives.

Phase 2. Development

The Benefiting Organization may outline required skill activities necessary to fulfill the needs and objectives specified. The Training Organization will develop a training plan identifying the courses in the specific program as well as rating and teaching method. The Training Organization will also determine and procure training aids and

[1]See pages 74 and 75.

materials and the facilities necessary for the program. The Support Organization may submit a proposal of its own to supplement the Training Organization Program.

Phase 3. Approval

The Training Organization will conduct a "dry run" of the program attended by the Benefiting Organization for approval of the content. Revisions requested by the Benefiting Organization will be made by the Training Organization which will also develop the class schedule. The Supporting Organization may at this time submit a proposal for approval as well.

Phase 4. Presentation

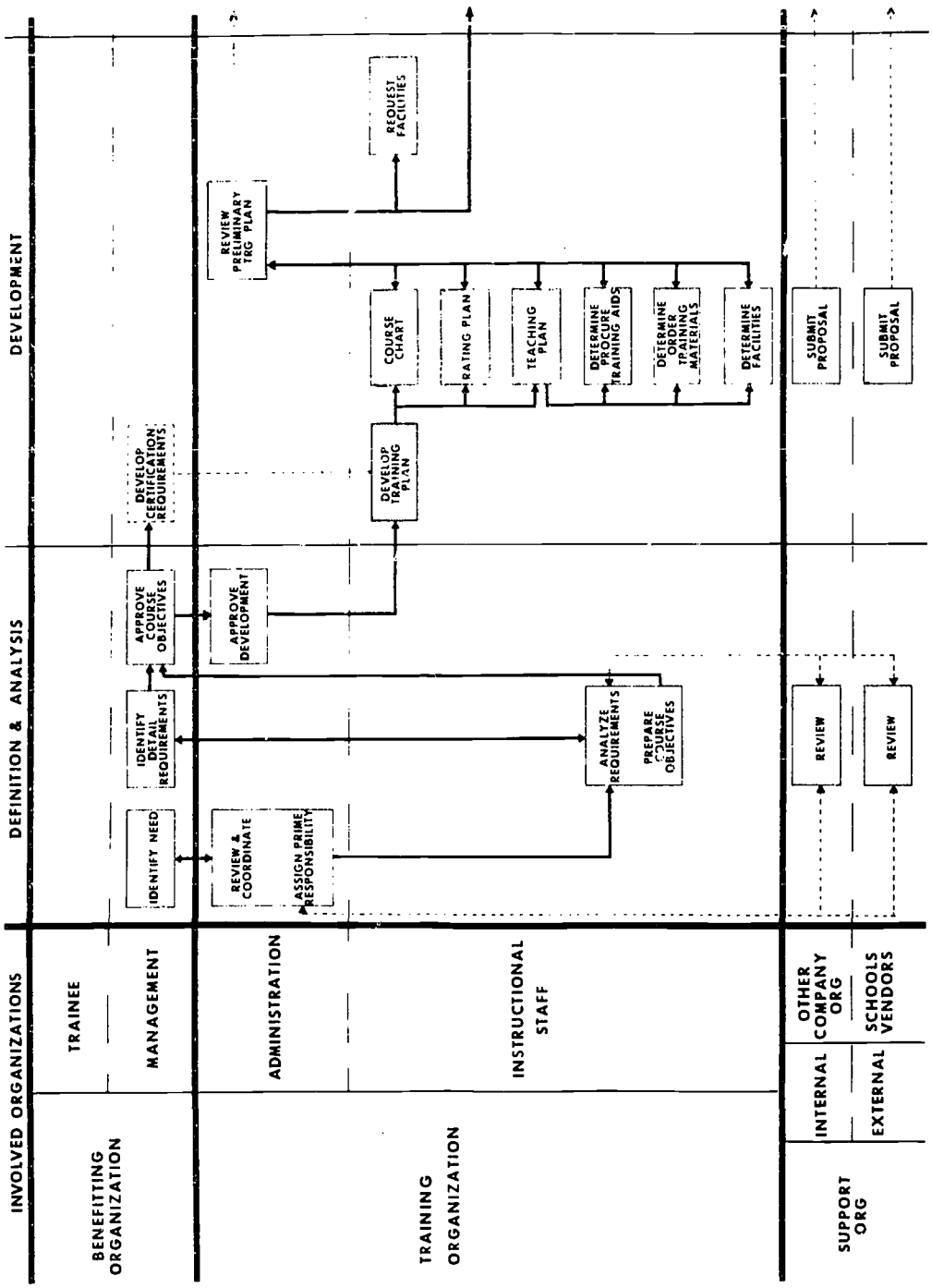
Upon formal approval by the Benefiting Organization and the Training Organization, the Benefiting Organization will assign and notify trainees concerning their participation, and the Training Organization (and Supporting Organization if approved) will conduct classes. The Training Organization will also originate the training record.

Phase 5. Evaluation

The Benefiting Organization will evaluate the training upon completion of the trainees' learning experience and, if further action is required, the Training Organization will respond to the specific needs which could also mean retraining participants or changing the learning method and/or core content of the course.

Phase 6. Records

Final reports are submitted by the Training Organization and the Benefiting Organizations. Both organizations file the reports. The Training Organization is further responsible for scheduling


INVOLVED ORGANIZATIONS
DEFINITION & ANALYSIS
DEVELOPMENT
BENEFITTING ORGANIZATION
TRAINEE
MANAGEMENT
TRAINING ORGANIZATION
ADMINISTRATION
INSTRUCTIONAL STAFF
SUPPORT ORG
INTERNAL
EXTERNAL
OTHER COMPANY ORG
SCHOOLS VENDORS
IDENTIFY NEED
REVIEW & COORDINATE
ASSIGN PRIME RESPONSIBILITY
IDENTIFY DETAIL REQUIREMENTS
APPROVE COURSE OBJECTIVES
DEVELOP CERTIFICATION REQUIREMENTS
APPROVE DEVELOPMENT
ANALYZE REQUIREMENTS
PREPARE COURSE OBJECTIVES
DEVELOP TRAINING PLAN
REVIEW PRELIMINARY TRG PLAN
REQUEST FACILITIES
COURSE CHART
RATING PLAN
TEACHING PLAN
DETERMINE PROCURE TRAINING AIDS
DETERMINE ORDER TRAINING MATERIALS
DETERMINE FACILITIES
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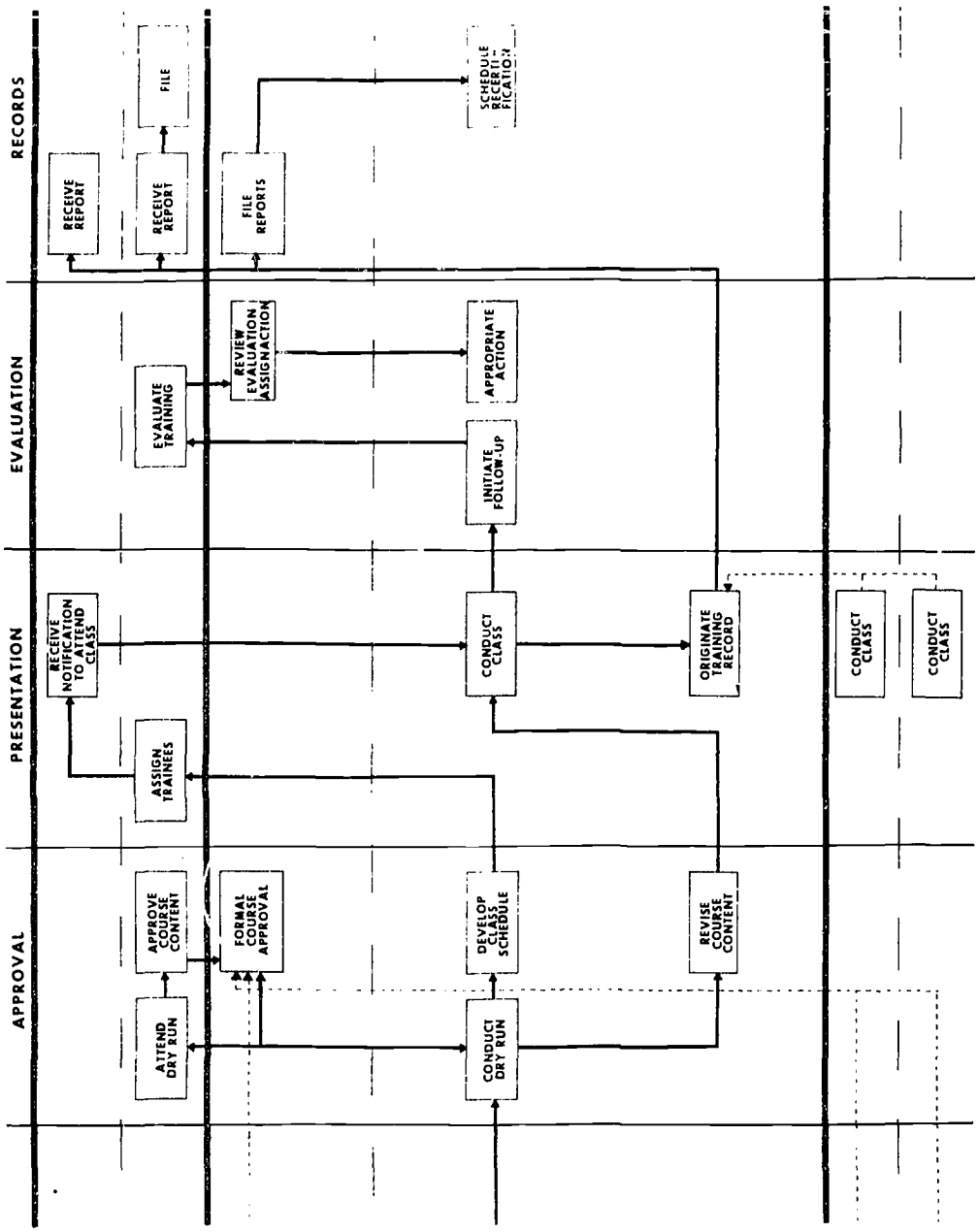

Fig. 14.--Event Logic Network for Course Planning and Development
(Courtesy of the Boeing Company, Commercial Airplane Group)

recertification which is a review for a trainee a few months after he completes his formal training.

Study guides, textbooks and other supplementary materials are used during the course duration. Progress evaluation is carried out during and/or after the ITV session.

Questions which deal with the major objectives of the session are built into the ITV lesson. After viewing the program, the participants answer the questions either orally or by a formal examination. Another method of question answering is an "electronic immediate response system." Each student sits at a table equipped with a battery of push buttons labelled A, B, C, or 1, 2, 3. Multiple choice questions are flashed on a screen. The participant pushes the button he thinks is the right answer. The instructor has a console with a battery of lights labelled according to table numbers and the response choice of the participants. The evaluation is immediate and the instructor can review areas in which learner weakness is evident.

Some of the duties of the Training Organization managers are outlined as follows:

a. To assist in identifying training needs, develop training plans, and select trainees.

b. To establish and maintain standards for scheduling and administering formal training programs and courses to meet the training requirements of the division.

c. To coordinate with line management in the development and implementation of on-the-job training.

d. To conduct training method research, train instructors, and provide training facilities on technical training matters.

e. To establish and administer off-hour education programs including administration of a tuition refund program.

f. To develop evaluation and testing methods for participants of training program and the instructors.

A major function of the Manager of Employee Training and Development is to be the company "interface" with outside agencies such as government education and social agencies, universities, community colleges, and high schools.

Other facts of interest are:

a. ITV investment at Boeing has reached $200,000.

b. As previously noted, during a "normal" year at Boeing, approximately 36,000 employees participate in IP.

11. International Business Machines Corporation, Systems Development Division, San Jose, California

The Systems Development Division has an Engineering Education Department. The primary objective of instruction in this department is to update technicians and engineers and permit them to continue their formal education for undergraduate and graduate degrees while remaining employees of IBM. This is accomplished through a CCTV microwave system originating from Stanford University and is called "The Stanford System."[1]

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[1]There are other university/industry links in operation. An example originates from Colorado State University. See Charles O. Neidt and Lionel V. Baldwin, "Use of Videotape for Teaching In-plant Graduate Engineering Courses," Adult Education Journal, XX, No. 3 (Spring 1970), 154-167.

The program is designed to fill continuing education needs of

The Stanford System was initiated in 1968. There are approximately nineteen industrial organizations in the San Francisco Bay area hooked up for TV communication via microwave from Stanford University. An employee may participate by applying to one of the following options:

a. Standard credit option for advanced degrees. The employees register with Stanford through IBM for credit courses as regular students.

b. Nonregistered option. The employee registers with Stanford through IBM, takes regular courses and is evaluated on his work but is not given university credit. This option is less expensive. If the participant wishes to receive credit at a later date, he may pay the difference for registration between the credit and noncredit option.

c. Association for Continuing Education (ACE). This is a Bay Area-wide program under the auspices of the industrial organizations hooked up to the microwave TV system. ACE makes courses available to employees who wish to update and upgrade themselves by self-instruction aids.

All the ITV programs are "live" and the first two options are broadcast during the work day. ACE programs are broadcast at noon or after work. The same classrooms are used.

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employed engineers. The project is called "Colorado SURGE" (State University's Research in Graduate Education). Remote plant sites in the area can enroll in-plant engineers for graduate credit courses taught via videotapes of campus classes presented on the previous day. The VTRs are delivered by couriers from the University.

"Instructor-student interaction was encouraged by on-site visits by instructors, by prearranged telephone conferences, and by the use of graphic transmission of material accompanied by voice. . . . prior to registration for the courses, a pilot tape describing each course was shown to prospective enrollees to facilitate enrollment decisions." Ibid., p. 155.

A courier service shuttles back and forth to IBM from Stanford, taking and returning examination forms.

IBM has three payment plans for participating employees:

a. For a graduate work-study program, IBM pays all the fees and the costs of books included for courses taken that are of prime interest to the company.

b. For a nonregistered work-study program, there is a cost-sharing plan.

c. For a corporate-wide work-study program, IBM will pay the tuition but not for books and other fees.

All employees are encouraged to participate. The ACE programs are voluntary and cover a wide range of subject areas. The participant in ACE will receive a tuition refund pro-rated by his grades (e.g., an employee who receives a high grade will have 100 percent of his tuition returned, lower grades mean less tuition return).

The ITV broadcasts originate from the Stanford classroom where the instructor is presenting the subject matter to on-campus students. It is the decision of the instructor whether or not the audio-visual media are used to supplement his presentation. The TV equipment at IBM is simply a monitoring device for IBM participants. In the IBM classroom, there is an FM microphone "talkback system" in order to permit the IBM employee to ask questions that may arise during the learning session. The Stanford philosophy is to preserve the integrity of the classroom via TV.

Stanford offers seminars on a weekly basis for industrial subscribers to the "System," the objective being to promote open

communications between the subscribers themselves and the professional instructors at the University.

There are approximately three IBM participants per course. The employee has a schedule for the course. He will arrive at the IBM classroom, turn on the TV monitor, "attend the class," turn off the TV set and return to his job.

The IBM employee will initiate participation in the program of his choice. Learning progress is evaluated through periodic tests sent through the courier system. Failure by the employee does not affect his job retainment; however, he will not be reimbursed for his studies. Employees who succeed in their studies receive, besides a tuition refund, a certificate or diploma from Stanford. Successful employees will have academic progress recorded in their personal employee file, an entry which is referred to as one of the factors considered for salary changes and advancement.

Generally, participants have voiced satisfaction in the Stanford programs and ACE, according to the IBM supervisor for engineering education; however, the participants have made comments concerning a "good" or "bad" instructor.

One of the problems encountered concerns the courier system which does not always function properly. Breakdown in TV equipment also causes loss of time.

12. General Electric Company--Atomic Power Equipment Department, BWR[1] Training Center, San Jose, California

The BWR Training Center's primary goal is to train operators for Boiling Water Reactor nuclear power plants. Ninety-five percent of the

[1]BWR--Boiling Water Reactors.

learners are staff employees of G.E.'s customers. The participants are generally tenured employees who were the operators of conventional (electric) power plants. In order for the customer employees to operate the nuclear power plants, they must meet examination requirements of the Atomic Energy Commission so that they become licensed operators.

Approximately 350 people participate in IP at the center during a twelve-month period. There are twenty-one G.E. staff members associated with the training department. At first, all training was accomplished by using simulation equipment, which was costly and time consuming. Because of this, line and staff employees knowledgeable in BWR developed in-house IP. ITV was used to complement conventional instruction methods, cutting down expenses and time as well as permitting more flexible scheduling for distribution of instruction to more clients.

Some seventy systems operations for BWR are taught. The Center developed eighteen different IP series. Approximately forty-four different subjects are covered which utilize some 300 VTRs (250 are instruction and the remainder are documentation and orientation tapes).

The customer can take the course of instruction in one of three ways. For example, the course in technology can be taken:

a. live in San Jose

b. live and VTR in San Jose

c. VTR at customer site.

