7-1-1961

An analysis of certain problems in using television in the Henrico county schools

Anne Morton Fitzgerald

Miss Anne M. Fitzgerald

AN ANALYSIS OF CERTAIN PROBLEMS IN USING TELEVISION IN THE HENRICO COUNTY SCHOOLS

A Thesis

Presented to

the Graduate Faculty of

The University of Richmond

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Education

---

by

Anne Morton Fitzgerald

August 1961

APPROVAL SHEET

The undersigned, appointed by the Department of Education, have examined this thesis by

ANNE MORTON FITZGERALD, B. A. in ED.,

candidate for the degree of Master of Science in Education, and hereby certify their approval and acceptance of it.

Calvin Hall Phippins, Ph. D.
(Professor of Education,
Limestone College)
Visiting Lecturer in Education

Franklin Ross Jones, Ed. D.
(Professor of Education,
Randolph-Macon College
Visiting Lecturer in Education

John D. Meade, M. A.
(Superintendent of Petersburg
City Schools)
Visiting Lecturer in Education

Edward F. Overton, Ph. D.
Professor of Education

Nathaniel H. Henry, Ph. D.
Associate Professor of English

Date August 1, 1961

ACKNOWLEDGEMENTS

This study was written under the direction of Dr. Edward F. Overton, Professor of Education and Dean of the Summer School, University of Richmond. The investigator wishes to express her appreciation to the committee and the persons who have rendered assistance in this work:

Miss Cornelia Adair, past president of the National Education Association, who made available for study materials relative to educational television on a national level.

Mrs. Mary D. Lowry, librarian, the Richmond Public Schools Professional Library, who furnished information relative to the use of television in the city public schools.

The writer would like to express her appreciation to the principals, supervisors, public school teachers, college professors and television consultants in the Richmond Public Schools, the Medical College of Virginia and the Union Theological Seminary, who were generous in their help in furnishing information concerning educational television in the Richmond area.

TABLE OF CONTENTS

CHAPTER I

THE PROBLEM AND THE IMPORTANCE OF THE STUDY

The developments that have taken place and are continuing to develop both on national and local levels justify an analysis to ascertain whether educational television may be used as a means of supplementing effectively the educational program of Henrico County.

At the National Education Association Convention in Los Angeles, July 1, 1960, the Resolutions Committee made the following statement regarding the development of communications resources in education:

> Fully aware that there is no substitute for the personal contact of teachers and students, the National Education Association recognizes the educational potential of instructional films, radio, television, and related means of communication. It therefore encourages the more effective use of these resources in education. The Association urges vigorous experimentation and research to determine the development of television, both closed-circuit and broadcasts and other communications resources for use in the classroom, especially with reference to the possibilities they offer for individualizing instruction.[1]

The National Education Association Executive Committee, which met in Los Angeles, California, June 23-25, 1960, recommended a grant

---

[1] National Education Association, Report of the Resolutions Committee, 98th Annual Convention, Los Angeles, July 1, 1960 (Washington, D. C.: National Education Association, 1960) No. 3, p. 9.

of $16,125 from the United States Office of Education to the National Education Association to enable the Division of Audio-Visual Instructional Services and Association for Supervision and Curriculum Development to conduct a second Pilot Regional Leadership Conference to explore ways and means of disseminating information concerning new educational media.[2]

In view of the rapid growth in Henrico County's school population, it is a challenge to explore the use of television as an important resource in the elementary, junior high and senior high schools. In September, 1958, Henrico County opened three new junior high schools, as well as four elementary schools. The Board of Education states that the new program of construction includes: 1961-62--two new elementary buildings, plus additions to existing buildings, for a total of 62 new elementary rooms, and 10 new high school rooms; 1962-63--three new elementary schools with a total of 78 classrooms, and three new junior-senior high schools with a total of 147 classrooms; 1963-64--either one new elementary school or additions to existing schools for a total of 22 classrooms; 1964-65--either one new elementary school or additions to existing schools for a total of 24 classrooms.

---

[2]National Education Association Executive Committee, Information Item F of Grants and Special Contracts (Washington, D. C.: N. E. A., June 23-25, 1960) No. 9.

I. THE PROBLEM

Statement of the problem. It is the purpose of this study (1) to secure information on the effect of educational television, (2) to secure information on the problems of scheduling and using staff and facilities, and (3) to determine what types of learning activity lend themselves best to television.

Importance of the study. At this time such a report seems particularly timely and appropriate. "Television has been established as a powerful new medium of communication,"[3] states the Department of Audio-Visual Instruction in Television in Instruction in a report of a seminar beginning September 9, 1957. Pamphlets from many educational organizations are implying that television can solve some of the problems of education. Individual teachers will want to know how to use television as a resource in instruction. People interested in education will wish to examine the use of television forthrightly and constructively to know its strengths and weaknesses. They will wish to explore fully its contributions. Because of the current demands on Henrico County, it is necessary to analyze the potential of educational television for use in the educational system. The use of television must be critically examined in relation to its potential to implement the present curriculum required by the public schools of Henrico.

---

[3]National Education Association, Department of Audio-Visual Instruction, Instruction in Television in Instruction (Washington, D. C.: N. E. A., September 9, 1957.)

II. ORGANIZATION OF THE THESIS

Arrangement of the study. This study is arranged to include (1) an analysis of the expense of initiating television in Henrico County, (2) the utilization of staff and facilities in educational television, (3) the effect of television on learning outcomes, (4) the practical ways of incorporating television into class instruction, and (5) conclusions and recommendations regarding the use of television for Henrico County.

Method of procedures. The Richmond Public Schools Professional Library furnished the information relative to the use of television in the city public schools. Data were secured from colleges using television. Through the period of one year inquiries were directed to those offering televised courses for credit. Publications relating to television were studied, especially those of the Ford Foundation and the National Education Association. The facts concerning the use of television in the Richmond Public Schools were furnished by Mrs. Mary Anne Franklin, television consultant. The writer also visited studios and viewed programs televised by the Medical College of Virginia and Union Theological Seminary. The programs viewed at Union Theological Seminary were those produced in a television class which is required in the general field of communication. To report these findings was the next step.

An analysis of the television program from its initial stages to its final presentation was made from the facts secured from the offices of the consultants for the Richmond Public Schools and Union Theological Seminary. These were the only sources of primary data available to the writer.

A sampling of opinion was obtained by consulting four principals, four supervisors, four public school teachers, and four college professors, all located in the Richmond area. The sampling of opinions extended to consultants pioneering in the field, such as Franklin and others contacted by mail.

