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ABSTRACT

A seminar on media and the Manpower Development Training Act focused on the following aspects of media applications: (1) the expected outcomes for using media in career education, (2) appropriate materials and equipment to achieve indicated goals, (3) fundamentals of effective media use, (4) techniques for local production of materials, (5) criteria for purchase decisions, and (6) sources of additional information. Included are the complete texts of 22 speeches delivered at the seminar. (EMH)

Final Report

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SEMINAR ON MEDIA IN MANPOWER DEVELOPMENT AND TRAINING ACT PROGRAMS

cooperatively planned by

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and

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

SEMINAR ON MEDIA IN MANPOWER DEVELOPMENT AND TRAINING ACT PROGRAMS

Introduction

The Members of the Educational Media Council, which are the leading national nonprofit organizations representing the media concerns of education and the education industry, share with the U. S. Office of Education a primary interest in the training of Americans for successful orientation to the world of work. The list of EMC Members in 1972 demonstrates the identity of the Council as an education-industry interface:

American Library Association
American Society for Training and Development
Association of American Publishers
Association for Educational Communications and Technology
Educational Film Library Association
Educational Products Information Exchange Institute
National Association of Educational Broadcasters
National Audio-Visual Association
National Instructional Television Association
National Society for Performance and Instruction
National University Extension Association
Society of Motion Picture and Television Engineers
University Film Association

(The National Association of Photographic Manufacturers, the National Cable Television Association, and the Public Broadcasting Service became EMC Members not long after completion of this project.)

In 1967, under a contract with the Office of Education, the Council completed a two-year study of media in vocational education and in programs for the culturally disadvantaged which documented both the notable potential of films, television, and other new media in basic career education and the infrequency with which they are used (OE5-16-032).

The Council therefore welcomed the opportunity to work with the USOE's Division of Manpwer Development and Training and its National Center for Educational Technology under a contract with the University of Maryland in planning and cosponsoring a seminar on "Media in Manpwer Development and Training Act Programs", held in Washington, D. C., in August, 1972.

In the expectation of a seminar registration of about 40, invitations (Appendix A) were sent to nearly 200 administrators of MDTA programs, State directors of vocational education, national contractors conducting MDTA training programs, and USOE personnel involved in related activities. Actual seminar registration totalled 112 (Appendix B),

including speakers and a few representatives of NAVA's Educational Materials Producers Council, many of whom generously loaned materials.

In the absence of Council President Howard Hitchens, Executive Director of AECT, who had a previous commitment to attend a meeting in London, a pride of Presidents of EMC Member organizations acted as chairmen for the seminar and participated throughout as spokesmen for the unique potentials of educational media to assist the teaching/learning process. The keynote speaker was John S. Jenness, President of ASTD and Director, Manpower Planning and Development, Consolidated Edison Company of New York. Presiding over seminar sessions were William G. Harley, President of NAEB; Armand L. Hunter, President of NUEA and Director of Continuing Education Service, Michigan State University; Jerrold E. Kemp, President of AECT and Coordinator of Audiovisual Production Services at San Jose State College; and Harry A. Shoemaker, President of NSPI and Training Research Manager for the American Telephone and Telegraph Company.

The structure and content of the seminar were constituted in accordance with a set of fundamental

Guidelines

The seminar is planned as an overview -- as comprehensive as possible in the limited time available -- of the following aspects of the application of media in MDTA Programs:

1. Educational media as assistance to teachers and trainers in solving problems in the teaching/learning process, with definition of reasonable expectations of the potential of the media to provide such assistance, and with particular reference to process and such specifics of basic career education as attitudes.

2. Appropriate educational equipment and materials that are readily available for immediate use, with demonstrations of selected typical hardware and software.

3. Fundamentals of effective utilization of media in education and training practice, with first-hand reports from experienced practitioners on positive and negative exemplary experiences.

4. Do's and don'ts for local production of educational and training materials to meet particular program needs.

5. Purchase decisions: equipment and materials -- including caveats and exposition of such problems as compatibility.

6. Sources of further information on all the foregoing.

In selecting persons to make seminar presentations, the planning

group identified practitioners in leading-edge manpower programs involving innovative uses of media, outstanding media specialists with experience related to manpower development and training, and experts on the various topics suggested by the program guidelines (Appendix C, Seminar Agenda).

Since most of the speakers made extensive use of media -- filmstrips, films, video and audio tapes, slides, overhead transparencies, etc. -- it is not possible to do them full justice in a written report. The following summaries will, however, record their main points and those raised by their audience in discussions subsequent to their presentations.

On the evening preceding the seminar, Desmond P. Wedberg, Director of the University of Maryland's Center for Educational Technology, presided at an opening session at which Robert T. Filep, Associate Commissioner-Designate, represented and extended the greetings of Commissioner of Education Sidney P. Marland. Dr. Wedberg then opened the proceedings by introducing the keynote speaker:

"What Is So Important About Media?"

John S. Jenness, President, American Society for Training and Development, and Director, Manpower Planning and Development, Consolidated Edison Company of New York

Defining media as "a general term referring to the broad area of communications between sender and receiver" and more specifically as "those devices by which the sender communicates ideas and thoughts to the receiver so that the receiver attains the most accurate understanding of these ideas and thoughts", Mr. Jenness demonstrated his conception by asking seminar participants to "organize" pieces of some plastic puzzles he distributed so that they formed a pyramid. He pointed out that just as those who remembered that pyramids have four-sided bases were handicapped in solving the puzzle, so people who come into training programs often have prior learning that may interfere with comprehension of what is being taught.

Suggesting that the three major uses of media in training programs are (1) to create interest, to motivate people to learn; (2) to actually produce learning; and (3) to reinforce that learning, he said that too often the first use is forgotten. The old story -- "If he (or she) would only pay attention and try to understand, it would be so much easier for them to learn"-- is not the answer in dealing with the disadvantaged high school dropouts whom manpower programs are trying to serve. Most of them have rejected school; and even if they have stayed long enough to earn a diploma, haven't learned very much. It is up to the trainers, he said, to get them interested, to make sure they want to learn, and that they get a chance to apply their learning.

"For trainers," he said, "creativity in working within budget limitations and coming up with effective use of media is tremendously

important." He recommended spending time with key instructors and program developers and studying the kinds and variety of media they are using and what the media are being used for, to make sure they are aimed at motivation, the learning experience, and reinforcement. Instructors who rely entirely on the spoken word must themselves be educated about the variety of instructional resources available to them in the media field.

At Con Edison, the "KASH" system of training is used -- K for knowledge, plus A for attitude, plus S for skills -- hands-on experience -- leads to H, which is habit. "If you can create a new habit," he said, "you've changed behavior. And if you've changed behavior, it is the result of a learning experience." And media, he added, are powerful aids for ensuring that behavior is changed as quickly, effectively, and economically as possible.

In response to a question, Mr. Jenness described his experience with Leavitt & Sons in training hard-core unemployed for building trades -- as framers or roofers or sheet-rockers working on a piece-work basis for pay on houses under construction. Men who were on welfare in March, he said, were earning $150 a week in June: "A trade. Piece work. And a lot of motivation because they could see the results."

Asked how the skills training programs he described are combined with adult basic education, Jenness said that both Leavitt and Con Edison had standard Department of Labor Manpower Administration contracts (MA-3, MA-4, Job 70, etc.), under which both counseling and job-related education are built into the program. Trainees are on the company payroll from the day they start, and the company is reimbursed by the Department of Labor for the excess of cost required to train them over what it would take to train the normal complement. Under such a contract, trainees from the hard-core unemployed usually work four hours in the skills area and four in the educational and training areas. In training programs without Government support, he added, the company gives skills training and makes the GED program available on an after-hours basis.

In response to a seminar participant who expressed reservations about media in manpower training programs because available materials are not geared toward the disadvantaged and minority groups, Jenness again endorsed media as "any devices that communicate ideas and thoughts to the receiver so that the receiver attains accurate understanding" and reiterated the trainer's responsibility to find or create the media that will well serve his instructional purposes.

"Educational Media and the Communications Generation"

Kevin O'Sullivan, Director of Professional Development,
National Audio-Visual Association

Mr. O'Sullivan narrated a multi-media NAVA presentation making use of motion picture films and slides simultaneously projected on three screens. The following paragraphs from his narration summarize its theme:

> Today's learners are the communications generation. Bombarded from birth with sophisticated programming: television, hi-fi's, transistor radios, movies -- better than ever. And in the process, the kids have grown bright, reasonably well informed, and sharply critical of both the messages and the media they are subjected to. As a result, educators today have the increasingly difficult task of both planning a curriculum that will be relevant to the students they serve and then presenting it effectively.
>
> To meet the needs of the communications generation, we must use the media the student knows best and will respond to. And, we must use them well. In short, I suggest that we have to close the communications gaps. It can be done. Here and there, it is being done. One way -- one way -- is through the use of modern educational media. The new media permit deep involvement of the learner; involvement of the senses through light, color, sound, and motion.

Asked how a typical manpower training program could find money to acquire the sophisticated media shown in his films and slides, Mr. O'Sullivan replied that his presentation was designed to serve as a frame of reference for discussion -- a "spark-thrower". NAVA's next presentation, "Helping Learning Happen", would take the next step to show in depth where schools and vocational programs have applied the basic message with successful and validated results.

"Media in Manpower Development and Training Programs"

Ann Donovan, Deputy Director, Division of Manpower Development and Training/ Bureau of Adult, Vocational, and Technical Education/ U. S. Office of Education

Miss Donovan briefly summarized the development of the Division's program since the passage of the Manpower Development and Training Act of 1962, with particular reference to the Technical Assistance Amendment which made possible sponsorship of such activities as the present seminar to give know-how to people working in the field.

Faced with the bewildering proliferation of available media, she said, manpower trainers have found that very few of the materials

on the market were geared to the needs of their trainees. Materials produced for school use tend to turn off people who have rejected the establishment type of training method, she pointed out. They have been out of school for some time; they are now adults. "They now have additional hang-ups and problems, and we are trying to reach them -- and we have to reach them as they are."

Miss Donovan described the seminar as an outstanding opportunity for participants from manpower training programs to talk with people who really know the media and to see relevant available materials. She urged, however, that all present bear in mind the needs of "now" people -- which cannot be served, she suggested, by the products of many months of research. The crisis of the "now" people, she concluded, demands consideration of the best kind of media for their use, media that have transferable uses -- now.

"The Role of Media in Instruction"

Jerrold E. Kemp, President, Association for Educational Communications and Technology and Coordinator of Audiovisual Production Services, San Jose State College

Making extensive use of slides, film, and the overhead projector throughout his presentation, Dr. Kemp opened his remarks by concurring with those of Miss Donovan and seminar participants on the unsuitability of most commercially available materials for MDT students. "They're of a general nature," he said; "they have to be, for reasons of sales." Therefore, MDT trainers must produce materials locally -- if possible, materials of a quality that is suitable and acceptable to instructors and students in their programs -- and then create a demand for them in other similar programs so that eventually the commercial producers will show an interest.

Since the seminar had previously discussed the motivational uses of media, he called for consideration of their instructional aspects. Although some teachers still feel that the best educational technique is the old-fashioned method of telling the student what you want him to learn, he said, there are other ways of approaching the problem. He illustrated his point with a miniature lecture on the rotary engine, first projecting an overhead transparency presenting a verbal description -- including such unfamiliar terms as rotor, excentrically, and wasp-waisted combustion chamber. "This," he said, "is the same thing in our experience that your people find when they walk into your training program -- a completely new terminology. And if I say, 'People, learn it,' it isn't going to happen." A second transparency showing a photograph of a rotary engine -- on which Dr. Kemp pointed out the rotor, the wasp-waisted chamber, the spark plugs, and other basic parts -- also failed to make the engine's operation clear to the audience, as did a motion picture that showed its "excentrical" action. But with a transparency diagram showing all the parts clearly and overlays demonstrating the engine's action (compression, power, exhaust), his

"students" declared they did now understand its basic action.

Good use of the technology of instruction, Dr. Kemp said, depended on a solid foundation for media decisions, in which the answers to three questions are implicit. First, what objectives are to be achieved by the learner? Next, what way -- by use of what methods and materials -- can we best satisfy these objectives? And, lastly, how can the learner's achievements be evaluated? Among other considerations, of course, would be support, facilities, equipment, materials, and budget; but the critical decision factors are objectives, methods and materials, and evaluation. Media decisions are too often made out of context, he said -- on the basis of what the instructor is familiar with, or likes, or finds readily available.

Objectives fall into three categories. The most common of these is imparting of knowledge and information -- the cognitive domain. The second, a major concern in manpower training, is provision of skills, vocational abilities -- the psychomotor category. The third area, that usually receives the least attention though it is probably the most important, is that of attitudes and appreciations -- the affective area.

All objectives of education and training programs fall into one or another of these categories. The question, then, is how to satisfy an objective in terms of methods and media to be used with particular students. In general terms, Dr. Kemp said, he finds that methods fit into three groupings. First, presentations to groups, the most common mode being speaking or lecturing by an instructor. But media play roles in presentations as well, and some are designed mainly for presentation -- the overhead projector, television, 16mm film -- with the pacing set by the instructor or by the materials themselves. The second instructional method is that of independent study or individualized learning; and psychologists tell us this is the best way of learning for many people, each working at his own pace. Among media designed for individualized learning are printed matter, teaching machines, slide projectors, learning laboratories, audio cassette devices, 8mm film loops, programmed instruction auto-tutors, television dial systems. The third kind of instructional method is personal interchange, opportunities to interact with the instructor and other learners; and this is particularly important with learners who need to be motivated, whose self-images must be reinforced. Among media that can be used in this kind of interchange are chalkboards, flipcharts, overhead projectors, small Portapak VTR units -- ways of presenting information, allowing students to work and report and to interact with the instructor and one another.

Media serve various objectives, Dr. Kemp pointed out; and they overlap, just as instructional objectives often overlap. A good presentation can create attitudes. Students' attitudes can be affected when they work alone; and certainly as an instructor and students work together they create and change attitudes and develop appreciations. So education calls for an intermix of methods, and that is why it is a tough game -- because media decisions have to be made.

If you're talking about media to serve specific purposes and objectives, Dr. Kemp continued, you have to make certain decisions. First comes definition of your objective and what kind of learner activity is involved. Then the decision as to how you are going to accomplish it -- by performance, by reading, by use of media affecting the visual or other sensory experiences? And if the decision is for media, then there are further decisions among media that are commercially available. Here Dr. Kemp mentioned a little book he had recently written, Instructional Design (Fearon Publishers, Belwood, California), which might offer help in making decisions as to the best most appropriate media.