In the latter case, the Center will send out two training engineers with approximately 100 VTRs for a five-week course, which is the first phase. The training unit will be completely self-contained regarding supplies and equipment. The trainers will carry with them all

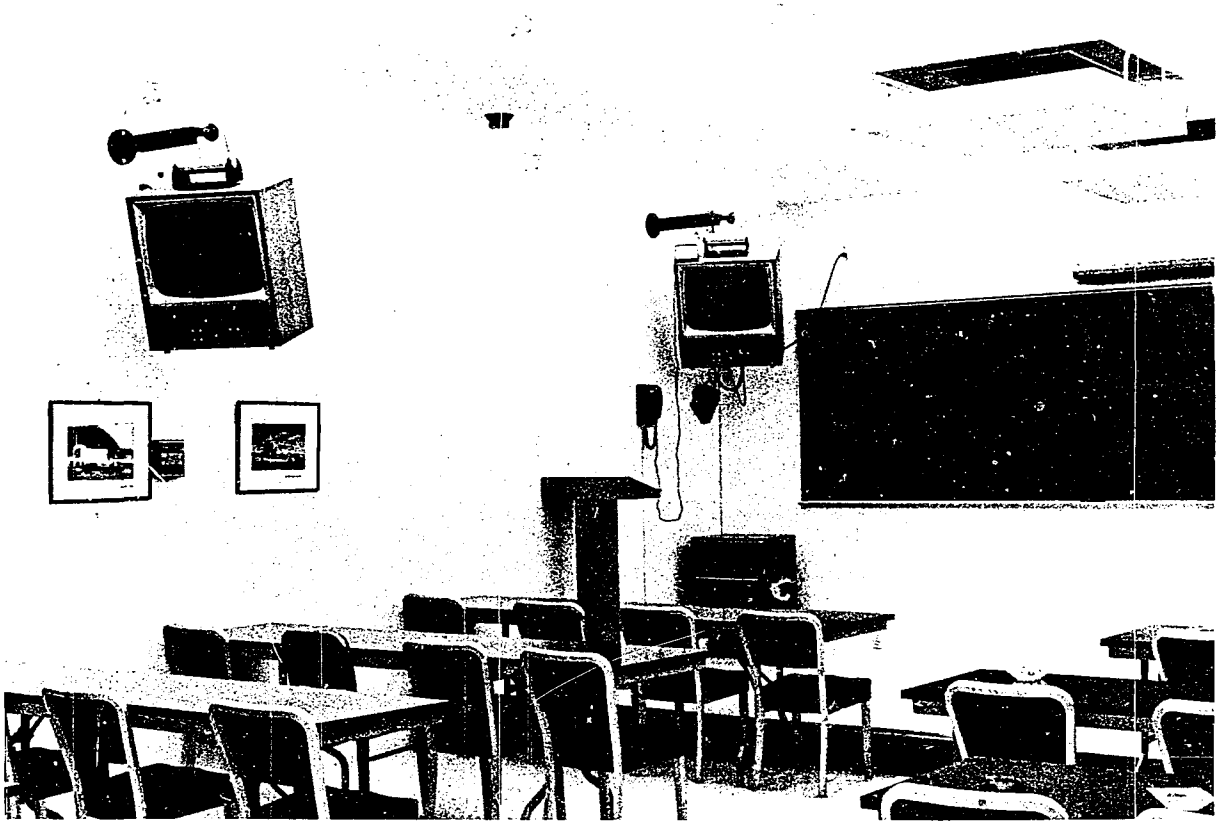

Fig. 15.--Typical ITV Classroom (General Electric Company--Boiling Water Reactor Training Center, San Jose, California)

the written material as well as double the amount of equipment actually needed. (E.g., two one-inch videotape recorders, two 23-inch monitors, and one 12-inch monitor. The 12-inch monitor is for after-hours individual review.) Before going to the customer site, the Center will establish contact with a local TV equipment vendor who is requested to serve the engineer-instructor in case of a breakdown. In all cases, the last phase of the learning process is carried out at a BWR Center in Illinois for simulated learning on a BWR unit.

The course format is similar to the traditional "educational TV utilization courses"; i.e., "study guides" or "fact sheets," which are the core content outlines of the session, are prepared by the Center and distributed to the participant. These sheets contain all the important factual material in the ITV lesson.[1] Together with the fact sheets the participant receives a printed copy of all the charts and diagrams that appear in the ITV sessions. These two separate supplements permit maximum retention and recall and are used as the basis for discussions with the in-class instructor before and after viewing the VTR. The supplements are also used for subsequent private study. A library contains VTRs for students who wish to review lessons.

The number of participants per course ranges from eight to thirty. The number of separate sessions per course ranges from two to twenty-one. The courses are offered during the work day and are full-time (eight hours per day) programs. The content areas deal primarily with operational skill training and technical supervisional skills with

[1]Books are sometimes used as well.

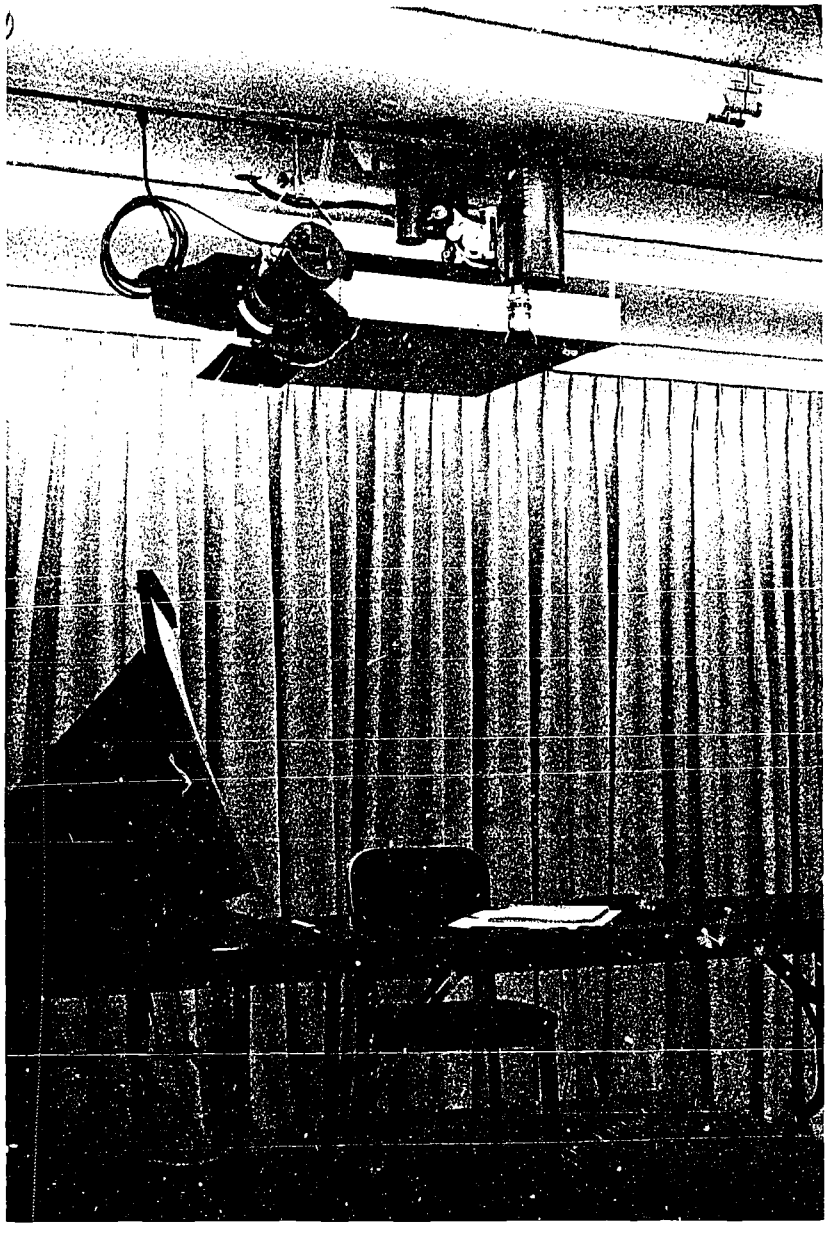

Fig. 16.--Overhead Camera for Hand Operated Activities
(General Electric Company--Boiling Water Reactor
Training Center, San Jose, California)

the atomic facility. Mathematics, physics, and chemistry are also taught. Costs for instruction are completely covered by the customer. Course participants who pass the requirements receive a certification of completion from G.E.

The Center has also made VTRs available to customers for lease and sale. From the approximately 300 VTRs produced so far, approximately 1,000 one-inch and 2,000 half-inch copies have been made for distribution all over the world.

Other facts of interest are:

a. The Center has about $60,000 invested in ITV equipment. They plan to convert to color during the first part of 1971. Color is an important factor in systems coding for the BWR equipment.

b. The Center has its own graphics department which fulfills the needs for both TV graphics and the written material which is distributed to the participants.

One of the problems that G.E. encounters is that the participants come from varied educational backgrounds. Some have had only an eighth grade education and others may have a Ph.D. in electronics and allied fields. Other participants may have been out of a formal learning situation for more than twenty years, which would reflect poor study habits. Still other participants may be twice as old or older than other participants in the same class. G.E. has found it difficult to respond to all these differences and, as a result, it seeks a "middle of the road" teaching approach. In some cases, where performance is weak, participants have been permitted to go through the course again with special help. Even with the above problems, course failure is very low.

The Center enthusiastically supports the medium of TV as an instructional method.

13. Kaiser Foundation (KF) Medical Care Program, Oakland, California. The KF Program is the largest prepaid medical insurance system in the United States. The KF Audio-Visual Center started ITV activities primarily for updating all the medical employees (i.e., doctors, nurses, medical and technical specialists), and for orientation of new employees in all hospital areas.

There are 8,000 employees in the North California Area,[1] and of this number approximately 2,500 participate in IP during a twelve-month period.

KF has a Training Department and an Audio-Visual (A-V) Department. Both utilize multimedia methods.

a. The Training Department concerns itself with training supervisors for patient public relations (e.g., how to handle people with different health problems) and scheduling supervisory personnel for university training in management and administration.

The Training Department prepares future training directors to hold posts in different locales.

b. The Audio-Visual Department assists the Training Department by making facilities available. Other functions of the A-V group are to produce VTRs for departments needing instructional material for medical staff, orientation for both staff and patients, and communications between departments.

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[1]There are six areas in all.

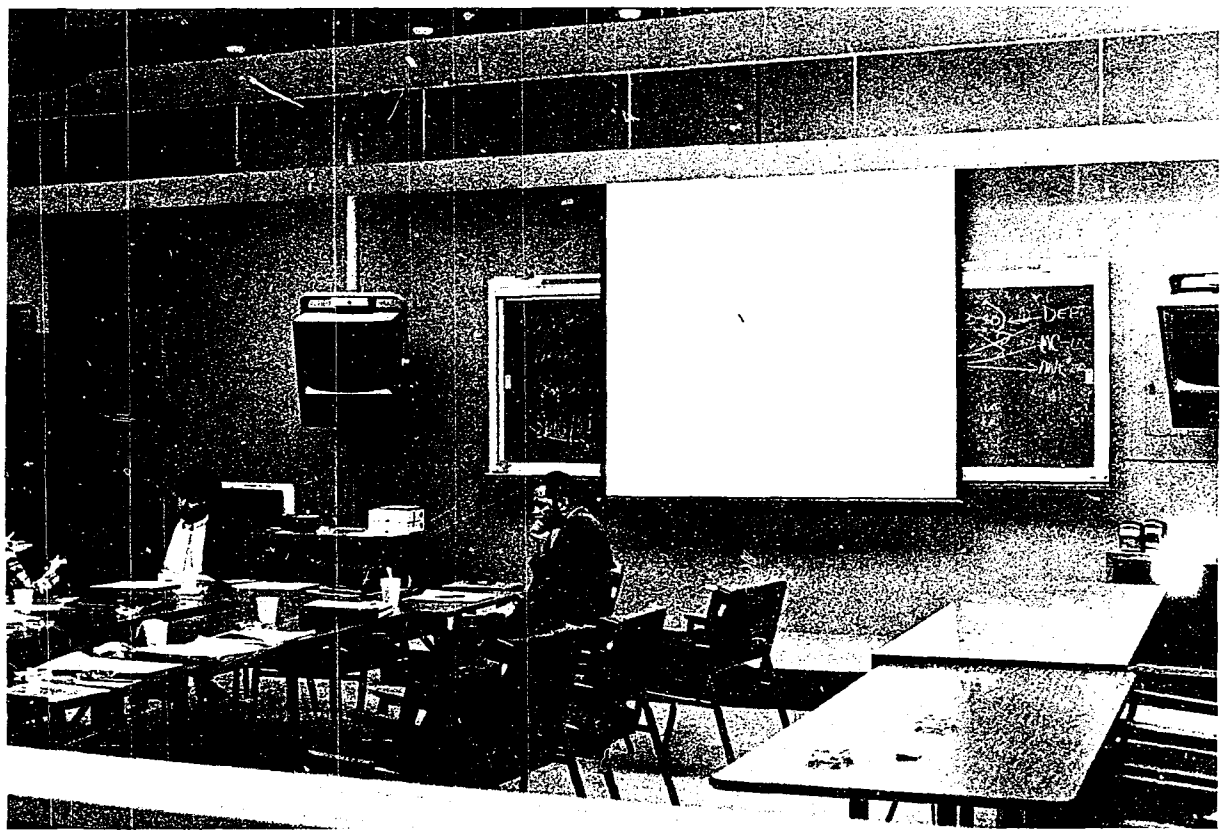

Fig. 17.--Combined Conference and Classroom (Kaiser Foundation Medical Care Program, Oakland, California)

A primary concern of the A-V Department is to record on videotape the medical "rounds" at the University of California.[1]

The "rounds" are regularly scheduled meetings discussing multiple medical topics. There are four main areas that are covered: (a) pediatrics, (b) internal medicine, (c) neural radiology, and (d) psychiatrics.

The videotapes of the "rounds" are erased every nine months because there is a constant input of new material which updates the information which was previously recorded. KF is of the opinion that their instructional activities, together with other ITV programming, should be considered by the Medical Association Agency in making KF an accredited institution for post-professional learning.

VTRs are also purchased from outside commercial sources; part-time consultants, experts in various fields, and guest speakers all help in the development of ITV instructional programs.

Other facts of interest are:

a. KF has invested approximately $1,000,000 in medical education and training programs.

b. Approximately $150,000 is invested in ITV.

14. International Telephone and Telegraph Corporation, ITT Gilfillan Incorporated

The Training and Development Department is responsible for IP in this division of ITT. Because of the classified nature of the work, every employee goes through a training and retraining ITV session in

[1]"Rounds" are discussions between doctors regarding specific problems with patients, as well as new methods of treatment. New methods and materials are discussed and experiences regarding specific cases are shared by the doctors at the university.

safety and security procedures at least once a year. Instead of the employees coming to the instructional facilities, however, VTR recorders are set up at centrally located areas in the shops, and according to a pre-arranged schedule, work in each area is stopped, the employees all sign in to their areas (signatures are required for TV security reviews), and the VTR is played. This procedure is also used for skill training. For example, a TV monitor may be put out in the shop for four employees to review a work operation.

There are performance evaluations of professional technical employees every six months. The employee's supervisor may identify areas of weakness in performance. The training director will in turn suggest outside agencies where this formal instruction is available.

Outside training is carried out after the work hours. ITT Gilfillan will reimburse employees who receive passing grades.

Work simplification VTR tapes, written and produced by the ITT Gilfillan Training Department, have been outstandingly successful.

The ITV activity in ITT Gilfillan is literally a one-man operation. The department head is scriptwriter, producer, director, cameraman, VTR engineer, light and sound technician. There are nine full-time instructors who all serve as trainers. "Talent" generally consists of line and staff experts in a given area.