An intensive review was made of periodicals, pamphlets, books, conference and committee reports and an exhaustive bibliography of publications concerning educational television. The evaluation focuses on vital points and areas affecting education. An effort has been made to study the achievement of pupils of varying abilities and those in both large and small classes. The results were contrasted with previous records of students taught by conventional methods. This led to the discovery of what learning values were present for those taught by television as compared to those taught by the traditional methods. The special ways in which the learning skills of questioning, observing, assigning were used in televised instruction were recorded. An appraisal was made of the skills cultivated. The next step was to identify the contributions of the studio teacher and the classroom teacher to the total learning situation.

Sources of data. The material in this study was gathered from a survey of some previous experiments made by the Ford Foundation. For the purpose of providing information for a locality which is interested in establishing educational television programs, it was believed that the Ford Foundation could share useful experiences that would save an initial expenditure of time and money. In some cases described in the following pages, the National Education Association has stated that some of the experiments described in the Research Bulletins may be subject to criticism for inadequacies in experimental research design. Nevertheless, it is believed that these carefully selected secondary sources provide valid data for study.

EARLY DEVELOPMENT OF TELEVISION IN THE UNITED STATES

The following review of the history of television is confined to the United States in general and to Virginia and Richmond specifically. Such a review may present some of the foundations on which its future lies. Although the first to experiment and use educational television was Great Britain, this country has yielded leadership in its development to the United States.[4]

Educational television has been in the experimental stage since the early 1920's. In 1952 public minded individuals urged

---

[4]Charles A. Siepman, Television and Our School Crises (New York: Dodd, Mead and Company, 1948) p. 14.

the Federal Communications Commission to set aside some channels for the transmission of educational programs as reported by Miss Cornelia Adair,[5] a member of the National Education Association that met with the Commission. Educational Television antedates the Federal Communications Commission's allocation of reserved frequencies. The Commission reserved 258 channel assignments. At the end of 1955 the commission reported that 36 educational stations had been authorized and that 15 were in operation. In 1956 there were 22 stations in operation and 60 colleges, universities and professional schools in 14 states used television in instruction.[6]

Since the methods of using educational television fall into the following four categories, these will serve as focal points for the review of developments. These classifications are: (1) schools having direct instruction by closed-circuit television, (2) schools televising programs in cooperation with commercial studios, (3) schools assembling films and presenting them over closed-circuit television and (4) schools tuning in on commercial programs with educational emphasis.

Recent applications of educational television. The first educational station, K U H T at Houston, Texas, began operations

---

[5]Miss Cornelia Adair, in conference with the writer, August, 1960.

[6]Arthur B. Moehlman and James A. Van Zwoll, School Public Relations (New York: Appleton-Century Crofts, 1957) pp. 471-480.

May 25, 1953. In May, 1959, there were 39 educational stations in operation. A survey by the Joint Council on Educational Television and the American Council on Education indicated that there are more than 150 closed-circuit installations in schools and colleges throughout the country, and that closed-circuit television is being used for instruction at twenty-one military installations. Pioneers in the use of the medium were a few universities, including Western Reserve and Iowa State, which first began to offer televised courses for credit about six or seven years ago.[7]

One of the earliest experiments at the school level took place in the Red Bank and Long Branch public schools of New Jersey when fifty-grade students viewed a two-weeks course of televised lessons in American history that had been prepared by six teachers under the supervision of the New Jersey State Teachers College at Montclair.[8]

During the past five years the Ford Foundation and the Fund for the Advancement of Education have provided financial support amounting to more than ten million dollars for more than fifty experiments at the school and college level. In Washington County, Maryland, a closed-circuit television links forty-eight

---

[7]Ford Foundation and the Fund for the Advancement of Education, Teaching by Television (New York: Ford Foundation, 1959), p. 3.

[8]Ibid., p. 5.

schools in the county to bring daily instruction in thirty-nine courses at all grade levels to nearly 18,000 students.[9]

The largest of the many current educational television projects is called "Continental Classroom." In this classroom about a half million people get up early each weekday to view half-hour lessons on Modern Chemistry on their television sets at 6:30 A. M. This 32 weeks course, as well as a course in modern physics (numbering 270,000) is telecast from coast to coast. This marks the first time that full college courses have been televised on a nationwide basis.[10]

The Research Division of the National Education Association in its 1959-R-17 Research Report tells how a local television station is being used for television lessons in Cincinnati, Ohio.[11] Although Pope County, Illinois, has no part in planning the educational telecasts that come from nearby commercial stations, the board of education incorporates them into the school program.[12]

In Texas, the facilities of a state-wide network of commercial stations have been made available to the state department

---

[9] Ibid., p. 7-8.

[10] Ibid.

[11] National Education Association, Research Division, Research Report 1959-R-17 (Washington, D. C.: National Education Association, October, 1959), p. 35.

[12] Ibid., p. 36.

of education for reaching beginning teachers with a series of lecture demonstrations designed to start them on the road to permanent certification. In Nebraska and Oklahoma, open-circuit television is being used to bring to students in small rural high schools college preparatory courses that otherwise would not be available to them because of the lack of qualified teachers.[13]

In Utah large numbers of high school students studied physics by films which were presented by television. Twenty schools participated in this study. In the 10 experimental schools students were taught physics by means of the Encyclopedia Britannica Harvey White Physics Films.[14]

The impact of mass media on children and families was explored and discussed at the 36th annual conference of the Child Study Association of America, March 21, 1960, in New York City. An audience of 1,000 parents and professionals heard a diversity of expert views covering questions of program quality, moral values, the responsibility of parents, program producers, and business interests, the stake of the adolescent in mass media and practical ways of getting the best from the media.[15]

---

[13]Ford Foundation, Teaching by Television, op. cit., p. 7.

[14]Fund for the Advancement of Education, The National Program in the Use of Television in the Public Schools. A Report of the First Year, 1957-58 (New York: The Fund, January, 1959) 89 p.

[15]New York Society for the Advancement of Education, School and Society, 88: 2176, Summer, 1960, p. 306.

