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TELEVISION AND RELATED MEDIA IN TEACHER EDUCATION, SOME EXEMPLARY PRACTICES.

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THIS IS A SERIES OF ARTICLES ON POSSIBLE AND ACTUAL USES OF VIDEO TAPE MATERIAL AND PROCESSES TO IMPROVE TEACHER EFFICIENCY, COMPETENCY, AND INSIGHT. EMPHASIZED ARE INDIVIDUALIZED AND SMALL GROUP USES OF TELEVISION, PLUS ITS POTENTIAL AS A RESEARCH AND DIAGNOSTIC INSTRUMENT. THREE MAIN USES OF TELEVISION ARE DISCUSSED--AS A SUBSTITUTE FOR LIVE OBSERVATIONS OF CLASSROOMS AND CHILD GROUPS, IN MICROTEACHING, TO PREPARE ELEMENTARY AND SECONDARY TEACHERS AND COUNSELORS, FOR INSERVICE TRAINING. ONE ARTICLE DEALS WITH THE AMPLIFIED TELEPHONE AS A TEACHING MEDIUM. SOME RESEARCH FINDINGS AND EVALUATION METHODS ARE ALSO INCLUDED. (JM)

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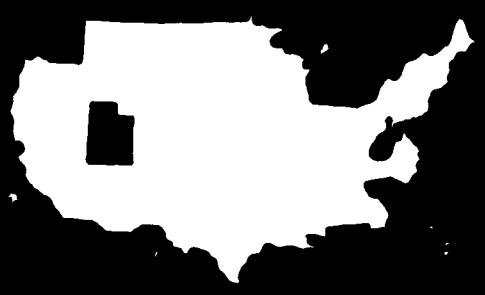
TELEVISION AND RELATED MEDIA IN TEACHER EDUCATION

one of a series of M-STEP monographs



TELEVISION AND RELATED MEDIA IN TEACHER EDUCATION

Some Exemplary Practices

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PURPOSE OF THE MULTI-STATE TEACHER EDUCATION PROJECT

"To strengthen the capacity of state departments of education to provide leadership in the development of joint responsibility between local education agencies and teacher education institutions in the preparation of professional personnel, with emphasis on laboratory experiences in elementary and secondary schools.

"The compact states have been brought together by a mutual concern for strengthening teacher education and a desire simultaneously to widen their leadership roles in their respective states. The multi-state nature of the proposed project is an innovation. By pooling resources and cooperating in pilot programs, it is hoped that a new dimension in the potential of state departments of education will emerge."

(Quoted from original Application to the United States Commissioner of Education, February 25, 1966)

The Multi-State Teacher Education Project proposal was approved by the United States Commissioner of Education on March 10, 1966. The project is federally funded under Section 505, Title V, Public Law 89-10 (Elementary and Secondary Education Act of 1965).

FOREWORD

In the earliest planning processes of what later came to be known as the Multi-State Teacher Education Project, or more familiarly, M-STEP, it was clear that the major thrust of project effort should involve the improvement of clinical experiences in teacher education. At the same time, logic demanded that in addition to finding ways to utilize more effectively the direct impact of laboratory situations in programs of teacher preparation, a parallel effort must involve experimentation with technological media as a means of supplementing and reinforcing other professional learning processes. The prospect of using videotapes in a variety of ways in teacher preparation intrigued both the Planning Board and the Administering Board of M-STEP. Subsequent progress in member states has been noteworthy.

As the project moved into the teacher education media field, the fact became clear that applications of television and some of its electronic cousins were assuming a status of experimental sophistication in several institutions and agencies throughout the nation. The facts were equally evident (a) that a need exists for exploring the scope of potential and actual application of instructional television in teacher education and (b) that some means of disseminating information on current institutional practices, accomplishments, and attendant problems might become a useful service to all institutions and agencies which are involved in teacher preparation.

Early in 1967, as an initial step toward achieving these goals, the project director invited a group of knowledgeable professionals to assume a lead role in preparing a statement concerning the scope of new media potential in teacher preparation, and to assume an advisory role in the development of plans for a bulletin explaining emerging practices at institutions which were known to be moving ahead in relevant fields. These professionals included Harold E. Wigren of the National Education Association, L. O. Andrews of Ohio State University, Walter J. Mars of the American Association of Colleges for Teacher Education, James E. Conner and Charles E. Trotter, Jr., of the U.S. Office of Education, Charles K. Franzén and George W. Slade of the Multi-State Teacher Education Project. To this committee the project director expresses his profound gratitude.

A list of possible and actual uses of television and certain related communication media, as viewed by this committee, follows this Foreword. The major body of the bulletin is devoted to descriptions of current practices and professional points of view. It was the intention to arrange the articles which follow to correspond with the topical sequence outlined in the ten-point list entitled "Uses for Videotape Materials and Processes in Teacher Education Programs," which will be found on the next page, although it is recognized that several articles cover more than one category of use. Within categories, articles are arranged alphabetically by institution.

A very special word of appreciation also must go to the respondents who prepared articles for the current publication and to the heads of colleges, universities, and other agencies whose advice was sought concerning institutional contributions. Their contributions constitute tangible evidence of their creativity and of their service to the profession. We are forever in their debt.

The fact is recognized that many exemplary situations exist in which television and related media are being used in teacher education, and additional pioneering examples were doubtless available. However, the necessity for early release of the bulletin imposed time limitations upon the current effort, with the inevitable result that many splendid examples of the uses of new media in teacher education have not been included or, possibly, discovered. Perhaps in a field of endeavor in which progress and change are so rapid, some organization or agency should issue an annual compilation of experimental efforts, breakthrough occurrences, and research findings on a broadly based utilization spectrum applicable to television in teacher education. Further phenomenal progress in the use and effectiveness of this medium seems inevitable in the months and years which lie immediately ahead, and reports of such progress should be widely disseminated for the mutual benefit of all professionals who are charged with the preparation of teachers.

August, 1967

HOWARD E. BOSLEY

USES FOR VIDEOTAPE MATERIALS AND PROCESSES IN TEACHER EDUCATION PROGRAMS*

1. Substitute for classroom and child group observations.
2. Self-appraisal process for student teachers.
3. Instruction in the skills and techniques of teaching
   a. skills, e.g., math, music
   b. various types of instructional tasks and techniques
   c. "micro-teaching" activities
4. Simulation.
5. Instruction by resource persons of national significance, e.g., distinguished lecturer series.
6. Telecourses for inservice education.
7. Teleconferences as aids to preservice and inservice teacher education programs.
8. Recording and evaluating progress of student teachers.
9. Recording pupil reactions to teacher behavior for further analysis and study.
10. Preserving original data for later analysis and research.

* This list of actual and potential uses was prepared by the committee mentioned in the Foreword.

INTRODUCTION

The widespread fusion of technology and education is rapidly becoming more the rule than the exception in our nation's schools and colleges. Innovative practices which employ with considerable sophistication the use of television and other technologies are to be found in increasing numbers at all levels of education. These practices indicate the growing willingness — and determination — on the part of educational leaders to make creative application of technology in the solution of instructional problems.

The purpose of this monograph is to bring to the attention of the educational community a selected number of experiments designed to utilize one particular technology — television — in the achievement of specific instructional objectives in the professional education of teachers.

There is now considerable evidence to document that television can be used with great effectiveness for a wide variety of instructional tasks, ranging from classroom instruction, pre-school instruction for young children, out-of-school instruction for youth, the fundamental and basic education of adults, the training of industrial workers for new jobs in an age of automation, and the pre-service and in-service education of teachers. In the judgment of many educational leaders, however, the greatest promise for instructional television lies in this latter category — i.e., its ability to offer professional growth opportunities for teachers. In fact, its use in teacher education has perhaps been educational television's "finest hour" in its brief history to date. With the advent of closed circuit television facilities, videotapes and eventually videorecords, there is every reason to believe that television's future in this area will be even brighter than its past. Its use will be extended and expanded beyond the education and re-education of teacher personnel to include also professional growth opportunities for principals and supervisors, as well as teacher interns and auxiliary school personnel.

Unquestionably, television will play an expanding role in education in the years ahead. Its use, however, will remain only as creative as the imagination of its user can make it. Television affords us not so much a new dimension in instruction as it offers a new way of approaching old and familiar problems. It offers an unconventional way of dealing with conventional teaching and learning situations.

There is also mounting evidence to indicate that the future of television in instruction may not be at all like its present use. As we now know television, it is all too often a **teaching** medium designed primarily for disseminating lectures to large classes. The possibilities of its use as a **learning** instrument by students in independent learning situations has been relatively unexplored. As television technology itself becomes more sophisticated, there will hopefully emerge more differentiated and less stereotyped uses of the medium. The practices highlighted in this publication seem to forecast a new direction in television's use — toward more individualized and small group uses of the medium. These practices place emphasis on the use of television as a research and diagnostic instrument rather than as a dispenser of information in mass audience situations. The use of videotapes and videotape recorders hold the promise of turning television into a much more flexible teaching and learning instrument than it has been up to now.

The contributors to this publication are to be congratulated for exploring new ways of using television in teacher education. It is to be hoped that these examples will serve to spark other creative uses of the medium to improve teacher efficiency and competency, as well as to increase immeasurably teacher insight into instructional-learning problems.

August, 1967

HAROLD E. WIGREN

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CLOSED-CIRCUIT TELEVISION AS A SUBSTITUTE FOR LIVE OBSERVATIONS

BERT L. SHARP
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Observation of child growth and behavior, teaching methods, classroom organization and management constitute a major factor in the preservice education of the teacher at the College of Education of the University of Florida. In 1964 a closed-circuit television system was installed between the College of Education and the laboratory school one-half mile away.

One of the main purposes of the closed-circuit system was to decrease the student observation load at the laboratory school. During the year preceding installation of the system, 1963-64, eight teacher education courses had demanded in excess of 20,000 hours of student observation in the laboratory school. Many hours were spent coordinating observations and attending to problems associated with handling such large numbers of students.

The closed-circuit system connected nineteen originating stations of the laboratory school with ten receiving stations (classrooms) in the College of Education. Two vidicon cameras were mounted on top of a portable, rack-mounted amplifier. One camera was a fixed focus with a nonmovable mounting. The second camera had an adjustable focus, azimuth and tilt, and adjustable zoom. An extra length (150 feet) of extension cable made possible the use of portable amplifiers and cameras outside of the nineteen originating stations.

Remote controls that were relatively simple to operate were installed in the College of Education building. These remote controls allowed the professor directing the observation to operate the cameras and thus eliminate the need for a central studio and cameramen.

As the professor operated the cameras, he selected and directed the observation to those aspects of human behavior or classroom activity that were relevant to his class of observers. To increase flexibility of the observations, a microphone attached to the remote panel provided for "talk-back" communication as a supplement to the observation. Provision for a videotaping allowed taping for classes and observations that met after laboratory school hours.

The first course in professional education is a course in human growth and development. It is designed to acquaint students with a basic understanding of the nature of the human behavior. Students are required to make observations of children and youth at various educational levels. Each student is expected to gain a required skill in objectivity of reporting behavior and the subsequent analysis of various behavior patterns. Other college classes may observe teaching methods, classroom management, and classroom organization.

MAJOR ASSETS

Various benefits other than the obvious one of a reduction of the student observation demands in the laboratory school were possible. Various professors had varying purposes for which observations were used in their courses. Some of these are listed below.

Training for Objectivity in Observation. Early in the term students observed a child for a period of time and then prepared write-ups of the observation. Several such exercises were used for students to obtain the desired skill necessary before the student moved to the next stage of making an analysis of the observed behaviors.

Overview of School Program. Students viewed scenes from various levels, kindergarten, elementary, junior high, or senior high school, as an introduction to the school environment and the scope of a total school program.

Invariability of Content. Students and professors have a common experience for interpretation and discussion of the observation. Discussion of observed behaviors, teaching methods, etc., is not restricted to the ability of the student or professor to recreate the events that took place during the observation through written and/or oral reports. Videotapes provide optimum opportunity in recreating events for replay during class discussion.

Vignettes. Through videotapes specific behavior patterns, i.e., teacher-pupil, peer, and individual are available for use in classroom presentations. These vignettes provide the instructor with material on specific experiences which might not be available to the student if left to chance during an actual observation.

Major Problems

Quality of Sound Signal. The laboratory school was not designed with the acoustical conditions necessary for transmission. Observers had difficulty in understanding the audio portions of the program. Microphones were not sensitive enough to pick up signals from all parts of the room or were so sensitive that extraneous sounds from within and without the originating classroom interfered with the receiver's understanding. This problem alone has contributed more to the lack of success of the venture than any other factor. Buildings designed with hard floors, walls, desks, etc., are not the best originating stations.

Technical Limitations of Professors. Most college professors are not skilled technically. The needs for even minor skills to operate the remote controls baffle professors and cause reluctance to use the equipment. Demonstrations by professors who are successful in their use of television are helpful in encouraging others to use television in their classes.

Technicians. Educational innovations often overlook the need for experts to maintain the system. Manpower to repair and relocate equipment is essential.

Editorial Work from Tapes. This editorial work requires time and some skill. The editor must be skilled in recognizing activities and selecting portions of the tape that illustrate these desired activities. Many hours of reviewing tapes are necessary to obtain the most adequate illustrations.

Viewing in Absence of the Instructor. The presence of the instructor is considered most important. When the instructor and students share the experience, there is less likelihood of misinterpretation on the part of the student observer. Clarification of content is much easier and more accurate.

USING VIDEOTAPES IN DIRECTED OBSERVATION

ROBERT C. JONES
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The purpose of this article is to describe and to evaluate our efforts in using videotapes in the directed observation phase of teacher education.

Students majoring in elementary education at this University complete two sequences of Directed Observation in the laboratory school, twelve hours during the freshman year and fifteen hours in the sophomore year. Observation is conducted from the observation corridor where University students watch through one-way glass and listen to the classroom activities being transmitted through earphones or overhead speakers.

Closed-circuit television is used to supplement the corridor in Directed Observation. The increased enrollment and scheduling problems made it extremely difficult to accommodate all the students in some sections in the observation corridor. This problem was most troublesome with the sophomore groups. Sophomore students had observed grades one through six rather extensively. All of this observation had been broad and general in nature.

In making plans for an effective sequence of observation lessons on the closed-circuit television some important generalizations emerged from the discussions. The decision was made to use videotapes in order to focus the attention on more specific teaching activities: the role of the classroom teacher, classroom facilities, curriculum considerations, and a structured overview of grade levels from one through six.

A structured, methodological approach was utilized in using the videotapes in Directed Observation. One week preceding the showing of any videotape the laboratory school teacher came to the observation class and presented a brief description of the grade level to be observed, her philosophy of teaching, and her experiences in planning for the taped material. This was followed by a discussion and questions from the University students. During the subsequent observation class session, the videotape was shown with the laboratory teacher present to make comments and to answer questions about the taped lesson. The University students are neither asked nor encouraged to be "critical" in their observations. They are encouraged to ask questions, and the positive approach is emphasized.