15. Lockheed Aircraft Corporation, Lockheed-California Company

The Scientific and Technical Training Department has served approximately 44,000 employees in IP during the last year. The IP is decentralized, each division is autonomous relative to instruction, and is responsible generally to itself, although Lockheed Corporative

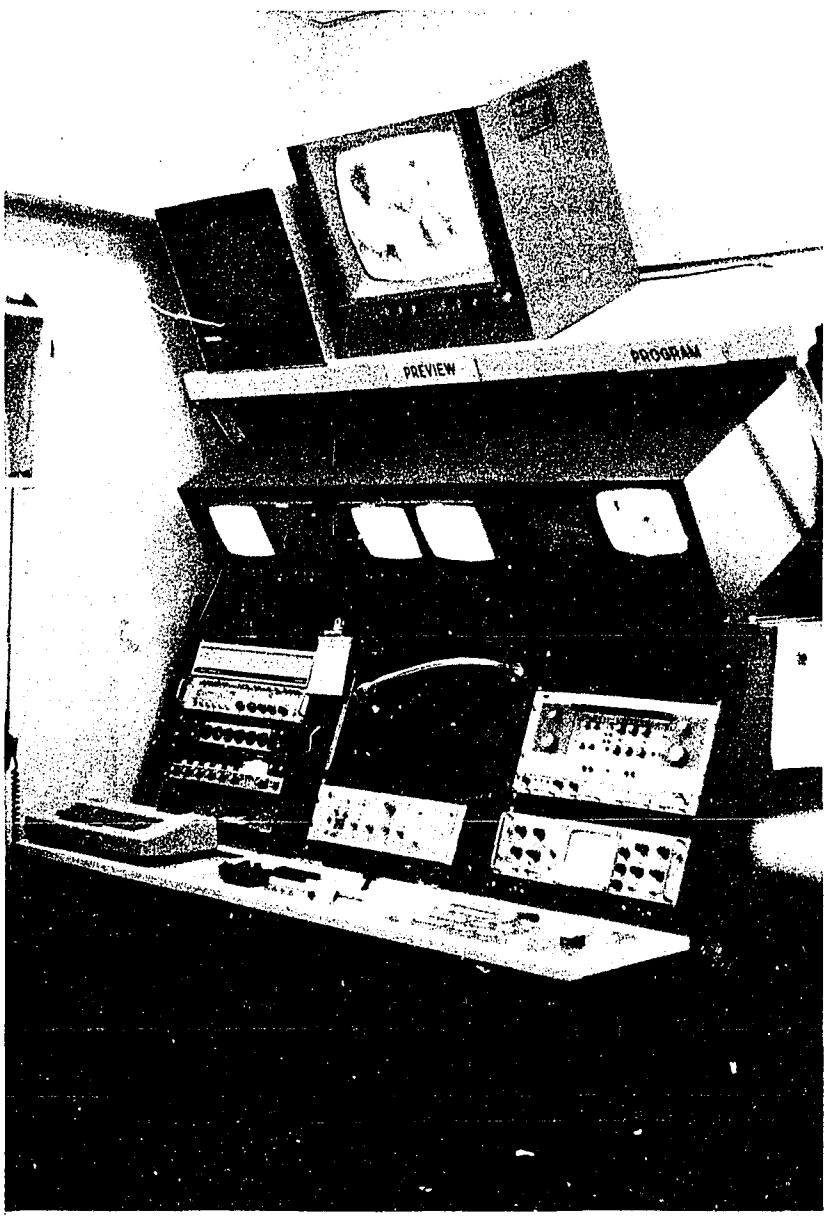

Fig. 18.--Color TV Control Room Console
(Lockheed Aircraft Corporation--
Lockheed California,
Burbank, California)

Headquarters does review some of the programs. There are Corporate directives on TV standards for intercompany distribution and compatibility.

IP is accomplished through the technical staff of the Training Department. An instructor or a line or staff expert (an engineer or technician) in the area of interest being considered is the content specialist who makes the pertinent information available to the script writer/producer. The producer will then put the script into a TV, slide-sound, or other format for presentation. The desirable medium is chosen by virtue of the objectives. There are two script writers/producers on the staff, one for ITV and the other for slide-sound.

The equipment is of professional standard and very sophisticated. The following are some of Lockheed's IP statistics.

During the year 1969, 44,000 employees representing 902,000 man hours were expended for IP. Direct costs (not including salaries) for both blue and white collar employees ranged from $1.25 to $1.50 per instructional hour. The total budget for training, including instruction, was approximately $6,500,000.00.

> CCTV produced 143 videotaped programs which required 1,136 hours of production time. [Some] 271 programs were played back to 42,458 persons. [Of these] sixteen fully scripted programs were produced.
>
> Audio/visual produced 78 programs which required 2,098 hours of production. [Of these] 86 productions were played back to 9,868 persons.[1]

The content areas for each employee category is as follows:

a. Blue Collar Employees

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[1]From a year-end report.

Fig. 19.--Slide-sound Production Control Room (Lockheed Aircraft Corporation--Lockheed California, Burbank, California)

Operators and craftsmen receive skill training and general education. Line foremen receive supervisional skills and self confrontation (for self-evaluation) training sessions.

b. White Collar Employees

All white collar category employees who participate in IP receive supervisional human relations training and participate in self-confrontation exercises.[1] Professional and technical employees also receive technical skill training and general education programs.

A study was conducted at Lockheed comparing learning by conventional methods and learning via ITV. A computer fundamentals course of 100 hours duration, when taught conventionally, was produced on ITV. The ITV course was of forty hours duration, plus ten hours for examination. The research attributed to ITV better participant comprehension, test grades averaging 10 percent higher, and a saving to the company of $44,000. The cost savings are directly proportional to the number of employees participating in the program. In this case it is calculated for 500 employees.

Lockheed also offers after-work courses on a voluntary basis "to assist employees to do a better job in their present work assignments, to help employees qualify for higher level jobs in their present work area or to prepare for positions in other fields."[2]

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[1]An outstandingly successful human relations ITV course was given to secretaries and clerical employees on Telephone Courtesy (proper telephone technique).

[2]Lockheed Extension Education Program (LEEP).

TABLE 1

BREAKDOWN OF COURSES (OR PROGRAMS), PARTICIPANTS, AND HOURS OF INSTRUCTION AS THEY RELATE TO EMPLOYEE CATEGORIES AT LOCKHEED AIRCRAFT CORPORATION

	Number of Courses Offered Per Year (All Methods)[a]	Number of Courses Using ITV	Average Number of Participants per Course	Average Number of Hours Per Course
Blue Collar Employees				
a. Operators--(Production and Assembly Line Machine Operators)	50	10	22	24
b. Craftsmen--(Tool and Die Pattern Makers)	75	8	22	24
c. Line Foremen (Production and Assembly Line Supervisors)	10	3	22	24
White Collar Employees				
a. Professional and Technical Staff (Engineers and Technicians)	100	10	22	30
b. Personnel and Sales Department Employees	10	2	22	20
c. Managers, Supervisors, Executives	10	2	22	40

[a]This includes not only ITV but also programmed learning and audio-visual learning.

Other facts of interest are:

a. About 350 disadvantaged persons were employed by Lockheed. Some 30 percent have left the program even though there is a screening process for applicants (Lockheed has a special program for the disadvantaged). Courses include skill training, use of machinery, and safety. General Education skills are also taught.

b. A basic problem encountered is one of distribution of learning material. Generally learners must come to the training department's classrooms.

c. Lockheed has recently installed a color facility.

d. About $200,000 has been invested in ITV equipment and facilities.

16. Hewlett Packard, Palo Alto, California

The IP unit at Hewlett Packard (HP) corporate headquarters is responsible for programs dealing with corporate policy and continuity as well as training employees. The unit also serves HP customers with training VTRs which may be purchased.

New programs introduced for production by the ITV unit are analyzed in relation to the behavioral objectives sought for the program participant (i.e., What is he to know and do? How is he to do it?). This information is given to the ITV producer-director who writes a complete script. The visual material is prepared and videotaped without sound. The script is narrated on quarter-inch audiotape which is then "dubbed" onto the VTR's audio track. Finally the VTR is edited for purposes of continuity. This procedure serves two important functions for HP.

a. The VTR presentation is a completely subject-oriented A-V

experience because it does not show the narrator, nor (in the opinion of the IP director) should it.

b. The "voice-over" audio "dubbing" technique permits HP to "dub" foreign languages into their VTRs for use by overseas divisions in many lands. Because the narrative is fully scripted, translations are made on the foreign site by native speakers, using the proper dialect, where dialect is a problem.

Some major areas of IP which utilize TV are:

a. New product introduction for both customers and HP sales employees

b. Customer training courses, paid for by the customers

c. Trouble-shooting

d. Sales support

e. Public relations (corporate image, etc.)

f. Supervisory and personnel training skills

Programs whose subject is equipment servicing are receiving some emphasis. Tutorial programs (How to . . .) which deal with concepts are also an important area of learning. The tutorial tapes may be from seven to ten minutes in duration, each of which has a self-testing process built into the program. HP will thus build an encyclopedia of training tapes, dealing with single concepts which are not recorded elsewhere (e.g., how a tuned circuit works and other phenomena). Approximately 300 VTR tapes are sent out to various places per month.

HP has invested about $200,000 in TV equipment at corporate headquarters. There are eight IP staff members. Each staff member

serves two roles, i.e., technician-engineer, cameraman-graphic artist, producer-director.

It is the opinion of the TV manager at HP that future ITV staff members should have behavioral science experience. It is also his opinion that graduates of learning institutions teaching TV broadcasting are not desirable because their learning experiences are not applicable to ITVI. Training people with behavioral science backgrounds for ITVI is easier than retraining people from TV broadcasting backgrounds. The reasons given for this opinion are that ITVI is more highly structured and disciplined than even ETV. Moreover, ego involvement, important in commercial TV, is done away with at HP because "credits" for the TV program are not given. Producer-directors and staff for all programs remain anonymous.

A program will have certain behavioral objectives. The participant must learn to perform a certain task proficiently in a certain length of time. The producers are given a certain set of rules that relate to the learning objectives.

The learning objectives are "weighted." This means that some measure is taken relative to learning areas critical for solution of the problem. For example, four objectives may be measured and put in an order of importance. If all are perceived to be critical, then all will receive full visual support. Less critical objectives will receive less visual support. This serves the purpose of deciding how much screen time and how much copy is necessary for each concept or objective. It is also important to ascertain time investment for each concept.

If the information concerning the "weighting" was not made known to the producers, then each objective or concept would probably be treated equally, a situation that is inefficient in relation to the particular learning material.

All immediate testing of the participants in IP is done by a process of self-evaluation. HP feels that if someone needs extra help, he will ask for it. If he needs the help and doesn't ask for it, this fact will become apparent through on-the-job performance, which has implications for retaining employment.

This phenomenon is more prevalent overseas than in the United States, which is one of the reasons that HP is developing the encyclopedia of tutorial VTRs.

17. Fireman's Fund American Insurance Companies, San Francisco, California

The San Francisco Bay Area seems to be an interesting market place for video products. The interviewer received the impression that there is a valuable exchange of information between manufacturer representatives and users. Suggestions and information are freely given. Generally the interchange is through the vehicle of monthly meetings between members of the Industrial Television Society's (ITS) local chapter which has as members both users of ITV and TV manufacturer representatives.

The ITV activities at Fireman's Fund started in 1966. The first TV equipment was rented, and the first use of ITV was for role playing by sales trainees. Today training programs differ in core-content areas and length of the programs. Some longer programs are

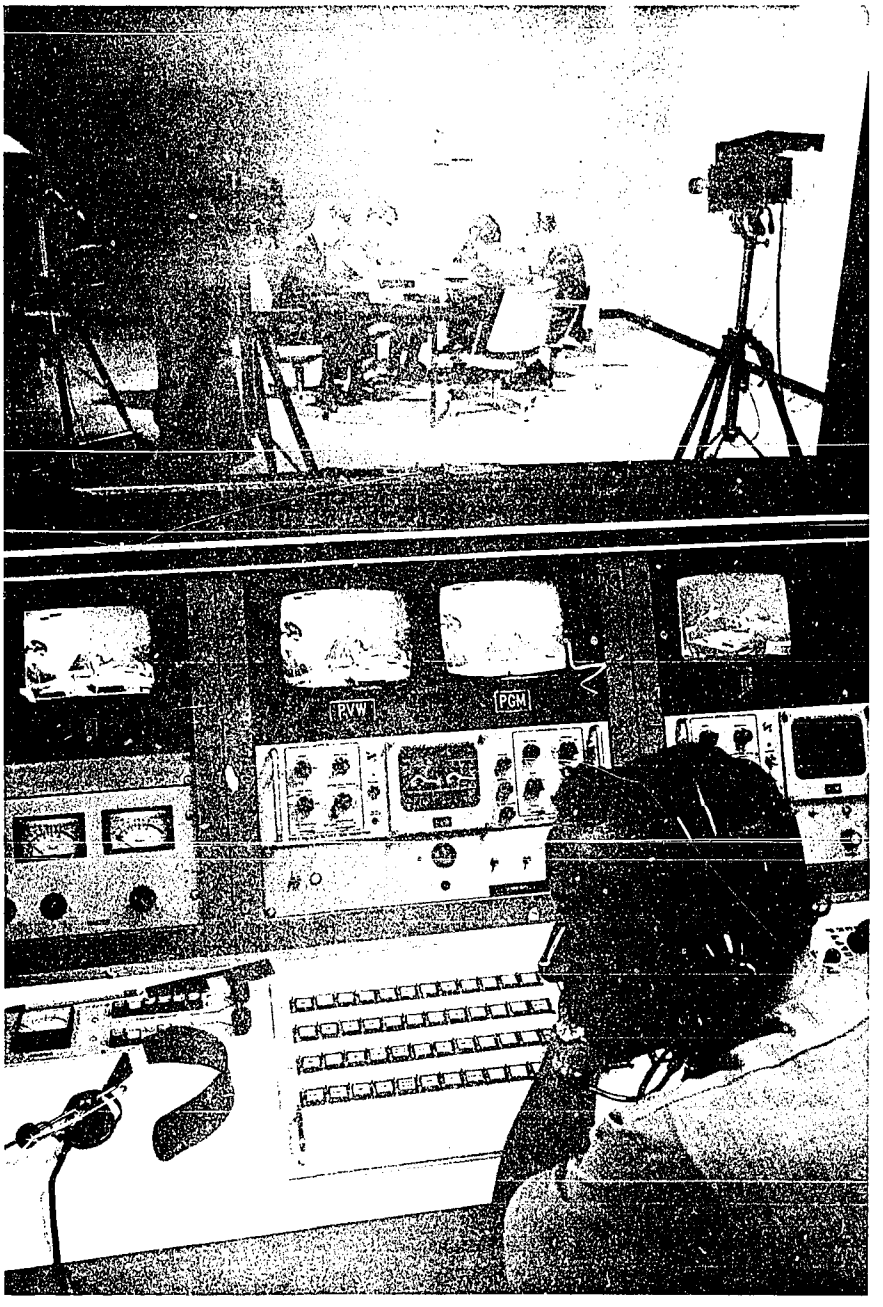

Fig. 20.--"A Training Seminar"--The view from the control room of the TV studio (Courtesy of Fireman's Fund American Insurance Companies, San Francisco, California)

taught at the home office while others are taught at the local division in outlying areas around the country. Programs range from three-day seminars to four-week "schools."

The IP department has experienced dynamic growth in ITV equipment; from equipment rental to an investment of over $100,000 within a four-year period.

One of the unique and innovative uses of VTRs for training is that of the claims department which is responsible for settlement of insurance claims in disaster areas.

VTRs are used to document damage caused by hurricanes. This type of documentation saved many hours of paperwork which had been conventionally used by claim adjusters at Fireman's Fund. More importantly, the added advantages of audio commentary, together with the videotaping at the site, gives a dimension of accuracy which was unattainable until now. As a result of this on-the-site, eye-witness account of damage, the information provided permits accurate decision making concerning large claim settlement.

Up until now Polaroid pictures were taken (they are still used to a degree), and although audiotapes had been used in the past, the claims adjuster at a great disaster site, working eighteen hours a day, would have to recall the sources of information which related to the pictures taken.

This claims recording, evidence gathering documentation process, is used in training programs. The same VTRs actually used for claims adjustment are used in a seminar training situation. The fact that the TV camera could be taken into places showing specific points of

interest was a valuable learning experience. The participant can learn, for example, about the differences in damage due to recorded wind velocities on one hand and damage due to water causes on a property, a difference which has important implications for claims adjustment.

Evaluation questionnaires are used after ITV programs and seminars in order to ascertain the progress, attitudes, and opinions of the participants and their reactions to the VTRs. This evaluation is also used as a feedback and updating mechanism.

18. Mattel Incorporated, Hawthorne, California

VTRs have been found to be an effective method for communicating technical information among the nineteen world-wide manufacturing plants of Mattel toys. The company believes that continuity in product manufacturing processes is an important consideration for producing quality toys. An ITV program called "Modern Injection Molding", developed by the instructional unit, exemplifies this approach. Mattel describes it as "a results-oriented program designed to effectively and economically teach modern injection molding technology to managers, engineers, supervisors, and technicians."[1] Five, ninety-minute sessions cover the following areas: (1) Molding Principles, (2) Molding Variables, (3) Molding Problems, (4) Mold Design, (5) Part Design. Because of the success of this particular program, Mattel has made a "package" offer to other companies who wish to train their technical staff in injection molding, according to three options:

a. Program Rental

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[1]From a two-page pamphlet called "Modern Injection Molding."

b. Program Purchase

c. One-day Seminars

Each option contains course materials, including:

a. Five videotapes or films

b. One leader's guide

c. Fifteen student notebooks

The notebooks contain a review and quiz for each session, a project or problem which relates to each session, an outline of each presentation, and a glossary of terms.