All such decisions must be made in terms of applicable constraints -- budget, facilities, the skills of staff. He showed a slide depicting an independent study laboratory at San Jose State College -- a biology class for non-science majors, using little audio cassettes and filmstrip viewers. You can buy self-study booth equipment and materials for $400 to $600 per booth, he said; but at San Jose they had invested just $55 a booth. Audio playback cassettes at $20 apiece and filmstrip viewers at $25 apiece. Filmstrips were chosen over slides because for 240 students, 30 copies of each material are needed; and a 14-frame filmstrip costs 30 cents, as opposed to slides at 20 cents each. Also provided are workbooks, displays appropriate to the lab activity, 8mm films and game cards. "And the college administrators can say to us, 'Well, this isn't going to cost any more,' but in the early stages, it does cost more," Dr. Kemp emphasized. "Research and development cost more ... But the worst thing to do is to start with 'What does it cost?' Please try to look at the positives, the alternatives, and evaluate them realistically."

In response to a suggestion from a seminar participant that many MDT students are not capable of independent study and cannot work without an instructor, Dr. Kemp commented on the need for study habits in individualized instruction. Lacking such habits, he said, students must work in groups with an instructor or in other supervised situations. A New Yorker who said that New York skill centers have learning laboratories as basic education components with third-grade reading level as a prerequisite, was reproached by others who claimed that that prerequisite would exclude three-fourths of MDT trainees. Another seminar participant described the technique of a colleague who motivates trainees for independent study by agreeing with their contention that their school system is responsible for their lack of success, and then says, "I'd be out of my mind if I tried to instruct you in the same old way that guarantees failure again -- here's my new plan." You have to sell students on the new way, he said, so that they will be willing to try it.

Other members of the group described ways in which they offered counseling or orientation to new ways of learning and conditioning for employability. One, commenting on institutionalized concepts of MDT students, suggested that special materials must be developed for them by persons in MDTA programs who have shared their experiences. Dr. Kemp termed this a good summary point, and said to the group, "You're in your positions because of your own experience and your leadership potential -- and you must make these decisions. Don't say it won't work. Don't say it can't be done."

"A-V System for Manpower Administration Programs and Networks"

William R. Woodfin, Deputy Director, Office of Technical Assistance and Training, Manpower Administration, U. S. Department of Labor (with Wade Link, President, Link Enterprises)

Mr. Woodfin noted that everyone present knew about the media that had been described or demonstrated earlier, but that few were actually using them. In his experience in various educational frameworks including the Department of Labor, he found that the biggest problem was lack of some kind of standardized media system. The Department of Labor, like other Federal agencies, administers many of its programs through contracts, under which many kinds of equipment and materials -- costing a lot of money -- are used. To him, the first step toward solution of this problem would be a basic standardized system of fairly simple equipment; and this concept was now being implemented for staff training in a Manpower Administration Network that would serve the national office components, some ten regional offices, and the State agencies -- so 2200 State and local offices of the employment and unemployment compensation offices.

The Manpower Administration's new equipment system makes possible the immediate transfer of a training program developed at the State, regional, or national level for use at any other point in the Network. The basic objective was incorporation of simple equipment that could effectively do the job and accommodate almost any kind of audiovisual material commonly in use -- equipment that could be used by manpower trainers who might not know much about media. Initially, at least one complete system would be provided to each national office component, each regional office, and each training program with an A-V center; and soon funds would be made available so that each State agency would have a system -- more than one for the larger and more populous States.

Mr. Woodfin then introduced Mr. Wade Link, President of Link Enterprises, to demonstrate the system his company had helped to develop.

Mr. Link explained that the system was built around a synchronous sound programmer utilizing the Philips-Norelco cassette fed by a 50-herz inaudible pulse. This mechanism coordinates Carousel slide projectors, filmstrip projectors with remote control capability, and overhead projectors; and the system is completed with Ektagraphic Visualmaker kits, screens, and rollaway cabinets. "We wanted at least to be able to mix a couple of Carousels or a Carousel and a filmstrip projector or some other piece of equipment without utilizing a dissolve unit," he said, "so that both projectors would be continuously in use throughout a presentation, with one projecting a main point and the other adding five or six pieces of support material beside it on the screen."

In order to transfer materials from one site to another, it was also necessary to develop a duplicating capability with a relatively inexpensive pair of cassette audiotape recorders. Unfortunately, Mr. Link

pointed out, most cassette recorders have only a plug for an earphone (their output other than a speaker) and a plug for a microphone -- the former going in at 10,000 ohms and the latter coming out at 8 ohms, so that "if you plug the two recorders together with a patch cord, you get something that sounds like your original tape being played in the midst of a typhoon". Therefore, it was necessary to design an impedance match box unit with which it is possible to plug into the earphone on one cassette player and into the microphone on another and match impedance closely enough for duplication of good quality.

The basic element of the Ektagraphic Visualmaker copying device is an Instamatic camera set in a frame that holds it in a fixed camera-to-subject position for making color slides showing any opaque object (or picture or diagram or chart) that is photographed. The 8"x8" base of the copy stand precisely frames the subject; and the kit includes a supplemental lens so that the focus is automatically compensated for. A second, 4"x4" frame and another lens make even tighter close-ups of small objects possible, without any adjustments for exposure or focus. Moreover, use of the Visualmaker is not limited to photographing objects that must be laid flat on a table top; the depth of field in which the camera is in focus allows use of the camera independent of the copy stand.

Mr. Link demonstrated some of the uses of the Manpower Administration's system with a presentation utilizing two Carousel slide projectors and an F-50 Concord cassette audio tape recorder-player, programming back and forth with three-second pulses between one projector and another and changing pictures on either with half-second pulses. "We try to design a lot of things," he said, "and we've got to make them better, and we've got to make them teacher-proof ... simple, down-to-earth, practical ways to do-your-own-things."

Mr. Woodfin described a planned service program whereby contractors would set up the new equipment, check it out, and provide a two-day conference for staff demonstrating the use of audiovisuals in training in general and in the [illegible] system in particular. These same contractors would then be available [illegible] r maintenance service on all units of the system.

Mr. Link then discussed the capability of the system to mix media, combining use of slide, filmstrip, and motion picture projectors by electronic pushbutton so that a commercially-produced filmstrip could be automatically interrupted from time to time for locally-produced supplementary slides to bring in something an instructor wanted to [illegible]phasize or add. Thus a commercial product that serves only perhaps 60 percent of an instructional purpose can be put to use very effectively.

"There are still a lot of things you can do with a chalkboard, a flip-chart. The magic word *media* does not eliminate these old ways of transferring a message," he declared. Vegetable coloring and cotton swabs add both color and comprehensibility to electrical diagrams and schematics and to slides prepared by the Visualmaker. Slashes of color

can be added to a chart by dipping a handful of cotton in vegetable coloring, wiping it across the chart, and writing inside the colored area with a cotton swab dipped in laundry bleach. The opaque projector can be used to project a diagram or a picture on a flipchart pad on which an instructor can then draw -- again with cotton swabs and vegetable coloring -- a fine, enlarged reproduction of the subject. "There are many very, very simple ways of creating media," Woodfin concluded. "Our objective in putting together this system was to develop one that could make use of a lot of material and equipment that instructors already have on hand ... We hope that with systems like this people will be able to express some of their own ideas in media format without having to bring in elaborate professional systems or spend a great deal of money on equipment."

"Sources of Information on Educational Media"

Desmond P. Wedberg, Director, Center for Educational Technology, School of Education, University of Maryland

Dr. Wedberg called the attention of Seminar participants to a 12-page annotated list of "Selected Sources of Information" (Appendix D) which he had prepared for distribution with other materials at the opening of the seminar that morning. Sample copies of the 65 books and periodicals included in that list under the headings of "Basic References", "Periodicals and Journals", and "Directories and Lists of Educational Media Equipment and Materials" were displayed on tables at the side of the room, he pointed out, and would remain available there for examination by individuals at their convenience.

The list, he said, was designed as a very general bibliography that in as brief a compendium as possible would give an overview of the media -- or educational technology -- field. Many of the references cited included bibliographies (some, at the end of each chapter: e.g., the basic texts of Dale; Brown, Lewis, and Harcleroad; Ely and Gerlach; and Wittich and Schuller) comprising many additional references on particular topics.

In view of the interest in local production expressed at previous sessions, he wanted to add to the list the book that Dr. Kemp had mentioned earlier, along with another that would be equally helpful:

8a. Kemp, Jerrold E. Instructional Design. Fearon Publishers, 6 Davis Drive, Belmont, California 94002. 1971. 130 pp. $2.25.

8b. Kemp, Jerrold E. Planning and Producing Audiovisual Materials. Intext, Scranton, Pennsylvania. 1968. 232 pp. $8.95.

In response to an inquiry from a member of his audience, Dr. Wedberg also endorsed a third book as helpful in connection with local production:

8c. Minor, Ed O., and Harvey R. Frye. Techniques for Producing Visual Instructional Media. McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, N. Y. 10020. 1970. 305 pp. $9.95.

He noted also a couple of changes for the list. Item #25, Educational Screen and AV Guide, had just recently changed its name to AV Guide: the Learning Media Magazine; and #40, Educator's Purchasing Masters, was now called Educator's Purchasing Guide.

On the subject of local production, Dr. Wedberg gave it as his opinion that before long producers would begin to meet the needs of Manpower Development programs, Career Education programs, and the like. "In a little while," he said, "it isn't going to be entirely a local production situation."

He then offered to provide copies of a packet of materials developed for a Maryland State Department of Education series of workshops on Career Education, and called the attention of seminar participants to other free materials on display, including the catalog of U. S. Government films and filmstrips available from the National Audio-Visual Center.

"Programmed Instruction and Media: What Is the Relationship?"

Harry A. Shoemaker, President, National Society for Performance and Instruction, and Training Research Manager, American Telephone and Telegraph Company

Using slides to illustrate his points, Mr. Shoemaker first discussed problems implicit in the evolving definition of programmed instruction and the definition of media. He himself viewed medium and media as terms which refer to the vehicles of instruction -- essentially, the embodiment of the strategies or tactics through which learning takes place. In the early days of programmed instruction, many viewed PI as a medium with certain characteristics -- a teaching machine or a programmed text as the basis for self-paced, individualized instruction involving student response. Alternatively, others believed that programmed instruction was not any single medium, but rather a combination of media having those characteristics.

Although this definition broadened the concept of programmed instruction, it still defined PI as a form of instruction; and still other people criticized it as failing to express the idea that PI was validated instruction, or instruction that was tried and tested and found to be effective. So some people defined PI as validated instruction, with no restrictions, while others defined it as validated instruction using media with self-paced, individualized student response characteristics. Then another group of people began to argue that the essential element of programmed instruction is neither restriction to any form nor the fact that it is validated, but rather its entity as the process of development

of validated instruction. Implicit in the word process is an initial task analysis -- of the learners and the situation in which they are to be taught. Next, development of objectives -- what the learners are to be able to accomplish, and tests or criteria by which their accomplishment of these objectives may be measured. Third, development of content and selection of media to present the content and of administrative tools to administer the training. Lastly, trying the materials out and revising them until they teach with assured quality. So this, he said, is what was meant by process; and there were many who found the definition of PI as process very appealing. "So you can see there has already been a rather major shift from conception of PI as a medium to the conception of PI as a process in which the medium certainly plays a very important part, but only one part among many."

Although this definition had a salutory effect on the field in general, he said, it left some loose ends. The focus on process seemed to imply that any media combination could lend itself to this process of validated instruction, whereas the fact is that some media lend themselves to the process better than others. There is, for instance, a great difference between a live lecture and a filmed lecture in terms of ability to maintain quality control, since the filmed lecture will remain constant over repeated uses. And in order to try out and revise instructional materials repeatedly and find differences, instruction must be held constant so that differences may be attributed to changes in the material rather than to differences in the instructor's presentation. So it began to be apparent that the programmed instruction process would work only if the media and the administrative controls selected were such as to hold the instruction constant so as to make sure that repeated administration of the same materials would have the same effect.

Ensuring quality control involves consideration of a number of elements interacting with one another. Clear criteria for mastery of what is to be learned are provided by the process of development. Implicit in quality control is a given learner population so that from one try-out of materials to another it may be assumed that differences in results are not attributable to differences between learners or groups of learners. A third component of quality control comprises the vehicles of instruction, the media, Mr. Shoemaker said; and he advocated "containerizing" the media -- using those which remain fixed and constant over a period of time. In view of individual differences, quality control is also exercised by individualization of instruction.

A final major element in quality control is accountability -- on two levels. First, accountability of the learners to complete a program, to follow instructions, to do their best to learn. Secondly, the accountability of the instructional administrators to measure the achievement of the learners. (A third accountability, he added, is that of those who develop the training materials; but that is part of the process as described.)

An interesting sideline development, Mr. Shoemaker noted, was some recent attempts at designing quality instruction in which resources are less containerized but students are given specific instructions to meet, with a good deal of flexibility in determining how they go about achieving mastery. In this situation, quality control depends primarily on an instructor's independent evaluation of the students' performance in terms of given objectives.

Returning to media as a means of achieving quality control, he cited the superiority of film over live presentation and the superiority of film providing for learner response over film that does not. Summarizing, he said that media have two major functions in the context of programmed instruction. One is the role of media as appropriate vehicles for content -- showing motion, for instance, or providing opportunity for practice. The other is provision of quality control. In the current thinking of most PI specialists, the aim of programmed instruction is quality-assured instruction. This involves an emphasis on the process through which materials are developed for proven effectiveness and a requirement of quality control so that the quality of materials is high and remains constant from one administration to another whenever and wherever they are used. "I think this is a much broader conception of PI than many people have had," he commented, "... and the only one I personally can find justifiable. I think it frees a programmed instruction writer to use a great variety of media ... provided they meet the requirements for providing some degree of quality control."

Asked by a seminar participant about combinations of two or more media in individualized PI programs, he reported successful combinations of audio cassette tape recorders with workbooks, recorders with slides, motion pictures with workbooks, and motion pictures or video tapes with learner exercises in performing demonstrated activities.

In response to a question about quality control of a program using a film on a vocational technique that has a rapid rate of change, he said, "You're in trouble -- I don't think it would be giving away any proprietary secret to tell you that at AT&T we once had to devote 10 times as much manpower to the maintenance of a program as we did to its original development." He pointed out, however, that AT&T has an unusually large multiplier factor in the number of learners for whom its programs are designed. Nevertheless, volatility of subject matter is obviously a constraint that must be taken into account. When subject matter has a short life expectancy, it may not be cost-effective to develop stable materials -- one should perhaps look for materials that are easier to change, and possibly even sacrifice some quality for the sake of greater versatility and flexibility.