Most of the videotapes utilized in the sophomore group observation were focused on some specific activities in teaching. One tape emphasized the teacher's role on the first day of school in a second-grade class. The tape depicted the children during the first forty or forty-five minutes of the new school year. What specific problems were encountered by the teacher in this situation, how were the problems handled, and what was the reaction of the children on this first day of the school year? This tape evoked much interest and enthusiasm, an experience in depth for prospective teachers.

A videotape emphasizing Christmas activities attempted to capture the reactions of first-grade pupils approaching the holiday season. Also, specific subject area lessons were put on tape: mathematics, social science, and science experiments. The science experiments tape attempted to develop an awareness of effective use of laboratory techniques and equipment at the fifth-grade level.

One videotape emphasizing instruction in a large group situation should be mentioned. Two sixth-grade classes were combined for a modern mathematics lesson. The focus was on the team approach and

other aspects of grouping. Here it was possible for the student in observation to see the reactions of pupils in a different setting from the self-contained classroom.

By videotapes it was possible for the observation students to observe pupils on the opening day of school in September and then to observe the same class towards the end of May. The comparison made an excellent study for prospective teachers to test their perceptions of children, to observe growth patterns, and to sharpen their understanding of what is involved in working with children in the classroom.

Used in the manner described above, these videotapes, it was felt, brought an awareness of and some understanding of classroom techniques and activities in a meaningful way to the prospective classroom teacher. Because of scheduling difficulties, it could not have been possible for sophomore students in observation to observe most of the activities described except by videotape and closed-circuit television.

The School of Education staff members closely affiliated with Directed Observation point out numerous advantages from using videotapes. A more flexible sequence of observations is possible. Special school activities can be taped and stored for viewing at an opportune time. Likewise, the laboratory teacher can plan for taping in the classroom specific activities which she feels will make an important contribution to the observation classes. Finally, the videotapes make it possible to conduct effective observation in a large group setting, an important consideration with the increasing University enrollment. The tapes have enriched the observation program and are an important supplement to the excellent observation corridor.

Some problems have been encountered in using videotapes. With one television camera it is not possible to observe the total classroom. The prospective teacher can see only a limited degree of interaction between the teacher and pupils. The teacher is in focus, but only a small number of pupils are visible. Additional cameras in the classroom would correct this difficulty.

The problem of sound effects in the classroom is a serious problem. Carpeting on the floors is a must to keep down the distractions from noises of moving chairs, desks, and other equipment.

A few of the taped lessons give the impression that uppermost in the mind of the laboratory teacher was the fact that the class was being televised. The lesson was taught for the observation students. Undoubtedly, this is a human tendency and one that can be overcome with continued experience in closed-circuit television and expert guidance from those involved in the program.

To this writer, the taped lesson does not seem to duplicate completely the classroom situation. Some changes must be recognized. Children do react to a television camera in the classroom. Some subtle teaching techniques must be utilized to compensate for this. Just as the children grow and develop, so too is using television in the classroom a developmental process. Children and teachers alike learn to live with the television camera and fascinating results can be secured in videotapes for use in Directed Observation.

Formalized evaluations of our efforts in this medium have not been attempted. The feedback coming to this office has been very favorable. The members of the elementary staff are enthusiastic about videotapes as a supplement to the observation corridor, not as a replacement for it. Elementary education students likewise seem enthused. They report interest in the new dimension in observation.

Our efforts thus far in using videotapes are only a beginning in what appears to be exciting new dimensions in teacher education. The self-appraisal process for student teachers, recording progress of student teachers, providing instruction in the skills and techniques of teaching, and micro-teaching make up but a partial listing of potential activities being discussed for use in the future.

VIDEOTAPES IN INSTRUCTION: ADVANTAGES, APPLICATIONS, AND PITFALLS

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The use of videotapes in instruction is increasing for every level of instruction from preschool through graduate study. Technological developments and cost reductions are such that it will soon be possible for the smallest school to include videotape recording equipment in its budget. This is all the more striking since just a few short years ago only the largest commercial television stations could afford to make a recording of a television signal.

I would like to note some of the advantages of videotape in the instructional setting, list some of the instructional applications at The University of Michigan, and then conclude with a word of caution to those who anticipate the utilization of videotape.

ADVANTAGES

One of the major advantages of videotape is the capacity for immediate playback. This feature not only provides an instant and accurate review of a student's performance, as in the case of practice teaching sessions or instruction in public speaking, but also allows for an immediate technical check of the material recorded.

Other features of videotape are similar to those of audiotape. Among these are the economies possible by erasing and reusing tapes and the capacity for editing.

A final advantage of videotape concerns its adaptability to future technological aids. Today's instructional videotapes should be fully compatible with the computer-based storage and random-access retrieval systems of tomorrow.

INSTRUCTIONAL APPLICATIONS

At The University of Michigan, videotape is employed by a number of academic disciplines, including Teacher Education. Here is a brief summary of some of these uses, listed under categories of interest to those who train teachers.

1. *Student Teacher Progress and Self-Appraisal.* Our School of Education faculty has used videotapes to record students in "micro-teaching" episodes, full-length teaching sessions, and guidance interviews. Now, a student does not have to rely on the memories of his supervisors but has an accurate aural-visual record of his performance. With videotape, the faculty member is able to conduct his critique by reference to a recording of the actual methods employed by the students. With a series of videotapes of the same student, progress, or the lack of it, can be fully documented.

2. *A Substitute for Immediate Observation.* Direct observation of teaching, interviewing, or therapy is commonplace in many areas of higher education. However, anyone who uses such observation in his teaching has experienced the difficulties in providing enough observation space and in scheduling observation periods. In our University, the English Language Institute and Children's Psychiatric Hospital make

extensive use of live television and videotape to solve their space and scheduling problems. In both cases, unobtrusive, remote-controlled television cameras provide less distraction than observers physically present in the classroom, and less inconvenience than crowding observers into a small room equipped with one-way mirrors. Also, with videotape observation sessions can be scheduled at a convenient time for the observers and not necessarily at the time of the actual event.

3. *Guest Lecturers.* Most teaching aids, from a simple map to a color motion picture film, allow the instructor to bring the real world into the classroom. On many campuses, the real world includes guest lecturers, ranging from the on-campus specialist to an occasional visiting dignitary. With videotape, the appearance of a guest lecturer is not determined by the time of the class meeting. A case in point involves the Physical Diagnosis course in our University's Medical School. This course is the sophomore medical student's first introduction to clinical medicine and is composed of brief introductions to each of the medical specialties. Until videotape, it was impossible to secure the senior professor in each specialty because of scheduling problems. Now, each lecture-demonstration is recorded at a time convenient for the specialist and then played back for the students at class meetings. A new dimension of quality has also been added, since the guest specialist seems to prepare his videotape presentations with considerably more care than he did his earlier "live" lectures. Our Zoology Department also experienced the same qualitative advantages from videotape when senior faculty members began recording the basic experiments for the freshman course.

4. *Preservation of Data.* For research purposes, videotape provides the opportunity for an aural-visual record of experiments which can be analyzed and reviewed at the convenience of the investigator. For example, faculty members from our School of Education recorded student teachers teaching a simple task to a number of preschool children. Researchers will now be able to code the student teachers' methods, both verbal and nonverbal, by a careful analysis of the videotapes.

A Final Caution

As we have seen, the new small cameras and videotape recorders offer many advantages in the field of Teacher Education. Although such equipment has been in use only a short time, enough experience has been gained to make a few generalizations regarding the appropriate equipment. In our opinion, two basic premises should be used in selecting equipment: its reliability under intensive use and its compatibility with other equipment in the institution. These two premises have led us to the conclusion that there is a definite minimum cost for this equipment. Further, we have reason to believe that when institutions have invested below this minimum, the performance of the equipment has led many of them to reject videotape as a useful instructional aid rather than to place the blame where it belongs—on substandard hardware. Our experience indicates that, as a rule of thumb, the minimum investment for a one-camera-one-recorder package should be $2,000. Also, for long-range reliability and compatibility, we feel that the helical-scan, one-inch videotape systems are indicated.

The use of any electronic aid is severely limited without reliable equipment. Television equipment manufacturers are in a highly competitive market and their salesmen make many promises of performance. We would advise anyone anticipating the use of videotape in instruction to seek objective advice before equipment purchase.

Finally, remember that in this field, as in many others, there are no bargains; there is an almost 1:1 relationship between price and quality.

OBSERVATION TELEVISION AT HUNTER COLLEGE

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and

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The Education Department at Hunter College began to experiment with live closed-circuit and recorded television in 1959. Initial efforts were devoted to three federally-subsidized projects on recording and evaluating the progress of student teachers, on comparing direct observation with live closed-circuit and recorded observation, and on training counselors in empathy. Since September, 1964, the Hunter College Observation Television Center (OTV) has focused on building a library of kinescopes of various instructional situations to supplement the direct observation which has long been part of a number of our course offerings. The overriding principle has been to record on-going, unrehearsed, instructional situations. A variety of problems were encountered. Their dimensions and solutions follow.

I. *In the Studio*

A. *Seating*—In order to accommodate pupils from kindergarten through college level and to solve an acute storage problem, we experimented with various kinds of tables and chairs. Our present stock consists of the following

—12 tables, 24x53 inches, adjustable in height from 20″ to 30″ in 1″ adjustments, and folding to a thickness of 2 inches;
—4 tables, 18x60 inches, 29 inches high, and folding to a thickness of 2½ inches;
—2 tables, 48x36 inches, 30 inches high, and folding to a thickness of 2½ inches;
—2 nonfolding trapezoid tables, 29 inches high, which are used to create a hexagon;
—36 folding metal chairs, 17 inches high;
—36 folding metal chairs, 15 inches high; and
—15 nonfolding conference chairs.

B. *Camera Wall Mounts*—In order to provide for flexibility in camera placement, the technical staff designed, constructed, and installed eight aluminum wall-brackets, five of which allow for three different heights, one for a fixed "long-shot" position, and two for overhead camera placement. Most of these can be modified with various kinds of extenders to permit special kinds of camera placement.

C. *Room Treatment*—The Studio, a converted classroom, has wall-to-wall carpeting, acoustically-treated ceiling and walls, drapes, chalkboards on one long and one short wall (to permit the use of both axes of a rectangular room), and two large window airconditioners (which are turned off only during actual recording sessions).

D. *Cameras*—The system includes seven cameras (4 MTI vidicons, 2 Norelco plumbicons, and 1 Fairchild vidicon) only five of which are actually used in the Studio to record a classroom lesson. Of these, four are mounted on remotely-controlled pan-tilt units, and one on a wall mount or

tripod (to provide a "cover shot" of the entire room). The four cameras also have remotely controlled 10-to-1 Zoomar zoom lenses. The "cover shot" camera will soon have the same remotely-controlled pan-tilt-zoom features to increase flexibility.

E. *Microphones*—There are five audio lines in the Studio. Three Sennheiser and one Telefunken microphones can be suspended from the ceiling in a great many different positions at varying heights. The fifth line will soon be used for a wireless microphone now on order. This will be worn by the teacher, so that even low-level conversations with individual students anywhere in the room will be heard.

F. *Lighting*—All lighting is from overhead fluorescent fixtures, whose ballasts are mounted in the hall outside the room to eliminate their constant hum. The fixtures provide a flat illumination of 150 foot-candles.

II. *In the Control Room*

(The Control Room is a windowless, large, former walk-in closet, across the hall from the Studio. The one exhaust fan is inadequate in warm weather. The room's location makes an airconditioner impossible, there being no place to vent the warm air. This is an unsolved problem at this juncture.)

A. *Audio*—The technical staff recently designed and constructed a new audio console with automatic level control over a greater range than presently available in commercially produced equipment. During recording sessions, an audio engineer monitors the original sound from the Studio, feeds sounds into the Control Room for the crew and controls the sound fed to the videotape recorder in the Recording Room. This is a highly sensitive operation since there is no way of anticipating whom the teacher will call on to speak, and how long and loud he will do so. The audio engineer is provided with a monitor carrying the "cover shot" plus a seating chart of the particular group in the Studio. Despite these precautions, sound is still the greatest problem we face. Even with only the four overhead microphones, the teacher can be heard from any part of the room except when she talks privately to an individual student. But we do have difficulty picking up the voices of younger pupils. We plan to experiment with ghost curtains at light-fixture level to eliminate standing waves in the Studio and with some kind of foam rubber table covers to counteract the bouncing of sound from their hard surfaces.

B. *Video*—Since the major aim of the OTV Center is to produce recordings of actual, unrehearsed, on-going instructional situations and to minimize all interference with teachers and pupils, our cameras are remotely operated from two control panels designed and constructed by the technical staff. Each unit, operated by one cameraman, has controls for infinite speed adjustments on pan, tilt and zoom. One unit accommodates two cameras, the other handles three. Video quality is controlled by a video engineer, whose equipment consists of

—the CCU's for each camera
—a waveform monitor and its associated video monitor.

C. *Special Facilities*

1. Titling Board—This is a horizontal board, also designed and constructed by the technical staff, electrically operated, which can be moved forward and backward at a variety of speeds. A vidicon camera and quartz crystal lamp are mounted overhead. We make titles on a Varityper Headliner and mount them in a specially constructed slotted board which rests on the titling board during recording sessions. Other visuals are also set down on the board for inclusion in recordings.

2. Controls for the Director—The director controls each program from a Dynair Switcher, with preview and line switching buses, and lap-dissolve capabilities. A special-effects generator permits the use of vertical, horizontal, and rectangular inset split images, plus keying and matting. These are used in the recording of individual pupils as they are subjected to tests of intelligence and achievement, to supplement the live demonstrations normally conducted by the Education Clinic. The Control Room also houses complete patching facilities to increase flexibility in the placement of cameras.

III. *In the Recording Room*

(Our earliest operations involved direct recording onto kinescope film via a GPL kinescope recorder. The installation of an RCA quadruplex videotape recorder made it possible to preview recordings prior to transfer to film. This in turn led to a more sophisticated use of the facilities, including the editing of recorded programs. Since we do not have tape-editing facilities, editing is done during transfer from tape to kinescope film or after a work print has been struck from the original negative. To avoid the costs and delays occasioned by outside processing, we purchased additional equipment.)

A. *Videotape Recorders*—The RCA VTR-1B makes it possible to review programs before deciding whether they are worthy of retention in part or in whole. Though still absolutely wedded to the concept of recording unrehearsed instructional situations, our faculty has found that edited versions of such material are frequently more effective than unedited versions, especially where a given process or instructional interaction is repeated a number of times. Therefore, tape playbacks are scheduled after each recording session both to show teachers and faculty what has been recorded and to permit evaluation by director and crew on the effectiveness of their performance. We also have a Norelco VTR 3400, which has been used as a "mirror" by the Music and Speech Departments for conducting and debating classes respectively. We hope to interest college faculty in using the Norelco and one or two cameras to record their own teaching performances for personal and private evaluation.

B. *Kinescope Recorder*—The film magazines on this recorder originally had a maximum load of 30 minutes of film. Since our RCA VTR can run at 7½ i.p.s. for two hours without reloading, and since we do not artificially limit lessons to any given length, we found that film was being wasted in the transfer process. We therefore obtained and installed one-hour feed and take-up magazines. These save us both film and personnel time. We have also modified the recorder by installing a Palmer camera to eliminate shutter-bar problems.