Mattel employees who participate in IP are requested to fill out a five-question evaluation form.[1]

Interview Respondents' Observations

The purpose of this section is to identify observations made by the interview respondents regarding ITVI. No attempt has been made to identify which individual of which organization made the observation; in accordance to personal requests of some of the interview respondents, the observations will remain anonymous.[2] There are many conflicting observations which, in the opinion of the writers, suggest the fact that the respondents represent different philosophies in approach and because of this, perhaps, put value emphasis in different areas.

1. Concerning the Philosophical Approach to the Use of ITVI

a. If ITVI is to work, it must work through the imagination and creative ability of the people working with it. ITV demands expertise

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[1] See example of form in Appendix B, pp. 45-46.

[2] Because of the nature of the interview, it is impossible to quote the remarks word-for-word. Therefore, they have been paraphrased.

no less than other professions do. An educator working in ITV, but with no prior experience with the medium, can think only in terms of teaching through the formal methods which are familiar to him. An ITV expert thinks in terms of presentation because who says a learning experience has to be dull?

b. Even for ITVI, you are obligated to do a professional job, and you can do productions with background music, narrative, insert films, make electronic edits, and so on. It's not really different from commercial TV.

c. If you do not create a good ITV production, you will lose your audience. If you lose your audience, you might just as well not have produced the lesson in the first place.

d. One of the greatest problems in ITVI is not with the CCTV equipment, but with the application of the equipment. The equipment is quite satisfactory. With an investment of considerably less than $2,000, one can create a professional production comparable to commercial TV.

e. Good results are important. One can achieve good results, if this is the objective, only with good equipment. With poor equipment you are limited. Good equipment immediately opens up options in terms of production and editing.

f. Sometimes, artistic perfection in a training tape can take on the aspects of entertainment thereby losing the instructional impact. Overproduction does not enhance information. If local people are used as ITV talent, it can have both positive and negative effects:

1) Positive in the sense that "this guy on the screen is one of my supervisors, therefore this material is very applicable to me."

2) Negative in the sense that "Hey, there's Joe and that's my work area," instead of "Say, Joe is really identifying one of my problems and showing me how to solve it."

g. If, in the opinion of the programming director, a learning experience can be better taught in another medium (other than ITV), then the better method should be used.

h. The utilization of ITV and the method of ITV presentation is limited only by the imagination and creative ability of the system's user.

2. Concerning ITV Expertise

a. It is not often that a person in the audio-visual department is also knowledgeable in ITV and VTR. Usually they have specialized in their particular field of audio-visual and they acquire expertise in ITV as they go along.

b. In the beginning, most of the instructional programming managers were old training directors who were thrown into a room with TV equipment and told to do something with it. Today this is completely untenable.

3. Concerning the Manufacturers of TV Equipment

a. The manufacturers of TV equipment do not know how to sell their own equipment effectively, much less set up servicing capabilities for equipment already bought. Why doesn't the manufacturer produce "how-to-do" videotapes? For example, "How to edit and with what equipment," "How to use the camera and how to make simple repairs," "How to use the special effects panel and what technical applications are available (i.e., split screen or methods of individual point emphasis, etc.)."

b. TV equipment is not standardized, which is a real problem. The manufacturers are not gaining by using their own individual specification formats, they are losing our goodwill.

c. TV equipment available to industry cannot take the abuse that we are sometimes forced to put it through.

d. The TV equipment manufacturers are not serving the customers to the extent that they could. Why are they not producing training videotapes for their own equipment for maintenance, proper use, installation of additional components, studio design, control room design, optimal equipment needs? This would not only be helpful to their customers, but also be a public relations and advertising vehicle.

e. There seems to be a total disregard by manufacturers of TV equipment regarding the technical problems involved with learning by ITV. They are not responding to ITV needs because they don't know what these needs are.

4. Concerning Multimedia

a. Attempts have been made in making a VTR from a slide presentation. This was found to be unsuccessful. The impact was greater in leaving the slide presentation a slide presentation.

b. Commercial training VTRs do not always respond to our particular needs, and besides they are usually very expensive. Some are more expensive than commercial training films.

c. ITV was more enthusiastically accepted when coordinated with films, slides, and other media.

d. We keep away from motion picture film because (a) the cost factor is so great and (b) it takes too long to see the results.

5. Concerning the Learners

a. By and large, people are not terminated from employment because of failure to absorb the learning material. Special help is sometimes given. New applicants are screened upon entering employment. During the orientation period, personal behavior and abilities are observed and if necessary such persons judged unacceptable are terminated. During the past years, we have recorded less than one percent termination due to learning failure.

b. We do not terminate our employees who do not "pass" our courses. They receive special help in order to absorb the material. Sometimes we even send them through the same course twice. Tenured employees are too valuable to us.

c. Upper management are the hardest people to train because they feel that they are where they are because of their ability and knowledge; therefore they don't need to be taught. Some of them haven't heard of "Peter's Principle."[1]

6. Concerning the Instructors and Instruction

a. It is most important to be selective relative to who is to be the instructor. The instructor is the most important factor in putting over the material. In some cases, it may be advisable to hire a professional instructor who is known as a good communicator.

b. A person who is an expert in a content area is not necessarily a good instructor. The instructor has to know how to be entertaining.

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[1]This refers to a book, Laurence J. Peter and Raymond Hull, The Peter Principle (New York: Bantam Books, 1970), whose thesis is that people in organizations are promoted by virtue of their ability to a final level of incompetence and there they remain.

7. Concerning University Trained TV Specialists

Schools teaching studio practices and basic knowledge of hardware to students of broadcasting do not give the specialized information needed for ITVI. Most students coming into ITVI seem to be surprised at the level of activity in industry. They (the students) find that they must reorient their thinking from broadcasting to ITV. Industry needs a jack-of-all-trades.

8. Concerning the Formal Education Institutions

The formal education community has had access to television to do something with this resource, but virtually nothing has been done. When we in industry buy TV equipment, we use it.

Summary

This section has identified activities of the different organizations which were visited and personally interviewed. Distinct areas of interest in each organization were described. As previously noted, these activities were not necessarily mutually exclusive of those in other organizations. The described activities were attributed to the specific organization because they illustrated for the writers the procedure, execution and/or mechanism necessary for this study.

ITV as an instructional tool is a recent innovation of industry. In all the industries studied, ITV was introduced no earlier than 1964.[1]

In all the cases, the respondents were part of a separate instructional unit responsible for IP whether within the local division of the corporation or within the corporate headquarters. The unit itself was defined in many different ways. The structural organization of instruction in terms of centralized planning was varied and in different degrees. In some cases, the planning and presentation were the responsibility of the IP group within the corporate headquarters. In other cases, the local division of the corporation would be primarily responsible for the IP. In still others the learning material came from a corporate headquarters which would concern itself with corporate policy and continuity. In all of the above cases, the participating learners would either come to the instructional facility to learn or, if the

[1] In some cases experiments were carried out before this date (1964). However, it should be noted that some U.S. Armed Forces Schools introduced ITV as early as 1951. Results of research concerning ITV in the army and navy was reported as early as 1955 (see section on related literature, pp. 20 to 21).

proposed number of employees or conditions warranted it, the instruction would be made available in the approximate outlying area of the learners.

ITV programming appeared to be emphatically directed toward the following objectives:

a. Orientation of new employees, both blue and white collar, such areas as corporate safety and security, company policy, employee benefits, and entry job positions.

b. Updating professional employees, primarily engineers and technicians, keeping engineers and technicians informed and appraised of the latest technical developments or maintenance methods. This was a primary objective in using ITV.

c. Skill training in the human relations and communications areas for managers and supervisors, sales and personnel department employees. All of the organizations interviewed expressed the fact that they had unusual success with the development of communication skills through self-confrontation exercise with TV.

d. Skill training for blue collar employees. Safety methods and machine operation were taught by using the TV camera from the position of the operator, thereby clearly illustrating the operation.

In all cases, ITV was used to complement formal instructional methods, and rarely used as a total teaching device[1] (i.e., unsupported by the presence of instructors, use of other media, group discussions, etc.). The instructional staff received instruction in the use of ITV

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[1]The Stanford system described in the IBM section (pp. 65 to 68) utilizes totally programmed ITV. It is the opinion of the writers, however, that the TV camera is used only as a communication carrier and not as a teaching method in itself.

methods and equipment, mostly by company experts. However, outside sources were utilized. For example, some instruction in equipment use is offered by the different commercial manufacturers of the TV equipment. Some instruction in the use of TV equipment is offered by private institutions. An example of this is ACTS.[1]

A number of the organizations interviewed had a staff member who was the product of the Adult Education Department of a university School of Education. High school and vocational school teachers as well as university instructors are also part of a number of IP staffs.

Many factors influenced the development of IP in the different organizations. Some of these were:

a. Research and development in applied science programs in industry have reaped a rich harvest of information concerning new methods and materials. This information had to find its way to the production areas in an organized manner.

b. Graduate education in formal educational institutions does not seem to be meeting the specific demands of industry. Therefore a stop-gap measure had to be introduced in the form of IP in industry.

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[1]ACTS (Advanced Communications Techniques Seminars) offers practical seminars providing "hands-on" (practical training) learning experience in workshops actually producing videotapes with different equipment. According to an ACTS brochure, the overall seminar objectives are to provide each participant with:

a. "A knowledge of the available television and videotape recorder equipment necessary for selecting systems to meet specific needs.

b. 'Hands-on' operating experience of typical television systems in a variety of simulated applications.

d. Knowledge and experience in the latest methodology for effective use of television and videotape in organizational training and communications."

c. More efficient and less expensive methods for employee orientation had to be found.

These were the primary factors in IP development. Other factors were needs determined by job analysis or the need to develop a new cadre of managers and supervisors from within the organization. Giving instruction for upgrading, updating and human relations training has become a policy of most corporations to assist employees in their development. ITV has become an instructional tool primarily because it enabled wider distribution of instruction to more employees, yet permitted flexible scheduling, and required less time consumption on the part of key people. In most cases the respondents expressed the feeling that ITV was less expensive than other media. Some organizations, however, were not primarily concerned with the cost factor, while others were very much concerned.

Generally, IP originates from within the instructional unit. Line and staff employees considered knowledgeable in their fields help develop IP in all the available media, whether on a corporate level or a local divisional level. For ITV these employees may give outline information to TV program producers or they may write the programs in script form and become the "talent" for the presentation. Some organizations either buy commercially produced training VTR, cooperate with local commercial TV station or university stations to conduct programs for them, and/or bring in outside consultants to help develop ITV programs.

Employees are usually chosen to participate in IP by their immediate supervisors according to perceived needs. In some cases

participation is mandatory for retaining employment. Of the organizations interviewed, some were service organization responding to customer needs and therefore, the customers made the decision regarding who in the customers' organization would participate.

Most of the instruction was offered during the work day, generally permitting a concentrated, eight-hour-per-day program. Engineering type courses are offered on open circuit TV before the work day in some areas, as well as multimedia courses in outside institutions (e.g., a local university or technical institution). These would necessitate part-time participation.

Product manufacturing organizations will generally cover all the costs of in-house instruction. For outside instruction, either a "cost-sharing" procedure would be followed (i.e., the organization would pick up a proportion of the fees), or a conditional "tuition-refund" procedure would be used. The "tuition refund" system will refund all of the fees (sometimes including books) to the employee, only if his grades are above a certain desired level. If the grade is below this level, the refund may be pro-rated or not returned at all.

As has been mentioned, ITV is not used as a total teaching mechanism. Questions that may arise during the ITV lesson are usually answered by one or a combination of the following methods:

a. A start-stop procedure is usually used, i.e., when a question arises, the VTR is stopped and either a brief discussion takes place or the question is quickly answered by the classroom instructor.

b. Study guides and/or other supplementary learning materials such as books and pamphlets will also supply answers.

c. Guided group discussions after the viewing with the in-class instructor is the most general practice. This of course is the system used for "live" TV programs. The start-stop system would be used after a "self-confrontation" ITV lesson during a guided group discussion session.

VTR is the most widely used method of televised presentation. Live programs are generally taped for self-confrontation and communication exercises, and afterwards the tapes are erased. Kinescope recordings are not widely used; however, films and slide presentations are used either within the VTR itself as supplementary visual aids, or as the main instructional media during the learning session. It should be noted that the writer was impressed by the fact that invariably the seminar type of class discussion was the method with which the learning period ended (i.e., where this method lent itself to the type of core content being learned).

Attitudes and methods regarding rewards for participants who complete the program varied. Some organizations treated the participation in IP as a prerequisite to retaining employment. Other organizations gave certificates for completion of a program. Outside agencies generally gave certificates or, as in the case of formal instructional institutions, an accredited diploma was offered. In all cases, the fact that an employee participated in instruction was noted in his personal file, and invariably all the organizations stated that when salary increases or actual promotion of an employee were involved or considered, his participation in IP was taken into account.

Updating ITV programs was accomplished generally by suggestions from instructors, learners and/or supervisors. In a few cases, IP committees would themselves suggest changes in the VTR. Measured evaluation of the results of learning experiences by management appeared to be a difficulty. Usually, evaluation was accomplished by one or a combination of the following procedures:

a. Testing the participant using written examinations

b. On-the-job performance rating by the immediate supervisor

c. Instructor's opinion of learner

In some cases organizations made comparative studies between total traditional instruction and ITV. The decision was reached that for the kinds of objectives that their particular instruction aimed for, ITV was the superior method.

The sum of money invested in ITV varied because of the relative support for ITV from upper management, which made the funds available, and also because of the perceived equipment needs of the ITV programming staff. The individual investments for ITV facilities for the fifteen organizations ranged from $6,000 to $200,000.[1]

[1]There seemed to be a tendency toward two levels or groupings of investment. The first group of industries averaged approximately $45,000 while the second group averaged approximately $150,000.

CHAPTER III

SUMMARY AND CONCLUSIONS

The findings in Chapter II are definitive descriptions of the activities, program formats, course designs, and objectives and observations concerning ITVI. It is now possible to define ITVI which was an objective[1] of this study. Instructional Television in Industry may be defined as an adult education technique utilizing the unique characteristics of television in a supportive role for the advancement of technical and general knowledge, which relates to defined specific objectives of the industrial organization for all employee strata.

ITVI has the capability through storage of information on videotape or related storing techniques to be used for review and recall by the learner, to give instant feedback for self-confrontation and evaluation of interpersonal communications instruction, and to be easily and inexpensively duplicated for distribution to remote areas for dissemination of information perceived necessary by the industrial organization.

The premises suggested in the first chapter have, in the opinion of the writer, been more than verified. These are:

a. Industry is an environment in which major adult educational

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[1]See page 19 of Chapter I.

activities are taking place.[1] The fifteen units surveyed (Corporate Headquarters and Divisions of the Corporation) alone represent an adult learning population of approximately 100,000 employees. This total does not include all the units throughout each individual corporation.

b. The formal educational system is not responding to industry's needs, nor perhaps can it.[2] This fact has been borne out by the proliferation of subject matter being offered to all strata of the industrial community which includes technical, supervisional, human relations, and communications skill training, technical updating for engineers and other professional employees, and basic and advanced general education (language skills, mathematics, money management).

c. Industry is proving to be a unique educational environment. This is borne out by virtue of programming formats utilized (i.e., videotape recordings for flexible programming relative to time, availability, and continuity).[3] The factor of availability and design through ITV and other audio-visual methods also responds to the premise that knowledge concerning ITVI can have important implications for the formal educational system and the disadvantaged (which includes the urban and rural poor), and can provide insights for further studies in the industrial environment.

These and other factors will be discussed in the following pages.

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[1]Chapter I, page 1.

[2]Chapter I, page 14.

[3]Chapter I, page 15.

Observations

1. Upper management support.--It was obvious to the writers that the ITV operation in each industrial organization reflected the amount of support that the instructional unit was receiving from the organization's upper management. This support affected the unit's organizational structure in terms of staff members, number of participants, TV equipment, facilities, programming format, distribution of instructional material, and above all the unit's budget.

In many cases, support is directly proportional to the ability of the IP staff to "sell" the ITV medium to upper-management. "Proof" of the medium is that it must justify itself financially. Financial justification can come from cutting down the learning period of the employee participants, time involvement of IP staff members, improving employee proficiency through ITV over and above formal methods of instruction, ease of distribution, and aiding corporate conformity and continuity in the content matter. The value of a service such as ITV to an industrial organization is difficult to evaluate in terms of overhead or investment. When doing battle with the budget controllers in industry, the instructional programming department must have top level support. The reason is simply that when management is favorably impressed with the ITV capabilities, then this medium is given the freedom to grow and the end product is generally of a better caliber.

2. Research comparing ITV and conventional teaching.--On the first page of this report, the writers emphasized the fact that ITV is just one of many other methods of instruction. IP directors interviewed agreed that ITV cannot stand alone as a total teaching mechanism for an

efficient learning experience. ITV must be used in conjunction with other methods, namely, in-class instructors[1] and study guides, group discussions, A-V media, hands-on-training, programmed learning, etc. This survey has borne out the fact that ITV is an educational method of major proportions in those industries surveyed. Tens of thousands of employees of all strata are participating in IP utilizing TV. Millions of dollars are being invested in TV equipment and facilities.[2] Hundreds of thousands of dollars are being expended on videotape recordings for distribution (by some industries) all over the United States and parts of the world.