The conferences held have been too extensive to list in this study but one particularly worthy of description was the third educational seminar sponsored by the National Education Association Division of Audio-Visual Instructional Service in May, 1959. At this seminar leaders outlined basic concepts and principles. Personal statements were made relating to educational television. Participants recommended plans for future television programs. Conclusions were reached about what had already proved valid in the use of television.[16]

At its third meeting in Washington, D. C., the Advisory Committee for Title VII of National Defense Educational Act selected for approval 34 research proposals from a total of 155 applications. Among the California proposals approved are:

> Santa Barbara high school district: Evaluation of junior high school foreign language instruction, with various degrees of electronic media.
>
> University of California at Los Angeles: group measurement of emotional response to film.
>
> Fontana unified school district: Use of closed-circuit television as a means of improving effectiveness of classroom teachers.

---

[16]National Education Association, "Instructional Technology and the Teacher," N E A Convention News Issue, (Washington, D. C.: National Education Association) July 1, 1960, 14: 19, p. 1.

> Previously approved has been the University of California Medical Center, San Francisco: Experimentation and development of new and more effective techniques and methods of training teachers in, and presenting subject matter through the special media of television in the health sciences.[17]

Status of educational television in Virginia. Virginia club women for the past two years have been studying television habits in the state of Virginia. These women received a special commendation for this study.[18] In September, 1957, the Virginia Journal of Education listed the recommendations for the study of educational television to be made to the Virginia Educational Facilities Committee appointed by Governor Thomas B. Stanley. The chairman of the committee was Senator M. M. Long from Wise County. It should be pointed out that a similar recommendation for experimentation in educational television had been made by a subcommittee of the Virginia Advisory Legislative Council. Later a nine-member commission, headed by Delegate Edward E. Lane of Richmond, was created by the General Assembly's 1959 special session to survey educational television possibilities. On December 3, 1959, this commission recommended that the 1960 General Assembly appropriate $250,000, but this recommendation was lost.

---

[17] California Teachers Association, "Hearing and Seeing," California Teachers Association Journal, January, 1960, p. 30.

[18] Press dispatch, Richmond News Leader, June 17, 1960.

Pioneers in the use of this medium in Virginia are the Medical College of Virginia and Union Theological Seminary which offer televised courses for credit. Schools making regular use of televised instruction indicate evidence of Virginia's interest in television.

> The systems which used educational television are Accomack County, Alexandria, Arlington County, Danville, Fairfax County, Falls Church, Fort Meyer, Fredericksburg, Loudon County, Norfolk, and Prince William County.
>
> Those colleges offering credit for "Continental Classroom" are Hampton Institute, Longwood College, Madison College, University of Virginia, Virginia State College and William and Mary College.[19]
>
> A central film library for presentation of fine arts films on television is being initiated by the University Center in Virginia. The films will be of lectures by world-renowned authorities in their fields, well-edited by experts in various academic fields. The 20 colleges in the University Center are the College of William and Mary, Hampden-Sydney, Hampton Institute, Longwood, Lynchburg, Mary Baldwin, Mary Washington, the Presbyterian School of Christian Education, Randolph-Macon College, Randolph-Macon Woman's College, Richmond Professional Institute, Sweet Briar, Union Theological Seminary, University of Richmond, University of Virginia, Virginia State College, Virginia Union University, Virginia Military Institute and Washington and Lee University.[20]

"Tele-College" is being conducted under the auspices of the department of Bible and Religion of the University of Richmond,

---

[19]Ford Foundation, Teaching by Television, op. cit., pp. 62-83.

[20]Press dispatch, Richmond News Leader, July, 9, 1960.

which during the school year, 1960-61, has tested the academic climate for educational television with one experimental program course, "The Literature of the Gospel." Taught by the chairman of the Department of Bible and Religion, Dr. L. D. Johnson, the class is being shown on Saturdays from 10:30 to 11:30 A. M. over W R V A - T V (Channel 12). The course costs $40 if taken for credit, $20 if taken for audit. A flexible class, it can be taken for undergraduate and (with more work) graduate credit. It continues for 23 weeks, ending in March. Price includes two texts and a course outline. Attendance at four seminars throughout the year is required.[21]

SUMMARY

Across the United States and in Virginia modern electronics may revolutionize teaching. Educational television may well be the catalyst for the most dynamic changes in teaching philosophy, textbooks, grading systems, curriculum, school architecture and the very routine of school life. The possibilities for a creative contribution from television would seem virtually unlimited. Since educational television which will transmit telecasts from an airplane to more than 500,000 students in six Mid-western states was also slated to begin February, 1961, there are extensive potentialities already.

---

[21] Press dispatch, Richmond News Leader, October 1, 1960.

CHAPTER II

AN ANALYSIS OF THE EXPENSE OF INITIATING EDUCATIONAL TELEVISION

There is an urgent need to discover sensible and practical answers to salient questions involving the expense of televised instruction in Henrico County Public Schools. What are the actual costs of initiating educational television in a school system? What amount must be paid for equipment and operation? Will the effectiveness of the instructional program be so improved by the use of this medium that the costs will be justified?

COSTS OF EQUIPMENT AND OPERATION

First, one must look carefully at the outlay involved, as Henrico County has undertaken an extensive building program with funds from bond issues approved by citizens in a county-wide referendum. To meet the increased enrollments school authorities would wish to know whether television can more than pay its way by off-setting the costs involved.

In considering the cost of closed-circuit television, it is wise to examine the records of schools using this medium. One of the systems which initiated such a project in September, 1956, is Washington County, Maryland. Washington County is similar to Henrico County in its desire to improve the quality of education. The geographic aspects of Washington County resemble those of Henrico County.

The areas served by the closed-circuit educational television system surround Hagerstown in much the same manner that Henrico County surrounds Richmond, especially on three sides of the city. Washington County, like Henrico County, must meet such current educational problems as the improvement of the status of teaching, the continuation of rapidly increasing enrollments, the lack of adequate classroom space and the distribution of the finances available for the school program. Appraisal of the Washington County Experiment will take into account the question of whether special costs of closed-circuit television can be met without special increase in the school budget. These costs do not appear to be inconsiderable, even though Hagerstown has received assurance that other schools cannot expect. Manufacturers of television, through Radio, Electronics, and Television Manufacturers Association (now the Electronics Industries Association) have so far contributed most of the equipment in use; this is estimated to have a wholesale value of $250,000. The Fund for the Advancement of Education and the Ford Foundation have provided about $774,000 so far to meet special costs of staffing and evaluating the experiment.[1]

After the end of the experiment, money must be found each year for salaries and administrative expenses of the special television staff--twenty-five studio teachers, three administrators,

---

[1]Ford Foundation, Teaching by Television, op. cit., p. 44.