C. *Processing*—We now process our own film with a Viscomat processor, which can handle direct positives, negatives, and prints. We also have a printer, which may be a weak link in the chain, due to as yet unsolved focusing problems. (It should be noted here that we use film as a medium of distribution because we have but one quadruplex recorder for record and playback. Even if playback time were more available than it is, we could distribute programs only at a relatively few rooms. Since heavy use is made of our programs at both of our campuses and during day, evening, and summer sessions, we use film. In addition, our films are listed and described in a catalogue circulated to other institutions, a number of whom rent our films for use in their programs.)

D. *Editing*—This is done with a Miniola film editor, which permits matching raw negatives to edited work prints, or double system (sound and picture) editing.

IV. *Concluding Statement*

As the material above indicates, we have had to modify equipment and operations to meet new demands on the system. Most fortunately, the junior author of this article is a graduate engineer with remarkable talents and energy (in the well-founded opinion of the senior author!). Too many school installations rely on what salesmen recommend, which often leads to sales but does not always result in facilities tailored to the unique needs of the schools.

Despite the technical leadership available to us, we still face the problem of employing and retaining additional technical personnel because our salaries do not compete with industry, especially in New York City. We have not solved the problem of getting higher salaries for our staff.

The problem of audio, as stated earlier, is still with us. Since we refuse to contaminate the instructional situations by the presence of technical personnel, we cannot monitor sound directly in the Studio. We seek solutions that are within the bounds of the basic concept of the OTV system.

Finally, as with all "hardware" on the market, the "software" lags in development. Since the recording of instructional situations must be controlled directly (or through a technical director) by professional educators, we need to develop a new specialization. Either personnel from the communications field must learn to record what educators want to have, or educators must learn to use the medium to record what they want. Or both. Recorded material has a tremendous contribution to make to instructional programs, but educators and communications personnel must learn to work together to produce the "software" which will vindicate the faith many of us have in the potentials of the medium.

USE OF VIDEOTAPED MATERIALS AS A SUBSTITUTE FOR CLASSROOM AND CHILD GROUP OBSERVATIONS

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Renewed emphasis is currently being placed on laboratory experience as the heart and substance of teacher education programs. Perhaps second only to the student-teaching experience itself, observation-participation activities are being given a major share of attention. Many preparing institutions are confronted with a dilemma, however. In the face of an ever-increasing demand for high quality student teaching stations, the number of model teachers available for observation and limited participation experiences is concurrently diminishing.

A possible solution to the problem lies in the application of the new media in teacher-education programs. In particular, the videotape recorder has opened whole new vistas in this regard. The videotaped observation has some inherent advantages over traditional direct observation in the classroom, chief among which is the fact that the recorded episode can be viewed, stopped, repeated, discussed, continued, and studied in great detail. With direct observation, the event passes and probably nobody remembers exactly what she witnessed in any great detail. In fact, perhaps no two people would see exactly the same thing. The videotaped observation, on the other hand, permits the instructor to preview the presentation, call attention in advance to specific or characteristic teaching techniques or methods, and replay all or parts of the tape to reinforce specific points.

In addition to the factors mentioned above, direct observation in the classroom has always been encumbered with certain limitations which interfere with realization of maximum benefit from the experience on the part of the prospective teacher. To begin with, there is the problem of space. Traditional classrooms were not designed to accommodate large numbers of visitors or observers, so observation experiences have accordingly been restricted to small groups. It has, therefore, been impossible in most situations for all students in a given professional education course to view the same thing going on at the same time and afterward to participate in a rather detailed analysis of the event.

Observers usually have been quite restricted in their free movement about the class lest this interfere with and distract both students and teacher from the primary purpose of the educative process. Even when special observation areas have been provided and one-way glass installed to minimize this problem, the limited view of what is actually going on is accentuated.

Other significant problems commonly encountered in arranging direct observations in classrooms involve such things as travel to the location where the observation has been scheduled, changes in plans or class schedules, and insuring that the particular activity has optimum value as an observational experience.

With the videotape recorder, on the other hand, equipment can be set up and a sequence taped at the convenience of the subjects involved—teachers, pupils, teacher-education specialists. Once recorded, the experience is almost completely at the disposal of the college instructor as to the manner in which it may be used. He may schedule at his convenience and in accordance with his overall teaching plan—correlating recorded episodes with selected aspects of teaching which may be under consideration. He can select, edit, or combine sequences to suit his purpose, and, as mentioned before, the episode may be viewed repeatedly, whole or in part, to reinforce certain key concepts.

It is not intended that we view the videotape recorder as a panacea which will provide the answers to all the perplexing questions in the area of laboratory experience. There have been, and continue to be, certain limitations to its use. Cost, a significant factor in the past, is becoming less of an obstacle as equipment becomes less complex and consequently less expensive. Adequate equipment is now within range of most teacher-education institutions.

In addition, it should be pointed out that videotaped observations are "vicarious, two-dimensional, subject to all the limitations of the television camera lens (and the operator who guides it), as well as inadequacies of microphones . . ., the transmission system, and monitors.[1] "

A question has also been raised as to the degree of artificiality that is induced by the electronic "gear" used in the classroom to make the initial recording. Experience has demonstrated that both students and teachers usually adjust rather quickly and tend to become so involved in what is going on by way of instructional presentation that they become somewhat unaware of the videotaping equipment. This adjustment is particularly true with younger pupils in the elementary grades. Junior high and senior high school students seem to be more concerned with their "image" on videotape and tend to "warm up" more slowly to active participation in the recorded classroom activity. Television cameras operated by remote control have been used successfully in this regard, but the pressure on the teacher resulting from his awareness that his performance is being recorded continues to be a limiting factor in this kind of structuring.

The 16 mm sound film camera has been used in place of the television camera with the inherent advantage of improved pictorial quality. Limited magazine capacity, however, coupled with the fact that television cameras can be operated from a distance, need less special lighting, and have uninterrupted recording capacity of up to one hour or more, tends to tip the scale in favor of the latter method of operation. Near instantaneous replay is a very important advantage which should not be overlooked.

In an effort to determine the extent to which videotaped classroom episodes could supplement, extend, and reinforce other laboratory experiences in teacher education, the state of Utah, as a part of an effort coordinated through the Multi-State Teacher Education Project, undertook the production of a series of unstructured observations in various kinds of classroom situations throughout the state. Included were sequences (1) at elementary and high school levels on the opening day of school, (2) in a fifth-grade classroom of an integrated school (Indian and white children) in isolated southeastern Utah, (3) in an economically deprived area—prekindergarten education in an Ogden City elementary school, (4) in a rural, two-room school in western Tooele County near the Nevada border, (5) in a continuous-progress laboratory school at Brigham Young University, (6) in a nongraded rural high school, (7) and (8) in a typical urban and a typical rural elementary school, and (9) on team teaching at first grade and at junior high school levels—coordinated with the Weber County Exemplary Team Teaching

[1] Herbert Schueler, Gerald S. Lesser, and Allen L. Dobbius, *Teacher Education and the New Media.* Washington, D. C.: AACTE, 1967, p. 29.

Center. At the present time these episodes are being used and evaluated by teacher education institutions in Utah and several other states.

While it may be too early to form valid conclusions with regard to the use of such videotaped observations, the following are a few of the impressions that have been conveyed by those who have had occasion to view and use some of the episodes:

1. Videotaped classroom episodes have distinct advantages over direct observation but also have some limitations. They constitute a valuable supplement to other kinds of laboratory experience.
2. Observations recorded on 16 mm sound film may have some advantages over videotaped episodes, particularly when immediate replay is not a vital requirement.
3. Short, single-concept episodes may prove to be more valuable than prolonged videotaped observations. The ultimate medium may be the 8 mm sound film loop made from videotape or 16 mm sound film.

No less an authority than L. O. Andrews has declared that ". . . there are certain kinds of observations that I would not like to substitute media for. There's the whole matter of reality. You need to expose young people to the reality of the kind of classroom they expect to teach in. They need to see it, they need to feel it, they need to smell it, they need to be a part of it, and this doesn't take very long; but unless this is done, many of the random observations that young people do in education, of course, simply have very little value. . . . the recorded classroom episode (is) a means of making observation more functional in education courses.[2]"

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[2] *Proceedings*, Multi-State Teacher Education Project, Planning Conference. Treasure Mountain Inn, Park City, Utah: July 1966, p. 24.

USING VIDEOTAPE ACTIVITIES IN TEACHER EDUCATION

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Within the School of Education at Syracuse University, the use of videotape was originally developed in a special program of teacher preparation for secondary school teachers. Under a grant from the Ford Foundation, the Inter-University Program in Teacher Education (Project I) was enabled to purchase the then expensive equipment and get a relatively early start in exploring the uses of videotape as a tool for studying teaching.

THE MAJOR USE

Initially, and still primarily, the major effort was to tape teaching interns in their own classrooms in regular teaching activities to enable them to see and react to their own instructional behavior. The first tapes were made in the fall semester of 1963. Since that time each intern in the special program has been taped in his classroom twice during the internship experience and has had an opportunity to view himself in action.

Typically, the recording has been a 30-minute segment of continuous classroom activity, sometimes with special planning, at other times with quite routine regular activities. In some semesters, when schedules permitted, much more than the half-hour was recorded, and the intern had an immediate opportunity (in a free period or immediately after school) to view an extended episode. In these cases a half-hour segment was selected and retained as a "record-tape."

The direct use of tapes has been accomplished in a variety of ways. In some cases the intern has arranged a private viewing with no one present except the technician. In other cases, he has viewed with a fellow intern or interns. Sometimes a supervisor or several staff members participated in a viewing and critique, and sometimes a tape was first viewed in a full seminar setting. Each approach has had its advantages and disadvantages. Our main concern has been that the tape be used for objective feedback and analysis of instructional behavior, and that a judgmental set be avoided as much as possible.

Student Reaction

By and large, interns have appreciated the opportunity to see themselves in action. Their reactions have ranged all the way from self-condemnation through quite objective analysis to defensiveness and self-justification. Some have tended to focus on the pupils and their behavior and to see things happening in the classroom that they had not been aware of while teaching.

It is possible that reactions to the experience would differ with students who have been prepared in different ways. The students in the special program had been prepared in a long-term context of studying teaching and of becoming alert to instructional behavior.

Preparing for the Experience

The interns who went through the experience described were in their second or third year of professional training (senior year or graduate year). They had been exposed to early teaching-participation

experience, had gone through rather intensive analyses of the teaching-learning process, and had been trained in the Flanders system of interaction analysis. They had gone through an exercise of preparing and taping a short television production for familiarization purposes and had been required to capture some of their teaching on audiotapes and listen to them prior to the videotaping. This context and series of experiences probably produced a different dynamic for viewing than would another series.

Technical Procedures

The technical details of the videotaping activity are not of major concern in this paper. However, some readers may be interested in avoiding our mistakes and guarding against some operational problems.

In contrast to some classroom recording operations which use remote controls, we have operated with one camera and a cameraman in the classroom. The recorder has typically been in an adjoining room or hall. The cameraman has used his own judgment in focussing on the teacher, the students, and other aspects of the classroom.

Although our intention has been to capture spontaneous behavior in regular classroom settings, it has been expedient to select one classroom in a school for video operations rather than move from classroom to classroom. On videotaping days, classes to be taped are scheduled into that room. With current improvements in simplicity and portability of equipment, movement from room to room may be desirable.

Getting consistently good audio-recordings remains the major problem. Our best results have been obtained with a wireless lavaliere microphone on the teacher and two standing microphones in the room. Judgments must constantly be made between simplicity of set up and quality of recording. As changed equipment has come on the market there has been a proliferation of videorecorders, and no standardization has occurred as yet. First recordings were done on a one-inch Precision Instrument recorder. Later recordings were done on a two-inch Ampex 660B recorder, and some current recording is being done with ½ inch General Electric Recorders. Other units in the School of Education are using Panasonic equipment. Eventually some standardization should occur, especially to provide for interchange of tapes.

Additional Uses of Intern Tapes

The library of examples of teaching contained in the intern tapes has made possible a number of additional instructional uses.

Training in Interaction Analysis

Selected tapes are used to provide repeatable observation experiences for analyzing instructional behavior. Teacher preparation students are trained to observe and record verbal interaction in the classroom in the system developed by Flanders. The tapes provide a wealth of classroom data for such training.

Illustrations of Teaching

Time has not yet been available to catalogue the tapes in order to isolate specific illustrations of teaching. However, certain portions of tapes that we are familiar with are regularly used in classes and seminars as illustrations of particular approaches to teaching and as examples of certain kinds of

teaching and classroom activity. As our program has moved toward a focus on studying instructional behavior, existing tapes are increasingly used as raw observation data. They have proved especially useful in the graduate programs for doctoral students with a major emphasis in Teacher Education as they move into various analyses of the teaching-learning process.

Role Playing Supervisory Conference

A beginning has been made in training supervisors and studying supervision by using the existing videotapes as stimulus situations for role playing post-observation conferences. A rotating, triadic role relationship of teacher, supervisor, and observer is set up with the tape as the instructional observation to deal with.

Demonstrations

Beyond the direct instructional use of the tapes, they have proved valuable as demonstrations of teaching activities and as bases for discussion of training activities at conferences on student teaching and similar professional activities.

Other Current Uses of Videotaping

In addition to the major use and the activities it has generated, a number of other utilizations of videotaping are continuing.

Initial Teaching and Micro-teaching

In conjunction with a special program to train teachers for urban schools, beginning interns have initial teaching experience in a summer session. A short segment of their initial teaching is videotaped and is followed up by planned micro-teaching activities. Both the initial teaching and micro-teaching sessions are videotaped for analysis.

Planning for Science Instruction

Special methods classes in science teaching have used a combination of role-playing and micro-teaching with videotape feedback for presenting and demonstrating science instruction.

Samples of Special Classes

One project just completed is the taping of spontaneous student and teacher behavior in classes for the mentally retarded and for the emotionally disturbed. In addition to the tapes, edited portions have been kinescoped and are being used both in a research project in special education and as observation data in special education classes.

Plans for Continued Use

As the special training program in which the videotaping was developed is brought to a close, we plan to extend the videotaping to segments of the regular program. The first such program is a combined training-research project with elementary student teachers.

Supervision of Elementary Student Teachers

In the 1967 Summer Session, thirty-five elementary teachers will be trained in a Workshop in the Supervision of Elementary Student Teachers. Each of these teachers has been videotaped in his own class-

room for a portion of a regular teaching day. The workshop activities will include analyzing their own tapes and using them for supervisory training. The teachers will be trained in the operation of cameras and videorecorders and in ways to provide feedback to student teachers.

In the fall, these cooperating teachers will work with student teachers, having cameras and recorders available so that they may help to provide feedback to student teachers.

The accompanying research project will follow these student teachers and another group working with untrained teachers to assess any differences in instructional behavior between the two.