To another question about methods of determining cost-effectiveness, he replied that with most of his training programs the first step was putting a price on the deficiencies the program will correct, how much they cost the company each year. Then comes the costing of training -- adding up the salaries of the trainees for a given time, the costs of

the training center, and the costs of materials -- and stacking those costs up aginst the value of the training as measured in terms of job deficiencies. In other cases, he said, there was no choice but to go ahead and develop training courses in areas where determining cost-effectiveness was difficult; but, again, the AT&T multiplier factor, the very large number of people who take the program, keeps the costs down -- in the neighborhood of two or three percent of the total cost of training. Thus, they were able to make a greater investment in the development of high-quality programs than if they were training a smaller number of people.

"Relating Books to Other Media"

Virginia H. Mathews, Senior Associate, Reading Development, Association of American Publishers

Saying that she would address herself to three topics -- the role of media, the learning adult, and the motivation of the affective domain -- Miss Mathews summarized her background, experiences, assumptions, beliefs, and definitions: "I am for an open society in which all people have an opportunity for self-realization above the basic survival level, and I am against any sort of terminal training or terminal thinking for any individual." As background for her talk, she noted that publishers producebooks, and many of them also publish a full range of other media: computer programs, tapes, films, filmstrips, and so forth. For years, publishers have been working with adult educators, reading specialists, librarians, and others in a united attack on illiteracy, on the narrowing of communications choices, and on public apathy toward these problems.

"Publishers are businessmen," she said, "and obviously must make money to stay in business. They are not subsidized as you are to do socially inspired and useful things. Many of them have done them anyway." She then commented on publihers' awareness of the needs for multi-cultural, multi-ethnic materials and their problems in determining exactly what was needed and in what form. "Therefore I would submit to you," she said, "that you have a very lively and current responsibility to help publishers and producers of materials to solve this question of market and how to reach it."

Noting that too often people who work with poor and undereducated persons fail to understand their capacities, she reported her own experiences with the National Book Committee in producing VISTA book kits for the Office of Economic Opportunity. "And those nice, young, eager, preponderantly white, college-graduate VISTA's would say, 'These people we're working with are only interested in the externals of their lives, the problems they have to face; and they're not interested in other kinds of materials.'" Yet in visiting with the people who were the consumers of the VISTA book kit materials, she found that, yes, they were interested in consumer education and literacy development; but

they were also interested in poems and folk tales and a wide variety of other things. She urged, therefore, taking care not to look only at the near distance: the undereducated, she said, bring something other than their pressing needs to their use of materials.

Books, she believed, meet the needs of this particular marke most successfully of all media, because the market for books has been better defined traditionally, with channels of distribution open and understood. "Paperback books," she noted, "are as much new media -- new in format, new in distribution, new in access points -- as film, which has been around fo. 70 or 75 years." In emphasizing that books are media, she referred to Jack Jenness's definition of media as "all means of communication between the sender and the receiver".

In this connection she asserted, "No medium -- known or to be discovered in the future -- replaces any other medium." As the variety of available media increases, so does the need to use media together in an interrelated way to provide a full range of learning resources. "It takes all of the media," she said, "to reach all of the teaching/learning objectives." One reason is the fact that some people learn most readily in one format of instruction and some in another; but even more important is the fact demonstrated by research that combinations of media produce a "stereo" effect, a multi-sensory reinforcement that provides depth and dimension to learning.

Reading, she reiterated, is a basic communication skill that is not only needed to acquire information and knowledge but is also helpful -- though perhaps less so than films and charts -- for skill building. But reading is absolutely essential in terms of self image and basic survival and progressing beyond the survival level. She called it "the clincher skill" that helps to sort out the impressions and stimuli of other media, "a process of internalizing, interpreting, analyzing, generalizing, and adapting from one set of circumstances to another". She emphasized the individuality of the reading process, in which each reader has his own rate of absorption and digestion, dictated by past experience, habit, attitude, and motivation.

"Obviously," she said, "different media communicate differently at different levels and depths to every individual. We seem now to have realized that although in some circumstances a picture may be worth a thousand words, the work of the world cannot be conducted only with pictures and spoken language. Higher intelligence and the entrepreneurial skills cannot be developed without a high degree of the ability to read. The conciseness and clarity and discipline required to express ideas in written symbols are essential to the creative, sophisticated use of the sight and sound media also."

Miss Mathews characterized basic literacy as a foundation -- a beginning and not a dead end. The majority of social, economic, and political leaders are those who typically use reading skills in every act of communication they perform. So reading skill has status, thus affecting the attitudes and motivation of learners. Yet we have 50 million

functional illiterates in this country -- a quarter of the population precluded from full effectiveness and realization of their potential because of that illiteracy. Literacy must be made a goal for them -- something they will be able to achieve.

Books, she pointed out, are cost-effective. Most are inexpensive, and there are many of them to meet many kinds of interests and needs for skill-building practice. But how do we train the reading/learning habit? In manpower training, many learners are reading at the third-grade level -- below the fifth-grade level traditionally set as the boundary for functional literacy, which in itself is no longer really relevant in the society of the '70's. The adults in second-chance programs who have been turned off of reading say that the turning off resulted largely from their own low expectations, low self-esteem, an acceptance of themselves as non-learners -- worthless -- and that this self-image has been negatively reinforced by the low expectations of others, particularly teachers and families. Second-chance programs succeed if they begin with acceptance of the talents, ideas, languages, and experiences that learners bring to them, and if teachers and counselors really seem to care what happens to them and believe in them as individuals rather than as unfortunate products of poverty and underclass environment. "Listening today," she said, "it seemed to me I heard some little intimation -- not scornful ... sad -- that these people are indeed a tremendous problem, to themselves and to you. And I think this is something we have to be constantly on guard against and be aware of in our own thinking."

In connection with adult learners who have dropped out, another factor in the transformation of non-readers into eager readers and learners often follows that new perception of their own identity and their desire to meet the estimate of some specific and other person: "There is almost always a significant other -- a reading model who believes in and challenges one's intellect, talks about books and affects one's desire to read them." She continued by warning against a danger implicit in emphasis on the practical and survival aspects of skills, including reading -- the mistaken assumption that creative literature is a luxury for those who can afford it.

She concluded with four recommendations: First, she urged relating of books and reading to all other media, along with use of cultural materials brought by the learners themselves. Second, she emphasized the necessity of high expectations on the part of the trainers, and warned against underestimating need for personal development because of harsh external realities. Third, she reiterated the formula in which interest plus expectation equals motivation, and noted that interest requires a caring on the part of the trainer and a communion between teacher and learner, who is thereby enabled to project himself into a new reality and envision possibilities for himself that he had not previously dreamed of. Fourth, she recommended exposure and ready access to a wide variety of books to help learners develop the habit of reading that will in turn help development in the affective domain -- motivation -- that may lead them into job-oriented skill development. In this

connection she noted a variety of existing resources -- libraries, particularly, and graphics centers and art departments -- that can prepare materials. Public libraries in cities like Philadelphia and Dallas have prepared bibliographies of paperbacks and other books for second-chance learners; and there are bibliographies of books for Chicanos, blacks, Indians, and other cultural and ethnic groups (Appendix E, Resource Lists in Adult Basic Education).

A seminar participant reported difficulty in organizing his program's library, saying that the Library of Congress and Dewey Decimal Systems provided inadequate guidance for breaking down subdivisions and subsections under general headings. Clarence Fogelstrom, USOE, recommended:

> Akers, Susan G. Simple Library Cataloging (5th ed.) Scarecrow Press, Metuchen, New Jersey 08840. 1969. 345 pp. $7.50.
>
> Hicks, Warren W. and Alma M. Tillen. Developing Multi-Media Libraries. R. R. Bowker Company, 1180 Avenue of the Americas, New York, New York 10036. 1972. 206 pp. $12.95

Other useful references mentioned were:

> Dunkin, Paul S. Cataloging U.S.A. American Library Association, 50 East Huron Street, Chicago, Illinois 60611. 1969. 182 pp. $5.00.
>
> Hickey, Doralyn J. Problems in Organizing Library Collections. R. R. Bowker Company, 1180 Avenue of the Americas, New York, New York 10036. 1972. 206 pp. $12.95.

Miss Mathews suggested asking for help from local public libraries and college libraries. In response to a question from a man who was having similar problems setting up a management training library, she suggested getting in touch with the Special Libraries Association in New York City.

Another seminar participant, returning to the problem of the poor reader, brought up U. S. Air Force training experiments which proved, he said, that anything that can be taught by the printed page can be taught just as well by nonprint media. Reading, he maintained, is an invention of man -- not natural, like speaking; and some people cannot learn to read. It was his opinion that learning styles of such people should be met with nonprint media.

Miss Mathews agreed that nonprint media assist learning for most people, in varying degrees; but she insisted that very few cannot learn to read unless they have serious physical or psychological problems. "Usually," she said, "it is just that we are too stupid or too lazy to help them learn."

"Learning 100 and the Hillsborough ABE"

Kermit H. Boston, Special Projects Director,
Educational Developmental Laboratories

Explaining that Educational Developmental Laboratories is a division of the McGraw-Hill Book Company, Mr. Boston said that EDL prides itself on the constant involvement of professional practitioners, and is currently forming an advisory committee of State directors of adult education to join in reviewing its present programs and to suggest areas for development of new materials. States presently participating: Florida, Kansas, Louisiana, New Jersey, New Mexico, South Carolina, and Texas, along with New York City and the District of Columbia.

He then introduced EDL's most successful program in adult basic education with a set of slides and an accompanying audio tape narration voiced by Helen Frackenpohl Marx.

"Learning 100" is a basic communications skills system for undereducated adults and school-alienated students that differs from traditional programs in that it is an instructional system -- defined by EDL as "a total learning environment that accomplishes specific learning objectives through interdependent instructional approaches, materials, facilities, and schedules". The basis of the system is a carefully worked out model of the four divisions of the learning process: seeing, perceiving, understanding and/or reacting, and elaborative and/or divergent thinking. A slide illustrated this model, showing how a stimulus is received as a retinal pattern and then becomes an identified and recognized word, after which language patterns or sequences are realized and then translated into meaning.

"Learning 100" begins on a far more basic level than the assumption that reading is the decoding of words: it starts with "attention to the seeing skills that enable a learner to receive the stimulus and translate it into a clear retinal pattern". After practice in binocular coordination and motility, students learn strategies for decoding language through visual, auditory, and contextual analysis. Specific techniques are used to develop students' powers of concentration and adequate reading rate. Thus they are thoroughly prepared for the understanding and reacting phases of their learning.

With "Learning "100", the classroom becomes a learning laboratory in which various forms of instructional technology are used to accomplish specific learning objectives -- the tachistoscope for development of perceptual and word-recognition skills, the sight-sound instrument EDL calls "Aud-X" for word attack, and the "Controlled Reader" for comprehension skills. Through use of this technology, much of the learning is auto-instructional and highly individualized; and the instructor is free to spend more time clarifying problems, evaluating progress, and giving attention to individual students.

"Learning 100" is a multi-level system accommodating nonreaders and deficient readers up through level six. "The student enters the system at a level at which he can succeed," the narrator explained as the slide set continued, "and progresses from there at his own rate. The self-pacing instructional cycle ... is an integrated sequence of activity which provides for the introduction, application, evaluation, and extension of each skill and concept ... Continuous evaluation is an integral part of each cycle, with the result that students do not move ahead until mastery has been achieved." The average learner completes one level, consisting of 30 two-and-a-half-to-three-hour cycles in 70 to 90 hours.

EDL attributes the success of "Learning 100" to the efficient and businesslike atmosphere of the learning laboratory environment, which appeals to and motivates mature students, and to content presenting situations and problems that are pertinent to the needs of older students. Another factor is the opportunities provided by multi-media instruction to learn through different modalities -- looking, listening, speaking, and writing; and a fourth is the effect of self-instructional learning in enhancing a student's self-esteem. "Instructional technology as used in L100," the narrator concluded, "humanizes education by freeing the instructor to do what he alone can do."

Mr. Boston next reported successful applications of the "Learning 100" program in a number of communities, and related in detail development of the program by the Adult Education Department of the Hillsborough County School System in Tampa, Florida, using another set of slides to illustrate his story. The Hillsborough program began in 1967 under the direction of Mr. Don Cammarata, Director of Adult Education for the County, and now has 11 communications skills centers serving over 2,000 adults. More than half the funding, including lab teachers' salaries, is local; and funds for laboratory instruments and materials often come from sponsoring agencies such as the State Department of Vocational Rehabilitation, which sponsors an L100 lab at the State Tuberculosis Hospital; the U. S. Department of Labor, sponsoring labs at the MDTA Center and at Treasure Isle; and the Tampa Concentrated Employment Program, participating in the development of the Adult High School. In the latter program, three L100 labs serve over 600 students; and in its GED section, over 70 percent have earned their diplomas. At the Six Mile Creek Prison, the lab is in a trailer stationed just outside the prison building that operates four evenings a week; and in its first year, 38 of 39 men passed the GED. At the Tuberculosis Hospital, many students progress two or more reading levels in three months; and some continue to work in L100 labs in their own communities after they leave the hospital. At the MDTA Center, all students go through L100 before entering such courses as secretarial skills, retail sales, diesel mechanics, refrigeration, etc.; and many are working toward the GED. The 450 students at the Tampa Model Cities Work Center are dropouts from other retraining programs; and L100 is part of their program, along with prevocational training, vocational counseling, and on-the-job training. At the Dorothy Thomas Detention Center, 90 adolescent girls who have had a taste of failure and

frustration find that the lab instruments respond to them and never put them down. Treasure Island, Incorporated, is a quick-freeze shrimp-processing plant that allows 150 of its 800 employees release time to attend the L100 lab. Nineteen workers have passed the GED; and among those now preparing for it is a woman who has been out of school for 45 years, and is attending with her daughter, a high school dropout.

"Mr. Cammarata and his staff have told us that the program is really paying off for them in Hillsborough County," Mr. Boston concluded. "It is paying off in many ways -- in self-respect, a new leaf for those in trouble, in more and better jobs for employees."

A seminar participant suggested that the volunteer learners in L100 were probably motivated and success-oriented, and therefore would succeed in any program; and Mr. Boston replied, "Not necessarily ... We gear our programs to the person who has been turned off, who has not been successful, the so-called 'hard-core' adult ... and the inner-city student who has previously had a poor academic record." Another member of his audience supported him by saying, "You're not screening them -- you're taking them where they are instead of saying, 'You have to achieve this level to get started' -- that's what turns them off."