five clerks, six engineers and others in operations, and an additional fourteen full-time and eighteen more part time persons in production--a total staff of more than seventy-one persons. The closed-circuit system makes use of the coaxial cable laid free of charge by the Chesapeake and Potomac Telephone Company. Use of the cable was provided free during the first two years; negotiations are now under way to establish a yearly rental fee.[2]

Hagerstown school officials believe that if the total cost and operations and transmission can be held below $350,000 per year, it may be possible to meet the costs of their new method of instruction through savings in the teaching staff, in instructional equipment, and in more efficient use of classroom space.[3]

So far, the clearest savings in staff time has been in the junior high schools, where seven fewer teachers than would otherwise be needed have been used with 1,500 boys and girls enrolled in the large classes. This saving in staff time has been used to reduce the student-teacher ratio in other classes. A different kind of savings has been effected in the elementary school program, where art and music were added to the curriculum through the use of only three teachers and the half-time of a fourth. According to the Ford Foundation, in terms of teachers' salaries, $171,600 in instructional benefits was obtained for $17,680.[4]

---

[2]Ibid., p. 45.

[3]Ibid.

[4]Ibid.

Dr. Alexander J. Stoddard has stated that it does not cost any more (if as much) to provide adequate closed-circuit television in school than is frequently spent on equipment for a shop, laboratory, or some specialized classrooms.[5]

Other records to be examined are those of the Norfolk system. Channel 21 was assigned to Norfolk by the Federal Communications Commission for educational purposes. Early in 1957 the Ford Foundation for the Advancement of Education made available funds to the City of Norfolk for an educational television experiment. The experiment would operate on a sum of sixty to one hundred thousand dollars for the first year, half of which the Ford Foundation would contribute to the system to be matched by an equal amount by the city. Municipal and school officials agreed to participate, and time was made available by W V E C - T V. C. Fred Kelly, principal of Ocean Air School, was named the first director of the Norfolk Educational Television Department.

Kelly reports that a financial advantage has been provided in two situations: (1) the Norfolk experiment utilized available space and (2) kept the schools involved from going on double shift sessions. The classrooms in most cases are lunch or music rooms that were used formerly only part of the school day.[6]

---

[5]Alexander J. Stoddard, "Can T V Teaching Make a Difference?," National Education Association Journal, October, 1957, p. 440.

[6]Fred C. Kelly, "What Television Might Do for the Schools," Virginia Journal of Education, October, 1958, p. 17.

In 1960 teaching by television reached 160,419 Norfolk area pupils every week. Subjects are elementary and seventh grade Virginia history; fourth and sixth grade social studies.[7] Norfolk, Hampton and Norfolk county school systems are now united in the production of educational television programs over Channel 13. School officials studied the possibilities of obtaining their own telecasting facilities for educational programs and a meeting of area superintendents was called for January, 1961, for this purpose.[8] Each of three television stations offered an hour's production at their individual studios on video tape per day at no cost to the school system. The taped programs would be used over a school television station if it could be established. Area superintendents accepted this offer and plans were made for the establishment of a school television station.[9]

Several schools and school systems have reported substantial savings in teaching positions and in classroom space--with no sacrifice of quality. Dade County, Florida, for example, saved the equivalent of twenty-seven teaching positions and twenty-nine classrooms. The 1961 Legislature will be asked to provide for

---

[7]Press dispatch, Richmond, [Virginia] News Leader, December 20, 1960.

[8]Press dispatch, Richmond, [Virginia] Times Dispatch, December 21, 1961.

[9]Press dispatch, Richmond, [Virginia] Times Dispatch, February 15, 1961.

educational television throughout Florida's public school system, State School Superintendent Thomas D. Bailey said in July, 1960.[10]

In the University of North Carolina In-Service Television Experiment a grant of $105,000 from the Fund for the Advancement of Education was matched in money or services by the public school systems of eleven major cities in North Carolina. William D. Carmichael, vice-president of the consolidated university, secured the support of public citizens, local foundations and local industry who contributed about 1.25 millions to construct the transmitter and three installations in Chapel Hill, Raleigh, and Greensboro. For the 1955-56 biennium the General Assembly appropriation of $108,000 per year was for the operation of three units. Two years later the General Assembly appropriated about $147,000 per year for the 1957-58 biennium. This year the Chapel Hill studio has an operating budget of $39,000. Five teaching grants, each of $1,000, were set up for the giving of five television courses.

A summary of the findings at Pennsylvania State University for fourteen courses by television indicates the following:

1. Moderate-cost "professional" vidicon equipment is entirely adequate for presentations of televised instruction on a large scale. Low cost "industrial" vidicon is adequate for magnifying live demonstrations (including the use of the microscope) in large auditoriums or laboratories.

---

[10] Supplied by the office of Dr. Thomas D. Bailey, State School Superintendent, Florida Public Schools, July, 1960.

2. Personnel usually found in a university can operate and maintain this equipment. Many functions can be handled by students.
3. Careful cost and analyses in four well-established courses showed savings of $38,000 in one year through the use of television as compared with the usual way of teaching these courses. Comparisons included all operating costs for television as well as depreciation of equipment.
4. Average costs per student-credit unit for the year in these courses were reduced from $9.48 for conventional teaching to $5.44 for televised instruction.
5. It was found that the "break even" point in relative costs was reached when 200 students were enrolled in the course.[11]

Another factor is the cost in time and effort. According to Dr. William B. Levenson, the following generalization might provide a rule of thumb: for each television series undertaken, the producing teacher should be relieved of one-third of her weekly responsibilities, at least for the first year of operation. The usual pattern of instructional television involves cooperation between the television teachers and the classroom teachers in planning and teaching courses.[12]

This teaching team has implications for variations in class size and flexible teaching. A most significant factor mentioned in the experimentation is that a large number of pupils can be involved. Nearly all 18,000 students in Washington County

---

[11]Ford Foundation, Teaching by Television, op. cit., p. 45.

[12]William B. Levenson, Teaching through Radio and Television (New York: Rinehart and Company, 1954) p. 214.

(Hagerstown) Maryland, public schools take part of their work by closed-circuit television. In 1959, students numbering 5,000 out of an estimated 400,000 regular viewers studied college physics for academic credit at 270 colleges.[13]

MATERIALS AND METHODS USED

Basic station equipment includes a transmitter for picture and sound with two cameras and sound and lighting equipment; film projection facilities; and a kinescope recorder as well as a processor for finishing local newsreels kinescopes.