One of the studies[3] mentioned in the section on Related Literature in Chapter I analyzed and compared what was referred to as ETV[4] as compared with conventional teaching methods. The findings of the above study concluded that "ETV May Be Just as Good (or Bad) as Other . . . Media."[5]

> Media and Methods.--A common distinction is made in the literature dealing with comparative instructional procedures. This is the distinction between media and methods. We may define an institutional medium as a total configuration of the technology and interaction between teaching and learning. Two media would be distinguished from each other if there were obvious and measurable

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[1]Other terms for instructors are: proctors, monitors, and teachers.

[2]Figures indicate that industry will spend about $770 million for (ITV) equipment in 1971 as compared to $690 million in 1970, an increase of 17 percent. Gerald Gronau, "Educational Technology: A Growing Market," Educational/Instructional Broadcasting, III (December), 19.

[3]Dubin and Hedley, "The Medium May Be Related to the Message."

[4]ETV is Educational Television. ETV and ITV are interchanged in the Dubin and Hedley study.

[5]Dubin and Hedley, "The Medium," heading of Chapter I.

differences in their respective configurations. Thus, face-to-face instruction is a medium distinguishable from instructional television. Both of these, in turn, may be distinguished from computer-assisted instruction as a third medium. Not only do the technical characteristics of the configuration vary among these three media, but the particular teaching inputs and the singular learning inputs may also be distinguished among them. [Underlining ours.]

A teaching method, on the other hand, is a recognizable procedure employing a given medium of instruction. Thus, a straight lecture versus a discussion method represent two variations within the medium of face-to-face teaching.

It is essential, in trying to determine the relative merits of a medium, as we are doing in evaluating educational television, to be reasonably certain that we are not confounding media with methods. If we propose to contrast the medium of face-to-face instruction with ETV, then it is essential to insure that possible variations in teaching method do not confound the media comparison.

We do not think that this dual impact of media and method has been adequately controlled in past reviews of the literature contrasting educational television with other media. Consequently, our first task in marshaling the data as a basis for making our comparative analysis consisted of a careful reading of each study to determine that similar or identical teaching methods were employed in utilizing the several media being contrasted. This led us to discard a number of comparisons on the grounds that variable methods of instruction were used in the comparison between the media.

It is important to understand this procedure for we believe that none of the previous summaries of the field undertook to hold constant teaching method in order to insure that this variable did not confound the media comparisons. [Underlining ours.] One of the important results of our study following this procedure was to provide an opportunity to make a detailed analysis of differences among media for particular teaching methods. Thus, for example, we will demonstrate that when a lecture is used in both face-to-face instruction and in the ETV medium, the former appears to produce superior results until we parcel out the effects of two-way TV, after which there is no difference between the two media.[1]

In the above section the authors attempted to differentiate between "media" and "methods" and by so doing, had in their grasp the basis for a well developed research study. If the above underlined passages in paragraph 1 in the quotation are considered, the "technical characteristics of the configuration" is the key phrase. Had the

[1]Dubin and Hedley, "The Medium," pp. 2-3.

authors analyzed the "different" technical characteristics of the configurations (i.e., face-to-face instruction, ETV, and computer assisted instruction) in relation to how they can effectively be used for different types of core content areas, their study, in the opinion of the writers, might have had an entirely different conclusion.[1]

However, this is not what the authors did. In the quotation underlined in paragraph 5 of the quotation, the authors held the teaching method constant. This is comparable to using a piece of chalk on a blackboard instead of pencil and paper in order to "amplify" or "carry" a written communication to someone in back of a room, or use a loudspeaker system instead of the normal voice to carry a verbal message farther than the normal voice can carry. In other words, in this study the television camera and monitor were used as a "sight-sound, carrier-amplifier"[2] in various ways for what is called in ETV a "chalk-talk" situation. The TV medium was not utilized for its unique characteristics as a teaching mechanism conducive to learning, in relation to

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[1]An experimental study such as suggested here might have significance in relation to comparative merits of different methods of teaching. The research model could be one of using similar control groups, all learning the same subject matter but using a number of different methods and media. The number of media and methods would equal the number of control groups. The result could have significance in relation to determining which is the best method (or medium) for teaching this subject in formal educational institutions.

[2]The Stanford System, Colorado SURGE, and other such systems are all TV "amplifier-carrier" systems of one form or another. They do not utilize TV's unique characteristics as a learning mechanism for complementing and supplementing other learning methods. Their service has another, and in the writers' opinion, no less important function and that is "availability." Availability will be discussed subsequently in this chapter.

particular core content learning areas. This is what should have been analyzed and compared and here is where significance can be logically measured. Face-to-face learning is better in certain areas of learning, and computerized learning in others. The same holds true for group-discussions, slide shows, lectures and hands-on training. One teacher (who in himself is a teaching mechanism) may be decidedly better than another by virtue of his method of presentation.

If the objective of the research study was to measure the effectiveness of a carrier-amplifier system, then the point was made. However, if the objective was to measure effective use of a medium, which the study seemed to imply, then the study was a complete failure.

3. Evaluation.--The difficulty in objective evaluation[1] of employees experiencing different forms of training, was overwhelmingly agreed upon by the persons interviewed. The respondents also generally agreed that the employee participants displayed satisfaction in being part of an instructional program (Hawthorne Effect). Objective evaluation is dependent upon many variables (e.g., from what kind of social environment does the employee come, what is his educational background, are there good communication lines between the employee and his immediate supervisor, how does the employee relate to others?).

Because the learning objectives are based on task-oriented needs, most of the evaluation methods attempted to measure the degree to which the learner progressed in effecting change in task efficiency as a result

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[1]Objective evaluation means the measure of the social-psychological effects of the learning experience (i.e., changes in attitudes and behavior).

of his learning experience (e.g., the production worker would produce more, and spoil fewer parts, the salesman would sell more, the engineer would respond better to problem solving, the service department would have fewer complaints from clients, and the serviceman would be called in less often for help in remote areas). In some cases the evaluation procedure was more sophisticated than others. For example, the salesman or serviceman would have a closely scrutinized monthly record, or, on the other hand the supervisor of a blue collar employee would be asked casually how that employee was getting on after having attended "school."

Usually if the IP department does not hear afterwards about the employee, this is taken to mean that the learning experience has had the desired effect. If there is negative feedback (i.e., the employee has not improved), then a decision is made regarding retraining. Retraining is not always considered as an indication of the employee's inability to learn but could also be an indication of the IP department's inability to teach.[1] Sometimes program and course designs are changed.

Evaluation must be a continuous process. The participant must be evaluated in order to ascertain if the instructional objectives have been realized. Participants and instructors must provide feedback concerning the validity and quality of the learning experience. Written tests, hands-on examinations, solicited and offered opinion, and direct observation are some feedback methods.

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[1]This approach to learning and teaching has important implications for teaching not only the university student but also the disadvantaged. This will be discussed in the following pages.

Curriculum

ITV programming in industry is still feeling its way. During the survey it was interesting to note that inter-communication between industries, concerning IP in general and ITV in particular, is just now becoming evident. The importance of interaction is obvious and as a result, two national organizations were recently established.[1] Their goals are to fill the perceived needs of the professional membership as they relate to the TV medium in industry.

Each industrial organization has developed models (designs) and formats (methods) for their own particular needs because no previous models could be used as a basis for development. There is the problem of establishing priorities for learning and program design. What is the best procedure? What methods are the best for a given content area? What is the educational level of the participants and how does the IP respond to the level? These questions and the survey results illustrate the need for a professional education to prepare interested students to fill staff positions in IP in industry.

Although the history of skill training in the United States dates back to American guilds which fulfilled the function for training new manpower, modern industry is meeting the specific training and educational needs for its manpower potential. The pioneers of industrial instructional programming have come from many disciplines with experiences in many areas (e.g., engineers, educators, multimedia experts,

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[1]The Industrial Television Society (ITS 1969) which originated on the west coast and the National Industrial Television Association (NTA 1970), originating on the east coast. It is the writers' opinion and hope that these organizations will merge.

and supervisors). Their struggle (and it has been a struggle) has been uphill. The main reason for this is the fact that instructional programming has had to justify itself every step of the way from staff and equipment needs to evaluation of results. Lack of support for IP from top management has developed because of the problem of ascertaining the value of the instruction. Is IP an investment bringing profitable and measureable results or is it an overhead expense? Whatever the individually perceived answer is, the evidence of the survey indicates that IP is rapidly growing and ITV is becoming one of the more popular and expanding methods used. As one of the respondents observed, while there are some problems of evaluation of some of the ITV courses, management keeps coming back to request more.

No matter what the problem may be, there is an expressed and growing need for a new type of trained professional who could fulfill the various tasks of instructional staff members in industry. This professional would be university trained in both the theoretical and practical aspects of IP in industry. The university curriculum could be designed for both undergraduate and graduate degrees. In all probability there are courses being offered at many institutions that would be applicable to such a curriculum.

Implications and Applications of IP in Industry to Formal Educational Institutions and the Disadvantaged

There are books filled with learning theories and the psychology of learning. One of the aspects of learning which perhaps can stand even more investigation is why people learn or why should they learn or

of what good is learning? The following are some observations about the "why."

> The overall purposes of learning are relevant to the social order within which they operate. We believe in the democratic way of life with its emphasis on (a) opportunity for the fullest development of the unique capabilities of the individual, and (b) a socially oriented group within which the individual may realize his destiny. [Underlining ours.] This means that one goal of learning will be the development of creativity, individual initiative and responsibility, and leadership. The other will be the development of social skills and good human relations.[1]

The aspect of realizing destiny (the words underlined above) is mentioned in the Kerner Commission Report and refers to "destiny control" in relation to the people of the urban ghetto. It is difficult to measure quantitatively the amount of control one has over one's own destiny. Most people want to believe that they do have some control. Yet members of the urban ghetto have very little hope of any control at all.

Burton has given moral reasons for the purposes of learning, and why not? It is the opinion of the writers that the human population of a society is the single most important raw material and as such the greatest investment should be made in it. One of the most important types of investment is relevant education. The reasons are not all moral reasons as has been suggested, but also reasons of self-preservation of the society because without education and the socioeconomic advantages derived from it, there will only be chaos.

> . . . the most dramatic evidence of the relationship between educational practices and civil disorder lies in the high incidence of riot participation by ghetto youth who had not completed high

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[1]William H. Burton, "Basic Principles in a Good Teaching-Learning Situation," Phi Delta Kappan, 39, No. 6 (March 1958), 242-248.

School.[1] Our survey of riots found that the typical riot participant was a high school dropout. . . .

The bleak record of public education for ghetto children is growing worse. In the critical skills--verbal and reading ability--Negro students fall further behind whites with each year of school completion.[2]

Relevance in the learning material may have a bearing on the above. How can the disadvantaged child relate to "the little red schoolhouse?" As the disadvantaged child grows up, his future aspirations and expectations seem to develop a greater gap. He may aspire to be an engineer or a doctor but his expectations will probably fall into the category of a day laborer or a garbage collector. Quantitative education has a direct bearing on the possibility of achieving economic aspirations. Incomes have been measured in terms of years of school completed. The average college graduate (Baccalaureate) earns almost twice the amount of money than that of the average high school dropout (one to three years of high school) per year.[3]

Social pressure as well as self-interest has given industry the impetus for growing involvement in the problems of the urban ghetto. Industry has begun to realize that

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[1]One of the original premises of this report was that formal educational institutions are not responding to the needs of industry. According to the Kerner Commission Report, the formal educational institutions are also not responding to the needs of the disadvantaged from the urban ghetto and the rural poor areas.

The writers would venture to advance the premise that industry can make a major contribution in helping the education processes for the disadvantaged. The following pages will help clarify and develop the response to this above premise.

[2]Report of the National Advisory Commission on Civil Disorders (New York: Bantam Books, Inc.), p. 425.

[3]Statistical Abstracts of the United States Department of Commerce, 89th Annual Edition, 1968, p. 114.

> . . . if the nation's big cities continue to deteriorate, corporate investment will deteriorate right along with them. Alternatively, companies view America's poor as a vast potential market. . . . Alfonso J. Cervantes, the mayor of St. Louis (1969), . . . maintains that corporate involvement in the ghettoes offers the only solution to the urban and civil rights crises. He says, "Ultimately it must be private industry that figures out ways to integrate the disadvantaged--especially the Negro--into the economy and to dissolve the slum, or it will soon be necessary to despair not only of the slums, but of the total central city."[1]

Companies of all sizes are making great efforts to hire and train people who are considered the "hard-core unemployed"[2] and during the past two years, a significant number of this group has been placed at entry level jobs (simple production line positions as operatives). However, many companies are striving to train the "hard-core" employee in order to keep him on the job and more significantly, where possible, to provide the opportunity for these employees to earn promotions and climb the corporate ladder.

The National Alliance of Businessmen (NAB), representing 12,500 companies and situated in the fifty largest cities of the United States, has pledged to hire 500,000 "hard core unemployed."[3] General Motors, for example, has been most active in employing "hard core unemployed" in relation to numbers. During the first eight months of the NAB campaign, which started in 1968, GM hired 21,700 employees. These people were

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[1]Richard Martin, "Business Tackles the Urban Ghetto," The American Way (May-June 1969), p. 35.

[2]The National Alliance of Businessmen (NAB) defines "hard-core" as "any 'poor person' who does not have 'suitable employment' and is either a school drop-out, a minority member under 22 years of age, over 45, or handicapped." (From an article by Richard T. Demaree, "Business Picks Up the Urban Challenge," Fortune (April 1969).

[3]Ibid., p. 104.

given a few hours of orientation before being assigned to jobs. By the end of the eight-month period, 33 percent of those hired had either quit or been fired.[1]

In a research proposal submitted by the Regents of the University of Michigan[2] to the Manpower Administration, U.S. Department of Labor, more pessimistic statistics are cited:

> Two major manufacturing companies with plants in Detroit and Chicago have recently undertaken programs of providing jobs for the chronically unemployed [a category of the hard-core] of the inner city: "Of those chronically unemployed individuals recruited, up to 25% do not complete their first day of work. Up to 50% do not complete their first week, and about two-thirds do not complete their first month. By the end of a year 90% of these recruits have left the company. Absence rates (especially Monday and Friday absences) . . . are equally dismal."[3]

Some of the interviews for this report seemed to indicate greater effort on the part of industry to respond to the social needs of the society in relation to the disadvantaged. Some lessons have been learned. There is more careful screening of the disadvantaged applicant. Some minimal educational background is demanded. Drug users are not hired. Some industries realize the medical needs of these employees and respond not only to these needs but also make available child care centers for working mothers and provide transportation where necessary.

Within the area of the task-oriented learning experience lies the potential of industry's aid to the disadvantaged. The definitive

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[1] Ibid.

[2] Initiated by Robert L. Kahn, Program Director, Robert P. Quinn, Study Director, and Irwin Katz, Research Psychologist. The proposal title is called, "Field Experiments Integrating the Chronically Unemployed into the Work Role."

[3] Ibid., p. 2.

goals of industry's IP can help make useful, self-sufficient employees and citizens of the disadvantaged through availability of a learning environment. If participation in a suitable learning situation were more accessible, perhaps more people would learn. Industry has built into its system a learning availability, and some of the program designs have implications for both the disadvantaged and the formal educational system. The Signal Corps has used ITV methods of learning that seem to respond to distrust and hostility which are the make-up of the disadvantaged. Another industry has decided, as a result of its experience, that personal contact during the learning process is most important for good communication between the instructor and the learner. The same industry has a well developed program for teaching academic skills (reading and writing) and environmental skills (money management, interpersonal relations, development of good work attitudes). The approach is one of:

a. eliminating individual classroom competition,

b. group discussions,

c. individual involvement,

d. stimulating "a success every day,"

e. making no presumption about personal ability, and

f. keeping material interesting.

The above points do not relate only to a specific method of learning (although group discussions are an integral part of the learning experience), but to a "philosophical approach" as well. The philosophical approach is based on hard, research data relating to educating adults.[1]

[1]John W. C. Johnstone, and Ramon J. Rivera, Volunteers for

The following are some examples of research findings:

a. "Lorge . . . found that when speed was not considered [i.e., learning without stringent time limits], there was no loss in general learning ability with age."[1]

b. Anderson (1956 made an extensive review of research which has important practical applications for adult education programs and institutions.[2] ". . . Learning is more rapid and efficient when the learner is a participant rather than a simple spectator. . . . When a visible and tangible product appears as a result of a learner's activity, interest is greater and the learning will be longer continued.

. . . Group learning is better (i.e., more effective) than individual learning.