"Nonprint Media in OIC Centers"

Jolai Elsberry, Career Curriculum Developer, and William McCray, Management Training Specialist, Opportunities Industrialization Centers of America

Miss Elsberry expressed the regrets of Mr. Elton Jolly, Deputy Executive Director of the Opportunities Industrialization Centers of America, who was unable to be on hand to make the OIC presentation, as originally planned, and had asked her and Mr. McCray to speak for him and OIC. Started in 1964 as one local job-training program in Philadelphia, OIC now totalled 105 centers throughout the United States, with interest groups in Guam, Puerto Rico, Africa, and parts of South America. It is built on two basic concepts: one, that unemployment is a psychological as well as an economic program; and, two, that employment is a national responsibility. "OIC has found that in order to have training programs that will reach their objectives of training the whole man who wants to help himself while maintaining his dignity, it is important to have administrators and key staff people in the program who are competent and well trained," she said. "This led to the development of the OIC Management Training School." And in the School's workshops for executive and deputy directors of local centers, use of media is prevalent.

Mr. McCray noted that since OIC is an unique program, it is often necessary to design media for its specific needs. Media are used to help reinforce or illustrate lectures; to change the pace of workshops; to save time; and to add realism to a presentation.

Turning to an OIC flipchart series, he showed a chart dealing with leadership styles, followed by sketches showing leaders in trouble -- "He wants to do it all by himself" and "He's arrived ... the laissez-faire administrator". As examples of the overhead transparencies prepared by OIC materials specialists, he screened several reporting the history of OIC, some with layover transparencies illustrating the geographical spread and growth of the organization. OIC-produced slides next defined leadership verbally -- "the work the manager performs which causes people to take effective action" -- and then humorously depicted the leader mediating, controlling, and organizing. "We feel the OIC workshop participant will remember the definition better if he has a comic picture before him," he said, "and we come back to make it more emphatic." Other slides illustrated the point that the leader cannot do everything and the characteristics of the effective leader. The importance of planning was demonstrated with a cartoon showing a surgeon consulting a textbook as he operated on a patient; and organization was illustrated by a sketch depicting a bricklayer who had failed to organize his bricks.

Color is used in the graphics to make them more vivid and more impressive, Mr. McCray explained; and he himself had made a considerable study of the motivational values of colors. Colors have a strong effect on the perceptions of learners, on the way they receive materials, and on the way they will remember them. He showed an OIC poster and called attention to its glossy print, saying they hoped to be able to laminate most of their posters and materials to prolong their usefulness. OIC also used hand-outs to reinforce many of its presentations, he added, particularly materials illustrating or demonstrating points made by speakers.

"One of the major philosophies of the OIC Management Training School is the theory that the secrets of good media are relativity and creativity," Mr. McCray said. In relation to media, he added, OIC is "in the process of becoming", and that is why they have not been able to use commercial materials. Films they have tried to use have not fit into their presentations or met their particular needs, and they hope eventually to be able to produce their own films. OIC is using videotape, however; and Mr. McCray showed a tape illustrating "Douglas MacGregor's XY Theory", a scene in which an employer is castigating a supervisor. "This is the Y aspect -- coercion, the assumption that the employee is not creative, that we have to stand over him and constantly prod him," he explained. At the particular workshop for which this tape was made, the people had this particular problem; and so the tape was specifically made to help them deal with it, in accordance with an OIC emphasis on identifiable materials. In conclusion, he urged creative local production tailored to meet local needs, rather than reliance on commercial vendors.

"Westinghouse Multi-Media Training Programs"

Richard L. Smith, Coordinator, Professional Skills and Training,
Westinghouse Learning Corporation

Since he was the last speaker to appear that day, Mr. Smith said, he hoped to be able to reinforce and expand on some of the remarks of the others. Industrial training, he commented, is very close to manpower training. "In both kinds of programs we're working with adults who are really grown-up children, and they have certain deficiencies that we are trying to overcome with education and training." The Westinghouse Learning Corporation -- although one of the commercial producers of materials rejected by some of the seminar speakers and participants -- has a strong commitment to education and training. It believes there is a place in training for individualized instruction. It uses programmed instruction. It uses a multi-media approach whenever economically feasible, and is mindful of the fact that the printed text is probably the most economical approach to training.

Education, he said, is not something that is done for or to a student; it is what a student does for himself in the way of developing his own power. "Teachers can help, and so can a curriculum; and the atmosphere of devotion to things of the mind is necessary. But, ultimately, the problem is the student's. If he would be an educated man, he must give his best efforts to the arduous -- the often discouraging -- task of disciplining his mind to the point where it is an effective mechanism, knowing full well that the trained mind is the most powerful instrument in the world. Now, how can we help him?"

In talking about individualized or self-paced instruction, he said, he wished to emphasize the fact that the instructor plays an essential role in mediating or administering the materials and in imparting a philosophy to the student, though the student has to be motivated. Motivation, in his opinion, comes from success -- first in small things, after which the student can be led on to success in greater things. With the right person administering the materials, the end product of the process will be an educated man, a man who can handle a situation, whether it's a simple production-line skill or a job as a clerk or a manager or a supervisor in a department store.

The Westinghouse Learning Corporation came into being in 1969, Mr. Smith explained, to meet the training needs in new Westinghouse plants -- 20 opened up in the previous three years. Having developed some programs that proved successful, Westinghouse had requests from other companies for these materials. Although Westinghouse trained instructors for some of these customers, they found that many had trainers experienced with programmed instruction and needed only the materials. Many custom-tailored programs had been developed as packages for use in training situations other than those for which they were designed; and Mr. Smith mentioned one called "AC and DC Circuits" designed for an electricity and electronics course at the U. S. Naval School in California and then converted into a course for training industrial technicians. Another

course, on precision measuring, was field-tested both in several divisions of Westinghouse and in some MDTA programs in Western Pennsylvania -- and the MDTA students scored considerably higher than some of the Westinghouse employees, suggesting that the latter needed some of the GED training.

He then introduced a Westinghouse training program for welders, saying that in the Westinghouse programmed learning approach, the key is: show, tell, do, and review. The program was based on a filmstrip with an accompanying audio cassette, and was designed to present certain basic kinds of information, beginning with terminology and nomenclature of the equipment. This "language of the trade" is taught with programmed textbooks, designed at the seventh/eighth-grade level. Some employees reading at the third-, fourth-, or fifth-grade level have, however, done very well in the course. "It takes them a little longer," he said, "but it also develops their reading skills."

Task performance is actually demonstrated in the audiovisual lesson, after which the trainee goes to his welding booth to practice doing what has been demonstrated. The filmstrip shown was one of a series of 12 lessons, demonstrating progressively more difficult welding tasks. "Try to practice what we are telling you to do," the recorded voice of the instructor urged. "If you find that we are going too fast for you, press the hold switch on your viewer. When you catch up, start the viewer again and proceed." Mr. Smith explained that it is suggested that a trainee first look at the entire filmstrip, then come back and review it for whatever information he needs as he sets up his welding booth. "But it usually takes two or three viewings before a trainee really knows what he's to do."

The audio instructions continued: "First, put on your safety glasses. Then put on your helmet and adjust it to fit your head comfortably yet firmly. Make sure you wear a cap to protect your head from sparks. This cap may be left permanently in your helmet. Next, adjust the visor so that a quick forward snap of your head will drop it in position in front of your face. Once it is adjusted, raise the shield over your head so that it is in position for a quick flip-down. Next, put your welder's sleeve on the arm opposite the one you write with. Then put on your gloves. Remember, always put on your gloves before you check your ground connection. Rub your half-inch plate on your metal table to make sure that there is nothing in between that would cause a poor ground. If the ground clamp will not get in your way when you are welding, ground the plate. In order to make a good weld, you must have a good ground.

"Pick up your electrode holder with the hand you write with. Your thumb should be in position to operate the spring release on the holder. Your instructor has already set the amperage control dial on your power supply and switched the power supply to the OFF position ..." And so the instructions lead the trainee through a series of steps to the globe of light that is his welding arc ("A good arc sounds like bacon and eggs frying.") Mr. Smith said that at the end of each lesson, the

student is told to bring his instructor over so that he is regularly checked out for safety and to make sure he understandswhat he is supposed to do in the welding booth.

"We're placing the responsibility for learning on the trainee, and it's very effective. He's developing a sense of responsibility. He's been successful with a programmed instructional text. He knows what the instructor on the tape is talking about because he knows the language of the trade and the nomenclature of the equipment; and he's now ready to perform his task. So then he begins to practice." With no previous experience, Mr. Smith said, the average trainee takes about 100 hours to complete the course. Moreover, since Westinghouse tries to obviate program obsolescence by teaching to a code -- in this case, a very sophisticated welding code -- the trainee is motivated by the fact that he is qualifying for an earning potential of from 10 to 20 thousand dollars a year.

The process of instructional design and field-testing begins with the collection of data -- in the case of the welding course, from metallurgists, metallurgical engineers, and good welding operators at work on the plant floor. Target population of trainees is also studied; and if it is not a group of Westinghouse employees, some testing would probably be done. The welding course was tested in the public schools, with groups ranging from ninth grade up to the twelfth; with adults in MDTA programs; and with Westinghouse employees. In such testing situations, a standardized test gives indications of scholastic aptitude and reading ability and levels. Furthermore, the course itself begins with a pretest that is diagnostic in respect to a trainee's readiness for the programmed textbook and his prior knowledge of welding.

Programs are validated by objective evaluation of a trainee's performance, measuring or x-raying the welds he has produced. Westinghouse uses linear programming for skills training, he said, because "the frustration level of branching programming is very high when a man wants to learn a technical skill -- he wants to learn it right now, and he doesn't want any jumping around through the materials; he wants to get the information as economically and efficiently as he can." Following task performance, the validation process calls for a frame-by-frame item analysis of the scores on the performance test; and this is usually followed by a differentiation index and a difficulty index over the test items. Even with a test population of 15 or 20 people, he said, this process gives pretty clear indications of what revisions should be made in both the program and the audiovisuals. Then text materials are corrected and the slides for the filmstrip are improved; and the revised program is then retested and the final product rechecked for technical accuracy.

Asked about the usual student-teacher ratio, Mr. Smith said that it varied widely, with an optimum of four trainees to one set of instructional materials and one instructor handling anywhere from 10 to 30 students, depending on the number who need extra time and help.

In response to a question about entry and completion factors, he said that with the flexibility of individualized instruction, a trainee can enter a program at any time or point. Moreover, all the programs are designed for adaptability to a variety of situations. General Electric, for instance, had experimented by using the welding course both with and without the programmed text, and concluded that use of the programmed instruction textbooks gave them certain insights into a man before he went to work on the production floor -- not how well or how fast he reads, but his ability to follow written instructions, which is considerably more important.

Asked how Westinghouse Learning determines how much information should be in each lesson, Mr. Smith said the problem was always the difference between "need to know" and "nice to know". In the welding program, for instance, although a good welder would tell you that the most important things an operator must know are metallurgy and rod selection, these things are not included in the course because in every division and type of fabrication the metals are different and preselected by industrial engineers and the rods predetermined by the codes the operator will be welding to. The program, therefore, is a basic instructional package, teaching the skill of welding. "We try to teach the trainee what he needs to know to do the job," he said. "We get into telling him why when we feel he needs to know that, too, to do his job effectively." In any training situation, he added, time is money.

In a question as to whether program research was based on talking to welders, he replied that sets of training specifications are based on objectives suggested by supervisory personnel. A content outline and behavioral objectives are written and methods of measurement are determined -- all in consultation with both the supervisor and the operator. On another question about possible use of the program for upgrading, he said it is often used to improve performance levels. Asked about the use of media in the developmental process, he said Westinghouse usually used cassette tape recorders, 35mm cameras, and polaroid cameras in collecting data.

In a final question, another seminar participant asked for advice on ways manpower programs could help the people who were screened out by industry and Mr. Smith suggested consultation with representatives of local industries to find out what skills are needed and how you can help [illegible] their employment needs. He also urged that in programs developed in this way for people in the lower scholastic-aptitude areas, plenty of time be allowed for practice with tools and materials. "They make excellent welders if they are given training. Their manual dexterity allows them to perform at a very high level. And they like to stay on that job -- it's a craftsman-type skill."

Media Mini-Fair

The first day of the seminar concluded with an evening of do-it-yourself media demonstration in which seminar participants were able to choose and screen or play back their own selections from a large variety of basic career education materials lent for the occasion by producers, notably members of NAVA's Educational Media Producers Council. Among the materials available were films, overhead transparencies, filmstrips, slides, video tapes, audio cassettes, print materials, and producers' catalogs and literature. A battery of projectors, screens, and tape recorders, along with some other kinds of equipment, were also available for demonstration. (Appendix F, Memorandum to EMAC).

"Broadcasting and Recording Media"

William G. Harley, President, National Association of Educational Broadcasters

After reporting briefly on recent national developments in the area of educational broadcasting, Mr. Harley noted that this was not an occasion for discussing industry problems, but really more important than that since seminar participants were concerned with "the basic and very important task of enlarging the coping skills and the capacities of millions of Americans for whom the word under is not merely a label but rather a way of life." There are ways radio and television can assist pursuit of the objectives of manpower programs, he said -- "and ways in which you can assist the radio and television community in expanding its ability and inclination to harness its very considerable forces for social benefit." Commenting on the varied terminology applied to non-commercial broadcasting -- educational, public, instructional broadcasting -- he suggested for the morning another label: useful broadcasting. "For the measure of whether the mass media will be useful to you is perception of them, both by those who plan their use and those who receive them, as useful."

As advantages of television and radio in education and training he cited the capacity to deliver materials across distances economically, the capacity to store and replicate those materials by recording, and the capacity to display information in attractive visual and oral presentations. "Other media do some of these things," he said, "but radio and television systems are useful to the extent that they combine these characteristics." It is necessary, therefore, to understand these basic characteristics and to apply them where they can be helpful and useful.

"As you consider the possibility of useful broadcasting," he continued, "you will need to know as much as you can about the setting in which

this broadcasting will be used. You will need to make a comparative analysis of other means for accomplishing the same objectives. Creating attractive programs is by no means the most difficult aspect of using the mass media: creating useful programs is -- for that requires you to have full knowledge of the audience you'll be trying to reach, knowing the conditions under which its members will be doing their viewing and listening, dealing with their own sense of isolation and frustration, dealing sometimes with a long history of personal failure, and dealing with the need for reward and the need to see a value in this instruction ... The program unit itself may be a central factor in what you do, but its characteristics and qualities must take into account the frames of reference, the orientation of the persons to whom it is directed and whose effective response is the only defensible measure of the program's success."

Conceding that radio and television unquestionably cost money, in part because broadcasting often involves different personnel and support materials from those found in current projects, Mr. Harley said that in developing any new program of mass media implementation it is essential that a full assessment be made of alternate ways of accomplishing given objectives; and he quoted Hadley Cantrell: "A tool must be evaluated not against an absolute standard of efficiency, but against the efficiency of alternative tools that are available."