The cost of erecting and equipping a noncommercial television station as estimated by the Board of Regents of the University of the State of New York is:

Studio equipment	$133,618
Transmitting equipment	252,496
TOTAL	$386,114
less 10%	38,611
NET COST	$347,503

The New York State Board of Regents' estimated cost of operating a station annually is:

Electric power, tubes, parts, supplies	$ 48,620
Personnel for operation, including director, labor and engineering personnel	97,000
TOTAL	$145,620[14]

---

[13] Ford Foundation, Teaching by Television, op. cit., p. 28.

[14] Jennie Waugh Callahan, Television in School, College, and Community (New York: McGraw-Hill Book Company, Incorporated, 1958) pp. 59-60.

Washington County officials believe that if the total costs and operations and transmission can be held below $350,000 a year, it may be possible to meet the costs of the new instruction through savings in the teaching staff, in instructional equipment, and in the more efficient use of classroom space.[15] Operating costs are minimized in educational television by the use of teachers and students and advisory personnel.[16]

There are two new developments that would facilitate more expeditious and inexpensive incorporation of the new medium for school use. One is the development of low-cost receiving sets which would increase the availability of television to the classroom. The other is the method of the recording of programs of educational value *via* kinescope transcription and having them rebroadcast during school hours.[17]

The inference seems to be that cost is a crucial factor. The most ambitious construction plan in this study--that of the Board of Regents of New York State--runs to 3½ million dollars--the cost of an average high school in a large city.[18] At Miami

---

[15] Ford Foundation, *Teaching by Television*, *op. cit.*, p. 45.

[16] Gallahan, *op. cit.*, p. 60.

[17] Levenson, *op. cit.*, p. 535.

[18] *Ibid.*, p. 541.

University in Ohio after four years of study the researchers reported that "to televise a course with professional studio crews at union wages and with some $300,000 worth of equipment. . . could well make T V teaching prohibitive for less than 600 to 800 student enrollments. . . .;"[19]

According to the editors of Television in Science and Industry there are three different stages in incorporating television in class instruction.

> First of all, we may have a closed-circuit television confined to a single school building. Here may be a limited number of originating centers, such as studios, demonstration rooms, and work shops. In addition the school antenna system would give access to programs provided by television broadcasting systems. Television receivers placed in every classroom would, in principle, be able to tune in any of these programs.
>
> That is, in fact, one possibility. The locally originated programs would modulate unused television channels and the resulting radio frequency signals would simply be added to the antennal output. The selection of the programs would be entirely at the discretion of the classroom teachers.
>
> As an alternative, a central switching unit can be provided....In the next stage the units in a school system may be looked at by a community television network....Programs may be originated at a single control unit or injected into the system from any of the component units.
>
> Finally, the primary source for specialized instruction may be the broadcasting studio of an educational television station or a commercial station under contract to the school authorities.[20]

---

[19]Arnold Perry, "Teaching by Television in Today's Schools," The Educational Forum, Vol. XXIV, No. 4, May, 1960, p. 395.

[20]V. K. Zworkin, E. G. Ramberg, L. E. Flory, Teaching in Science and Industry (New York: John Wiley and Sons, 1959) pp. 28-29.

No school system would wish to invest in an innovation unless it is of value. The medium will have little value unless it is used judiciously. No innovation can eliminate the factor of effort from successful teaching and effective learning. The aim of improved education should be kept uppermost in mind as they consider an investment like this.

From the present evidence it would appear that the wide use of television would be observed with interest and, perhaps, concern by the patrons of Henrico County. A school principal, a supervisor, and an experienced teacher agreed that the use of television must involve careful planning and a conservative attitude.

Data would seem to indicate that such an approach in conjunction with the Richmond city schools would have merit. Sometimes teachers who are particularly skillful in motivating pupils to learn may be observed. New ideas for presenting subject matter may be taken over from the television teacher and incorporated by the regular teachers in their own lessons.[21]

One observes from library research on the subject that those who have considered the installation and maintenance of an educational television station have found that the costs are usually divided into the initial costs and the operating costs.

---

[21]Conference with Dr. Edward F. Overton, Chairman, Department of Education, University of Richmond, August, 1959.

Whether the initial cost will be greater or less depends upon several essential factors:

> Many variables can affect the initial cost of a television station. The extent of the area covered by the station, the amount of power and the tower height necessary to cover the area, the amount of the distance separating the studios and transmission facilities and requiring the use of either coaxial cable or micro-wave relays, the number of equipped studios, the nature and amount of studio and office equipment, the availability of space for conversion into studios and offices, the use of equipment already owned or given to the organization, and availability of legal and engineering counsel are a few of the factors which can determine whether the initial cost will be higher or lower than the average.[22]

Without the aid of national or local foundations, it is doubtful whether most of the existing stations could have started broadcasting. Each of the first ten educational television stations on the air was given $10,000 by Emerson Radio.[23]

One promising development of the past year in the pooling of resources has been the evolvement of live interconnected regional networks of educational stations. In 1959 the three stations in Alabama functioned smoothly as a state network. In California, Sacramento is linked to San Francisco; in Oklahoma, Oklahoma City to Tulsa; and Durham, New Hampshire, is linked to Boston. The State of Florida is proceeding with plans for a five-station connection.[24]

---

[22]William Y. Elliott, Television's Impact on American Culture (East Lansing, Michigan: Michigan State University Press, 1956) p. 210.

[23]Ibid., p. 211.

[24]National Educational Television and Radio Center, National Educational Television: Its Development and Its Functions (New York: National Educational Television, 1959), p. 53.

As consumers of already prepared educational television programs, Henrico County Schools would be faced primarily with the cost of suitable television receivers and the necessary expense of maintaining such receivers. In many cases receivers have been donated by Parent Teacher Associations. In others, dealers and trade associations have made gifts. In a few instances sets have been placed in schools on loan. Maintenance of receivers is provided by the system, by local schools and by dealer donation.[25]

The cost is magnified several times by entering into the production end of educational television programs on reserved channels. The actual production of programs can be expensive. By using television film and kinescope materials, these costs can be reduced considerably. This development of the kinescoping of programs by the use of tape and that of a new electronic photographic process of major importance to cutting costs are most promising.[26]

The new electronic photographic process was devised by Dr. William E. Glenn, a scientist at the General Electric Research Laboratory, Schenectady, New York. He describes it in the December, 1959 Journal of Applied Physics. The process offers a new electronic method for recording, storing and reproducing

---

[25] William Y. Elliott, op. cit., p. 305.