Taping Segments of Instruction for Multiple Sections

Quite a different use of recording equipment is planned for the school year 1967-68. In selected courses with multiple sections, two different approaches are to be used. In one approach, appropriate segments of instruction will be videotaped in the first section presentation and used in later sections. In the other approach a pre-planned studio presentation will be taped and presented in multiple sections. In both cases this will have the effect of freeing the instructor for activities other than repetitious presentations. How large a portion of the courses will be handled in this way is not yet known.

Studying Teaching

It is hoped that the library of taped classroom episodes being assembled can be used increasingly for study projects in teaching behavior and for repeatable observation in teacher preparation. The resource is here. Time and energy are the variables in short supply.

Opportunities and Difficulties

Much of the literature and discussion on the use of television and videotape in education emphasizes its *mass media* quality. With few exceptions, the uses described here move in quite a different direction. They emphasize the very *personal* and *individualized* use of the medium.

To capture spontaneous behavior and to see myself (in classroom recording); to perform, observe myself, try again (in micro-teaching); to react to another on a one-to-one basis (in supervisory role-playing); to analyze interaction among students and teacher in a particular situation—these all have peculiarly personal impacts. No other medium has quite the intimacy for self-analysis that videotape, used in particular ways, can have.

It seems to us that, for teacher education, these more personal and immediate meanings provide greater opportunities than the more conventional mass media concepts.

We have been most fortunate in being able to acquire equipment at the critical times in the development of videotape activities. We have also been most fortunate in acquiring graduate assistants with the combined interest and training in teacher education, media utilization, and television.

As equipment proliferates, the need for maintenance and technical help starts to become crucial. Expansion of interest in videotaping is beginning to present logistical problems that we are not yet staffed to organize and handle.

Finally, the existence of voluminous data on videotape becomes an embarrassment of riches. One is frustrated by the knowledge that there is so much more that one could and should be doing with this tool and resource for teacher education.

THE USE OF VIDEOTAPES IN THE PREPARATION OF ELEMENTARY SCHOOL TEACHERS OF ARITHMETIC

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In September of 1963, the College of Education at the University of Delaware installed closed-circuit television equipment between the College of Education building and an elementary school classroom in the Newark Special School District. Two television cameras were installed in the elementary school classroom, one directed on the blackboard in the front of the room and one directed on the children's desks. A classroom in the Education Building was equipped with two television monitors and a control panel placed in the rear of the room. From this control panel in the University classroom, it is possible for the operator to turn, zoom in or out, and focus the cameras in the elementary classroom.

This closed-circuit television system was initiated to be used in developing an arithmetic methods and curriculum course to be offered by the College for elementary education majors. The college students have the opportunity to observe elementary school classes in arithmetic in their own campus classroom with the college professor. This is a vast improvement over the usual procedure of traveling to schools in the neighborhood where college students might file into a strange classroom, distract the pupils and teacher, and often observe some unrelated lessons. While this equipment offers many worthwhile improvements to the elementary program, it was not until the addition of a videotape recording unit that the real advantages of the closed-circuit television system were realized.

In the spring of 1965 a videotape recorder was obtained, and since that time two additional recorders have been purchased. These recorders make it possible to record on tape the activities in the elementary classroom; then the tapes are available to be played back when desired.

Arithmetic lessons are taught by an experienced elementary school teacher or a member of the University staff, recorded on tape, and later viewed by the University students at various times throughout the semester when they are appropriate. Since the University professor has an opportunity to review and plan the type of lesson to show his class on tape in advance, this makes it possible to discuss with his students before it is viewed the preplanning that went into the lesson and the particular aspects of the lesson to look for. Also, the tape may be stopped or played back during the observation so that an incident may be analyzed at the precise moment it occurs without losing the remaining portion of the lesson. Between observing the lesson at a time when it is pertinent to the course content, discussing its planning and execution with the teacher, and critically analyzing its effect on the students during and after it is observed, the students become completely involved in the program.

Perhaps one of the most worthwhile experiences made possible by this equipment is the opportunity for the prospective teacher to plan and teach an arithmetic lesson and then observe herself by means of videotape. Three or four students are assigned a particular lesson to be taught to an elementary school class. These students plan and prepare the material for the lesson with the assistance of the University professor, and one of them takes the responsibility of teaching the class. Their lessons are recorded on videotape, and a viewing session with the University professor is held to analyze the presentation. The benefits of this conference while watching the lesson on tape are invaluable and considered a highlight

of the experience. There is no more effective means of self-evaluation in a teaching situation than being able to observe oneself on tape, and students who have had this opportunity claim it was one of the most worthwhile experiences in their training.

The use of the videotape has made it possible to develop a library of significant lessons and activities to be used with different classes and individuals. Tapes have been made of specific aspects of the elementary arithmetic program. One such tape, used on many occasions, involves the demonstration of prenumber activities with preschool children. A group of preschoolers was individually presented Piagetian number-concept tasks and their performance and reactions were recorded on videotapes. These tapes are used when a class is considering number-readiness concepts with primary school children.

Recently, with addition of portable television cameras, the Mathematics Education staff at the College of Education has been traveling to various high schools in the area to tape lessons taught by student teachers from the University. A panel truck was purchased to transport the equipment to the location, and a graduate assistant has been assigned the responsibility of recording the sessions. This has enabled the secondary majors to have the same opportunity to analyze their teaching as has been described for the elementary majors.

There have been technical and organizational problems connected with the system, but adjustments have been made to overcome many of these. For the first few weeks the elementary school students were extremely conscious of the cameras. The same elementary school classes are used during the entire year, and after a couple of weeks of being televised they become accustomed to the situation. Unlike some of the dramatic demonstrations exhibited by the elementary children, the high school students seem reluctant to participate in class discussion because of the self-consciousness caused by the presence of the cameras.

The key to the success of viewing videotapes is the effective utilization in the presentation. Unless the student is aware of specific goals for viewing the tape and is made to feel a part of the presentation, he or she will rapidly become bored. The writer has found that videotapes have a definite advantage over live telecasts. If one knows in advance the critical aspects of the lesson, then he may prepare the class for the observation and be certain that the class will observe a particular aspect of the presentation.

The staff is presently considering a proposal to design an inservice program for elementary school teachers, centered around the use of videotapes to supplement class instruction. The plan would be to use tapes of actual elementary school class lessons in conjunction with discussion of teaching techniques for various topics in arithmetic. Teachers frequently criticize inservice programs because of their lack of reality when considering the actual classroom situations. Videotapes could be used to demonstrate to the teacher the application of ideas presented in class. Videotapes have already been used in this manner with University summer school classes for teachers. Tapes of elementary school classes, recorded during the school year, have been utilized in the development of an arithmetic methods and curriculum program.

The experience of working with videotapes in this program has made it evident that the possibilities offered by the use of this medium to teacher education are unlimited. However, it should be noted that it is imperative that good technical assistance in the operation of the equipment be available to the people using the system. The curriculum developers utilizing the videotape equipment must be free to spend their time implementing this medium in the teacher preparation program without concerning themselves with such problems as quality of the picture or sound, moving of equipment, blown fuses, and various other technical complications. Therefore, it is recommended that before an institution attempts to use this equipment technical assistance should be available.

MICRO-TEACHING IN THE TRAINING OF TEACHERS: PROGRESS AND PROBLEMS

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The term "micro-teaching" was coined at Stanford University to describe teacher education procedures developed in connection with its Secondary Education Project which was financed by the Ford Foundation.

Micro-teaching as practiced at Brigham Young University consists of the presentation of a four- to eight-minute lesson by a trainee to a "class" composed of three to five local elementary or secondary students. This presentation has as its aim the demonstration of a specific behavior. With the student teacher and the volunteer "class" are the other members of the trainee's teacher education class and the course instructor.

As the lesson is presented, it is recorded on videotape. The instructor-evaluator observes the trainee's teaching effort and jots down suggestions for improvement. At the conclusion of the lesson, the "class" members and the college class complete evaluation forms.

The instructor and the trainee discuss, in a general, usually positive, way the performance. The instructor may make suggestions about what to look for during the videotape playback. The trainee, instructor, and college class observe it and comment freely. Occasionally the students in the micro-class are invited to participate in the oral evaluation. Specific suggestions for improvement are sought by the instructor from the micro-class, the trainee himself, and the observing college class members.

Practice at this point varies depending on the needs of the trainee as perceived by the instructor-evaluator. Some trainees benefit more from constructive criticism, others from positive reinforcement.

One of the aims of the evaluation session is to prepare the trainee to reteach his lesson. At the conclusion of the evaluation, the instructor and the trainee decide on one or two areas of major difficulty on which the student will concentrate in his next presentation.

Some examples of specific behaviors sought at Brigham Young University are

1. Teaching a concept
2. Reinforcing student behavior
3. Asking appropriate questions
4. Interesting and involving students
5. Giving assignments
6. Using inquiry training
7. Teaching a concept non-orally

Those who work with micro-teaching encounter a number of problems with the procedure. Many institutions will encounter a problem not experienced at Stanford University because of the number of students enrolled in a teacher training program. The ratio of one student and one supervisor which

Stanford has found so successful requires more time than is available. The university, for instance, which trains and certifies a thousand teachers a year, as does Brigham Young University, could not possibly give these teachers experiences in one-to-one ratio. One solution which has been tried and is briefly described earlier in this paper allows the micro-teaching to take place with a class of trainees observing and evaluating the teaching performance of one of their peers.

Evaluation forms which help trainees look at and judge a specific behavior are used by all persons observing the performance of a micro-teacher. Often these trainees participate in the oral critique of the micro-teacher following the presentation of the lesson. Experience indicates that this procedure tends to sensitize the trainees, thus requiring fewer micro-teaching experiences to accomplish the same degree of proficiency.

Another problem which will exist at many universities, and does at Brigham Young University, is the problem of obtaining students for the micro-class. Ideally these students should be either secondary or elementary students of an age appropriate to the trainee's future teaching assignment. To do micro-teaching during the day is quite impossible because students of these ages are not available. Another part of the problem is encountered when students have to be transported to and from their homes or to and from their school after school hours. Quite often the most desirable high school students have employment or other activities which add to the difficulty of obtaining them. Stanford has solved one of these problems by hiring appropriate high school students. At most institutions, this will not be possible without research and development funds. At Brigham Young University students are recruited with the aid of principals of local adjacent secondary and elementary schools. These students must usually be used after school hours or in the evening. Parents are usually happy to permit this kind of activity, but transportation is often still a problem. Some universities have chosen to do peer teaching instead of using public school students. Peer teaching is a situation in which the trainee teaches a concept or a skill to three or five of his peers, other college students, who then subsequently help in judging his performance. With peer teaching there is always a ready-made micro-class available. This creates a disadvantage, of course, in that the micro-teacher does not know whether his objective is appropriate for a specific age group and usually the peer class already knows what the micro-teacher is attempting to present, so that the experience is not so realistic as it should be. As the Brigham Young University Laboratory school moves into flexible scheduling on a daily basis, students may be available at all hours of the day for micro-teaching classes.

Some of the problems related to micro-teaching have to do with the physical facilities necessary. Sound, for instance the ability to capture the responses of micro-students and also the voice of the teacher, has created problems for most persons who have used this medium. The use of the small class, four or five students, helps alleviate this problem. By using an audio mixer, which allows a lavaliere for the teacher and also one or more microphones aimed at the micro-class, many of the problems of sound have been reduced. When micro-teaching is conducted in a typical classroom, acoustics is always a problem, and nothing short of moving into a micro-teaching studio will solve this problem. Studios of course are not available on most university campuses, and micro-teaching usually occurs either in a regular university classroom or in a renovated facility. Under these conditions, equipment has to be moved in and out with all of the attendant problems of moving video-recording equipment.

Beginning with the fall semester 1967, Brigham Young University will do the majority of its micro-teaching in a studio. Lighting, of course, will be much more consistent and appropriate; sound problems will be reduced; and the difficulties of moving and storing equipment will have been overcome.

Micro-teaching involves a great expenditure of faculty time per student trained. Stanford's solution, and one which is probably as promising as any other, is to use graduate assistants to do much of the supervision of the micro-teaching sessions. Trainees themselves play a greater part of this role after having micro-taught three or four times. Model tapes which demonstrate specific behavior for the supervisor may also reduce the time involved by professional supervisors.

An innovation is of little worth to the education profession unless it can be used by persons other than the creator. This is one of the difficult drawbacks to the widespread use of micro-teaching. Most public school teachers and supervisors are afraid of the procedure. Most university and college personnel are not acquainted with it. As with any other new procedure, until members of the profession become much more comfortable and knowledgeable about micro-teaching, inertia will prevent its widespread use and acceptance. It is easier for us to do what we know than to take time and expend energy to learn of a new method, regardless of the promise it may hold. Some teachers, possibly more common in universities than in public schools, assume an attitude which often gets in the way of their trying something new; they tend to pre-judge the procedure in terms of their past experiences rather than try it. Time and research will probably reduce this problem. As teachers become more acquainted generally with micro-teaching and with the research regarding its efficacy, they may be more willing to use it in their classes. It is quite possible that students who have micro-taught as part of their teacher training will provide a positive picture of the procedure as they move out into the classrooms and universities. As public school teachers are involved in planning inservice training projects, they too will become less afraid and more knowledgeable.

VIDEOTAPE TECHNIQUES AT STANFORD UNIVERSITY

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The micro-teaching clinic at Stanford University was developed to reduce the complexities and trauma associated with the first teaching experiences of student teachers. Conventionally, a student teacher faced thirty or more students for fifty minutes the first time he taught. In addition, he had to await feedback on his performance until his supervising teacher had a free period that day or possibly even the following day. In either event he would probably need to wait until the following day before he could implement suggested changes.

Micro-teaching provides a teaching encounter which is scaled-down both in time and in the number of students. Typically the teaching episode is five minutes in length and is recorded on videotape for subsequent playback during the critique. Each teaching episode provides a genuine learning situation as the teacher faces a new group of students during the reteach phase.

The micro-teaching clinic is conducted the summer prior to the internship in public schools. The first three weeks of the clinic interns teach five-minute lessons in teach-reteach sequence with an intervening critique and planning session. One intern will teach two sequences each week. Following a one-week recess, groups of eight interns all in a subject-matter area plan a series of 20-minute lessons to be taught during the ensuing three weeks. Each intern teaches two lessons during the three weeks of micro classes.

In addition to the above, interns teach a diagnostic lesson the first day of the clinic. Both lessons are five minutes in length, and the intern teaches a lesson of his choice within his subject matter field.

The videotape recording of the teaching episode is played back during the critique sessions following each teaching experience. Supervisors select one or a maximum of two teaching behaviors for emphasis during the conference. These may be of his own choosing or be pre-determined by the organization of the clinic. The videotape provides the teacher and supervisor with a common frame of reference for their discussion rather than recall alone.

As the tape progresses, the supervisor reinforces the teacher for positive instances of the teaching behavior and stops the tape to point out instances where the teacher can increase or implement certain behaviors. Videotape also provides the facility for reversing the tape and viewing certain sections repeatedly, if the situation demands.