"In other words," he continued, "let's not be abstract about it. To compare a mass-media-based training program with one that makes extensive use of volunteers could be misleading if the mass media facilities are not available or if the volunteers can't be found and trained." As a kind of guide for use of the media in manpower development and training, in conclusion he offered the words of Buckminster Fuller: "The role of technology in our lives is to help us to accomplish progressively more with relatively less."

The speakers of the morning whom he was about to introduce, he noted, were skilled practitioners on hand to show seminar participants some ways of implementing that challenging theory.

"Everything You Always Wanted to Know about Local ETV Production But Were Afraid to Ask"

Murray V. Tesser, Audio-Visual Production Officer and Assistant Chief, Office of the Director of Instruction, U. S. Army Signal Center and School, Fort Monmouth

Mr. Tesser professed surprise at having heard some seminar participants make such remarks as "How does that apply to me?" and "We don't have the money to do that" and "I don't know how we could do it", and he announced that it was his intention to prove that they could work through media -- "You can do it." Having ascertained that many people in the room were using overhead and slide projectors and a few were using television, he said, "Of course if you didn't have television, I would tell you, 'Don't get into it -- unless you know what you're doing.' I've seen

television cameras in schools, high schools, colleges; and they use them for football games, and then they lock them up in closets." He next referred to the people who complained that they could not afford to do the things they see done on network television -- the titles and special effects and superimpositions. "And I say to you, yes, you can. With whatever you have in your shop, you can make it work."

Referring to the $120 Visualmaker recommended by another speaker for blowing up pictures, he asked, "Has anybody ever heard of a magnifying glass? ... Do you know that if you put a magnifying glass on an image, it blows it up; and if you take a picture of that image, you don't have to buy a $100 lens to do the job? It's not so good as a $100 lens, but it works ... A magnifier, used line by line, will also give you large lettering for titles." A camera that takes a slide, he said, will take you half way to a multi-media presentation. He recommended imaginative use of the overhead projector, and he described a successful media experiment performed by a music teacher faced with the resistance of the rock generation to classical music. Using water or mineral oil in large petri dishes, the teacher gave the youngsters vials of food coloring and let them create swirling color moods to match the music.

On reading, Mr. Tesser said that media can be used to make students want to read. He suggested, for instance, using television as the medium for a competitive student newscast in which each must choose the most important stories in the day's newspaper to read on camera. "Reading the newspaper is no longer a homework assignment, and they're learning reading and more."

He recommended consideration of the techniques of commercial television for application in instruction, citing the comprehensibility of programs in a weekly series, even for people who have not seen preceding episodes, and the comprehensibility of programs half-watched while performing tasks or interrupted by phone calls or trips to the refrigerator. "You understood. Why? There's a structure there that's inherent ... tell them what you're going to tell them, tell it to them, and then tell it to them again. You always know the bad guy. You always know something; even if you see only the end of the program, you know what happened before you tuned in." Another intrinsic value of commercial television, he said, is participation; and he cited the example of viewers watching quiz programs, trying to outguess the contestants, talking back to the television set, so that television is not an observational medium.

There is no magic about producing and directing television, he said -- only the magic of creativity. At Fort Monmouth, producer-directors are trained in five or six months. They learn how to write, produce, light, direct, run cameras, and produce programs in six months. "No magic," he repeated, "but the magic is how good it is, how structure can teach a creative person to do a job." Creativity is not learned in school, he continued; in fact school often kills it. But media

can be used to help students develop their own creative capacities.

To illustrate his conviction that education can be made interesting, exciting, no matter how dull a subject is, Mr. Tesser screened a kinescope film comprising opening segments from videotape training materials produced at Fort Monmouth. A lesson that was "An Introduction to Automatic Digital Control" borrowed a program device from television's "The Ghost and Mrs. Muir" in presenting an electronic spirit who helped a baffled student understand the basic concept of the fully automated digital data switching system. A mini-drama featuring two amateur racing drivers illustrated the folly of failure to maintain a racing car -- or an Army jeep. An "Introduction to the Digital Subscriber Terminal" was a spoof of the various kinds of conventional openings used in Army training films. Another, entitled "Physical Security Orientation", designed to introduce a series of post regulations, was typical:

> RECRUIT: ... This is my seventh working day, and I guess I've got to get my vehicle registered (KNOCKS AT VEHICLE REGISTRATION OFFICE DOOR).
>
> NONCOM: Type of vehicle? RECRUIT: Wheelchair. NONCOM: Make and year? RECRUIT: American Hospital Machine, 1967 model. NONCOM (TYPING INFORMATION ON FORM): Color? RECRUIT: Silver. NONCOM: All over? RECRUIT: No, it's got a green seat and black tires. NONCOM: May I see your certificate of registration? RECRUIT: I don't have it with me right now. I've got one, but not on me ... I can go and get it, I suppose. NONCOM: How about liability insurance? Are you covered? RECRUIT: Yes, I am; and I've got a copy of it right here. This is from the State of California -- will that be all right? NONCOM: All right, as long as it's on their books ... You say the vehicle is motorized? ... Standard safety features? And it's passed the New Jersey State inspection? RECRUIT: No, I bought the vehicle in California; and I passed the California inspection, not the New Jersey inspection. NONCOM: In that case, you'll have to take it to the post garage and get it inspected, and then return home and get your registration and bring both those items back here, and then you can register your vehicle. Drive safe! (RECRUIT EXITS IN WHEELCHAIR, DRIVING SAFELY. SECOND RECRUIT ENTERS.)
>
> SECOND RECRUIT: I'd like to register my weapon. It's a pistol. NONCOM: Do you have a D. F. from your company commander? SECOND RECRUIT: Yes, I do. NONCOM: Type of pistol? SECOND RECRUIT: Cap pistol. NONCOM (TYPING ON FORM): Does your weapon use air? SECOND RECRUIT: Air? Well, I don't think so. I don't know exactly what you mean. NONCOM: Any type of pneumatic weapon -- anything that uses air -- is banned on the post and would have to be locked up until you leave. SECOND RECRUIT: No, I don't think that covers mine. My weapon uses Mighty Bang Caps. NONCOM: In that case, you wouldn't be covered by the regulation,

so you wouldn't have to register it on the post.

All of Mr. Tesser's presentations included background music and sound effects, and he particularly recommended use of music -- the kind of music that is "in" with the learners for whom a production is intended. He noted, further, that with videotape, new music can be substituted from time to time to keep the production "today". Among other techniques he mentioned were use of slides or motion pictures superimposed on video for effective titles. In urging imaginative titles, he suggested titles inscribed in sand or powdered mica which, through use of an ordinary vacuum cleaner, can be made to disappear without the effort and expense of animation.

To improve audio in a classroom, he suggested use of supermarket egg cartons tacked on the walls and ceiling -- "soundproofing, and a nice geometric pattern". Another audio trick he described was conversion of an ordinary studio microphone into one that could pick up the song of a bird in a tree: "Get a broomstick, put a lavalier mike on the end of it, collar it with the top of a large tin can or a child's snow saucer for a no-cost parabolic reflector -- then hold this up toward the bird, and you'll get the sound." To save television production time, he recommended starting off by putting the narration on audio tape and then matching the video to the audio: "You don't need to see the Big Talking Face, anyway; and you can start and stop your announcer any time you want. He never gets tired, he never coughs -- and your production time is cut in half."

In concluding, Mr. Tesser said he would like to emphasize the instructional effectiveness of single-concept programming, the importance of holding a lesson to the amount of information the learners can digest. "If you come to me and say you'd like to do a program on 'How to Take a Picture', I'll say there are too many objectives. A program on how to light, how to load the camera, how to focus the lens -- these are single objectives, teachable concepts."

"Job Man Caravan"

Thomas L. Stepp, Executive Assistant, South Carolina ETV Network

The South Carolina Educational Television Network operates a State-wide closed-circuit system, Mr. Stepp explained, as well as six broadcasting stations. "We have a very broad mandate, to serve all the educational purposes of the State." One of many projects, including direct instruction, is the weekly series called "Job Man Caravan", which he then introduced by showing a videotape presentation in which Mal Gude, United Nations correspondent for ABC News, talked with some of the people who participated in the conception and production of the series.

Gude first introduced Henry Cauthen, General Manager of South Carolina ETV, who explained that the idea for "Job Man Caravan" originated with

the staff of the State agency. He said it was his opinion that -- powerful as television is -- it too often merely explores problems, rather than seeking solutions, and that it could help provide solutions for some of those problems. He and his staff agreed that the basic problem in the State was employment, which relates to education, race relations, the whole spectrum of problems in South Carolina. The target audience, he said, was the black community in the State, which is moving out of an agricultural economy into an industrial economy that presents opportunities for the black community not previously open. But how do you bring the two together -- the black community and the job opportunity?

SCETV gathered together a group of influential State leaders, black and white, and asked them that question. They knew, for instance, that in the Piedmont section industries really needed manpower; and in the Southern part of the State there were thousands of people in need of jobs. What was needed was a method of bringing together the people who needed jobs with the industrial leaders who needed manpower. "Job Man Caravan", he said, takes a man who needs a job and challenges him and inspires him to get whatever help he needs, and tells him how to get it.

In trying to devise a plan for making sure the black community would watch educational television, the best suggestions came from two black members of the ETV staff, including the name of the black master of ceremonies, Bill Terrell. The original objectives of the series, according to Mr. Cauthen, were "... to provide information on the opportunities that were available for employment ... for job training, for education ... the new opportunities that were open to black citizens ... and to encourage them to take advantage of them."

As the videotape presentation continued, Mr. Cauthen explained that their "Caravan" budget was supplemented with two successive one-year grants from the Ford Foundation, and thus some of their more ambitious ideas became feasible. On their basic decision to develop the series as a program by and for blacks, rather than trying to reach both the black and white communities, he said, "We have yet to receive the first critical letter."

Interviewed next by Mr. Gude, Bill Terrell, host and associate producer of "Job Man Caravan", said that he had something to do with both the name and the format of the show. On the air, he said, he was "the Job Man", head of the troupe that takes the show to different communities with a mobile television studio, bringing both entertainment and job information. Part of the troupe are the "Jobettes", a group of young ladies who have a wide variety of responsibilities, both on location and in the studio. As a typical "Job Man Caravan" feature, a dramatization next showed the wrong way and the right way to apply for a job, with emphasis on grooming, attitude, courtesy. Another dramatization dealt with the problem of tardiness in reporting for work. To illustrate "job profiles" featured in the series, a videotaped nurse explained her job.

Asked about entertainment in the series, Mr. Terrell said it was included to motivate people to watch the show, and that local talent was employed along with nationally-known entertainers like James Brown and Aretha Franklin. Another popular feature of the series was on-location interviews, giving people in the various communities an opportunity to air their opinions and gripes; to discuss community problems; and to talk to representatives of State, Federal, and local agencies. Other on-location interviews with industrialists report available jobs, and the series has had 100% employer cooperation.

Tony Briscoe, producer of the show, introduced VTR footage showing a remote outdoor videotaping session. The mobile television unit, he said, is a self-contained unit with its own generators, its own VTR machines, three cameras, and a complete control room set-up. "We pick a site; and usually it's right in the middle of the black neighborhood -- a school parking lot, such as this, or a baseball park or a city park." Taping begins around two o'clock on Saturday afternoon. The show has its own band, with a flatbed trailer truck for the instruments. Representatives of organizations that collect information about job openings and on-the-job training opportunities have previously been invited to be on hand, along with representatives of adult education and educational technology centers. The "Jobettes" man a job board showing jobs open in the city or county, and answer questions and help people. In Spartanburg, they drew a crowd of about 1,200 people; in Charleston, about 2,000 were in the audience.

Asked about the cost of the series, he reported a considerable investment in videotape, since all tapes are retained intact in case of questions about any segment. The biggest budget item, however, is talent -- soul talent, an unusual item for an educational television system. Talent is contracted through talent bookers or agencies, and "Caravan" pays the going rates. On promotion for the series, Briscoe described posters and handbills sent into a community four or five days before a remote taping session. Radio spots are also purchased on major soul stations, and modest press releases are sent to newspapers. They also relied heavily on word-of-mouth -- "And it didn't take any time at all. It was really amazing how fast word travelled about the show."

Cutting the videotape presentation short, Thomas Stepp said that program emphasis was divided equally between jobs and training opportunities. The program's producers had worked closely with all of the community and State agencies, any kind of MDTA program, vocational and technical education programs, the Urban League, OEO information and referral services; and they also, of course, had direct contacts with industry. The most important outcome of the program, in his opinion, was its beneficial effect on race relations in South Carolina. The series had also been given credit for helping solve a kind of short-term employment crisis in the State, but was now featuring less direct job information in the more routine employment situation that now obtained.

After the series had been on the air three months, an S. C. University School of Journalism Communications Research Center survey showed that 54% of black households in the State were watching "Job Man Caravan". After 17-months, the figure had risen to 69.56% -- with an 18% viewership in white households. White teenagers enjoy the show's music and entertainment, and the show's emphasis on staying in school and graduating applies to them as well as to black teenagers. Another consequence of the series was a substantially increased enrollment in the Adult Education Television High School. Still another was a closing of the credibility gap between the black community and the S. C. Employment Security Commission, which has reported that 67% of the people who came to them as a result of watching "Job Man Caravan" had never consulted them before; and 36% of these people have been placed in jobs or training programs.

With termination of the second Ford Foundation grant, funding had become more of a problem, Mr. Stepp said; and there are now fewer remote taping sessions. "But it is the involvement, the audience participation, the community feedback on this series that really makes it tick ... The fact that ordinary people see themselves, express their opinions, argue and debate on television is incredibly important to the success of what we've done," he said, adding that a visit of the mobile television unit to a small town could be the biggest thing that has happened to that town in five years.

Mr. Stepp concluded with a quotation from Edward R. Murrow: "The trouble with television is that it's like a sword rusting in its scabbard during a fight for survival."

"In South Carolina," he said, "we're trying not to let that happen."

"Cable TV -- An Educational Tool"

Wallace Briscoe, Senior Vice President for Association Affairs, National Cable Television Association

Mr. Briscoe addressed himself to an unique capability of cable television: "to be a local, strictly local audiovisual medium ... to enjoy the luxury of being able to talk to a small group of people". He had long been enchanted with the word narrowcasting, he said; and the narrowcasting concept is cable's message to people involved in education and local public affairs, because the medium goes only as far as the extent of the cable that serves a given community. Local cable systems can also be -- and are being -- interconnected, and more extensive interconnection will eventually be possible through the domestic satellite system.