[26] Ibid., p. 306.

photographic images. Communications industry authorities said that it may have major effect on the reproduction of television shows. The equipment used in this process is called a "thermoplastic recorder." Recordings can be played back immediately and be erased or used repeatedly.[27]

Allocation of charges and income, budgeting or financing courses are the major problems. Many educational television courses offered for credit do not bring in enough revenue to compensate for the expenses of production in colleges and universities.[28] County systems could not depend on tuition fees as a source of revenue.

Professor Donald G. Tarbett of the School of Education of the University of North Carolina said the television teachers, who are not associated with any particular school, are paid about $6,000 a year, more than the average teacher in the classroom in North Carolina. He also states that at the University there is the problem of how to compensate the instructor for the added work load occasioned by teaching. The difficulty was cased when five teaching grants, each of $1,000 were set up for the giving of five television courses.[29] Another factor would be that services of popular television teachers would rise in monetary value when offers come from other colleges.

---

[27]Associated Press dispatch, Richmond [Virginia] Times Dispatch, December 24, 1959.

[28]William Y. Elliott, op. cit., p. 309.

[29]Press dispatch, Richmond [Virginia] News Leader, October 1, 1959, p. 6.

In the production end new television stations now planned will add to the moderate number of jobs that normally open each year. In medium-sized stations, like these operated by the average university, average earnings for non-specialists range from $80 to $110 a week.[30]

The price range for a commercial video recorder, which R C A markets, is from $50,000 to $63,000. Although this recorder has been considered as a possibility for reducing costs, the initial cost is no little item. R C A technicians, however, have also designed a scaled-down, less expensive model for school use and on a laboratory basis have devised a "home-sized" recorder. The costs of these are not yet available.[31]

One could certainly infer from the data that television installation and operations are costly, especially when used only part time. The amount of time spent in preparing and presenting lessons is increased.[32]

SUMMARY

For summarizing the findings regarding the costs of initiating educational television in a school system, the data and materials may be listed under the following groupings:

---

[30]Bureau of Labor Statistics, U. S. Department of Labor, Occupational Outlook Handbook, (Washington, D. C.: U. S. News Publishing Corporation, 1960).

[31]"The Strong Medicine of R C A," Forbes, February 15, 1960, p. 22.

[32]Carlos de Zafra, Jr., "Some Pros and Cons of CCTV," Clearing House, 32: 153-54, November, 1957.

1. Television installation and operation are costly, especially when used only part time.

   a. Basic station equipment may cost from $250,000 to $350,000.

   b. The average annual cost of operating a station may approximate $150,000.

2. The amount of time spent in preparing and presenting lessons is increased.

   a. There is the problem of how to compensate the instructor for the added work load.

   b. There is the problem of how to compensate the resource people, and those whose professional services must be secured.

3. The aid of national and local foundations may not be available after the experimental set-up and the various stages of investigation have served initial purposes.

4. In view of the previously mentioned possibilities, it would not seem feasible to set up an educational television station in Henrico County. The costs would not seem to be justified when Henrico has such apparent accessibility to Richmond.

5. The most sensible approach, it would appear from the present study, would be a cooperative enterprise in conjunction with Richmond, using receivers placed in classrooms.

6. In considering the data to ascertain whether there will be enough assets to outweigh the limitations, one can see, as nearly as can be determined, that there are possibilities for enrichment that cannot be overlooked.

By taking a conservative approach, which would be a comparatively inexpensive one, Henrico might find that the potential value for enrichment could far offset the cost, if the cost is kept low by the plan mentioned. Variety has an important place in education.

If innovations like television and audio-visual aids can bring the past into the present and the distant into the near, they can be of value and enrich the curriculum.[33]

Since the television program may provide a welcome change and stimulus satisfactory to the desire for variety, this factor is worthy of consideration. A second inference that could be drawn is that classroom teaching might be enriched by programs that give meaning to school subjects.

---

[33]Supplied by Dr. C. H. Phippins, Professor of Education at Limestone College and Visiting Lecturer at the University of Richmond Summer School, in a class, July, 1960.

CHAPTER III

UTILIZATION OF STAFF FACILITIES IN EDUCATIONAL TELEVISION

In all cases where television is being used in the public schools, it has been undertaken with the participation and co-operation of members of the staff. The support of parents and teachers, as well as lay persons and business leaders, has been enlisted.

REORGANIZATION OF THE STAFF

Wherever the use of television has been introduced, it has become necessary to make changes in staff reorganization. Richmond's School Superintendent H. I. Willett states that the implications of teaching by television portend a radical change in school buildings, class size and teacher scheduling.

The standard class size of twenty-five or thirty pupils will be abandoned. Instead, a master teacher will lecture in general subject areas to as many as 100 pupils, either by television or in person. There will be small college-type seminars of 12-15 pupils and perhaps, special groups of as few as two or three pupils for advanced work.

Buildings will be designed for flexibility, with greater use of partitions to expand or divide classroom spaces. These features have been included in the city's new John Marshall and

George Wythe High Schools.[1] A major portion of this study falls into the categories of staff and buildings. A wide variety of practices is revealed in the three sections that follow, in which individual experiments are briefly described.

In the summer of 1957, the Keene Academy Fund, a private organization, made a grant to the Keene, New Hampshire, public school system for experimentation in the use of educational television. Problems that arose were mostly mechanical, the most difficult being in scheduling for a crowded building. It was believed that having a classroom used for multiple purposes was not desirable. Having a room used only as a studio, and not as a classroom as well, would have been more efficient.

The first classes to be televised were high school biology classes. For the teacher they represented great savings of time, since she did not have to give the same lesson four times. In one room was the regular biology teacher. In each of the other two rooms was a monitor teacher. A student assistant was present to hear responses to questions asked by the television teacher. The responsibility rotated from one student volunteer to another.

Resource people were heard by all the biology students. School engineers set up the cameras. Later the cameras were set up and operated by three students taking courses in the use of audio-

---

[1] Robert M. Andrews, "3 Rs May Outdo Trade Courses," The Richmond Virginia Times Dispatch, January 4, 1960.

visual aids.[2] This example and that of Richmond show that reorganization of staff has been present in both instances. It would seem that the logical approach would be to inquire into the extent of the introduction of new personnel.