This recording also provides a cumulative record of the intern's performance over the course of the summer and throughout the internship.

The micro-teaching format is particularly well suited to research on various procedures for training teachers. Several research projects are conducted each summer and throughout the internship. These

consist of interns teaching a sequence of three five-minute lessons with two intervening sessions varying according to the design for the study.

Each of the regular micro-teaching sequences and the experimental sequences just described emphasize a technical skill of teaching.

Technical skills of teaching are defined as specific teaching acts which can be stated in behavioral terms. The technical skill can be evaluated using behavioral criteria as opposed to subjective and opinion measures commonly used to evaluate gross teaching ability.

Examples of skills defined are:

Probing: a specific questioning technique (with several subcategories) requiring students to go beyond "first answer" responses.

Reinforcement: the teacher administers verbal and nonverbal rewards for student participation and/or answers.

Silence: the teacher creates a period of silence at various points in a lesson such as after a student response or following a question—a technique to stimulate student thought and discussion.

Redundance Skills in Lecturing: using varied repetition (examples, etc.) to emphasize and clarify key words and principles.

Television models have been prepared for each of the technical skills. These model tapes are typically five minutes in length and feature only one skill and its subcategories. They have the advantage of fewer distracting stimuli which permits the teacher to focus on the specific teacher behavior being demonstrated.

Various viewing techniques have been developed. A supervisor may view the model tape with the teacher focusing his attention on the relevant cues and teacher responses. Currently a self-viewing procedure has been developed. Focusing comments which are contingent upon the behavior being modeled are recorded on the parallel sound track of the videotape. A second procedure consists of inserting or superimposing a visual prompt when the behavior occurs.

Portable television recording units are utilized in micro-teaching and classroom recordings. This unit is self-contained with all the components installed in a 20-inch by 30-inch wood and formica cart mounted on casters. The vidicon camera is mounted on a removable board which sits atop the cart. The recorder is mounted in the bottom of the unit and is connected to a patch panel on the top deck. The unit also contains a small 5-inch monitor, a mixer-compressor-amplifier, and a wireless microphone and receiver. The operation of the unit has been simplified to the point that one college undergraduate can roll it into the classroom and prepare it for recording in four minutes. Due to the absence of hanging microphones, multiple cameras, and extra lighting, the recording procedure is relatively unobtrusive in the classroom.

THE USE OF VIDEOTAPE RECORDING IN TEACHER EDUCATION

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The College of Education at Wayne State University has been engaged in the use of videotape as a tool in teacher education for a number of years. Early work under a Ford Foundation Grant known as the Teacher Education Experimental Project developed the technique of remote recording and feedback of performance as well as interaction analysis for student teachers in a special training program at the Master of Arts in Teaching level.

More recently, we have engaged in extended use of portable videotape equipment for self-appraisal of student teachers, for supervising teacher appraisal of student teachers, and for appraisal of student teacher performance in the classroom by other groups. In the last eleven months, we have developed a number of formal micro-teaching activities in areas such as Business and Distributive Education, Industrial Education, Secondary Science Education, and in our basic introductory course in the College of Education for prospective teachers. Beginning with the Summer Session, 1967, extensive micro-teaching activities will be conducted for all students in Master of Arts in Teaching Programs. The National Teacher Corps Project here at Wayne State University is also making extensive use of portable videotape equipment for both micro-teaching type activities and self appraisal. Connected with the self-appraisal process is extended use of such techniques for recording and evaluating progress of student teachers, recording pupil reactions to teacher behavior for further analysis and study, and for purposes of preserving original data for later analysis and research. An improvement in the overall calibre of the various teacher preparation programs utilizing micro-teaching has been the required identification and definition of teaching skills. Evaluation instruments have been refined to reflect those skills of teaching which have been the focus of concentrated training rather than vague generalities concerning indefinable teacher qualities.

The most significant aspect of our efforts in these areas has been the increasing involvement and interest of student teachers, supervising teachers, and University faculty members in the critical analysis of teaching learning behavior. After a short exposure to the self-appraisal process, student teachers become enthusiastic supporters of this technique. They see it as a method for developing their confidence in themselves as teachers before entering the classroom. Student teachers and supervisors both report that they have a common perceptual base on which to discuss the student's teaching activity. The re-teach aspect of the micro-teaching sequences is particularly appreciated by the student and is judged by him to be highly significant in changing his basic approach to teaching. College faculty members are enthusiastic about the long-range research and progress measurement that will be made possible through selected clips in an information storage bank. It also appears to be feasible to build an extensive library of teaching examples, which, in the near future, can be stored in our random access facilities for direct instructional purposes.

The only significant problems that have cropped up have been of an administrative nature and have been solved largely by allocating technical support to the on-going activities of recording classroom episodes, supplying a facility for self-appraisal, and providing regular scheduling activities through clerical and secretarial help. As these have become increasingly efficient, most of the slippage in performance of equipment and delivery of program at the correct times has been eliminated. One of the most desirable off-shoots of the self-appraisal and micro-teaching activities has been the encouragement given the student teacher in the use of many other types of new media in his actual on-going teaching. The micro-teaching self-appraisal process seems to have eliminated some of the fear students may have of operating technical equipment. They see their supervising teachers and college faculty members using this equipment, which has had up to this time somewhat of a mystique surrounding it, and they discover that they, too, can make appropriate use of new media materials and devices.

Long-range planning is now in process to provide every student who enters teaching program experiences in both micro-teaching and self-appraisal before he enters the classroom as a student teacher, during his student teaching experience, and following his student teaching experience. Hopefully, each student will be able, before he accepts his first contract, to review his entire performance in the teaching field during his two years of training in the College of Education. In the future, it may be possible to provide interviewing officers with samples of a candidate's teaching behavior as a part of that person's credentials in a job application situation.

We have received many requests from inservice teachers for an opportunity to engage in the same kinds of processes that student teachers are now engaging in. It appears that the micro-teaching self-appraisal technique has great application for inservice training.

SELECTED RESEARCH ON MICRO-TEACHING

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Micro-teaching is a recent development in teacher education in which a miniature teaching situation is created under controlled conditions. All of the elements of the teaching act are present. The uniqueness of micro-teaching consists of two elements: (1) the ease with which the teaching situation can be controlled and manipulated and (2) the availability of immediate feedback for the student teacher.

This paper will summarize briefly selected research at three institutions related to micro-teaching. No attempt is made to provide either an exhaustive digest of research or a comprehensive bibliography. The reader is assumed to have some familiarity with the technique of micro-teaching.

I. *Stanford University*

A. Preservice. The findings proceed from four micro-teaching clinics conducted from 1963 to 1966 during the summers. To date 459 students have participated in these clinics.

1963—Experimental and control groups were formed, and controls were given field observation experience and also acted as teacher-aides. The experimental group had three micro-teaching sessions per week for eight weeks. Teaching performance of members of both groups was evaluated by the high school students who acted as the micro-class and by the Stanford supervisors. The instrument used rated performance on eight items along a five-point scale. Both the micro-students and the supervisors received training in the use of this instrument. The findings are reported as follows:

1. Candidates trained through micro-teaching techniques over an eight-week period and spending less than ten hours a week in training, performed at a higher level of teaching competence than a similar group of candidates receiving separate instruction and theory with an associated teacher aide experience—involving a time requirement of between 20 and 25 hours per week.

2. Performance in the micro-teaching situation predicted subsequent classroom performance.

3. Over an eight-week period, there is a significant increase in the accuracy of the candidate's self-perception of his teaching performance through identification of weaknesses as well as strengths.

4. Candidates who received student appraisal of their effectiveness improved significantly more in their teaching performance than candidates who did not have access to such feedback.

5. Ratings of video transcriptions of teaching encounters correlate positively with live rating of the same encounters.

6. Trainees' acceptance of the value of micro-teaching is high.

7. Micro-students' ratings of teaching performance are more stable than any other—including those of supervisors.

8. Three skills subjected to experimental treatment in micro-teaching produced significant changes in the performance of intern teachers. (Bush and Allen, 1964)

1964—substantiated findings of 1963.

1965—substantiated earlier findings. A new criterion instrument was adopted, the Stanford Teaching Competence Appraisal Guide. When comparing the first and last lessons which were micro-taught, significant change was found in twelve observation categories at a probability level less than .01.

1. Clarity of aims.
2. Appropriateness of aims.
3. Organization of the lesson.
4. Selection of content.
5. Selection of materials.
6. Beginning the lesson.
7. Clarity of presentation.
8. Pacing of the lesson.
9. Pupil participation and attention.
10. Ending the lesson.
11. Teacher-pupil rapport.
12. Variety of evaluative procedures.

1. Micro-teaching provides realistic approximations to classroom teaching conditions allowing predictions of subsequent classroom teaching performances to be made with a high degree of accuracy.

2. Candidates receiving student feedback (in addition to the video playback) improved significantly more in their teaching performance than candidates not having access to such feedback.[1]

1966—Definite discrepancy between student ratings and supervisor ratings appeared. Student ratings are now considered more reliable. The effectiveness of micro-teaching again was substantiated. The gain in rating from the initial diagnostic session to the final diagnostic session (six weeks later) was significant beyond the .00001 level—as rated by both students and supervisors on the Appraisal Guide.

Stanford personnel note that the videotape recorder is a valuable adjunct to the micro-teaching process because of the immediate feedback available to the student teacher. It was further concluded that it is of little help merely to sit and view the videotape in a global fashion; specific things (one or two) to look for need to be pointed out to the student teacher.

B. Inservice. Although *there have been no empirical data published*, Stanford has done inservice training with school districts in northern California and is beginning to research the following areas:

1. Micro-teaching as a means of determining appropriate level of instructional materials.

2. Micro-teaching for preemployment prediction. Stanford has found that prediction of employment of teachers by a school district can be accomplished by utilizing micro-teaching ratings.

3. Micro-teaching to train supervisors.

4. Micro-teaching for continuing the supervision and evaluation of beginning teachers. It could be used in teacher clinics and workshops.

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[1] *Micro-Teaching: A Description,* Stanford University School of Education, Summer, 1966.

II. *Hunter College*

Elementary student teachers were compared over a semester period as to gains in observed performance of teaching. It was hypothesized that supervision which utilized kinescope recordings (made from original videotapes) of the student teacher's performance would facilitate his growth more than supervision procedures which relied on verbal recollection of the performance.

Three sources of data were 1) analysis of scores on a classroom observation schedule, 2) recorded interviews with student teachers, 3) reactions of the student teaching supervisors.

Findings related to micro-teaching:

A. OSCAR (the observation schedule developed for this project) scores did not find significant differences between supervisory styles—no preference for kinescopes. The authors of the study mitigate this finding by suggesting the following elements jeopardizing the internal validity of the research:

1. Limited exposure of the student teacher to the training method.

2. Limitation of the observation schedule, OSCAR.

B. Both students and supervisors expressed positive opinions about the value of kinescopes in training student teachers.

Supervisors additionally claimed that their own perception of the teaching process was sharpened and that the immediacy of the recorded experience aided their efforts to assist the student teacher.

III. *Brigham Young University*

Some 200 micro-teaching sessions have been conducted with students in teacher education since spring semester, 1966.

A. Preservice. It has been found that

1. Students react positively to the technique—ninety-five percent of those who have received micro-teaching training judge the experience to be "valuable" or "very valuable."

2. Students do not see themselves as performing atypically because of the "threatening" nature of the micro-teaching experience. This expression concurs with that of the micro-teaching instructors: anxiety reactions among micro-teachers at Brigham Young University are essentally negligible. Only in the initial experience, and rarely then, is evidence of performance-distorting reaction found.

3. Students who have received micro-teaching rate themselves as more nearly like the "ideal teacher" than do students who have not received micro-teaching.

4. Experience at Brigham Young University corroborates the conclusion suggested by the Stanford research: observing a trainee's teaching performance globally is much less valuable than observing, and helping him to observe, one or two specific, discriminable actions within the teaching act. Further, the micro-teacher must prepare his brief lesson to achieve a similarly specific skill or competency.

B. Inservice. Micro-teaching has been used in Utah school districts as an inservice training device.

The following tentative conclusions are summarized from the projects conducted by Brigham Young University.

1. A taped micro-teaching session conducted in the public school setting is more threatening to experienced teachers than it is to college students.

2. Most experienced teachers overcome the fear and threat of micro-teaching. This usually occurs after the first or second micro-teaching experience.

3. After the initial threat of micro-teaching has passed, experienced teachers improve rapidly in achieving a specific discriminable skill or competency.

4. Experienced teachers who micro-teach and then observe the videotaped playback of their performance privately, using an observation guide sheet to direct them, can be helped to make significant changes in their teaching behavior.

Answers to four questions are being sought in investigations at Brigham Young University:

1. How does micro-teaching affect a teacher's concept of himself?

2. Under what conditions does the micro-teacher receive the most effective help from the critique of his efforts?

3. How can micro-teaching be used best in the professional training of a teacher; what kinds of experiences with micro-teaching are desirable at what point in the training?

4. What is the result in teacher performance when micro-teaching is substituted for all or part of the traditional student teaching experience?

Research should provide practitioners with intelligent direction. It should be noted that 1) micro-teaching research, while significant, is almost nonexistent when compared with research done on many other innovations and 2) many universities and school districts are purchasing videotape recorders, as they have other gadgets, with insufficient understanding of their objectives to insure reasonable success in teacher training projects.

When utilized to deal with specific teaching actions, micro-teaching, including videotapings, has a tremendous potential for changing the behavior of teachers.

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VIDEOTAPES IN SIMULATED EXPERIENCES AND SUPERVISION IN COUNSELOR EDUCATION

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Simulated experiences in one form or another appear in common use in counselor education programs about the country. Role playing by counselor education students and professors has served students in gaining a basic understanding of the counseling relationship and the "feel" of being a counselor. The writers have been interested in the use of videotape as an aid in this activity and have made some use of this medium in their teaching.

Videotapes have been used in an introductory course in counseling theory and in the supervised counseling practice (practicum). In the introductory course students are "paired" as a student team to work together in simulated counseling experiences as the initial step from theory into practice. Videotapes of students assuming the role of counselee and counselor are recorded for class discussion. These tapes afford the class with an experience very near that of actual counseling. As they assume their counseling roles for the simulated experience, counselors are encouraged to be open and genuine. They reveal their own problems of becoming counselors as well as working with situations where "structured problems" are presented. To supplement the videotape, an additional instrument has been devised with a system of lights and remote foot controls for the counselee and counselor. The counselor and counselee each has a control to excite a separate signal light. This device is used to illustrate the effects of such variables as empathy, interpretation, threat, etc., as they occur in the counseling interview. The person viewing this live is then made aware of the presence of such variables as he sees the ramifications of variables in the counseling relationship. For example, at times the counselor's light will indicate that he is not experiencing the degree of empathy that he desires; however the counselee's light may indicate that he is experiencing empathy. Such an experience serves as a positive reinforcement for beginning counselors who frequently experience feelings that they must be "in tune with the counselor" at all times for the session to be effective. While such a goal is desirable, it is helpful for the student counselor to have some reassurance of success without complete achievement of the goal. The videotapes showing such situations as these serve as an objective criterion for class discussion. The primary focus is upon the counseling relationship, but the added light signals supplement the communication via videotape. Precautionary steps are taken by the professor to present evaluation responses based upon the presence of lights on or off in the supplementary system. The device does allow the counselor and counselee to extend their communication to areas that do not appear in the regular video or audio signals from the tape.