But the unique local opportunities afforded by cable television's many channels of frequency space make possible development of local services never conceived before, he said. Limited-interest programming, dealing with small problems for small groups of people, can be

a reality for the first time, if properly conceived and developed. The National Cable Television Association used to be called the National Community Television Association, he recalled -- representing an industry made up of community antenna television systems: "That was when we functioned primarily as a master antenna service, serving the whole community; and it was not until 1966 that the industry adopted an agressive approach to local program origination."

The capability had always been there, he continued; but there were problems with copyright and with a proposed FCC prohibition of program originations by CATV systems. Beginning in 1966, cable systems began to develop their capability for local programming; and more than 25% are now involved in such production. He cited some deterrents to more extensive production -- incompatibility of videotapes, inhibiting program interchange, for instance, and lack of an economic base for development and operation of local programming. "But you can do a great deal that is of great significance for a small number of people on a very small amount of money," he said, "if you have dedicated people who are interested in the problem and capable of solving the logistics problems of getting programs on the system ... you can do a lot with one camera and one microphone, or with one camera and a tape deck, or with a slide projector and a tape deck. What we're talking about is simply displaying and transferring information; and as the interest in and utilization of the facilities becomes greater, the money for support will come from people who have messages to convey or programs to develop."

Another unique factor in cable television, he pointed out, is its origination function, the fact that a cable telecast need not pre-empt other programs: "You're talking about making available to those who have an interest in a given subject a program that doesn't interfere with anybody's right to watch Lawrence Welk, and it can be done inexpensively on a regular basis." In cooperation with schools, many of the 2,800 cable systems currently operational were doing such programming. "For example, in Abilene, Texas, seven hours a day on one channel for local schools. Seventeen different programs, including one for Mexican-American students to introduce them to the English language while at the same time mainatining positive attitudes toward their native language and heritage ... In Casper, Wyoming -- one of the older CATV systems in the country -- they're showing motion pictures for the schools, full-length review courses for remedial programs, youth discussion programs, and a library reference service. In Grand Junction, Colorado, a teenage show produced by teen-agers who are teaching each other social sciences, chemistry, art. They receive high school credit for working in the studio, and their teachers receive guidelines for producing as well as using programs, in-service training throughout the year. Southwestern State College in Weatherford, Oklahoma, has a campus studio that programs for the students and for the general cable audience in the community so they also see what's happening on the campus. Originally intended for teacher training, the whole concept has now been expanded for general viewing."

This last point, Mr. Briscoe said, seemed to him pertinent to a major problem that education faces today -- the concern over public support, which in many places seems to be withering away. Closer involvement of the community with educational programs can do much to ameliorate this situation for schools, colleges, universities, and other kinds of educational programs working with cable systems. Cable can also help education in practical ways, such as videotaping of State ETV programs for replay at times convenient to the schedules of local school systems and for repetition where indicated.

Moreover, education is much more than school systems, as MDTA programs demonstrate. Right now, Mr. Briscoe said, 2,800 community cable systems are serving about 6,000,000 homes, nearly 10 percent of the American television audience; and with new FCC regulations recently propounded and a new copyright statute, this number should grow substantially. And even within the 2,800 communities, the 6,000,000 figure should also grow substantially as more innovative programming is developed. New networks developing with the domestic satellite should overcome the problem of distribution of programming and the very elaborate and expensive land-line construction necessary for distribution of cable programming simultaneously around the country.

In conclusion, Mr. Briscoe stressed the interest of the cable television industry and of the National Cable Television Association in expanding their relationships with education and training, which they consider a natural alliance from which both will profit. He invited questions and contacts at NCTA, located in Washington, which has an active Education Committee and a Community Services Committee and is in the process of initiating several new programs to further develop service for more people throughout the country who can use this kind of local audiovisual medium.

Asked about an NCTA survey of educational cable activities which he had mentioned, Mr. Briscoe said it was currently being completed and would soon be available.* Another seminar participant asked how someone involved in manpower job training could utilize cable television to tell people about the service and how to take advantage of it, and he suggested that the best way would be to have the manpower program or the local employment service contact the local cable system. "We have no standard distribution techniques right now, and I'm not too sure that is bad, because it tends to force the development of local innovation ... For example, 1,500 to 1,800 cable systems in the country have time and weather channels on a 24-hour basis, and most of them have slots at either end on which community notices can be posted."

In response to a participant who identified himself as a producer of educational films and other materials and then expressed the concern

*Cable Television and Education: A Report from the Field, NCTA, 918 Sixteenth Street, NW, Washington, D. C. 20006. March, 1973. 51 pp., single copies free on request.

of his industry over the possibility that use of materials on cable television would interfere with local sales, Mr. Briscoe acknowledged that this problem called for adjustment and some hard thinking; but he admonished, "Now, don't think of us as a customer. Your school is still the customer. I don't envision CATV systems getting into the education business; the CATV will be a conduit for what the educational community and the educational interests want to present throughout their community."

A member of the audience commented on the fact that most cable systems are not in large cities; and Mr. Briscoe said that most major cities would also soon have cable, noting that Los Angeles had a very substantial system under construction, as did Atlanta and San Francisco.

Asked about the availability of cable channels or segments of channels for lease and how such leasing might be funded, he pointed out that all cable systems are going to be required by the FCC to provide access channels in the communities they serve on a first-come-first-served basis. "There certainly will be nothing to stand in the way of leasing channels; in fact, this is being done on a limited basis now. I don't presume at this point to have any answer to the question on how you finance the programs. I do submit that it is not necessary to spend the kinds of money that are spent for network production in order to do a job within a community that is meaningful to that community ... I think there are people all over the place who have motives for programming if given the opportunity and sufficient incentive to fund it." Another member of the audience asked if public-access channels are free for public use or available for paid leases. "Essentially," Mr. Briscoe said, "it's free. The time itself is free. In some instances, there may be production charges if costs exceed a minimum production capacity. The requirement is that the studios be there, and that minimum production facilities be available. But you don't have to pay for the air time."

Mr. Harley summed up by recommending that if seminar participants were not already working with local educational radio or television stations or State networks or local cable systems, they should get in touch with them; and he predicted they would be responsive in helping to advance manpower training programs. "Those of us in noncommercial broadcasting don't have any money; but we do have lots of time, and we're used to working with target audiences. As for cable, particularly at this stage of their development, the systems have lots of underutilized capacity, and they're interested in finding ways they can relate to their communities."

"A Prevocational Basic Skills Job Corps Training Program"

Lawrence Langfeldt, Program Specialist, Job Corps, U. S. Department of Labor (with James A. Cole, Education and Training Division, Volt Information Sciences, Inc.)

Mr. Langfeldt described his program as one directed specifically to the 16-to-21½-year-old disadvantaged youths who are the enrollees in some 75 Job Corps Centers throughout the country. It is a basic skills program, he said, designed to help young men and women become entry-level employees -- a basic vocational training program, supported with basic educational programs, including the GED.

"We found over the years since we began that many of the youths who come into the program had very little skill with common hand tools, didn't know how to use them, didn't really know what they were." It became necessary, then, he said, after initial orientation and determination of a vocational interest, to teach them about the tools used in particular trades. Later, the Job Corps began to develop a program of basic handtool preparation, introduction, and use that was designed for the orientation enrollees before they made vocational decisions. An instructor with a class of 25 or so would start off with "This is a saw" and explain how a saw was used; and then the trainees -- or some of them -- had a chance to practice a little with a saw and a piece of wood. "Some didn't," he said. "Some just sat there in the class and learned that that was a saw and that was a pair of pliers and that was a wrench. There wasn't any standard on how this information was to be presented, but we knew something had to be done prior to the trainees' selection of vocational interests."

From recognition of this need, he said, came the idea that they might be able to use the media for some kind of individualized, self-pacing program on basic skills. The resulting program had now been tested at two Centers for nearly two years, and the Job Corps was now developing a similar but more sophisticated program for more skilled trainees in automechanics.

The basic skills program was designed to meet two objectives: (1) to enable the trainee to identify and use mechanics', carpenters', and masons' common handtools and to apply proper safety precautions in their use; and (2) to identify and use common rulers and measuring devices to measure items of various lengths to the nearest one-eighth of an inch. "The basic skills system provides all enrollees in the program with a broad range of general prevocational skills as soon as possible after they arrive at the Center ... and thus prepares them to undertake the vocational training they select or are assigned to." The system is largely self-instructional, with instructors serving primarily as monitors. The only sequential instruction imposed is that relating to to the linear measurement kit. There are 17 kits, in addition to an orientation kit that explains the autotutorial machine and how it is used -- how to load it, how to insert the cassette, how to rewind -- along with something about the program in

general and the kits they'll be using and the testing at the end of the course. Each program is packaged in a resource kit containing a filmstrip, an audio tape cassette, tools, work samples, materials, and a student response booklet. The enrollee works on the program in a learning carrel equipped with an audiovisual machine. Information is presented to him in three ways: an audiovisual display, actual tools and materials, and the response booklet; and he thus has three modes of response. Self-evaluated feedback is continually provided during the course of the instruction and is accomplished in two ways: through the capabilities of the audiovisual device and by means of comparison standards provided by the device or by the kit.

The machine shown in the filmstrip he was about to screen, Mr. Langfeldt said, was a Dorsett Educational Systems multiple-choice programmed instruction device, the M86C, used with filmstrips and audio cassettes. This device has three buttons and is programmed so that neither the filmstrip nor the tape will advance if the trainee has made an incorrect response. Instead, it makes a beeping sound. This kind of feedback, he explained, is primarily used in the instructional component designed to teach tool identification and usage. For the practical application components, comparison standards are provided, either in the kits or in projected pictures. At the end of the lesson, a test is administered by the audiovisual device for student response in the response booklet; and on completing the test the trainee takes both his booklet and his application samples for evaluation and further feedback from the instructor, who has been monitoring and providing feedback throughout the course of the instruction.

Having tested the program at two Conservation Centers, the Corps now planned to implement it at 30 additional Centers -- rural Centers, each accommodating 180 to 220 men, and all located in National Forests or Parklands. One interesting result of the pilot program had been a marked decrease in the rate of "voluntary termination" of the program by trainees during the first two weeks, when dropping out is substantially higher than at any other time. In the two Centers where the Basic Skills Program was tested, only three or four youths left the program after beginning it.

Mr. Langfeldt then demonstrated the filmstrip and the audio cassette used for a lesson on the use of pliers. It was designed, he said, on a nonreading basis so that a nonreader could go through the program without having to read manuals. It had been found to be very effective. Only a few trainees found it necessary to go through it two or three times in order to answer the test questions satisfactorily; and it has even held the interest of school rejects, who find the equipment a challenge. Most trainees complete the lesson in about one hour. An excerpt from the recorded narration illustrates the instructional techniques applied:

> ... This lesson is on pliers. There are three types of pliers in the top of your kit. Pliers are used to hold things. They

work like fingers. At the end of this lesson you will be able to do four things. You will be able to name all three kinds of pliers. You will be able to pick the right pliers for the right job. You will know how to use pliers safely. You will be able to do many things with pliers.

Now push Button A, and let's get started. Pliers can do many things. You can hold heavy things with pliers. They are stronger than your hands. You can hold very small things with pliers. They hold small things better than your fingers. You can cut things with pliers. You can cut wire, for instance, as the picture shows. You can hold hot things with pliers. They won't burn your fingers. And you can reach into small places with pliers -- places too tight for your fingers.

Now push Button A, and let's get going. The most common type of pliers are called slipjoint pliers. The picture shows slip-joint pliers. You have slipjoint pliers in the top of your kit. Find the slipjoint pliers in your kit and take them out. Get out the slipjoint pliers now. When you have them out, press Button A. Slipjoint pliers are for general use. They do many things. Their most important job is to hold things. They hold small things, big things, hot things. Look at the picture on the screen. It shows how to hold slipjoint pliers. You hold them like scissors. Hold them in one hand, and they open up when you open your hand. Close your hand, and the pliers close. Hold the pliers the way the picture shows. Try opening them and closing them to see what it feels like ...

The lesson continued, instructing the trainee in practice exercises with a wood form in his kit, covering use of the teeth on the slip-joint pliers ("Do not use them on things you don't want to scratch."), use of the pliers for cutting, and so on. With rapid advance on both audio and filmstrip, Mr. Langfeldt skipped to the test phase of the lesson:

Now, in Question Two you must circle the lineman's pliers. Draw a circle around the lineman's pliers in Picture Two. Circle the lineman's pliers in Picture Two now. And in Question Three, pick out the slipjoint pliers, Draw a circle around the slipjoint pliers in Picture Three. Circle the slipjoint pliers in Picture Three now.

He then screened some motion picture footage showing the program being pre-tested by Job Corps trainees at a Center in North Carolina. Carrels, materials, and equipment were pictured, including the Viewlex rear-screen presentation device which would in future be used in the system. He explained that on the basis of the testing, the kits and materials had been refined and redesigned; and he said that when the process was completed, the kits would be made available commercially. In answer to a question, he said that at the Center shown in the film

in addition to six carrels there is a shop area in which the trainees can practice what they have learned in working with the lesson kits. To another question he replied that the instructor does not rely on the kit materials, but also performs demonstrations himself. Asked about the length of the orientation program as a whole, he said it varies from Center to Center. At the one shown in the film, it runs nearly two weeks and includes not only the basic skills program but also an occupational exploration program in which enrollees spend four hours in each of a number of vocational areas, engaging in hands-on activities to determine which might interest them -- automechanics, carpentry, welding, masonry, etc.

Mr. James Cole, of Volt Information Services, the company which was producing the audiovisual system for the Job Corps, explained some of the complicated logistics involved in developing the 18 basic tool kits, the filmstrips, tapes, and other materials for 30 Job Corps Centers. In addition, he said, Volt was developing a course in basic automotive mechanics, consisting of six kits. "Now, we're not trying to make skilled mechanics of these Job Corps men," he said. "The system we are putting together will be a very basic one dealing with the electrical system and parts of the system. We will teach the students something about battery maintenance and battery checkout. The distributor -- how to check the cap, the rotor; how to replace the ignition points in the distributor; how to check the sparkplugs and the wires leading to them, and replace them if necessary; how to check out the starter to make sure that it is functioning properly, and replace it if necessary; and the same for generators or alternators, checking to be sure they are functioning, and if they are not, how to replace them." The resource kits, he said, would contain all the tools and parts required for this module of instruction, along with the tape cassette and the filmstrip. There are some problems yet to be resolved -- for instance, one rooted in the fact that in order to time an ignition properly, you need a functioning automobile engine. "We're not sure how we're going to have a Viewlex system in a carrel and still have an automobile handy."