. . . Learning must be used to be retained."[3]

c. Adults can learn and, given their own time, can learn as effectively in later maturity as in earlier adulthood, unless physically handicapped. . . . While the amount of schooling makes a difference in later learning, the educationally disadvantaged can and do learn."[4]

Learning (Chicago, Ill.: Aldine Publishing Company, 1965); Edmund de S. Brunner, David S. Wilder, Corrine Kirchner, and John S. Newbury, Jr., An Overview of Adult Education Research (Chicago, Ill.: Adult Education Association of the U.S.A., 1959).

[1]Gary Dickinson, "The Learning Ability of Adults," Training in Business and Industry (May 1968), p. 54.

[2]From Edmund de S. Brunner, et al., An Overview of Adult Education Research, p. 22.

[3]Ibid.

[4]Ibid., p. 23 (underlining ours).

The application of this "philosophical approach" was evident during the interviews, which has important implications for both the disadvantaged and the formal educational institution.

> The whole object here in industry is that people, when they leave the classroom, they know the answer. We're not in the business of grading people. Here's one of the predominant differences between industrial training and academic training. When a man leaves my classroom, he'd better know what to do, not be graded on whether he can do it or whether he can't. If he can't, he'd better not go back to that shop because he isn't going to get the job done. If he flunks in one of my classes, then it's a private consultation between one of my instructors and [his] supervisor to decide what to do with him. . . . We've even had to lengthen the course or class sessions, and we will do this if necessary, hold people over until they learn it, because this is the only reason we're [IP department] in business. It's a whole different concept [from that in the formal educational system].[1]

The above quotation was echoed from a number of sources. Learning in a formal educational institution is oriented toward the individual. The goals are arbitrary and general in the sense that they are not applied to a specific set of conditions but rather to general sets of conditions, be they in the fields of business, general education or engineering.

Instruction in industry is directed toward group effort (albeit through individuals) for specific task-oriented goals, be they business, general education, or engineering. Both formal educational institutions and industry's IP "do their thing," perhaps as it should be done; however, there are basic and important differences, as the above quoted observation pointed out. The formal institution employs a grading system to signify achievement and progress. Examination scores may be given, and if the student achieves an average of 65 percent (sometimes

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[1]From a personal interview.

a statistical "curve" system is used)[1] or more, he is considered eligible to continue on to a more advanced level. This situation is completely untenable in industry. The conclusions drawn from the student evaluation are different to the extreme. A pass-fail situation is unacceptable in industry because industry cannot accept a person who does not have all the correct information to do his job, and not just 65 percent. No competition is involved. Industry must overcome deficiencies, and they are recognized by industry as not only the deficiencies of the learner but possibly from the IP itself. Industry wants its employee to remain and will do the maximum to retain him. They will even attempt to find another position for an employee who is unable to progress.

> . . . If we can't train the person, if he is obviously misplaced, and this happens occasionally, then it's part of my job to make a recommendation on what should be done. Many times we will move him from a mechanical job to a clerical job, or vice versa. . . . He may be a slow learner, but he might learn well. . . . So part of our job in training is screening as well as training.[2]

The implications of the "industrial approach" (if it can so be called) toward the disadvantaged, and of IP as a formal learning institution, are, in the writers' opinion, profound in terms of educating adults "to learn completely" and not "to pass." Interestingly enough, industry is applying research findings concerning adult education to its programs while formal educational institutions are still living in the past, relative to learning approach and method.

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[1]The greatest cluster of students in any percentage range will presumably receive the grade "C." Arbitrary proportions are set up for the other grades.

[2]From a personal interview.

IP staff people who use ITV in industry have not only recognized but also responded to the fact that the expertise of an individual in a certain field does not necessarily automatically make him a proficient instructor.

> Since we've been using television, it seems to be a good tool to sort out the real teachers from the ones who think they are teachers. It gives you so much more visibility as far as the instructor is concerned that we've never had before. . . . The guy [instructor] might be terrific man to man, but making a group presentation for some reason he just doesn't have it. It's something that has become real evident since we've tried to put some of our better instructors on television and they flunked the course, so to speak. Yet I wouldn't trade those guys in an actual work environment situation. . . . They're terrific.[1]

Most of the organizations have discovered the truth of the above statement, and as a result either some kind of preliminary training is given the TV teachers or people better able to communicate have been the TV instructors. The quality of instruction has also been observed and responded to in the Army.

> The great merit of closed-circuit TV is its flexibility. A low-aptitude student can use videotapes as an aid to his formal classroom instruction, and end by becoming as proficient as a high-aptitude student. Indeed, the whole concept of "low-aptitude and "high aptitude" now needs redefinition. What do these designations really mean? One thing is certain, they mean something very different than we have believed in the past. There is now ample evidence that many aptitude evaluations have less to do with how well the student can learn than with the cultural value-system of the educator. Too many instructors look at a reticent, or apathetic, or even hostile student and conclude: he is a low aptitude learner. In most cases it would be more realistic for the instructor to take a hard, honest look in the mirror and conclude: I am a low-aptitude teacher.[2]

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[1] From the interviews.

[2] Robert S. McNamara, "The World's Largest School," Training in Business and Industry (August 1967), pp. 20-21; (underlining mine).

Availability of the best instructor, the newest information, reaching the most remote areas; simplicity of presentation, realism of content, possibility of individual review--all are part of the unique characteristics of ITV. There are low-aptitude teachers in the inner-city just as well as the university. Perhaps if core content subject matter conducive to ITV were videotaped, with these unique characteristics in mind, then the problem of low-aptitude teachers would not be such a problem in either place.

Another possibility is the format of the Open University[1] which makes learning available primarily to working adults but has implications as well for other members of the society of all ages.

> The correspondence courses will use modern learning methods, including programmed learning methods where appropriate. The broadcast programmes will also pioneer new paths; they will not reproduce conventional university lectures, but will experiment with all the resources of the media. The television and radio programmes are being produced jointly by the university and the BBC.
>
> . . . The philosophy of the Open University was admirably summarized by its first chancellor, Lord Crowther, in his inaugural address . . . 23rd July 1969. . . .
>
> We are open, first, as to people. . . . The first, and most urgent, task before us is to cater for the many thousands of people fully capable of a higher education [or any education], for one reason or another do not get it. . . .
>
> We are open as to places. . . . From the start, it will flow all over the United Kingdom. . . .
>
> We are open as to methods. . . . Every new method of communication will be examined to see how it can be used to raise and broaden the level of human understanding. We are open, finally, to ideas.[2]

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[1]The headquarters of the Open University are in the new city of Milton Keynes in North Buckinghamshire, England, but the activities are organized on a regional (twelve regions) basis.

[2]The Open University Prospectus 1971 (Leeds, Great Britain: E. J. Arnold and Son, Limited), pp. 16-18.

The writers would venture to say that the "Open University" concept is the transition between "school room" teaching and the push button A-V learning carrels of tomorrow. Some form of one-to-one instructional feedback system will evolve and learning will be as available as pushing a TV button.

Summary

Industry is an environment in which major adult educational activities are taking place. The formal educational system is not responding to the needs of industry, nor perhaps can it.

ITV activities in each industrial organization reflect the amount of support that the instructional unit is receiving from the organization's upper management.

Studies have shown that learning by ITV is as effective as learning by conventional methods; however, the comparison was made without taking into consideration unique characteristics of each learning method.

ITVI is an adult education technique utilizing the unique characteristics of television in a supportive role for the advancement of technical and general knowledge which relate to defined specific objectives of the industrial organization for all employee strata. There is evidence of continuing growth of ITVI in terms of population reached and the cash investment made.

The ITV operation in each organization surveyed appeared to reflect, in direct proportion, the amount of upper management support enjoyed by the IP unit.

ITVI cannot stand alone as a total teaching mechanism and must be used in conjunction with an in-class instructor and study guides, group discussions, and the A-V media.

Some studies have been made comparing ETV with conventional teaching; the studies, however, have used the TV camera and monitor as an amplifier-carrier and not as a mechanism for learning with unique characteristics of its own.

Student and program evaluation using ITV has been difficult, but respondents to the survey agree that the internal demands for ITV of each organization on its IP units is great.

The survey indicates a need for professional people who can undertake responsibilities as staff personnel in IP and ITV units. The writer was given the impression, from conversations with members of the professional ITVI community, that universities and technical schools could respond to this need by a program of learning with the following types of offerings from different areas of learning:

1. Speech or Communications Department. Skill training in directing, producing and writing of radio and television programs, use of sound effects and lighting, graphics and multimedia audio-visual presentation.

2. Adult Education Department. Adult education methods, psychology of adult learning, program development and evaluation, social psychology of groups and organizations.

3. Instructional Methods and Vocational Education. Skill training for teaching in different areas of interest, audio-visual methods (other than TV), occupational analysis and curriculum design.

4. Personnel and Business Administration. School administration, budget planning, systems analysis methods for business and industry.

5. Engineering Department. Materials and processes, industrial communications methods, human engineering, TV equipment maintenance. It would be advisable where possible to have a cooperative program with an industrial organization while learning.

It is the opinion of the writers that industry can and should be in the vanguard of society in helping the disadvantaged, first through employment and then through education and training. Industry can make learning readily available to the disadvantaged. The direct approach and definite goals that relate to the specific needs of industry give relevance to the learning experience of the disadvantaged.

Some of those surveyed suggested that mass-media teaching methods are not appropriate for the disadvantaged because the people needed a one-to-one learning experience. Others suggested that good results were obtained using TV because the disadvantaged were accustomed to TV. General education is an important body of knowledge to be taught to the disadvantaged, as well as technical skill training.

The formal educational institutions can learn from industry's methods and approach. The important objective is to teach in order to "learn" and not to just "pass." Not all people who have expertise in an area or discipline are also expert educators. Through ITV it is possible to make a good communicator available to many students. A seemingly low-aptitude student can be the result of a low-aptitude instructor. Formal education, although the source for adult education studies, does not itself use the research findings for modernizing the educational

system. Industry seems to be paying more attention to these findings.

The "Open University" which was developed in England makes higher learning available in all areas of that country. This approach may well be a transitional step for newer and more modern technical methods.

It appears that there is a need for development of more accurate means of measuring effectiveness and efficiency of ITVI as well as other educational technology.

It is the opinion of the writers that both ITVI professional organizations in the United States, namely the Industrial Television Society (ITS) and the National Industrial Television Association (NITA), mentioned previously should merge on equal terms to make one large organization. Both organizations are doing the same things in much the same way. If nothing else, this survey has borne out the fact that there are valuable experiences available on both coasts which could be shared in the profession, adding strength and direction to its activities.

The similarity of objectives of both ITS and NITA far outweigh the dissimilarities to the extent that the writers cannot think of any meaningful differences. If one believes only in the theory of "strength in numbers," then this in itself is a valid reason for bringing the two organizations together.

APPENDICES

APPENDIX A

FORMS

I. BASIC INFORMATION FORM

WE WOULD APPRECIATE YOUR RESPONDING TO THE FOLLOWING SERIES OF QUESTIONS THAT ARE BASIC TO OUR ENQUIRY.

1. When was Instructional Television (ITV) first introduced in your Corporation?

   Date _____

2. Which of the following institutions is responsible for instructional programming in your corporation? (Check all applicable)

   ☐ Corporate curriculum planning group for all divisions

   ☐ Divisional (local) in-house planning group

   ☐ Separate instructional unit of the corporation

   ☐ Outside professional instructional/educational agency

   ☐ Other (please specify) _____

3. How much emphasis in ITV programming is directed toward the following objectives. (Check all those applicable)

	Great	Some	None
a. Orientation for New Employees			
b. Upgrading Employees Who Have Tenure			
c. Updating Professional Employees (Engineers, Technicians, Human Relations Personnel)			
d. Transfer of Employees to Different Positions			
e. Human Relations*			
f. General Education of Employees			
1. Special emphasis on employees from urban poor areas			
2. Employee's families: Spouse / Children			

*Learning skills and techniques in human interaction; e.g., problem solving, group communication, personal behavior.

	Great	Some	None
g. Preparation for Retirement			
h. Other (please specify)			

4. In what manner is ITV most used for employee categories in the following list? (Check all those applicable)

	Complements Formal Instructional Methods	Totally Programmed ITV	Both Equally	Not at All
Blue Collar Employees				
a. Operators--(Production and Assembly Line Machine Operators)				
b. Craftsmen--(Tool and Die and Pattern Makers)				
c. Line Foremen--(Production and Assembly Line Supervisors)				
White Collar Employees				
a. Professional and Technical Staff--(Engineers and Technicians)				
b. Personnel and Sales Department Employees				
c. Managers, Supervisors, Executives				
d. Employee's Family				
e. Other (Please specify)				

5. May we visit your corporation for a personal interview with the person in charge of ITV?

☐ Yes ☐ No

IF YES

Name of Person _____

Position/Title _____

Name of Division _____

Mailing Address _____

_____

Located In/Near _____
Large City

Name of person who would arrange the interview; e.g., secretary, assistant

_____

Telephone Number _____
Area Code

IF NO, would you respond to a questionnaire if sent to you by mail?

☐YES ☐NO

IF YES, please fill in the information above, naming the person to whom the questionnaire should be sent.

PLEASE ASSIST US WITH THE FOLLOWING PERSONAL DATA IF IT IS DIFFERENT FROM THE INFORMATION IN QUESTION 5.

Official Name of Corporation _____

_____

Name of Respondent _____

Title/Position _____

Name of Respondent's ☐Plant or Division ☐Training Unit

_____

Mailing Address _____

_____

WOULD YOU PLEASE ASSIST US BY SUPPLYING INFORMATION REGARDING OTHER PEOPLE WHO COULD HELP US WITH THIS ENQUIRY?

DIRECTORS OF INSTRUCTIONAL PROGRAMS

1. Name of Person _____

   Position/Title _____

   Name of Division _____

   Mailing Address _____

   _____

   Located In/Near _____ _____
   Large City

   Telephone Number _____
   Area Code

2. Name of Person _____

   Position/Title _____

   Name of Division _____

   Mailing Addresss _____

   _____

   Located In/Near _____
   Large City

   Telephone Number _____
   Area Code

THANK YOU FOR YOUR COOPERATION

II. INTERVIEW QUESTIONNAIRE ON INSTRUCTIONAL TELEVISION IN INDUSTRY (ITVI)

This questionnaire is designed to obtain information regarding Instructional Television in Industry (ITVI) for all employee categories (Blue and White Collar). To help us acquire continuity in understanding instruction in industry, some of the questions pertain not only to ITV in particular, but to instructional programming in general.

The following questions are self-explanatory. Where specific information is unavailable, please give your opinion. If more space is needed, please use extra pages and identify the question to which you are responding.

Glossary of Terms

Course--A series of study periods in sequence whose core content deals with learning one subject; (e.g., lathe operation, thermodynamics, etc.)

Instructional Program--The design of one course or an integrated series of courses directed toward complementing and supplementing the learning experience for one category of employee; (e.g., teaching skills to a blue collar production line employee to become a line foreman, etc.)

Unit--The local industrial organization that the respondent belongs to; (e.g., plant, division, corporation, etc.)

Plant or Division--A single, economically autonomous local unit of a corporation.

Corporation--An organization of a number of plants and/or divisions whose activities are directed by a board of directors.

In-House--Within the local unit.

---

1. Which of the following best describes your unit's primary function?

☐ Product Manufacturing Organization

☐ Instructional Institution

☐ Service Organization (e.g., insurance company, consultants, training customers' employees, etc.--please specify)

_____

☐ Other _____

2. How many employees are in your unit? _____

3. How many of these employees participate as learners in instructional programs during a twelve-month period? (If yours is an instructional institution, how many employees receive instruction during a twelve-month period?)

Total _____

4. How many people are associated with instruction as staff members in your unit? (State the number.)

Total Full Time _____ Total Part Time _____

5. Are the unit's Instructional Program Directors and their production staffs trained in ITV by the corporation?

☐YES ☐NO

In either case, please explain:

_____

_____

_____

6. Are there professional adult education experts on the staff?

☐YES ☐NO

a. If YES, in what areas do they work? (Please explain)

_____

_____

_____

7. Which of the following factors has influenced the development of instructional programming in your corporation? (Rank your preference 1, 2, 3 with 1 the highest or equally important.)*

☐Needs determined by job analysis

☐Needs due to customer complaints

☐Needs due to new methods and materials

☐Specific requests from

☐management ☐employees ☐union

*Two or more answers may have equal rating.