In the counseling practicum three uses have been made of videotapes: (1) the use of tapes in actual counseling sessions by practicum students, (2) actual taping of the supervisory session, and (3) allowing

the practicum student to role play the part of his client in an effort to gain insight into the dynamics of his client's behavior. The uses have been limited, and the third one on a very limited or exploratory basis.

Advantages of Videotapes in Simulated and Supervisory Experiences

Chief advantages of the use of videotaping as an aid in simulated experiences in the introductory theory course include the following:

1. The student counselor sees and hears himself as others see him, thereby gaining new insight and understanding of himself as a person and future counselor.
2. Tapes serve as a means of positive reinforcement for the student counselor. It is true that he sees his mistakes, but he may also see progress in the counseling relationship in spite of these mistakes.
3. Simulated video experiences allow the students to make comparisons with earlier video recordings in an effort to improve their skills, note changes in behavior and genuineness of the relationships being established.
4. Class discussion of pre-recorded counseling sessions allows students who were recorded to interact with other students about feelings and attitudes manifest in counseling sessions. The pre-recorded sessions result in a saving of class time for discussion and interaction rather than for use in the role-playing activity.

The practicum in counselor education is a second level of practice for the student counselor. It is in this course that he begins to work with actual cases in counseling. The contributions of the videotapes in the practicum supervisory sessions are these:

1. Videotapes of the supervisory session provide the practicum student with an opportunity to see himself in counseling. The interaction between student and supervisor acts as a helping relationship for the development of the student as a future counselor and as a person. Videotapes afford the supervisor an opportunity to view himself as an agent in the growth process of the student counselor.
2. Videotapes provide students with an opportunity to re-experience and criticize, under optimum conditions, an actual counseling interview with a supervisor. Video adds a new dimension to the usual critique for student counselor over the traditional audio tapes used by supervisors. Many feelings and much of the interactive process are lost or forgotten with the passage of time. The videotapes serve as an optimum curator of the stimulus and allow for recreating the actual counseling session for the supervisory conference.
3. Videotapes provide in some instances opportunity for the student counselor and his client to re-experience a previous counseling session. Stopping the tape, clarifying content, feelings, and other behaviors may become an aid to further counseling. Videotaping the latter session may afford the student counselor and his supervisor new insights into the problems faced in the counseling process and relationship between student counselor and his client.

Major Problems Encountered

1. As in any simulated experience the problem of artificiality arises. The initial reaction of many students and professors to tapes is negative and in part due to the seeming artificiality of the setting and counseling relationship. The problem of artificiality, however, can be dealt with from two points of reference. First, the student dislikes viewing himself in a "fake" or artificial

role; thus the artificiality serves as a negative reinforcement and encourages him to be more genuine in future sessions. The professor may discourage artificiality and support and encourage students to be open and genuine in their efforts of assuming the counseling roles, counselee and counselor.

2. There is a reluctance on the part of some individuals to make use of any media of a mechanical nature. The reluctance is prevalent in the use of videotape equipment and may be due to the negative stereotype that most professions have of the medium. These negative feelings can be dealt with by having the service of an operator to handle those routines of setting up the equipment prior to the recording session. Short training sessions for persons to learn how to acquire the minimum skill necessary to operate the equipment are helpful.
3. The demands for maintenance require that the skills of a technician be available on very short notice to maintain and to keep the system operational. While this may appear as a problem, most educational institutions have access for services of a technician within the institution or through a contractual arrangement with an outside agency.
4. Tapes are costly. When tapes are not to be reused but kept throughout a term for each student, a considerable capital outlay is required to provide such a supply of tape. Proper storage and handling can increase the life of such tapes and thus result in eventual savings.

Conclusion

Although the writers have had limited exposure to the use of video recording in the area of counselor education, our general experience has been positive and stimulating. Video recording of the counseling session has thus far proven to be a very valuable tool in research projects. The use of the video medium will continue to aid researchers who wish to investigate (1) various variables and their interactions as they manifest themselves during the counseling experience, (2) the development of the individual as a counselor, and (3) the counselor education program.

The supervisory role of the counselor educator has gained a new perspective as a result of video recordings. The counseling experience is more adequately preserved and available during video replay. Students in training may look forward to viewing counseling sessions from satellite viewing stations as well as specific cases from a video library. As the cost of recording equipment and tapes continues to decrease, we may look forward to the day when all practicum students videotape their counseling sessions and submit these tapes to their professors.

BUILDING A SIMULATED LABORATORY FOR TEACHER PREPARATION

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Using the medium of television, it is possible to recreate life-like classroom problems which teachers face. Supplemented by other media such as slides, magnetic tape, and written materials, a complete school setting may be created and used as a laboratory experience for the training of teachers. One such program now known as the "Teaching Problem Laboratory" began to develop at the State University College at Brockport, New York, in 1964.

In April, 1965, in an effort to improve its teacher education product, a committee in the Department of Education conducted a follow-up study of its June, 1964, graduates. Employing an instrument called the "Perceived Problems Inventory," 284 first-year teachers were asked to respond to the severity of 117 teacher problems reported in the literature.[1] An analysis of the 163 returns indicated that thirty-two problems were significant at the .01 level.[2]

With this information in hand and supported in part by a Cooperative Research Grant, a team of faculty[3] began to analyze the thirty-two problem statements and to consider how they might be reproduced. The versatility which videotape recordings permit coupled with the relatively low cost of the process compared with film production led to the employment of that technique.

As each problem statement was studied, it became obvious that some problems were more adaptable to presentation via videotape recordings than were others. For example, it would not be difficult to show a "constantly disrupting child"; on the other hand, it was vexing to illustrate "having students see relationships between undesirable behavior and its consequences." After long and sometimes strained discussions, it was decided that only ten of the problems could be reproduced suitably using videotape recordings.[4]

Scripts were written and performed admirably by a fifth-grade class in the Campus Demonstration School. Each "take" required about one and one-half hours of rehearsal and two hours before cameras. The use of videotape contributed to a relaxed shooting environment, since the children knew if they made a mistake they simply could begin again.

Several technical decisions already had been made. First, the camera was to be the teacher, i.e., the teacher never was shown but merely followed the classroom action. Second, the teacher's voice was not to be heard since later both male and female students would be asked to take on the role of the teacher. As a result, written dialogue was superimposed at appropriate times during the action. For example, at one point of a boy's misbehavior the title appears, "Jack Brogan, take your seat and stay in it!"

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[1] Credit is acknowledged to Seymour Lemeshow, Stanley Dropkin, Marvin Taylor, Marjorie Smiley, and Arthur Sprague.

[2] A few of the problems which were "significant" were:
—handling the constantly disrupting child
—not knowing what to do with children who finish work early
—having trouble interpreting a child's real ability to his parents.

[3] Dr. Frank Broadbent, Mr. Roy Bubb, Dr. Mel Smagorinsky, and the author.

[4] The remaining problems were reproduced as either role plays or written incidents.

In this way videotape recordings running from 45 seconds to nine minutes in length were made by children and faculty members for the following problems:

1. Handling the constantly disrupting child.
2. Handling children's aggressive behavior toward one another.
3. Handling students not motivated to work on class assignments.
4. Not knowing what to do with students who finish work early.
5. Involving many of the children in group discussion.
6. Being unhappy with classroom clerical work.
7. Having children do independent work quietly.
8. Providing appropriate work for the class while at the same time working with a small group or individual children.
9. Being impatient with students.
10. Not knowing how to deal with children's reading problems.

Some of the usual technical problems of tracking and slipping occurred which caused several takes. Immediate replay of a scene determined whether this was desirable or necessary.

In order to make the "incidents" more portable, they later were recorded on kinescope and edited to remove as many technical flaws as possible. Obviously the kinescope recording was of lower quality than the original videotape recording.

At the same time that the problems were being recreated, the project team was building a hypothetical school and school district in which the problems would be made to occur. Colored 2 x 2 slides were made into filmstrips showing a community and an elementary school setting. Magnetic tape recordings provided dialogue and oriented the teacher-player to his or her new job as a fifth-grade teacher. Cumulative record cards, a faculty handbook, curriculum guide, sociograms, and samples of children's work were reconstructed for use by the teacher-player as needed in the problem-solving incidents.

In all, a rather extensive laboratory was created in which a participant could assume the role of a beginning fifth-grade teacher and engage in analyzing and attempting to solve critical teaching problems.

Early results from field tests are encouraging. Participants find the simulation experience engaging both intellectually and psychologically. They report that they consider the technique far superior to the usual components of a teacher education program.

PROJECT IMMORTALITY

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A teacher affects eternity; he cannot tell where his influence stops.
— Henry Adams

Recently I saw a highly imaginative play entitled "Project Immortality" by Loring Mandell. The plot was constructed around the idea of collecting and recording all the significant thoughts, concepts, notions, etc., of an eminent physicist. Full use of computer technology was being utilized before his untimely and ironic death by an incurable disease.

The play speaks to a timeless urge in man: the desire to leave something of himself behind. Henry Adams' words take on an intriguing meaning when measured against the promise of our emerging technology. The thought that a Socrates, a Kilpatrick, or an Oppenheimer could be "frozen" in time and subsequently "resurrected" by future generations is even more exciting than the alchemists' dream of converting lead into gold. Our potential needs only be matched by our imagination and energy.

The idea of filmed lectures by distinguished teachers, scholars, and practitioners is not a novel one. There are notable examples of the filming of "historic" figures and events. Both public and commercial television provide us with examples of the potency of filmed and videotaped lectures and interviews. The scope of the material, however, is as limited as its application. The attempts have been largely unsystematic.

There is an urgent need for the systematic utilization of emerging technology to the problems of education generally, and to teacher education, specifically. The imaginative use of videotape has the potential of extending the influence of the great teacher to millions of people. (By teacher, I do not intend to exclude those people who do not belong to the teaching profession.) In fact, we urgently need to tap the teaching power of the "nonteachers." Stated another way, we can enlarge education by the fuller utilization of diverse human beings who have the capacity—if not the professional license—to "teach." (Teaching—seen as a transactional process—can include a whole array of people.) Nowhere is this more evident than with our culturally disadvantaged.

With the advent of inexpensive, portable, easily-operated videotape players, the educational world could be profoundly changed. The quality of education from elementary school through college would be raised. The gaping chasm between the "have" and "have-not" schools and colleges—while not filled—would nonetheless be bridged.

We would be remiss if we failed to consider the impact our electronic technology will have on our traditional concepts of the role of the teacher. Quite obviously, the promise of technology cannot fully be realized unless we apprehend new educative functions for the teacher. To this end we will need to reassess the teacher's place in a curriculum shaped by science and technology.

Unfortunately, we do not have ideal videotape machines and recording equipment, but this should not deter us from beginning to build up videotape libraries for the "diffusion" of teachers and scholars. The relatively primitive state of our technology should not keep us from considering its potential for the individualization of learning.

Presently the technological developments, like Hamlet's cloud, are no larger than a man's hand. But the rapid pace of man's hardware inventions may catch us with our imaginations down. We will need to project ourselves into a future which our technology will shape. It is heartening that groups such as the Multi-State Teacher Education project are beginning to do this.

There are many outstanding teachers in our universities, small colleges, and in "visible" and obscure high school and elementary classrooms throughout the country. There are men and women who have profoundly shaped their respective fields. Some are in advanced years and will shortly be gone, their claim to immortality a mere whisper—tragically lacking the amplification technology could give their voice and spirit.

Not only will students have the benefit of a wide range of substantive "content" through the use of taped lectures, but the student-of-teaching will also enjoy an expanded repertoire of affective "content." The student-of-teaching will be able to scrutinize the teaching styles of more good teachers than would be possible in several lifetimes without electronic technology.

Donne's words are prophetic: the bell tolls for all of us. The needless loss of one great teacher (because we failed to use our technology to full advantage) is beyond measure. We now have the capability to preserve our teachers to perpetuity. M-STEP could be a force in launching "project immortality." Or perhaps the challenge will be taken up by a consortium of colleges and universities, or a public or private foundation. It is possible that state education agencies could become the initiating and coordinating force.

The mechanics for an operation of taping distinguished lecturers will need to be worked out. Of paramount importance will be the realization of the unparalleled promise the creative use of videotape offers.

The dream which M-STEP has fashioned—of easy accessibility to great teachers—will surely harden into reality. The Rubicon has been crossed.

The question now is when will our promise catch up to our hopes.

GEORGIA'S INSERVICE EDUCATION PROGRAM IN READING

I. E. Aaron
Professor
University of Georgia

A series of videotapes on the teaching of reading was viewed by more than 15,000 of Georgia's elementary and secondary teachers during the 1964-65 school year, and uncounted others viewed re-runs of the series in 1965-66 and in 1966-67. Consisting of eighteen thirty-minute programs, the series was designed to help teachers in school groups to evaluate their present programs and to give them guides for needed changes.

A joint undertaking of the Georgia State Department of Education and the University of Georgia, the programs were aimed toward school viewing groups rather than toward individuals. Discussion leaders were selected in each school prior to the beginning of the series, and leaders were briefed by television a week prior to the starting of the programs. Leaders had the tasks of briefing participants in their viewing groups a few minutes before the program began and then of leading a discussion following the telecast. The aim of the latter was to focus program content on local school reading problems.

Each viewer was furnished a listening-viewing guide by the discussion leader during the briefing period. That guide contained major points to be covered by the videotape and left space for notetaking. Occasionally, additional items such as rating scales of reading practices were included on the listening-viewing guide to stimulate participants to evaluate their own programs in terms of what was suggested in the telecast.

Discussion leaders were furnished a discussion leader's handbook. Within that publication were duplicates of the eighteen individual listening-viewing guides and suggested activities for each telecast. Leaders were urged to plan their own follow-up activities, but a number of possibilities were included to aid the leader. For each telecast, several suggested readings in professional books on reading were given. These were based on eight references which viewing groups were asked to use if they wished further information on the topic of discussion.

Programs were telecast on a weekly basis with each program being run two days a week. For example, during the first year, the telecast was presented on Tuesday from 3:30 to 4:00 and then repeated the next day from 4:00 to 4:30. Viewing groups could select the time most convenient for them. All educational television stations in the state ran the series. This varied from two stations the first year to four the third year.

Topics of telecasts included guides for a good reading program, teaching word recognition skills, teaching comprehension skills, giving an informal reading inventory, and many others. A total of thirteen topics made up the eighteen tapes.

Videotapes have since been made into kinescopes and are available for use to school groups within the state.

Though no systematic evaluation of the series was undertaken, feedback from viewing groups indicates that the program did generate interest in the improvement of reading instruction. Another indication of interest is that teachers have requested that the series be shown again in 1967-68 and that college credit be given to participants. All previous use has been on a noncredit basis. Plans are underway to enlarge the series and to add supplementary activities that will permit college credit to be offered.