With this specially modified Viewlex machine, he said, they would provide a QRS (Quick Responding Systems) device that supplements the programming cues on the tape. With an IBM card inserted in the responder unit, it would be possible to keep track of the number of tries a student made to respond correctly to a single question. The filmstrip will not advance and the audio tape will not play again until the correct answer is given.

Materials, he said, must be self-instructional, requiring only a monitor in the instruction area. They must be highly graphic, because Job Corps trainees are generally on about a third-grade reading level. They must be based on thorough research of available standards for automobile mechanics' helpers and automobile service repairmen. They must also provide some sort of hands-on training -- a practical application approach; and they must be nonsequential, so that any student can enter at any point in the system with any one of the kits -- no one of them is a prerequisite for any other.

Complete management and implementation instructions would be supplied to the various Job Corps Centers, Mr. Cole said, including both an instructor's manual and a cassette of taped instructions to make sure the systems are properly used.

The automotive mechanics kits in preparation would have two significant functions. One was demonstration of the fact that it is possible to provide effective training in the automotive skills area in an audiovisual mode. The second was provision of a basic core of instruction on which courses teaching other systems of the automobile could be founded. "It is sort of a pathfinder effort," he said. "We're showing that it can be done; we're showing how it can be done practically. And we're going to find out a great deal about the cost-effectiveness of such a system."

"The Role of University Extension Programs in Career Education"

Armand L. Hunter, President, National University Extension Association, and Director, Continuing Education Service, Michigan State University

Presiding over the final session of the seminar, Dr. Hunter opened the afternoon by reporting on the role of extension programs in career education and manpower training, noting that it was currently a limited one. He explained that of course colleges and universities primarily identify with career training and education at the professional level -- medicine, dentistry, law, engineering, business, education, social work, and so on. They have not, as a rule, he said, entered actively into development of programs related to technical and vocational training at the direct or beginning level.

"Through the extension divisions, however," he continued, "those units of a university which make an effort to extend the resources represented by the faculty and staff of the various disciplines, departments, and offices of the universities to meet public and adult societal educational needs have, as such -- as those divisions -- long had a very keen interest in career development. And in most instances our university or continuing education divisions have attempted to carry out this particular function and role by working as closely as possible with other educational resources ... other educational institutions and organizations and agencies within the State." As examples of such agencies he mentioned the adult educational and vocational and technical training divisions of the public schools and the technical training and career development programs of community and junior colleges.

"In many instances," he said, "I suppose the colleges and universities play their most significant part in developing the trainers and administrators and those who are working actively in the developmental field or are working in this particular area on a professional basis. And in this context they do a great deal in the area of conferences, institutes, seminars, workshops, and special training programs that have been, we

hope, of some value and significance in this whole area of critical need for job development, manpower development and training, and technical training." Summarizing the efforts of extension divisions to make effective use of their resources to assist such activities, he emphasized their cooperation with other agencies and programs and their willingness to make their resources available to such programs as those represented by seminar participants.

"Career Education Resources"

John P. C. McCarthy, Program Specialist, Curriculum Center for Occupational and Adult Education/ Bureau of Adult, Vocational, and Technical Education/ U. S. Office of Education

After describing the structure of the Bureau he represented, Mr. McCarthy said he was on hand in response to requests from seminar participants for materials on career education. Among those he would recommend was a handbook entitled Career Education -- a Handbook for Implementation, available from the Superintendent of Documents (Stock No. 1780-0926, price 55¢, U. S. Government Printing Office, Washington, D. C. 20402). Another, written by Kenneth Hoyt, Rupert Evans, Edward Mackin, and Garth Mangum, was Career Education: What It Is and How To Do It (price $4, available from Olympus Publishing Company, 965 East Ninth South Street, Salt Lake City, Utah 84102), which includes a selected bibliography. Two publications scheduled for release within the month by the General Learning Corporation were designed for use by schools but would also be helpful in manpower training and development programs: Career Education Resource Guide and Career Education In-Service Training Guide (prices, respectively, $4.25 and $1, General Learning Corporation, 2139 Wisconsin Avenue, NW, Washington, D. C. 20007); and Mr. McCarthy mentioned Gene Bottoms, Rupert Evans, Kenneth Hoyt, Jarvis Morgan, and Jack Lloyd as contributors to these publications, which include materials taken from exemplary programs funded by the Office of Education, more than 100 case studies in all. He also mentioned the service called Career Education News (22 issues each year, $25, Career Education News, 230 West Monroe Street, Chicago, Illinois 60606).

In response to inquiries about relevant programs of the Bureau's Curriculum Center, he reported that the Center was now completely geared to career education and had funded 33 proposals during the current year -- including four or five for the disadvantaged, one for Spanish-speaking people, one for Indians, one for developing businesses, and one on employability skills for disadvantaged adults. Reports on these projects would be coming out in eighteen months to two years. Further, he said, the Center had funded proposals for five curriculum laboratories in different parts of the country and two or three projects concerned with the administration of vocational and technical education in career education. Another is a metrication project "so that when the United States is ready for the metric system, the teachers will be ready for that". ("And by the way," he said, "those clusters are not set in cement. They're very flexible.")

"Footnotes on Equipment Purchase Decisions and Use of Equipment"

Sheldon Z. Fisher, Program Associate, Division of Manpower Development and Training/ Bureau of Adult, Vocational, and Technical Education/ U. S. Office of Education

Mr. Fisher called the particular attention of the group to a presentation scheduled for the end of the afternoon on audiovisual equipment consumer education. "You've seen a lot of equipment in the last two days -- overhead projectors, television, 8mm film, slides, multi-media. The temptation now is to go back to your programs and say, gee, which one should we buy?" Speaking for the Office of Education, he said, "We cannot issue you a blank check to go ahead and buy one of these or all of these for your project. The idea of this meeting is to tell you what's available in instructional technology, and to equip you to make judgments as to what you can use to make your program more effective.

"Quite often we get proposals saying, 'We want to buy a Sessue Hayakawa Model 3 Portable Back-Pack Videotape System -- one camera, one reel of tape, one 12-inch monitor.' The question then becomes: what are you going to do with it?" And the answer, he said, too often is, "We don't know, but the salesman said ..." In view of the many uses possible for videotape or motion pictures, he emphasized, "It is absolutely essential to know what you are doing. And unless you are prepared to invest the blood, sweat, and tears to develop the expertise of educational technology -- stay with the blackboards. Because you can spend an awful lot of time and an awful lot of money to make an awful lot of bad film." Effective use of media, he maintained, takes planning and creativity. To help with planning, this seminar was arranged to demonstrate what's available on the market and what its uses are "so that nobody sells you a Chevrolet, making you think it's a Cadillac until you find out it's a bicycle."

As a further footnote he advised, "If you're going to use instructional technology, know how to use it yourself. Know how to handle the overhead projector, how to change the bulbs, how to thread up the videotape, how to trouble-shoot. Don't tolerate a bad picture; don't tolerate bad audio. If you can't really see it and you can't hear it clearly, turn it off -- because it's not going to teach, it's going to distract. Turn it off until you've learned to use it right."

"A Vocational Guidance System to Replace Computers and Counsellors"

John L. Holland, Director, Center for Social Organization of Schools, Johns Hopkins University

In explaining what had prompted him to develop the system he was about to demonstrate, Dr. Holland said that for 15 years he had been a practitioner in vocational guidance, beginning with military service during World War II. "I quickly learned that men are not infinitely

complex, although that was what I had been taught. That, really, there were only a small number of types." Subsequently, he had worked as a rehabilitation counselor in psychiatric and physical therapy settings, served as coordinator of a university counselling service, and been in charge of research and development for the American College Testing Program -- in which, he said, he became intimately acquainted with audiovisual aids and with computers and their weaknesses. "During those 15 years I learned that there ought to be some way that you could deliver vocational guidance that is inexpensive; that is not a Hollywood production; not dominated by professionals who are concerned about being more sensitive rather than being more helpful; and not requiring scoring services with all their delays, expense, and occasional errors."

The next 15 years of his life had been spent working on that problem. "And we think we now have a useful solution so that we can deliver vocational guidance to people for about 60 cents, in a hurry, working by themselves without a professional hanging over their shoulders worrying about whether they're doing it correctly or whether they're going to make some serious error which they will inflict on themselves or their children."

He then distributed copies of research editions of the Self-Directed Search test booklet and the related Occupations Finder booklet to all seminar participants. After they themselves had taken the test, he said, he would show them an elaboration of this device so that they could set up their own vocational guidance systems -- the "Self-Directed Career System" -- "on an ordinary small table in dormitories, health centers, libraries, or homes". The test may be taken on the spot or carried away to be worked at home.

The system is geared for a reading level between the seventh and eighth grades, he said. "And you have to be able to add up to 16 and to multiply by two and by three ... Most of all, you have to be able to concentrate ... Normally, the best way to administer this device is to let people take it home, or take it to their rooms or their desks." He then asked his audience to read the instructions and begin taking the test.

The first section of the Self-Directed Search test poses 11 questions for YES/NO answers on each of six competencies categorized as Realistic, Investigative, Artistic, Social, Enterprising, and Conventional; the second section calls for report of attitudes and feelings toward 11 occupations listed under each of the same six headings; and the third elicits self-estimates (HIGH/AVERAGE/LOW on a scale ranging from seven down to one) in respect to traits related to the six aforementioned areas of aptitude (Mechanical Ability and Manual Skills -- Realistic, Scientific Ability and Mathematical Ability -- Investigative, etc.) The instructions then lead the test-taker to draw line graphs which enable him to rank his occupational aptitudes and express them in a summary code such as IRE -- Investigative-Realistic-Enterprising.

Reference to the summary code in the Occupations Finder booklet then enables each test-taker to consider a list of appropriate occupations, supplemented by other lists found under codes such as RIE or REI that resemble his basic IRE type.

After about 30 minutes of test-taking, Dr. Holland interrupted his "clients" to hand out copies of a post-test checklist, "Making the SDS Work for You". He announced that he had done an informal analysis of the group: "You are a bunch of SEA and SEI's -- Social Enterprising types -- and you're about equally divided; you're about half Enterprising and half Social ... There are a few I's, Investigative types, here -- ex-engineers, I think, but very few. Most of us are educationally oriented and administratively oriented; and the device should probably indicate that for 95 percent of you, I think. Some are audio-visual people, a new group to us, in some ways, so I suppose there are a number of Artistic types mixed in here. At any rate, one of the things you hate a lot is clerical work; and so that's why I'm interrupting you at this point ... You can continue later and find out what you're really like."

He then continued, "Unlike those things published by many publishers, this one happens to have some flaws. It works maybe only 60 percent of the time. Most people enjoy it. Students who take it find it broadens the number of occupations they are thinking about... We've tried it out on people aged from nine to 69; and we can get almost anybody who is interested through it, with a little supervision. We prefer, however, to give as little supervision as possible ... so we can easily help counselors reach the entire populations of students in a high school or adults in training centers."

Dr. Holland then explained the next step in his system, the "Self-Directed Career Program", which he described as a complete vocational guidance system. "It's a paper system, and more expensive than what you have just been exposed to -- it costs nearly 73 cents a student." This was the table-top system he had previously referred to, consisting of a locally-produced sign (DO-IT-YOURSELF VOCATIONAL GUIDANCE) and stacks of the instruction sheets, test booklets, Occupations Finder pamphlet, and the checklist sheets just used by seminar participants, along with one copy of the U. S. Department of Labor's The Occupational Outlook Handbook*, which remains on the table for reference by persons who have taken the test and are now interested in information about a variety of occupations, including job descriptions; how much training is required; potential earnings; etc.

He then distributed copies of a manual prepared under an USOE grant (No. OEG-2-7-061610-0207, Project No. 60610-05-D), A Guide to the Self-Directed Career Program: A Practical and Inexpensive Vocational Guidance System. This report describes the system, recommends supplementary

* The Occupational Outlook Handbook, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20404. $6.25. (revised very two years)

materials, and proposes some general plans to assist users in evaluating the SDC program.

The current set of materials, he said, represented the eighteenth revision of the system: "Because it's a paper system, not a computer or audiovisual system, we can make revisions at very low cost." The Occupations Finder booklet was not his creation, but based on scientific occupational classifications and solid research data. For this reason, any vocational materials in existence can be reorganized in accordance with its classification system. As an example, he cited the Krumboltz Vocational Exploration Kits published by Science Research Associates of Chicago, which are simulations or games posing real-life problems set forth by practitioners of 22 different occupations. The contribution of the SDC was demonstration of how to code the classifications on the basis of six major groupings, with elaborations reflecting interactions, that cover every occupation in the Dictionary of Occupational Titles, with its descriptions of occupations and estimates of interests and aptitudes associated with each.

Asked about an SDS test-taker who could not find her particular permutation of the six-letter code in the Occupations Finder, he recommended checking the codes beginning with the first two letters in the three-letter permutation, adding that the first letter was really the most important. In response to a question about kinds of people using the system, he listed high schools; a few elementary schools at the higher levels; colleges, particularly where large groups are involved; vocational education programs; career centers for women; and some Veterans Administration Centers.

Moreover, Dr. Holland added, he himself used it. Reminding the group that he had been trained as a traditional psychologist -- "thorough, making use of test after test"-- at Johns Hopkins, he said, he is now running off-the-street counseling. "I do not have appointments. You can see me in five minutes almost any day. You won't stay long. You come in. I talk to you five minutes to find out whether you've had electro-shock ... or some severe problem of any kind ... So once I assure myself there's nothing exciting here, I talk to you briefly about your occupational aspirations; and then I say, 'Fill this out. Do the best you can. In case of any doubt, follow directions.' Then I give you a copy of the Occupational Outlook Handbook; and when you finish the test, look up any occupations you're interested in ... People come back talking. They don't ask what the test means -- they know. So we have another brief conversation, and I show them how to get more information or get some training ... I handle more clients -- friends -- than almost anybody in the University ... students and adults in the community who've heard about this. We do not charge fees, we let them make a donation to the coffee fund (though only two people have done so). But they are more appreciative, and they are more in charge of their lives."

The system does not appeal to professionals, he added, because it looks too simple and too easy. "It's clear. You know what you're doing. There are no secret questions." Summarizing, he said the "Occupational Daydreams" section is a check on the validity of the device. "If you

want to know who's going to do something, what he says he's going to do is what he's going to do -- not what this device or any other device says. SDS is a way of enlarging the search he's already on." The section on Activity is an attempt to assess a person in terms of the six kinds of people in the world. The Competency scales are imitations in some respects of the old oral trade-crafts of the two World Wars, thus eliminating an aptitude test. The section on Occupations is a vocational preference inventory devised by Dr. Holland in 1963 that included 453 items, now reduced to 84. "The self-rating," he said, "is another attempt to deal with aptitudes. People are not so ignorant as we've made them out to be. They can tell you something about what they're good at. And when you're doing the profiling and scoring, you are imitating what a computer diagnostician does and what you do when you hire employees ..."