Introduction of new personnel. In a greater part of the experiments, the team approach has been evident. The Ford Foundation describes team teaching in television classes as follows:

1. The studio teacher, classroom teachers, and curriculum specialists cooperatively plan the courses in advance and prepare teacher guides.
2. The studio teacher presents, explains, and demonstrates the major points of the lesson, raises questions, and stimulates student interest.
3. The classroom teacher prepares students for the telecast part of the lesson, answers questions, clarifies points, leads discussion, makes assignments, gives individual help and supervises testing.
4. The studio teacher and classroom teachers confer regularly to evaluate the lessons and make improvements.[3]

At the meeting of the American Association of University Women March 8, 1960, Mrs. Mary Anne Franklin told of the staff utilization of the Richmond School system for television classes for school children from the second through the sixth grades.

---

[2] Muriel K. Cook, "Do We Dare?," New Hampshire Educator, 38: 14-15; March-April, 1958.

[3] Ford Foundation, Teaching by Television, op. cit., p. 12.

The project is an experiment designed to enrich regular classroom teaching. The lessons, recorded on the videotape by members of the Richmond School System, were telecast for 13 weeks, Monday through Friday morning at 9 on W R V A - T V (Channel 12). On Monday "Bonjour La France," a lesson in French, was telecast by Mlle. Christiane Giletta, of Nice, France, a Fullbright exchange teacher, for fourth grade pupils. A language arts consultant, Miss Virginia Watts, gave the lesson for second grade pupils each Tuesday on the topic, "It's Time for Reading, Writing and Listening." Wednesday, Miss Jane Willard, music consultant, televised "Let's Make Music." The science coordinator, Earl Savage, taught "Science in Action" on Thursday. The week was concluded by Friday's lesson for sixth grade pupils, "Understanding Arithmetic," taught by Mrs. Doris Moore and Robert Clary, mathematics coordinators, for sixth grade pupils. The draft of each lesson was prepared by the teacher who would give it. From this report it is evident that no new personnel were introduced in this stage of the procedure.

After the draft of each lecture is prepared by the teacher who will give it, Mrs. Mary Anne Franklin, television consultant for the city schools, rewrites the draft into script form. This is the standard broadcast technique employed by commercial stations which provide homes and schools with educational programs.

At W R V A - T V the rehearsals were directed by Don Vest, studio director. Background music was selected, timed and taped.

Makeup and costumes were worked out. Sets were designed and constructed. This involved the participation of lay persons and business organizations in the community as well.

Pupils showed their willingness to cooperate. At Stuart School, for example, fourth graders made furniture for a doll house that was used in the French program they watched. The secretarial staff participated in the project. Prior to the first week of lectures, mimeographed guides for pre-show and follow-up instructions were mailed to the classroom teachers throughout the broadcast area. This included Henrico, Chesterfield, King William, Charles City and Mecklenburg Counties. The telecasts were also received in the communities of Victoria, Blackstone, and Crewe.

The lectures were put on video tape two weeks prior to the first week's showing. The same week, rehearsals began for the second week's lectures and scripts were being finished for the third week. Three members of the studio crew designed sets for the series, which continue through May.[4]

In order to determine fully the personnel involved, one must inquire into those needed in script development and those essential for the preparation of various script forms. The list would include: (a) talk, (b) interview, (c) panel, round table or forum, (d) actuality, (e) quiz, (f) dramatization and musical drama,

---

[4]Robert M. Andrews, "Reading, Writing and T V," The Richmond Times Dispatch, February 1, 1960, p. 7 L.

(g) demonstration, particularly effective in art, science and music, (h) the demonstration lesson, (i) the simulated classroom, (j) the public relations program, and (k) the musical program.[5]

In the straight talk a speaker with a dynamic personality or one who is a noted world figure would seem to be needed. In the panel, round table or forum, a good moderator is usually needed. Television newsreels would be involved intact in the actuality broadcast, and a great deal of pre-planning by the teachers and technical staff would be involved in the presentation of a quiz. Professional actors for dramatizations and musical dramas are usually beyond the range of the school budget. Expert help is necessary to achieve real quality. Demonstration programs require people skilled in the use of props. This would necessitate outstanding teachers. The simulated classroom has been considered the easiest method.[6]

William and Mary College used students for the camera crew and other production workers for an introduction to an arts course two hours a week. Charles K. Woodcliff is in charge of the school's television facilities, and says that it allows Professor Richard K. Newman to conduct a demonstration that can be seen in close-ups on the screen.

---

[5]William B. Levenson, Teaching Through Radio and Television, p. 130.

[6]Ibid., pp. 130-166.

The fine arts course is viewed in two studios that have been converted into classrooms with the installation of several television sets.

An intercom system connects studios, control room, projection room and classrooms. This permits operational directions and also enables students to ask questions of the lecturing professor.[7] This production method is that of a simulated classroom.

Another plan used successfully in the Richmond area has combined the quiz and demonstration method and involved the participation of 12 students, a moderator and 3 judges.

Selected students from 12 high schools in the Richmond area took part in a series of three chemistry contests to be used each year, the telecasts by Station W R V A - T V.

The contests were televised from 1:15 to 1:45 P. M. on Sundays, beginning the first Sunday in December, 1959. Sponsored by the Virginia Section of the American Chemical Society, the competition featured teams competing in answering questions about chemistry and chemistry demonstrations. Six students--three on each of the two teams--would appear on each program. The winning team the first week would meet the second week's winning team in the final week's competition.

---

[7]News Bureau dispatch, Richmond [Virginia] Times Dispatch, November 8, 1959, p. D-5.

Dr. Scott Sears, of Virginia-Carolina Chemical Corporation, was master of ceremonies. The judges were Drs. Mary Kapp of Richmond Professional Institute, W. Allan Powell of the University of Richmond and Doyle Smith of the Medical College of Virginia. One notes that a skillful moderator and judges with expert knowledge were utilized. One may observe here an opportunity for automatic and subtle demonstration of good group relations.

The criteria for evaluating such a program would be the initial choice of participants on the basis of intelligence, academic standing, attractive appearance, fluency of extemporaneous speech, and the ability to think on their feet. Comments from four teachers, a principal and four parents confirmed the hypothesis that these criteria were met in an effective manner.[8]

Abstracts of reported studies in the effect on and use of staff. In looking into the reorganization of the staff and the introduction of new personnel in preparing script forms for television, one finds the frequent use of workshops. An example of this method is the television-radio workshop held in Richmond, Virginia, at Union Theological Seminary and W R V A - T V and W R V A - Radio September 21-24, 1959. It was sponsored by the Virginia Council of Churches and Union Theological Seminary in cooperation with the Broadcasting and Film Commission of the National Council of Churches.

---

[8]Press dispatch, Richmond News Leader, Thursday, December 3, 1959.