MATHEMATICS INSERVICE TRAINING IN GEORGIA VIA TELEVISION

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and

JOHN HANSEN
Assistant Professor of Mathematics,
Armstrong State College, Savannah

The University of Georgia received the 1967 Distinguished Achievement Award for Excellence in Teacher Education from the American Association of Colleges for Teacher Education for the program described in this article.

An inservice institute in mathematics for elementary school personnel was conducted in 35 centers throughout the state of Georgia during the academic year 1966-67. A total of approximately 1,100 elementary and junior high school teachers and administrators participated in the program, which was supported by grants from the National Science Foundation and the Southeastern Education Laboratory in cooperation with the University of Georgia, the Georgia State Department of Education, and 45 school systems.

THE PROBLEM

Attempts to improve school instruction must be aimed at teachers of all levels, from those preparing to be tomorrow's teachers to those now teaching in public school. The plight of the latter group, especially those responsible for elementary and junior high school mathematics, is a problem throughout the nation. With inadequate or outmoded preparation, many of these teachers are being asked to teach mathematical concepts completely alien to them. Without a large-scale program of reeducation for these teachers, better mathematics instruction for children becomes merely a dream of the future.

Thus the problem explored was to determine the feasibility of using educational television with adjunct problem sessions to adequately retrain a large number of teachers. Experience of the institute staff in a similar program for 500 teachers the preceding year, which did not use educational television, led to the design of the institute herein described.

DESCRIPTION OF THE PROGRAM

After previewing several television series for teachers of mathematics, one developed by Robert Kalin and George Green of Florida State University was selected. This instructional package consists of 28 half-hour videotapes and an associated textbook. Each lesson in the text is divided into the following sections: (1) pretape exercises, (2) outline of the television lesson, (3) posttape exercises, and (4) homework. Additional sections include a summary of each lesson, historical notes, and references to selected text series and teacher training texts.

Instructors for the institute were selected from a cadre of outstanding college, junior college, and secondary school teachers throughout the state. All had earned a master's degree in mathematics and most had completed at least an additional year of graduate study. Instructors attended an orientation program held on the campus of the University of Georgia near the end of the summer of 1966, and three additional meetings were held on Saturdays during the academic year.

Participants attended weekly meetings between September, 1966, and May, 1967; each session was scheduled for one and one-half hours. Each class chose its own time of meeting from one of four possibilities, the TV portion of the lesson being repeated four times each week. The in-class time was divided into three half-hour segments: pretape; TV lesson; posttape.

Institute participants were able to earn undergraduate or graduate credit for the University of Georgia course, Basic Ideas of Arithmetic. In this course, emphasis is placed upon the structure, concepts, and ideas of elementary mathematics rather than upon computational skills of arithmetic. Tuition and fees were not charged to participants, and textbooks were supplied by the grants supporting the program; however, travel costs were not provided.

Results

At the time of this writing, data are being collected to measure the effectiveness of the institute program compared with the following: (1) on-campus instruction in the same course, (2) inservice instruction during the previous institute which did not include the use of television, and (3) mathematical understandings of children in classes taught by participants and nonparticipants.* Pretests and posttests have been developed and administered to participants, samples of nonparticipants, and children in classes taught by these samples.

Even though all data pertinent to the major hypotheses have not yet been collected or processed, certain observations now appear to be valid. These observations should be of value to anyone planning a similar activity. They are

1. The use of a state television network and adjunct instructional sessions is effective in teaching a large number of teachers.
2. The entire operation when measured in terms of cost per student is extremely efficient.
3. The program produces an interesting by-product, namely the development of specially trained instructors who are locally available for further inservice programs.

The Georgia inservice mathematics institute was originally envisioned as an exploratory program which could serve as a model for other states and other disciplines in the inservice education of teachers —particularly through the use of educational television. The feasibility of administering such a program has been demonstrated; the research evaluation will determine its effectiveness.

*A similar report of the evaluation of the 1965–66 inservice institute is currently available upon request to Len Pikaart, Baldwin Hall, University of Georgia, Athens, Georgia 30601.

TELEVISION AND TEACHERS INSERVICE

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From the beginning of educational television, its proponents have averred that one obvious use of educational television systems would be to offer teachers on the job an opportunity for continual professional growth. Indeed, there have been those in the profession of education who were violently opposed to the use of television for the instruction of pupils and yet highly favorable to using the medium for the teaching of teachers. As a result, in nearly all systems where television is one of the power tools of education teachers have been taught with the assistance of television.

As massive changes in curriculum have occurred because of national curriculum development efforts, both the school administrator and the school book publisher have begun to understand that the key to implementation of these changes lies in updating the hundreds of thousands of teachers on the job. NDEA and NSF institutes are part of this effort, but increasingly it has become clear that the task of retraining teachers or of simply keeping them abreast of all that is going on in educational change is all but overwhelming.

Initially, television was used in this effort to reach teachers because of its capacities for recording, storage, and distribution. These are qualities television shares with film, but because it is cheaper to produce it has been more widely used than has film. Simply put, in most efforts television has been used to bring the one expert in the studio to the many teachers scattered out in the schools, thus reversing the time-honored educational process of asking the many to come to the one. State departments of education, schools of education, publishers, and school districts have all used television in this way to overcome the problems of distance between teacher-learners and teacher-teachers.

When videotape recording is added in such a context, time as well as space relationships can be altered; the one can be brought to the many time and time again.

Instructional resources for inservice are not equally divided among school districts or among states. Through television it is possible to extend these resources to districts which otherwise would not receive them and to make scarce people available almost on call. As a device, then, for altering space and time relationships, television has already made a real contribution to teacher inservice opportunities.

For the most part, these efforts in using television for inservice training have provided the two conventional forms of instruction, i.e., either the inspirational lecture on, say, "The Characteristics of a Good High School Program" or a series of lessons on "Modern Mathematics for the Elementary Teacher." And, characteristically, these programs have been offered in the preschool orientation sessions for teachers or at 3:15 in the afternoons and on Saturday mornings. Also characteristically, the studio presenters in these programs have been college professors, curriculum specialists, or state department of education supervisors.

In other words, to a very large extent the medium of television has been adapted to the forms, systems, and traditions of teacher inservice, and teacher inservice opportunities have not been vastly modified because of the medium of television.

No one can deny, I think, that the very existence of commercial television has vastly modified the ways in which we Americans spend our leisure time. The motion picture business was wrecked and then rebuilt because of television. Professional baseball is on shaky ground, and professional football is "in solid" because of television. And former Vice President Nixon can make some very personal observations about the power of television in politics.

There is an inevitability, then, that television will affect the modes of teacher inservice. It has already begun to do so. Even in its simplest form of recording a lecture and distributing it widely it has already done so. Using television imposes a discipline on inservice efforts which has been all too lacking heretofore. To coordinate educational television production and scheduling with useful viewing and follow-up requires a level of planning not often found in teacher inservice efforts. And the commitments of time, effort, and money when television is involved make inservice planning committees peculiarly conscious of the necessity for long-range planning and resource development.

Furthermore, involvement in television for inservice seems particularly to objectify the need for regarding teachers as learners with nearly all of the characteristics of the pupils they teach. To record the college lecture on understanding modern mathematics and to distribute that lecture to teachers at 3:30 p.m. via educational television is a first step and a valid one in inservice efforts. But inevitably all concerned eventually get restive about stopping at that level.

Television people complain that "the talking face" is not good television. Directors of instruction propose that merely lecturing is not a good example to set for teachers. The tired teachers on the receiving end of the program ask how they can translate that lecture into actual classroom practice tomorrow for their fourth graders. And the studio teacher, often seeing himself for the first time, is shocked to discover that that is the way he sounds, or looks, or acts.

The great danger at this point is that all concerned will throw in the sponge and go back to doing the same things without television, not understanding that the fault lies not in the medium but in ourselves. The far better hope is that all concerned will re-study what it is they are about in teacher inservice. If television serves to bring about such thoughtful reconsideration, it will have all been worthwhile.

Because such a thoughtful reconsideration may eventually lead to a careful examination of teachers as learners—to an assessment of their real needs as they perceive them and to their individual differences and competencies—hopefully that reconsideration may lead to the design of television and other materials related to those needs and differences. At best, it may lead to the development of materials particularly adapted to the television medium and tried out and tested with representatives of teachers and then modified in the light of that trial.

Hopefully, the thoughtful reconsideration of teacher inservice programs may lead to the development of some great teachers of teachers who can be shared through the medium of television. And it may lead to the development of well-designed, learner-centered, validated materials, both print and nonprint, which together can reach out to teachers where they are in time, in space, and in need.

All this is simply to say that using television for teacher inservice has thus far largely revealed the shortcomings of traditional teacher inservice efforts. It is abundantly clear that materials for teaching teachers are as complicated and expensive to develop as are those for teaching pupils. Despite the fact that using television usually adds to cost, it may well be that the combination of resources which television demands and the distribution of those resources to more teachers than can otherwise be reached will, in the long run, prove to be the most efficient way to enhance the quality of inservice education of teachers.

Still largely unresolved are the ways in which inservice growth opportunities can be afforded to teachers, except just after school and on Saturday mornings, and how best to organize these opportunities so that teachers may get some reward, either professional or financial, for having participated in them. Technology can be applied in the management of schools in such a way that lockstep scheduling of teachers' time can be broken as has been that of pupils, provided administrators are willing to make the commitment to technology and to put it to work. But technology cannot help much if it is always asked to adapt to conventional ways of doing things.

Those who would start down the road of finding where television fits in teacher inservice education should know that that road is a bumpy one, full of pitfalls, and characterized by many branches leading to dead ends. But it is also a road which can lead them to enriched understandings of the teacher as a learner and to the exciting potentials for assisting these learner-teachers to become greater teachers of learners.

TELECOURSES FOR INSERVICE EDUCATION
OLD HATS AND NEW

DANIEL A. KEELER
Specialist, Educational Television
Utah State Board of Education

Probably the cynical adage, "nothing new under the sun," applies to "Telecourses for Inservice Education." What is thought to be innovative in Cedar City, Utah, may be old hat in Hyattsville, Maryland. Be that as it may, let's try on a few old hats for size at the local haberdashery.

THE NON-COURSE INSERVICE TELECAST

A television broadcast facility provides an excellent means for administrators, supervisors, and subject-area specialist supervisors at both the state and district levels to reach principals, teachers, and other school staff personnel. Such contacts through television are not necessarily classified as courses. They may consist of one or several telecasts. Through television, art and music supervisors can give appropriate help to classroom teachers in holiday art and music or describe plans for a district-wide art exhibit and music festival. A district department of health services can present a special telecast at the beginning of the school year to acquaint principals, teachers, and cooperating PTA members with procedures to be followed in administering the Snellen Eye Screening tests. State math and social studies specialists can reserve one or two telecast periods early in the school year for introducing new state guides. The director of the school lunch program using television may give a film and graphic presentation on current practices or report a particularly fruitful convention. Using the television medium, a district superintendent can communicate regularly with his entire staff.[1] Television may be used to preview sample lessons from new courses giving large numbers of teachers an opportunity to make evaluations and recommendations and involving them in the selection process.

Inservice telecasts may be recorded on kinescope or slant-track videotape for extended use in conferences, workshops, and institutes.

INSERVICE COURSES A LA MODE

The use of television for inservice courses has been in vogue long enough to see the development of similar patterns in many school systems across the country. Teachers in Utah schools, like those elsewhere, have tuned in periodically to credit and noncredit offerings in such subject areas as new math,[2] "English Fact and Fancy,[3]" American economy, "Making Literature Come Alive,[4]" state history,[5] science meth-

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[1] Since 1959, the Utah State Board of Education and participating school districts have made over 600 non-course inservice television presentations in such widely diverse subject and service areas as health and physical education, foreign language, science, pupil personnel practices, business and distributive education, testing, instructional media, industrial-technical education, homemaking, television utilization, American values, and student self-government. Telecasts have been scheduled daily during the 3:40–4:10 p.m. time block and repeated early in the morning.

[2] *"Sets and Systems"* was produced by WETA-TV, Washington, D. C., and was broadcast by the Utah Network for Instructional Television in 1965–66.

[3] Also produced by WETA-TV, Washington, D. C. Telecast by UNIT in 1966–67.

[4] Produced by the University of Utah. Distributed by UNIT, 1966–67.

[5] Produced by KUED, Channel 7, Salt Lake City, 1964–65.

ods,[6] art instruction,[7] "Parlons Francais" (French) for teachers,[8] the teaching of foreign language, and Spanish for secondary schools.[9]

New Bands for Old Hats—Innovation?

Two Utah school districts may have felt a tinge of innovative pride two years ago when large numbers of teachers completed a noncurriculum course for credit in "Medical Self-Help."

Chances are the Rocky Mountain Education Laboratory and the University of Utah achieved a first with a six-program series produced this year for school personnel on the operation and utilization of portable videotape machines in the classroom. The Rocky Mountain Education Lab has also produced a "Discovering Arithmetic" course. The course was used recently with excellent results by teachers in the Moab area. Television demonstrations were taped off the air and rebroadcast over a community cable system tied into a local production facility. Once a week all participating teachers, using a telephone hookup, conferenced with the TV teacher 250 miles away in Salt Lake City.

Considerable attention will focus on Granite School District's projected series for teachers and students, the use of television as a programmed learning device. Still in the planning stages, the project will probably center around teaching economics in the elementary grades and will use a keyed workbook to provide immediate reinforcement for student responses to questions posed by a TV teacher.

The Southwest Media Center, a seven-county, Title III project centered in Cedar City, Utah, has designed an unusual program for bringing some instruction to both students and teachers. Inservice telecasts will be produced and recorded at the center for later release by means of videotape and distribution equipment installed in a bus and transported to outlying schools not receiving an off-the-air television signal. It will be a television version of the traveling bookmobile. Teachers in a small cluster of schools in the northeastern part of the state will be using a similar system. Since there is no available educational television signal in that area, inservice telecasts will be mailed to schools and played back on a convenient local schedule, using portable videotape machines and classroom distribution monitors.

A lot of interest and some excitement has been created in Utah by the "California Project Talent" programs developed cooperatively by the Los Angeles City Schools, California State Department of Education, and the United States Office of Education. Course samples have been previewed by curriculum specialists and used in workshops on creativity. The series will be scheduled by UNIT for broadcast next year over the state system.

Educators have merely scratched the surface in their efforts to employ television as a vehicle for teacher training. We have described rather superficially the meagre experiences of one state system. Tomorrow and the day after will see the genesis of many innovative practices—new trimming for old hats.

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[6] Produced by Granite District, Salt Lake City, 1964–65. Broadcast statewide by UNIT, 1965–66.

[7] Granite and Salt Lake districts have produced several inservice art courses. The latest Granite series was broadcast by UNIT in 1965–66.

[8] *Parlons Francais* teachers' programs produced by Heath de Rochemont. Used by UNIT between 1963 and 1966.

[9] Foreign language courses were produced by the Utah State Department of Public Instruction and aired by UNIT in 1965–66.