He explained that the profiles in the Activities, Competencies, and Occupations Graphs should all look much alike, have the same general shape. "If they don't, they suggest something peculiar about your experience -- not abnormal, but peculiar, unusual; and either there is some confusion or you have had some very diverse experience." The final steps in the system he said are sending the test-taker on to take indicated action on test results and making sure they are referred back to counselors if things go wrong or if they need further help.

"Choosing and Using Audio-Visuals"

Katherine P. Breen, Corporate Training Director, Montgomery Ward Company

Because local in-house production had been discussed by several of the other speakers, Miss Breen said, she would address herself to situations in which it was necessary or advisable to employ the services of an outside producer; and although she would be talking mostly about film producers because film was a major element in her own program, her remarks would apply equally to producers of filmstrips, slides, broadcast media, or even posters.

She opened her presentation by showing a short animated film on performance standards designed for use in training programs in the Montgomery Ward system. After taking note of the many kinds of barriers to communication that hamper understanding between employees and managers, the narration described how performance standards are determined, beginning with preparation by each employee of a draft list of major responsibilities pertaining to his job that will be negotiated with his manager. These standards, subject to periodic review, can be adjusted to suit changing conditions, to help solve problems, or to be more realistic in terms of experience. Aided by lively cartoon characters in the film, the narrator continued:

Standards of performance bring us four great advantages. Number

one is the development of people -- we all know that development is really self-development. And all any company can provide is the opportunity and incentive to encourage development. With this system, we have that opportunity ...

The film, Miss Breen explained, illustrated the main points she wanted to make. First, the importance of choosing the right producer to develop training materials. In her job as training manager for a large company, she said, she was beseiged by salesmen trying to sell hardware or services. "It's kind of risky ... because very frequently if you get the wrong producing group, you could lose your job or a program could die, because you've invested a great deal of money and a great deal of time." In the case of the film just shown, she said, it was necessary to collect reactions from people in over 500 retail stores. She and her staff had worked for a year, researching, producing, and testing a seven-minute film.

In choosing a film producer, she said, she had four criteria: creative ability, quality, awareness of the client's problems, and capacity to become involved with those problems. Commenting on creative ability, she talked about the supersalesman -- "the reincarnation of Cecil B. de Mille", she called him. "If you tell him, for example, that you have a problem and you want to teach something rather mundane like inventory recovery, and you're interested in going through some very, very ordinary steps -- he doesn't want to do that. He has his own idea, and he's going to persuade you... Right then and there I know I'm in trouble. I have a creative genius, but he's not for Montgomery Ward." Another danger sign was the sample of a producer's creative work that turns out to be 10 years old: "The people who wrote the scripts and the artists have long since left the company." Equally significant are several film samples that betray the fact that the producer keeps making the same film over and over. It is also important, she said, to choose a producer who will allow you to deal directly with the script writers, rather than communicate with them through the director.

On quality, she said that excellence in production, art work, sound, and other elements of film are extremely important because people today are visually very sophisticated. As for awareness of the client's problems, she liked to hear a prospective producer ask such questions as: who is the audience, what is the educational level, what do you hope to accomplish, what are your long-term and short-term goals, and when this film is finished, what do you want people to think, to feel, to say, or do? "And then, of course -- most important -- I am favorably impressed if he asks whether this film is part of a program." She would have no use for a producer so naive as to think a film alone could make everyone in its audience a real devotee of standards of performance. If a producer asks those questions, she said, you know you have a pro.

"The last quality that is important is involvement. This is something like a romance between you and the producer. How do you interact? What kind of communication is going on? Do you feel he understands the program and your problems? Do you think you can work with this particular

person?" And the basic, bottom-line question, she said, is: will this training material make people more productive? "If the film comes out artsy-craftsy and is a creative masterpice, but it doesn't do the job ... then I'm in trouble ... So I have to be very careful when I work with a film producer that we have this kind of rapport, that he understands what is at stake ... If the film wins an award, that's fine. But if it helps the store manager do a better job and he becomes more productive, that's my goal."

Miss Breen cautioned that in choosing a film producer, the financial stability of candidates should be considered, because producing a film is expensive. A request for advance money is a danger signal, she said, and she recommended checking with some of the producer's previous clients. On the other hand, the client also has ethical responsibilities: "You don't ask for a film treatment for nothing ... All the producer has to sell is his time."

In response to a question on the relative values of live-action film versus animation in terms of cost-effectiveness, she pointed out that with live-action, Montgomery Ward -- being in the merchandizing business -- has the special problem of fashion-consciousness: women's hemlines and men's haircuts date a film very rapidly these days. It was for this reason that they had decided on animation for most of the film she had shown earlier.

Asked about a rule-of-thumb on film costs, she said that the traditional estimate of $1,000 per minute must be upped to at least $1,600 per minute for live-action 16mm film and even more for animation. On filmstrips, costs would vary from $60 to $125 per frame, with the average eight-minute filmstrip running about 100 frames. In her program, filmstrips are frequently used, she said, but she considered 16mm film more effective; and it can be converted for 8mm cartridges or, in some cases, to 35mm. She was also looking forward to using Cartavision videotape cartridges.

"How to Specify and Purchase Educational Hardware"

William C. Lewis, Technical Advisor, Educational Products Information Exchange Institute; and Director of Technical Systems, American College of Life Underwriters

Mr. Lewis said that he was going to repeat some of Miss Breen's software caveats in relation to hardware: Please buy with care ... It's a very complicated business ... You can spend a lot of money on equipment that in six months will serve you as very large and very nice paperweights -- and will have done absolutely nothing for you or the people you are trying to motivate." Even traditional equipment costs a lot of money, he said, citing school buildings with public-address systems, master clock systems, perimeter security systems, fire alarms systems -- to which they are now adding master-antenna television systems and even dial access systems. "All of these systems are bought separately -- you know, $1,800 for clocks ... Well, for 50 years or so, the broadcasting business has been

going BEEP on the hour automatically with a little hundred-dollar box. We could do that on the PA system and forget all the automatic clock nonsense and save a lot of money."

As another economy measure, he described a learning-space wall made of matte white formica: "Easy to maintain. Durable. Relatively inexpensive. Makes a great projection surface. You can write all over it with water-based felt pens. You can tilt it to break up the acoustical properties of the room. It's great, and it does work." It is also, he said, considerably cheaper, over a period of time, than the various screens and chalkboards and flip-chart easels and bulletin boards and acoustical baffles it replaces. "It's whatever you want it to be. Lots of images, one image, the whole works ... And it's relatively inexpensive." There are many nontraditional kinds of hardware that will make a teaching job easier.

The first consideration in purchasing equipment, he said, is the setting in which it is going to be used. A typical classroom is 24 feet wide and 32 feet long. Using overhead transparencies to illustrate his points, he continued, "In order to be seen from the back of the room, the width of a projection screen must be from one-sixth to one-eighth (depending on whose book you read) of the distance between the screen and the viewer in the back seat." If you take one-sixth of a typical classroom roughly 32 feet long, you set up a 48-inch screen in the front of the room and a typical 16mm projector two-thirds of the way down the middle aisle. But most 16mm projectors come equipped with two-inch lenses -- which means that your image will be off the screen on either side. A better expedient, he said, would be to use a 70"x70" wall screen, and back the projector to the very back of the room, which gives the additional advantage of moving the projector noise away from the audience. Another mistake teachers make is leaving the speaker right by the source of all the other distracting noise, the projector, instead of placing it near the screen at the front of the room. If the cost of an external speaker is a problem, the speaker from the public address system would serve very well by phantom-lining. He recommended careful consideration of lenses in making projector purchases -- the right lens for the spaces in which the projector will be used.

For a classroom setting in which 16mm film is to be used, there are a number of special requirements. High audio output on the speaker is one. Remote control is useful, so that the teacher can stand in front of the room and start and stop the film without running to the back of the room. The projection lamp should have a high light output so that the pictures are clear and bright. Heat output is not critical. A lens that will fill the screen is essential. The size of the projector is not a factor: "It's going to sit there -- nobody's going to be behind it." A long AC cord is important; but in this connection local fire codes must be considered, because in some school districts cords over 15 or even 10 feet are prohibited.

In contrast, when 16mm film is to be used in a carrel, other factors must be considered. High audio output is not needed; in fact,

headphones might be useful. Remote control is not needed. A 300-watt lamp may be entirely adequate -- and save money: "We're close to the screen. The screen will still be bright." As for heat output, he said, "Well, where it wasn't critical in the classroom, if you put a little kid or any student in a carrel with a 1,000-watt lamp in a typical projector, he will come out looking as if he had just come back from Miami." A short lens will give a large picture in a small space. The size of the projector could be very important; a large projector won't fit in a small carrel. Projectors with both arms on top are good for carrels. AC cords should be short. "Little things -- how you're going to use the machine -- determine what features you buy."

As sources of information on equipment features, Mr. Lewis recommended the Audio-Visual Equipment Directory published annually by the National Audio-Visual Association (Appendix D, #32) and the services of the Educational Products Information Exchange Institute (Appendix D, #24).

The first step in making purchase decisions, he said, is the writing of specifications. Purchasing procedures requiring bids tend to get complicated, he said, and often increase costs: "We've gotten to the point where bidding says to the dealer, 'How high can you set your prices and still underbid the next dealer who's trying to get a high price?'" A set of good specifications, therefore, has several uses. First, it requires a purchaser to become informed about the equipment he is considering -- to look at catalogs, ask questions, talk with experienced people, perhaps even hire a consultant. Being informed, then, he will be able to evaluate available equipment in terms of his own needs and those of the teachers or trainers who will be using what he purchases. Specifications are also a communications tool in justifying purchases to the administrator who is responsible for expenditures: "I need this. Here's why. Here's what it's going to cost. Here's how it's going to work." Particularly important when spending public money is the fact that specifications set ground rules for the vendor on cost, performance, and bid regulations. They also communicate the purchaser's needs to the vendor so that he can be sure he gets the kind of hardware he wants to do a job.

Software he defined as ideas, concepts, something you want to say or communicate to a learner. "Hardware is this overhead projector -- which is not going to say a thing ... So in between is what I think should be called mediumware -- the software put in some form that can be moved from place to place ... We can take the concept and squeeze it into a film. All the hardware does is allow you to recover the software that is stored in the mediumware; it is nothing more than a tool which allows us access to ideas."

Turning to the problem of standards, he discussed the question of compatibility of videotapes. Sixteen-millimeter film is more expensive, he said, but they can play it back in Anchorage, Alaska, or Podunk, Iowa, or any other place. There are, however, some problems with playing back videotapes and videotape cartridges. Again, the purchaser's decision must be made in terms of settings and uses. "If you need something that is standard, that anyone in the world can play back, then stick with some standard

medium ... If you're writing a specification, know what standard you're talking about, know what it will do. Are you aware that there are 17 different film formats in use in the United States today?" Mr. Lewis went on to say that in the case of videotape, the problem is considerably more serious. But if a purchaser needs videotape, he must understand that problem and incorporate into his specifications the standard that will meet his needs. Once the decision on a standard is made, it is important to enforce it with all bidders. EPIE, he noted, has available a recent report on writing specifications, with some good formulas.

Further, in choosing a consultant to help with purchase decisions, he recommended using many of the same rules Miss Breen had suggested for choosing a producer. What do previous clients say about him? Will he get involved with the client's problem? Does he ask pertinent questions? Does he have ideas that stimulate the client's thinking? Does he know his business today: "Is he a man who has had 10 years of experience, or a man who has had one year of experience 10 times?"

He also cautioned seminar participants against the glamour of the videotape field. "I think video cassettes are coming, but they're not really going to arrive until you can buy a cassette player or recorder for something like $300. I think that to expect people to pay $1,200 to $1,600 is ridiculous -- especially when the only software you can get is really film transferred to tape, and you can buy a film projector for a third or a half the cost of a cassette player, and the quality of 16mm projection is better -- better sound, better color, better resolution ... It doesn't make any sense to me yet. It will. But it doesn't yet." If a training program seems to require videotape in order to have two soundtracks for a bilingual program, he said, the problem can be solved by taking an optical sound film and half-striping it -- putting down a magnetic stripe that covers half the track and recording the Spanish track on that half to be used with projectors that play back both magnetic and optical sound.

"If you're going to make a commitment to equipment, remember you are also making a commitment to people," he warned. "Somebody who can fix it. Somebody who understands how it runs. Somebody who can move it from place to place where it is needed." Another thing to remember in making purchase decisions, he added, is the fact that systems -- related components of equipment that have to be connected -- tend to get complicated. "You have to think in terms of systems. Be careful. Make sure you have good advice and good help, and remember that the salesman is there to sell the system; he's not there to solve your problem."

He advised, too, that it was important to learn how to operate and use the equipment, once it is purchased. As for specially modified equipment for special purposes, he recommended trying what is available off the shelf first. Specialized equipment is available, however, if that is what is really needed. Before purchasing it, it is important to talk to other customers who have actually used it. Being the first purchaser of a piece of equipment, he cautioned, may mean being stuck with

a problem.

In concluding, Mr. Lewis recommended dealing with reputable salesmen who are interested in the client's problems -- "a person you've seen more than once and will see more than once again". Next, he said, "Try and stick with simple systems. Make sure you're not being razzle-dazzled by the bright lights and the pushbuttons and go into a combination multi-media supercassette video-audio slide-show workbook system when a well-produced 16mm film would do the job for you ... Seek a lot of help. Look for people who have had the same problems you have, and are working with the equipment you are considering. You have an opportunity in this field to start using educational media in manpower training and the teaching of skills -- where it may be that they can do a better job than they can in any other kind of program. And I certainly hope that you'll all go back to your programs and make some exciting new mistakes instead of the same old ones."

Seminar Follow-Through

Twelve days after the seminar, a follow-through memorandum was sent to all participants (Appendix G), requesting comments on specific aspects of the seminar planning and program. Response was gratifyingly commendatory ("useful and interesting" "a pleasant and useful experience", "most beneficial", "very well organized"), with a surprising number of people reporting they would have preferred a three- or even four-day seminar to the two-day event they had attended, so as to allow time for additional kinds of discussion such as group problem-solving sessions.

Although such activities were not part of the seminar design, the Educational Media Council, too, would have liked to spend more time with the representatives of MDTA programs -- from whom, nevertheless (as Jack Jennett noted in his seminar keynote address), representatives of EMC Member organizations who took part in the program learned much that was and will continue to be of great personal and professional value.