☐ Need to develop new cadre of professional leaders from within the unit

☐ Policy of corporation to assist employees in their development

☐ Part of a recognition and reward system for employees

☐ Other (please specify) _____

_____

8. Which of the following would identify the reasons your unit uses ITV? (Rank your preferences 1, 2, 3, etc., with 1 the highest or equally important)

☐ Enables wider distribution of instruction to more employees

☐ Requires less expense than other methods

☐ Complements conventional instructional methods

☐ Enables total teaching (i.e., without a classroom instructor)

☐ Requires less time consumption

☐ Enhances motivation of participants

☐ Permits flexible scheduling

☐ Other (please specify) _____

_____

9. Is there a corporate ITV program used for all (or most) of the units?

☐ YES ☐ NO

a. What kind of coverage is involved? (Check those applicable)

☐ Provides specific corporation-wide instruction for continuity at all plants

☐ Supplements "in-house" instruction

☐ Other (please specify) _____

_____

b. From what sources do ITV programs originate? (Check applicable answers)

- ☐ Corporate technical institution for programming and instruction
- ☐ Purchased from outside commercial sources
- ☐ Transmitted to company classroom from local university
- ☐ Encouragement of "outside" ITV agencies (e.g., TV stations) to conduct programs for employees, transmitted over local TV channel
- ☐ Utilization of line or staff employees considered knowledgeable in their fields who develop in-house programs
- ☐ Part time consultants that help develop programs (e.g., professors, instructors from universities, etc.)
- ☐ Other _____

_____

10. Fill in the relevant answers in the following list: (Approximate if necessary)

	Number of Courses Offered Per Year (All Methods)	Number of Courses Using ITV in Part or Totally	Average Number of Participants Per Course	Average Number of Hours Per Course
Blue Collar Employees				
a. Operators--(Production and Assembly Line Machine Operators)				
b. Craftsmen--(Tool and Die Pattern Makers)				
c. Line Foremen--(Production and Assembly Line Supervisors)				

	Number of Courses Offered Per Year (All Methods)	Number of Courses Using ITV in Part or Totally	Average Number of Participants Per Course	Average Number of Hours Per Course
White Collar Employees				
a. Professional and Technical Staff--(Engineers and Technicians)				
b. Personnel and Sales Department Employees				
c. Managers, Supervisors, Executives				
Employee's Family or Other (please specify)				

11. How are learners chosen? (Check applicable answers)

- ☐ By recommendation of immediate supervisor
- ☐ By overall departmental plan
- ☐ By specific request of personnel or labor relations department
- ☐ According to rotation system
- ☐ Through long-term training plan
- ☐ Other _____

12. What method is used to encourage employee participation in instructional programs?

_____

_____

13. At what time periods are ITV courses offered? (Check all applicable)

	During Work Day	After Work Day	Both During and After Work Day	Full Time (concentrated program)
Blue Collar Employees				
a. Operators				
b. Craftsmen				
c. Line Foremen				
White Collar Employees				
a. Professional & Technical				
b. Personnel and Sales Department				
c. Managers, Supervisors, Executives				
Employee's Family or Other (please specify)				

14. Briefly identify the main objectives of ITV programming for each of the following (see q.10 for categories).

Blue Collar _____

_____

_____

White Collar _____

_____

_____

Other _____

15. Which of the following identifies the ITV content areas for each category of employee? (Check applicable answer)

	Technical Skills	Supervisional Skills (i.e., Human Relations*)	Self-Confrontation (VTR playback--seeing yourself as others see you)	General Education (i.e., Mathematics, Language Skills, etc.)	Other _____
Blue Collar					
a. Operators					
b. Craftsmen					
c. Line Foremen					
White Collar					
a. Professional & Technical					
b. Personnel and Sales Department					
c. Managers, Supervisors, Executives					
Employee's Family					
a. Spouse					
b. Children					
c. Parents					
Other					

*Learning skills and techniques in human interaction.

16. How are questions which arise during the ITV lesson answered?

☐ Careful analysis by experts see to it that all possible questions are anticipated and answered in the ITV lesson

☐ If the lesson is on VTR, the recording is stopped and an in-class associated instructor answers the question

☐ Study guides have answers

☐ Supplementary materials (e.g., textbooks) are used

☐ Guided group discussion

☐ Other (please specify) _____

17. Which of the following ITV methods and aids are most widely used by your unit? (Rank order your answers 1, 2, 3)

☐ Video Tape Recordings ☐ Kinescope Recordings ☐ Live Programs

☐ Other (please specify) _____

18. How are ITV courses updated? (Check applicable answers)

☐ Special updating committee

☐ Periodical re-evaluation by curriculum planning group

Suggestions from ☐ Instructors ☐ Learners ☐ Union

☐ Supervisors ☐ Management ☐ Other _____

19. Are there courses in which ITV has been outstandingly successful? Please explain, giving content area and employee level (use extra pages if necessary)

_____

_____

20. Which types of programs, in your opinion, are best suited for ITV? (e.g., skill training, human relations, etc.) Please explain _____

_____

_____

_____

21. Please describe the methods used to evaluate and/or measure the results of the learning experience (e.g., learner's opinions, instructor's opinion, testing, on-the-job performance, etc.)*

_____

_____

22. What methods, if any, are used to evaluate the effectiveness of ITV in comparison with traditional instruction methods? Please explain.

_____

_____

23. Is there a reward system for completion of course and/or program?

☐YES ☐NO (please go on to question 24)

a. If YES, how is the learner rewarded by the corporation upon completion of the instructional program?

	Higher Title	Salary Increase	Actual Promotion	Cert. or Dipl.	Other _____
Blue Collar					
a. Operators					
b. Craftsmen					
c. Line Foremen					
White Collar					
a. Professional & Technical					
b. Personnel and Sales Department					
c. Managers, Supervisors, Executives					

*If opinion or evaluation forms are used, please enclose samples when returning this questionnaire.

24. What is the approximate average cost per hour for instructing:

    a. Blue Collar Employees? (Consider costs for instructors, on-the-job time loss, materials, etc.)

    $_____ per instructional hour

    b. White Collar Employees?

    $_____ per instructional hours

25. How are costs for instruction covered? (Check those applicable)

	Blue Collar Employee	White Collar Employee	Employee's Family
Costs completely covered by division of corporation			
Costs shared by employee and by the corporation			
Costs completely covered by the employee			
Subsidized by outside agency			

26. Approximately how much money is invested by your unit for instructional programs per year?

    $_____

27. Approximately how much of this sum is invested in ITV?

    $_____

28. a. Which group or department in your unit is responsible for operating and maintaining the TV equipment?

    _____

    _____

    b. If maintenance and repair is done by an "outside organization," what is the nature of that organization?

    _____

    _____

This section pertains to the Disadvantaged. (If your organization does not hire Disadvantaged, please go on to the last page.)

DISADVANTAGED--Those people of the urban ghettos or urban poor who have been left out of the main-stream of the economy, whether they lacked rudimentary training or education, had prison or drug addiction records, have given up hope of getting a decent job, or lack behavioral traits or positive work attitudes needed in order to retain employment.

1. Has your ☐corporation, ☐plant or division hired disadvantaged employees?

   ☐YES ☐NO

2. Approximately how many disadvantaged are employed in your unit? ____

3. Are there special instructional programs for the disadvantaged?

   ☐YES ☐NO

   a. If YES, explain _____

   _____

   b. Does this instruction include ITV? ☐YES ☐NO

4. Which of the following types of instruction is offered? (Double check those programs using ITV)

☐☐Use of hand tools	☐☐Money management
☐☐Use of machinery	☐☐Mathematics
☐☐Human relations (i.e., work attitudes, etc.)	☐☐Reading and writing skills
☐☐Safety	☐☐Leisure time utilization
☐☐Other _____	☐☐Other _____

Please identify any problems and/or limitations in the use of ITV in your unit.

Any observations you care to make regarding ITV programming in your unit will be appreciated.

PLEASE ASSIST US WITH THE FOLLOWING DATA.

Official Name of Your Unit _____

Your Name _____

Position/Title _____

Mailing Address _____

What are your main responsibilities? _____

May we acknowledge your organization in our final report?

☐YES ☐NO

Would you agree to be personally acknowledged in our final report?

☐YES ☐NO

Do you wish to have a free copy of the final report sent to you?

☐YES ☐NO

Please enclose any descriptive material regarding instructional programs which you may believe to be helpful to this survey (i.e., course lists, training plans and programs, facility descriptions, participant feedback forms, evaluation forms, and any information regarding ITV; pamphlets, brochures, and press releases will be greatly appreciated).

THANK YOU FOR YOUR COOPERATION.

SAMPLE ILLUSTRATION OF FIELD ENGINEERING TRAINING REPORT

Field Engineering Training Report — **Information Systems Division**

Name	Employee No.	Section No.	District Name

Course – Unit	Training Location	Report Period	Report Type
		To	☐ Progress ☐ Final

RATING SCALE

UNSATISFACTORY	MARGINAL	SATISFACTORY	SUPERIOR	EXCEPTIONAL
performance grossly deficient, remedial measures unsuccessful.	overall level below acceptable standards, or performance erratic.	performance meets requirements. This is the basic standard for rating.	performance superior, exceeds requirements.	performance outstanding, excels in all areas.
1	2 3	4 5 6	7 8	9

TECHNICAL KNOWLEDGE			BEHAVIORAL CHARACTERISTICS	
Equipment – mechanical, electrical and electronic principles, unit and component operation and functions; electrical circuit analysis, data flow, control functions.			Attitude Toward Job – interest and involvement in job-related information, skills and procedure; adherance to company policy and regulations.	
System – applications, functional interrelationships and interaction of units and devices, sub-system interfacing, programming.			Dependability – attendance, promptness and completeness of assigned tasks.	
TECHNICAL SKILLS	**Elec.**	**Mech.**	Co-operativeness – willingness and ability to get along with and work with others.	
Problem Identification – detection of malfunctions by the use of system knowledge and the application of diagnostic routines to the interpretation of symptoms from available indicators.			Personal Impression – grooming, dress, appearance, manner, deportment, ability to inspire confidence.	
Localization of Problem Area – use of diagrams, documentation and test equipment in the isolation of defective components.			Initiative – functioning without close supervision, self-starting, innovative.	
Repair – restoration to operable conditions, including replacement, adjustment and alignment.			Communication Skills – ability in written and oral expression.	
Quality of Work – effectiveness, precision of thoroughness in performance of laboratory exercises, care of equipment, housekeeping (i.e. tidiness, safety precautions), preventive maintenance.			Rate of Learning – ease and speed in acquiring new knowledge and skills.	
Rate of Work – speed and consistency in performance of laboratory exercises.			Leadership Ability – willingness and ability to assume responsibility, to influence others and to engender respect from others.	
Overall Evaluation – extent to which trainee is judged capable of performing required maintenance functions.				

Comments

Days Absent	Days Late	No. of Revisits	Evaluator	Date

14.00-105 5/68

(Courtesy RCA Computer Systems Division/Field Engineering Technical Education)

SUPERVISOR'S ROUNDTABLE SEMINAR[1]

Evaluation Form

As a participant in the Supervisor's Roundtable Seminar, you can be of assistance by evaluating the program and offering suggestions for improving future sessions.

---

1. What phases of this program were most helpful to you?

   Why?

2. What phases could be cut down or eliminated?

   Why?

3. Do you feel that the material presented in this seminar can be applied to your job?

[1] Courtesy of Mattel Incorporated, Hawthorne, California.

4. General impression of the program. Other comments.

_____

_____

_____

_____

_____

_____

_____

_____

_____

5. Please rate the entire program in terms of benefit to you and your job.

10____9____8____7____6____5____4____3____2____1____0

Extremely beneficial — Average — No good

APPENDIX B

ORGANIZATIONAL AND BUILDING DIAGRAMS

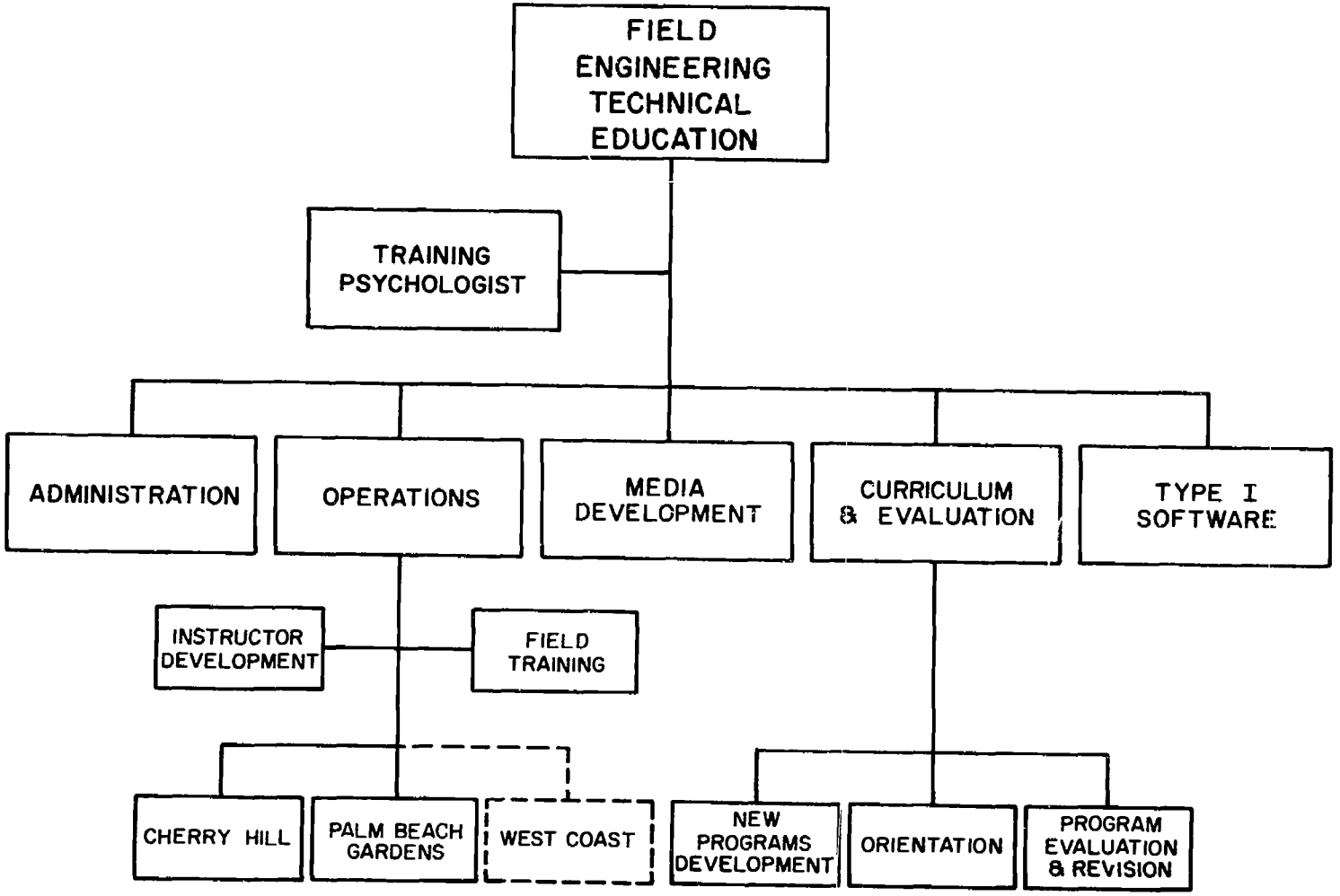

Diagram 1.--Organization Chart 1 (Courtesy RCA Computer Systems Division/Field Engineering Technical Education)

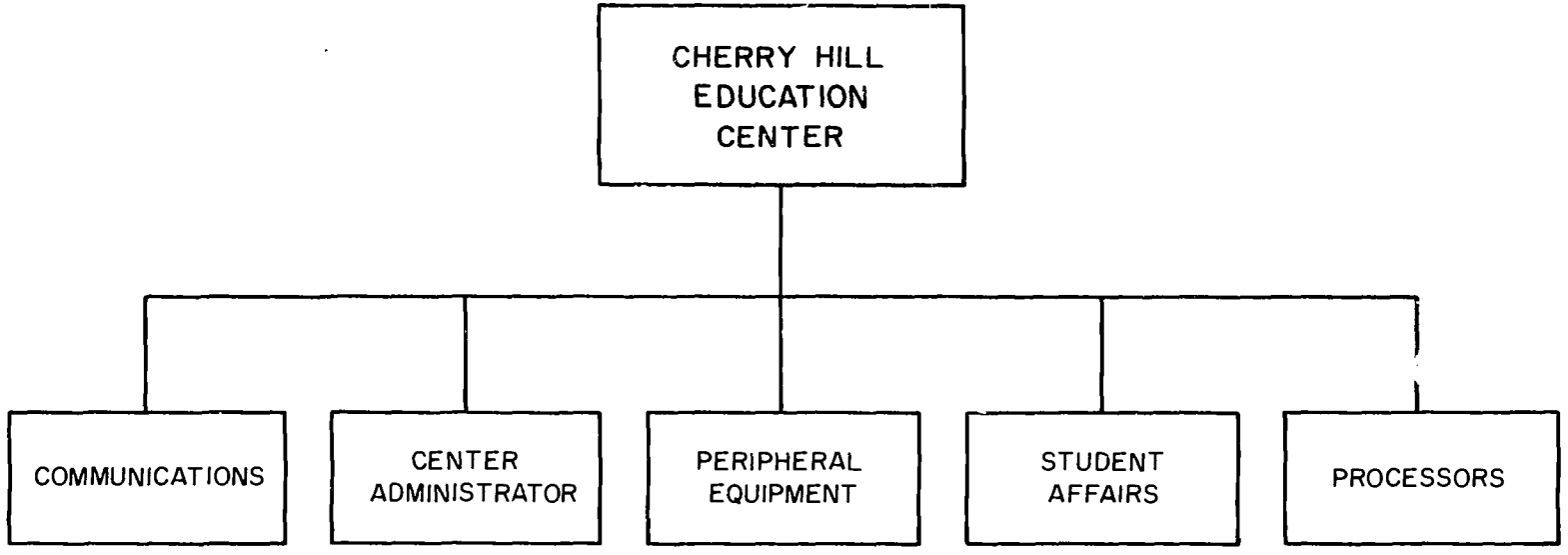

Diagram 2.--Organization Chart 2
(Courtesy RCA Computer Systems
Division/Field Engineering
Technical Education)