AMPLIFIED TELEPHONE AS A TEACHING MEDIUM: DESCRIPTION OF AN INSERVICE SCIENCE SEMINAR (1)

Designed as an inservice training program for college science teachers, the seminar called "The Improvement of Science Teaching" was a noncredit course coordinated from the Stephens campus with six other colleges in the network participating. Dr. Alfred Novak was the master teacher. In this role he arranged for and introduced the speakers at each of the thirteen weekly sessions. Following each speaker's lecture (lasting approximately 30 to 45 minutes) he asked for questions from the individual colleges, led discussions, and summarized. The "students" actually were college science and mathematics teachers in the participating institutions. At the same time, the institutions invited to their campuses science and mathematics faculty members at other nearby colleges— and at selected nearby high schools—to participate in the seminars. The result was that on the seven campuses nearly forty-five educational institutions were represented.

Guest lecturers for the Science Seminar included three Nobel Prize winners: Dr. George Beadle, University of Chicago, who spoke on the "Molecular Basis of Heredity"; Dr. Hermann Muller, University of Indiana, on "Genetic Aberrations"; and Dr. Peter B. Medawar, British National Institute for Medical Research, on "The Future of Man."

The list of outstanding speakers and their subjects also included:

Dr. John G. Kemeny, Dartmouth College, "The Role of Mathematics in Science."

Dr. Joseph J. Schwab, University of Chicago, "Scientific Inquiry."

Dr. Earl A. Evans, Jr., University of Chicago, "How Life Began, Biological Organization."

Dr. Alfred Novak, Stephens College, "The Problems of Multicellularity."

Dr. Irwin Sizer, Massachusetts Institute of Technology, "Protein Architecture, Enzymatic Systems."

Dr. Herbert Goldberg, University of Missouri, "Competitive Molecules — Antimetabolites."

Dr. Harry Sisler, University of Florida, "Chemical Bonds and Organic Molecules."

Dr. James Bonner, California Institute of Technology, "Nuclear Organizations."

Dr. Philip Siekevitz, Rockefeller Institute, "Cellular Dynamics."

A structured discussion for each lecture session was set up by Dr. Novak, varying the schedule so participating colleges rotated positions in the question periods. Time was allowed for free discussion with the lecturer and "students" in the classroom network. In addition, Dr. Novak provided a summary for each session and an extra course-summary session the week after the final lecture. (Sample structured session is given at the end of this article.)

SCIENCE SEMINAR

Those institutions participating in the Science Seminar were: Drury College, Springfield, Missouri (Dr. S. D. Larson); Kansas Wesleyan University, Salina, Kansas (Mr. Charles Creager); Langston University, Langston, Oklahoma (Mr. James A. Simpson); Le Moyne College, Memphis, Tennessee (Dr. W.

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(1) By permission of Dr. Charles F. Madden, Coordinator, Amplified Telephone Projects, Stephens College, this article is reproduced from Jolly, Joan, and Madden, Charles F. *Amplified Telephone as a Teaching Medium*, Stephens College Educational Report: I, Columbia, Missouri, March, 1965, Pages 9–10, 14–15, 36, 37, 41–42, 56–58.

W. Gibson); Morehouse College, Atlanta, Georgia (Dr. H. C. McBay); Wilberforce University, Wilberforce, Ohio (Prof. E. L. Harris); and Stephens College (Dr. Alfred Novak).

There were thirteen sessions in the Science Seminar under the direction of Dr. Alfred Novak. The class met from October 1, 1963, through February 4, 1964. The sessions were held on Tuesday evenings at 7:00 p.m. CST.

During the opening session initiating the project there were greetings to the participants from President Seymour A. Smith of Stephens College and Dr. Alvin C. Eurich, Vice-President of the Fund for the Advancement of Education, both of whom were in New York City.

The lecturers in this series covered a wide range of scientific materials from the opening address by Dr. John G. Kemeny on "The Role of Mathematics in Science" to a profusely (and beautifully) illustrated lecture on "Cellular Dynamics" by Dr. Philip Siekevitz. Most of the material was descriptive of recent investigations being carried on by the speakers themselves and was, therefore, timely, interesting, and, sometimes, provocative. Those who attended the seminar were particularly interested in the contradictory points of view expressed by the two Nobel prize winning geneticists Dr. Hermann Muller and Dr. Peter Medawar when discussing the future of man.

Dr. Novak conducted two complete sessions. During the first he presented a paper on "The Problems of Multicellularity," and during the second he moderated the verbal evaluation of the tele-lecture course.

During the Science Seminar we initiated the procedures of "Structured Discussion." To avoid confusion during the question period, we issued from the coordinator's office a time schedule for each session. This sheet contained a listing of the order in which questions would be accepted from the participating institutions. The institutions were "rotated" so that each had, at some point, the first question in one of the sessions. This proved so successful that it was made a regular procedure in each tele-lecture course. Only occasionally did we schedule "free discussion." For those occasions we asked simply that the speaker identify himself and get a "go ahead" from the moderator. The teacher of the course moderated each session.

Since this course was for teachers, there were no examinations or papers to be written. After each session the coordinator and the technician were asked to submit evaluation forms indicating, on the one hand, response to the subject matter and, on the other, a description of the technical reception. These forms provided a running critique of both aspects of the program, and many subtle changes were introduced as a result of responses recorded here. We were also able, through these evaluation forms, to gather evidence on the number of participants and the schools they represented.

An evaluation session was scheduled by telephone on January 21, 1964. The conclusions expressed on that occasion are included in the next section of this report.

Assessment

The evaluation of such an extensive project must, of necessity, contain comments on many different facets of the program. It can be said, without qualification, that the program was highly successful. The three courses demonstrated that even for different kinds of subjects and for teachers using various instructional methods, the telephone, amplified and provided with additional microphones, can be an effective way of carrying on interinstitutional programs.

Some of the technical difficulties of such a program have already been discussed in this report. The most persistent difficulty, however, can be traced to the personnel. Speakers must be briefed on the use

of the telephone—the necessity for speaking distinctly and slowly. Those using the conference set must learn the operation so that the directional microphones may function as designed and so that the circuit noise may be kept to a minimum.

The use of the conference hook-up made it possible for speakers to reach audiences spread geographically throughout the eastern half of the United States. The system made available to eleven small, liberal arts colleges a schedule of guest lecturers that would have been impossible in the budget of any single institution. The project suggested to the participating schools the feasibility of regional networks where faculty of one institution might be shared by neighboring ones. The administrative officers of each institution have expressed considerable interest in adapting the technique to other institutional ventures.

The value of any educational experiment should be measured by the responses of the students. Throughout the three programs described in this report we sought evaluation materials from the teachers or moderators or technicians. As a final session in each course we sought student responses. In several instances the teachers of the courses have summarized responses from their classes. Those included below are typical.

"First, I would like to compliment you on your choice of speakers. I believe one of the major products of the series was the opportunity that our undergraduates had to encounter some of the most outstanding modern biologists in what was really an almost face-to-face situation. The situation was very exciting and dynamic because we knew that we *could* ask questions of these people if we wanted."

Kansas Wesleyan

"For me this has been 'Operation Up-date.' I was especially appreciative of the talks given by Dr. Bonner and Dr. Siekevitz. On the whole the level was quite good. I think the mid-session question period was a great benefit in bringing the speaker to the level of the audience—whether he needed to come up or down . . . I've been particularly impressed with the in-the-room feeling that I've had. I've felt as if the speaker were sitting on the platform with Dr. Novak. It has been wonderful."

Christian College

In a letter to Dr. Novak after his long-distance lecture-discussion, Dr. Bonner stated: "I thought the telephone session was a marvelous success . . . In approximately a little less than two hours time we were able to talk to, and I hope, transmit some information to, an audience which if personally visited, group by group, would have taken me a week or two to do. Keep it up."

In another letter, Dr. Harry Sisler commented: "I believe that this new technique has some real possibilities in providing opportunities for widespread communication with small college campuses at relatively small cost."

Advantages

"Without the telephone facilities provided in this experiment," commented Dr. Madden, "it is highly unlikely that any student—or teacher—would in his lifetime have an opportunity to discuss person-to-person the major ideas of such a distinguished company.

"There are few opportunities for any of us to talk directly and informally with persons whose actions and ideas are shaping our world: winners of Nobel Prizes or Pulitzer Prizes, officials or analysts of the political scene, or writers and thinkers of extraordinary merit. This project has made the ideal possible."

The Fund for the Advancement of Education was especially interested in the telephone lectures as originated at Stephens and used by ten other colleges and universities. Dr. Alvin C. Eurich, vice-president of the Fund, commented: "Such a technique makes available some of the finest teaching personnel to

institutions which would normally be limited in attracting to their campus such distinguished leadership." Referring to both master teachers as well as guest lecturers, he commented further that "the development of amplified telephone networks has great potential for more effective and efficient use of our best college and university teachers in the future. This will be essential as mounting enrollment pressures put heavier and heavier demands upon available teaching personnel."

Costs

Expenses involved in the 1963-64 experimental telephone lecture series fall into several categories.

During this period telephonic equipment was leased to the schools in the network by local telephone companies. Although local or regional companies installed and leased the equipment to the institutions, all used the same devices developed by the Bell Telephone System. Costs came to approximately $40 per month per school, after the initial installation cost of $25 per school.

For this series of calls, arrangements were also made to have telephone operators' head-sets in the home or office from which each guest spoke. Costs for these amounted to from $5 to $15 depending upon local situations.

Long-distance charges for each complete conference call, which averaged 45 minutes, ranged from $120 to $225 in the continental United States. The trans-Atlantic call to Dr. Medawar in London totaled $450.

Honoraria for guest speakers were budgeted at $100 each.

All of these costs were paid by Stephens College from the grant funds supplied by the Fund for the Advancement of Education.

Each of the colleges and universities arranged for and provided for its own local classroom teacher and technical personnel without compensation from the Fund or Stephens.

STEPHENS COLLEGE SCIENCE SEMINAR
A Telephone-lecture Course
(Example of a Presentation)
Time Schedule

6:55 p.m. CST	All colleges connected in conference call; warm up conversation.
7:05 p.m.	Introduction of subject and speaker. Dr. Alfred Novak.
7:10 p.m.	Dr. Hermann Muller University of Indiana "Genetic Aberrations"
7:30 p.m.	(a) Structured discussion of Dr. Muller's presentation. Questions will be accepted from participants in the Seminar by calling on the institutional centers in the following order: (1) Stephens College, Columbia, Missouri (2) Morehouse College, Atlanta, Georgia (3) LeMoyne College, Memphis, Tennessee (4) Langston University, Langston, Oklahoma (5) Drury College, Springfield, Missouri (6) Wilberforce University, Wilberforce, Ohio (7) Kansas Wesleyan University, Salina, Kansas (b) Free discussion among participating institutions (c) Summary by Dr. Novak
8:15 p.m.	Sign-off.

RECORDING AND EVALUATING PROGRESS OF STUDENT TEACHERS AT THE UNIVERSITY OF UTAH

EARL W. HARMER, JR.
Professor of Education
University of Utah

Student teaching at the University of Utah is designed as a "professional quarter." This means that the student is presumed to be involved full time with student teaching and a parallel methods course. Fifteen quarter hours of credit are awarded per quarter. It is assumed that the student teacher will not be engaged in any other course work nor any conflicting outside work.

The intent of this organization is to emphasize the student teaching experience as the most influential learning activity in the professional sequence. This plan has been in operation for over ten years and in the judgment of staff and students is an excellent arrangement.

The professional staff is concerned about recording and evaluating the progress of student teachers. The purpose of this article is to indicate the systems now operating to achieve that purpose.

The most common recording and evaluation instrument in student teaching is that of coding devices. The University of Utah has been fortunate in having persons such as Marie Hughes, Robert M. W. Travers, George Miller, and Norman Wallen who have been interested in developing coding devices for classroom instruction. Consequently the Department of Education has had access to some relatively sophisticated teaching competencies codes which have been utilized in the assessment of student teachers. Every professor in the Department who supervises student teaching (this is judged to be the responsibility of major professors; instructors and graduate students are used only as ancillary resource persons) inevitably modifies the coding instrument in terms of his particular interests and competencies. In brief, the coding devices are the result of considerable refinement.

Ordinarily, evaluation of a student teacher follows a full teaching lesson. This means that the evaluator will have an appointment with the student teacher and the cooperating teacher. The teaching lesson will be coded, and the evaluation will include all three individuals—the University professor, the cooperating teacher, and the student teacher.

The second tool for recording student teaching data is that of videotaping. The use of video recorders in the student teaching program is relatively new, at least at our University. Portable video recorders are located in several adjacent school districts. These video recorders are taken into the classroom, the student teacher's work is recorded, and the videotape is later reviewed and analyzed. The primary intent of this effort, of course, has been to modify the student teacher's behavior. Another major purpose of video recording is to preserve student teaching data for subsequent research.

Some members of the staff have made extensive use of audio tapes as a device for recording student teaching. Recording the verbal interaction of teacher and pupil with tape recorders is less of an interference with the ongoing class than the bulkier video recorder. The audio tapes are frequently transcribed and then subjected to analysis via codes. By transcribing the audio recording, it is possible for long-term, thoughtful review of precisely what has happened verbally.

A fourth attempt to record student teaching data has been the University's program of micro-teaching. Micro-teaching at the University of Utah means that the student teacher will video-record with his peers small sections of lessons that are to be taught in the public schools. These micro-teaching sessions have been stored and utilized in the subsequent discussion of what the student teacher actually did in the schools. The intention is to provide a comparison between what the student teacher practiced and what actually occurred.

It will be noted from this brief review that recording and evaluating data for student teachers are comparatively haphazard and unsophisticated. The Department of Education is aware of the need to devote additional staff time in the solution of this problem. Some of the issues that have been identified are these:

1. Should the staff attempt to reach agreements as to the precise teaching competencies of student teachers? Such agreements would facilitate the collection of student teaching data for evaluation and would tend to heighten the validity of evaluation. On the other hand, individual professors are jealous of particular emphases in their perception of what a student teacher should do.
2. The University of Utah has invested considerable time and money in training observers to code classroom teaching. A logical consequence of this is to extend the training program of coders and to assume that these individuals will be primarily graduate students. Consequently, major professors could use their time for the analysis and discussion of coded data. Again, many professors feel as if the direct contact with the student teacher is a "must" item to acquire the necessary insight for judgment.
3. There is considerable interest in expanding the videotape library. The staff would like to acquire numerous exemplars of excellent student teaching. The logistics problem is obvious. One of the debated issues is the extent of resources to be invested in this program.
4. Everyone associated with the evaluation of student teaching is aware that certain student teacher qualities are impossible to record. For example, it is quite difficult to acquire precise data on such items as charisma, love, thoughtfulness, and many aspects of higher mental processes. The University is as anxious as anyone for helpful leads in the solution of this problem.

In summary, recording and evaluating the progress of student teachers are largely the consequence of coding devices, audio-visual recordings, and professional judgment.

MULTI-STATE TEACHER EDUCATION PROJECT

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