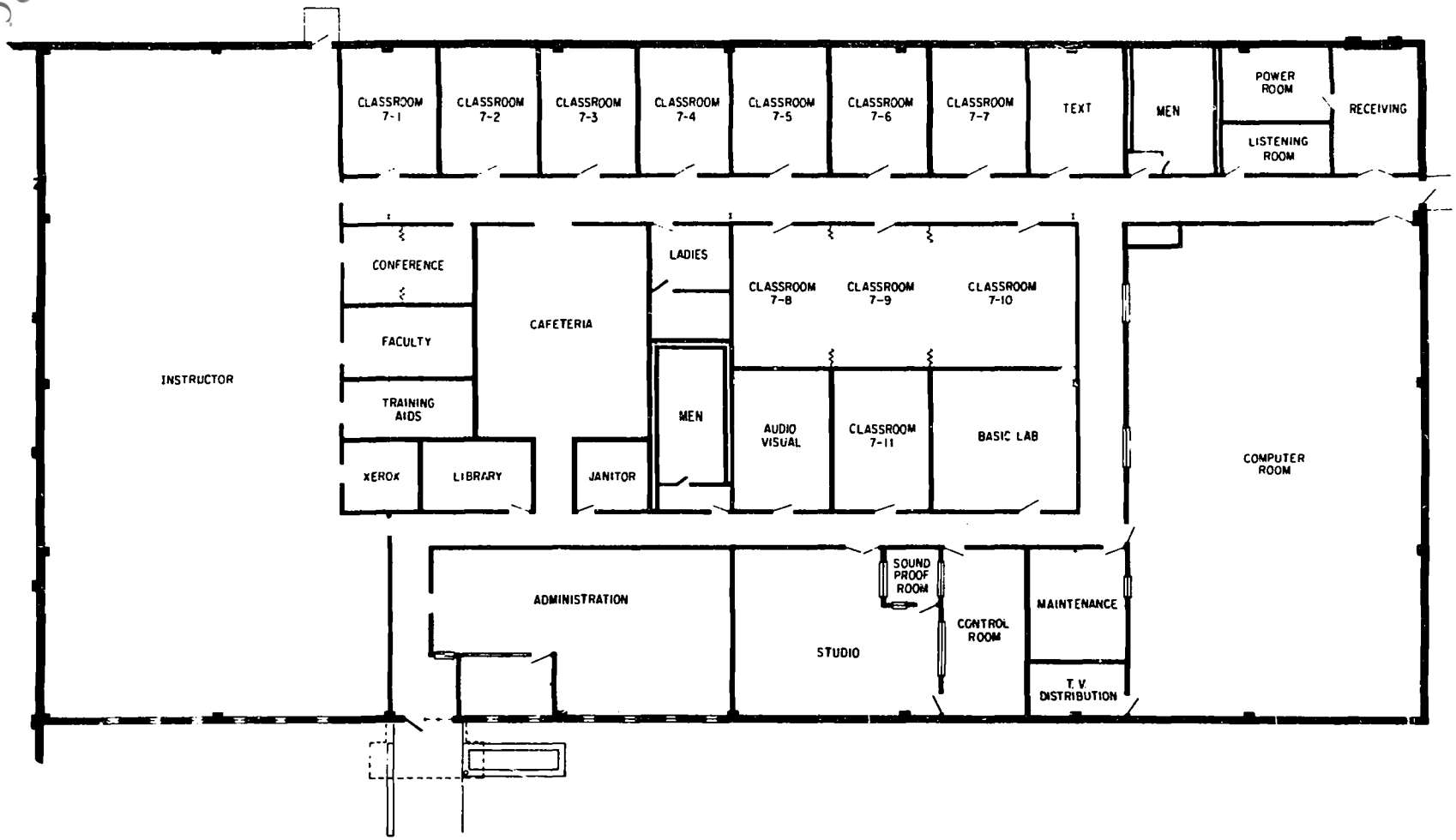

Diagram 3.--Training Center Floor Diagram
(Courtesy RCA Computer Systems Division/
Field Engineering Technical Education)

BIBLIOGRAPHY

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Books

Brunner, Edmund de S.; Wilder, David S.; Kirchner, Corinne; and Newbury, John S., Jr. An Overview of Adult Education Research. Chicago, Ill.: Adult Education Association of the United States of America, 1959.

Chester, Giraud; Garrison, Garnet R.; Willis, Edgar E. Television and Radio. New York, N.Y.: Appleton-Century-Crofts, Division of Meredith Publishing Company, 1963.

Clark, Harold F., and Sloan, Harold S. Classrooms in the Factories. New York, N.Y.: New York University Press, 1960.

Diamond, Robert M., ed. A Guide to Instructional Television. New York, N.Y.: McGraw-Hill Book Company, Inc., 1964.

Etzioni, Amitai. Modern Organizations. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1964.

Hilgard, Ernest R, and Bower, Gordon H. Theories of Learning. New York: Appleton-Century-Crofts, 1966.

Johnstone, John C., and Rivera, Ramon J. Volunteers for Learning. Chicago, Ill.: Aldine Publishing Co., 1965.

Katz, Daniel, and Kahn, Robert L. The Social Psychology of Organizations. New York: John Wiley and Sons, Inc., 1966.

King, David. Training Within the Organization. Chicago, Ill.: Educational Methods, Inc., 1964.

Murphy, Judith, and Gross, Ronald. Learning by Television. The Fund for the Advancement of Education. New York, N.Y.: The Georgian Press, 1966.

Pfeiffer, John. New Look at Education. New York: The Odyssey Press, 1968.

Robinson, John, and Barnes, Neil, eds. New Media and Methods in Industrial Training. London, England: BBC Publications, 1968.

Schein, Edgar H. Organizational Psychology. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1964.

Smith, Mary H., ed. Using Television in the Classroom. Midwest Program on Airborne Television Instruction. New York, N.Y.: McGraw-Hill Book Company, Inc., 1961.

Tannenbaum, Arnold S. Social Psychology of the Work Organization. Belmont, California: Wadsworth Publishing Company, Inc., 1966.

U.S. Department of Commerce. Statistical Abstracts of the United States. 90th Annual Edition, 1969.

Weik, Karl E. The Social Psychology of Organizing. Reading, Mass.: Addison-Wesley Publishing Company, 1969.

Whyte, William H., Jr. The Organization Man. New York, N.Y.: Simon and Schuster Inc., 1956.

Articles and Periodicals

Aleinikoff, Eugene N. "Educational Television--A Non-commercial Viewpoint." Educational Broadcasting Review, III (April 1969), 25-33.

Biedenbach, Joseph M. "Continuing Engineering Education at RCA." Educational Television (August 1970), pp. 15-17, 27-28.

Bumstead, Richard A. "Don't Kid Yourself, Hardware Comes First." Training in Business and Industry (February 1970), pp. 30-35.

Clark, Sam, and Dore, Russell. "Boeing Trains Employees at Home by Broadcasting Industrial Course Over Local TV Stations." Training in Business and Industry (March 1967), pp. 29-30.

Dehan, William H. "Self-confrontation Via TV." Training in Business and Industry (March 1967), pp. 21-22.

Demain, James H. "CCTV--A New Fad?" Training in Business and Industry (March 1967), p. 18.

Demoree, Allen T. "Business Picks Up the Urban Challenge." Fortune (April 1969), pp. 103-104.

Dickinson, Gary. "The Learning Abilities of Adults." Training in Business and Industry (May 1969), pp. 54, 55, 74-76.

Doremus, George H. "The Present and Future of ITV at Xerox." Educational/Instructional Broadcasting, I (June/July 1968), 19-20.

Elwood, Peter. "Continuing Engineering Education or How to Remain a Chemical Engineer." Chemical Engineering (April 1967), pp. 131-134.

Gronau, Gerald. "Educational Technology: A Growing Market." Educational/Instructional Broadcasting, III (December 1970), 19-20.

Hatcher, Thomas F. "Business and Industry Need to Use Television." Educational Television (August 1970), pp. 13-14.

"Historic Breakthrough in Texarkana." Phi Delta Kappan (November 1969), p. 135.

"Idiot Box Gets High-IQ Attachment." Machine Design (June 1970), pp. 34, 36.

Josephs, Arnold J. "Videotape Programmed Instruction." Annual Awards Journal, I (1970), 4-5.

Kneedler, Peter. "Tele Briefings: ITV in Industry." Educational/Instructional Broadcasting, III (February 1970), 28-30.

Kriegel, Monroe W. "The Professional Society and CES." Chemical Engineering (April 1967), pp. 150-153.

Lavoie, Francis J. "The Classroom Comes to the Engineer." Machine Design (June 1970), pp. 117-121.

Martin, Neil A. "A New Message for the Medium." Dun's Review (July 1970), pp. 63-65.

Martin, Richard. "Business Tackles the Ghetto." The American Way (May-June 1969), pp. 32-39.

McNamara, Robert. "The World's Largest School." Training in Business and Industry, IV (August 1967), 20-21.

Mead, Margaret. "Thinking Ahead." Harvard Business Review (November-December 1958), pp. 23-24, 170.

"Money in the Classroom." Forbes (April 1967), pp. 70-73.

Morris, Albert J. "University-Industry Television, Radio and Telephone Links." Educational Broadcasting Review, III (February 1970), 44-52.

Morrison, Virginia B., and Childs, John. "Strategies for the Application of Videotape in Teacher Education." Audiovisual Instruction (March 1969), pp. 43-48.

Neidt, Charles O., and Baldwin, Lionel V. "Use of Videotape for Teaching In-plant Graduate Engineering Courses." Adult Education Journal, XX (Spring 1970), 154-167.

"A New Message for the Medium." Dun's Review, 96 (July 1970), 63-65.

Orme, Maynard E., and Stoltz, Jack H. "To Save a Medium." Educational/Instructional Broadcasting, III (November 1970), 47-50.

Popper, Herbert. "Industry's Unique Role in Continuing Education." Chemical Engineering (April 1967), pp. 144-147.

Rinehart, W. T. "Continuing Education in Industry." Research/Development (May 1970), pp. 32-36.

Rocket, Jack. "The Industrial Survey." Chemical Engineering (April 1967), pp. 147-149.

Smith, Julian C. "Credit-free College Courses: An Industry Explosion." Chemical Engineering (April 1967), pp. 139-143.

Tracy, Eleanor J. "The Fortune Directory of the 500 Largest Industrial Organizations." Fortune (May 15, 1969), pp. 166-185.

Training in Business and Industry. Entire Series: I-VII (1964-1970).

Uhl, Vincent W. "Self Study--A Mainstream Activity." Chemical Engineering (April 1967), pp. 135-138.

"Videotape Recording in Industry." Educational Instructional Broadcasting, III (March 1970), 35-40.

Reports

Biedenbach, Joseph M. Industrial Video Tape Applications to Continuing Engineering Studies Programs. Report to the Annual Meeting of the American Society for Engineering Education. University Park, Pennsylvania: The Pennsylvania State University, June 23-26, 1969.

Chu, Godwin C., and Schramm, Wilbur. Learning from Television: What the Research Says. Washington, D.C.: National Association of Educational Broadcasters, 1967.

Design for ETV. Report from Educational Facilities Laboratory. Prepared by Dave Chapman, Inc., Industrial Design, 1960.

Dublin, Robert, and Hedley, Alan R. The Medium May Be Related to the Message. Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1969.

Instructional Television Research Reports. NAVTRADEVCEN 20-TV-4. United States Naval Training Device Center, Human Engineering Department, Port Washington, Long Island, New York, June 1956. (This group of seven technical reports is described in Chapter I, pp. 6-8.)

Mendelsohn, Harold. Operation Stop-gap: A Study of the Application of Communication Techniques in Reaching the Unreachable Poor. II. Denver, Colorado: United States Department of Health, Education, and Welfare, Office of Education, Bureau of Research, 1969.

Schroeder, Wayne L., and Sapienza, Dunnovan L. Adult Education Activities of Florida's Businesses and Industries. Tallahassee, Florida: The Department of Adult Education, College of Education, Florida State University, 1968.

Stroh, Thomas F. The Uses of Video Tape in Training and Development. New York, N.Y.: American Management Association, Inc. (AMA Research Study 93), 1969.

Pamphlets

Brethower, Dale M. Programmed Instruction: A Manual of Programming Techniques. Chicago: Educational Methods, Inc., 1963.

Cooper, Bernarr, ed. ITFS: What It Is . . . How to Plan. Washington, D.C.: The Division of Educational Technology, National Education Association, for the FCC Committee for the Full Development of the Instructional Television Fixed Services, 1967.

The Open University Prospectus 1971. Leeds, Great Britain: E. J. Arnold and Son, Limited.

Newspapers

Crate, Jim. "G.E. Demonstrates Closed-circuit Video Network in Color." Detroit Free Press, July 9, 1970.

Greeley, Andrew M. "Academia vs. the Outside World-superiority Challenged." Los Angeles Times, October 11, 1970.

Interviews
(In the order in which they appeared in the study)

Michigan Credit Union League, Southfield, Michigan. September 10, 1970.
Robert M. Roderick, Director of Education and Training
Robert Wright, TV Technician, Education and Training

Black and Decker Manufacturing Company, Towson, Maryland. September 28, 1970.
Jay A. Jacobs, Director of Organization Planning and Manpower Development
David E. Kelley, Marketing Training Manager
George Manchester, Director of Manpower Development and Training

Borg-Warner Corporation/York Division, York, Pennsylvania. September 28, 1970.
John W. Hasson, Producer-Director Television

RCA-Computer Systems Division/Field Engineering Technical Education, Camden, New Jersey. September 29, 1970.
A. L. Christen, Manager Technical Education
Herbert Strachan, Manager of Education Media Services

United States Army Signal Center and School, Television Division, Office of the Director of Instruction, Fort Monmouth, New Jersey. September 29, 1970.
Murray V. Tesser, Deputy Chief, Television Division

Burlington Industries, Incorporated, Greensboro, North Carolina. September 16, 1970.
Robert Lincks, Assistant Personnel Director
Henry R. Kritzer, Director of Educational Media

ALCOA--Aluminum Company of America, Pittsburgh, Pennsylvania. September 17, 1970.
M. H. Holland, Staff Assistant, Education and Training Department

Texas Instruments, Incorporated, Digital Systems Division, Houston, Texas. September 21, 1970.
Richard H. Forst, Manager, Field Service Technical Service
Carl Witte, Field Service Products Specialist

Humble Oil and Refining Company, Houston, Texas. September 21, 1970.
John T. Leonard, Section Head, Reproduction Services Department
Don R. Nash, Supervisor of Video Recording

The Boeing Company, Commercial Airplane Group, Seattle, Washington. October 5, 1970.
T. Reetz, Manager, Employee Training and Development Section.

International Business Machines Corporation--Systems Development Division, San Jose, California. October 6, 1970.
Gary L. Pastre, Senior Education Specialist

General Electric Company--Boiling Water Reactor (BWR) Training Center, San Jose, California. October 6, 1970.
Richard L. Gridley, Manager, BWR Training
Thomas W. White, Specialist, Video-Recording
Rodney M. Davidson, Training Engineer

Kaiser Foundation Medical Care Program, Oakland, California. October 7, 1970.
Robert M. Bodine, Supervisor, Audio Visual Center

International Telephone and Telegraph (ITT) Gilfillan, Incorporated, Van Nuys, California. October 8, 1970.
Frank C. Irvine, Manager, Training and Development

Lockheed Aircraft Corporation--Lockheed California, Burbank, California. October 9, 1970.
Kenneth R. Berkheimer, Manager, Scientific and Technical Training Department
Leslie F. Nelson, CCTV Coordinator

Hewlett Packard, Palo Alto, California. December 22, 1970.
Carl Mahurin, Corporate Training Manager
Walt Robson, Television Coordination Manager

Fireman's Fund American Insurance Companies, San Francisco, California. December 23, 1970.
Patrick McGowan, Manager, Training Media

Mattel, Incorporated, Hawthorne, California. December 28, 1970.
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