Pastors, educators, chairmen and members of radio and television committees attended as well as organists and choir directors and denominational executives. The directors were Charles H. Schmitz, director of broadcast training, Broadcasting and Film Commission, National Council of the Churches of Christ in the U. S. A.; Gordon Alderman, program director and production manager, W H B N - T V, Syracuse, N. Y. and Dr. Robert W. Kirkpatrick, professor of homiletics. Direction of the Audio Visual Center at Union Theological Seminary is one of Dr. Kirkpatrick's chief concerns. Five other Richmond television and radio executives were present. The purpose was to give specialized training in "how to gain attention, hold the audience, and influence its thinking," learning new methods of communication, because these audiences do not respond satisfactorily to the usual pulpit manners and ways. Director Schmitz evaluated the new program begun here thus:

> Jesus was a conversationalist, not a pulpiteer; He was a teacher, not a lecturer; He told His followers to go out and preach the Gospel. If learning to take the message to people through radio and television isn't going out into the world, what is?[9]

If the workshop has value for ministers, the implication for teachers would seem to be evident. As a school enterprise, it might reinforce the teacher's efforts and provide improved classroom

---

[9]Mary Moore Mason, "Modern Approach to Ministry Taught," The Richmond News Leader, October 8, 1959, p. 21.

procedures. The teachers might begin to realize, as the ministers did, that many of the techniques they had used were not suitable to their new audiences. The great value of the minister's workshop seemed to be in the fact that it remained informal.

"You have to have the joy of communication. You have to get right into the living room," Alderman warned the ministers as he stalked back and forth, waving a cigaret.

In a speech course at Evanston Township High School, Illinois, in 1958-59, both students and consultants considered cadet teachers inadequate in giving classroom guidance.[10] One observes that the introduction of adequately paid personnel would have contributed to the improvement of the effectiveness of teaching by this method.

The report on the Evanston program showed that closed-circuit television could be used for teaching a number of classes at one time. This economy of time would be a favorable consideration. The use of nonprofessional personnel, it was agreed, called for further work.[11]

---

[10]Carpenter, William G. and Others. "Closed-Circuit Television at Evanston Township High School." Bulletin of the National Association of Secondary School Principals. 43: 75-78; January, 1958.

[11]Mitchell, Wanda B., "Evanston, Illinois, Township High School Expands Use of Closed Circuit Television in 1957-58." Bulletin of the National Association of Secondary-School Principals 43: 75-78; January, 1958.

In the experiment in three elementary schools in Jefferson County, Kentucky, one regular classroom teacher and an aid were used in the receiving room. Two other teacher aids served in the school, one to help with the creative arts program, the other to give general clerical aid to teachers.[12]

In the Norfolk experiment the commercial station in Norfolk agreed to provide complete camera and technical facilities, studios, engineering and programming personnel.[13]

Since 1954 the public schools in Cincinnati have been receiving educational television programs which have been telecast from a W C E T studio. Personnel working on the program included a technical crew, the studio director of production, a coordinator from the Cincinnati Schools, and the television teacher. Many outside resource people were called in to appear on the program. One person served half-time as a coordinator of the television program in three schools.[14]

---

[12]Jefferson County Board of Education. Educational Television Project Relating to Teacher Redeployment and Organization, 1957-58, Louisville, Kentucky, 22 p.

[13]Helen Hylton and others, editors. The First Year of Educational Television, Suburban Park School, Norfolk, Virginia: Board of Education, June, 1958, 86 p.

[14]Cincinnati Public Schools. Report of an Experiment in Teaching Biology and Driver Education by Television, Cincinnati, Ohio: Board of Education, July, 1958, 69 p.

Problems anticipated by the Fund for the Advancement of Education were in the recruiting and training of the studio teachers.[15]

Possibilities for teacher training are emphasized by de Zafra: cadet teachers might be in the receiving rooms while master teachers give the lessons. Cadet teachers and probationary teachers might also be observed through closed circuit television without the supervisor's entering the classroom.[16]

The present investigation and the abstracts of reported studies indicated the following findings:

1. There is a limitation on personal contacts between the teachers and pupils.

2. The implications of teaching by television are apparent for changes in class size and personnel.[17]

3. The premise in most of the experiments is that there are certain non-instructional burdens placed on the teacher that could be handled more efficiently by others, leaving the teacher free to attend to the main job of teaching.

4. Some advocates of the team approach note that this method may give the individual teacher more time for preparation.

---

[15]Fund for the Advancement of Education. The National Program in the Use of Television in the Public Schools. A Report of the First Year, 1957-58. New York: The Fund, January, 1959, 89 p.

[16]Carlos de Zafra, Jr., "Some Pros and Cons of C C T V." Clearing House. 32: 152-54; November, 1957.

[17]Robert M. Andrews, Times Dispatch, op. cit.

An example of the method by which lay citizens may be involved was observed in the Carner experiment in Central New York. In this instance the teleteacher also made frequent use of other persons for teaching special classes over television. An author discussed how books are published as a part of the library lesson for fourth and sixth graders. Another person discussed the reading rate and taught them special reading skills as they apply to the textbook.[18] One thing that might offset the limitations of contact between teachers and pupils is the talk-back system which the teachers can use on demand.[19] Telecasting and teleteaching is a full-time job and requires persons who are able to give their undivided attention toward this end.[20]

PROBLEMS OF COORDINATING STAFF AND FACILITIES

The difficulties of scheduling and problems of operation. Much has been written in regard to the problems of operating educational television, the difficulty of scheduling, and mechanical failures at times and matters of obtaining space, but only a brief

---

[18]William D. Shelton, "Television and Reading Instruction," Education, May, 1960, p. 552.

[19]Ibid., p. 554.

[20]Ibid., p. 554.

summary of the work done on the problems closely related to those such as Henrico might face will be given here.

Abstract of the experiment in direct instruction at Hagerstown. Hagerstown, beginning the telecasting of its first television lessons on September 11, 1956, televised them from a makeshift studio with the use of mobile transmitting equipment. For the first several months of operation lack of equipment restricted the program to the four high school instructional areas. Gradually a television station with three studios evolved and permanent equipment replaced the mobile temporary equipment.

With the exception of an occasional art lesson from the Washington County Museum of Fine Arts, the telecasts originated at the center. By using transmitters operating on different frequencies, several lessons can be sent simultaneously.[21]

Sets in the classroom are tuned to Channels 2, 4 and 6 on which the program is scheduled. A set, which is usually a 21-inch receiver, is provided for every twenty to twenty-five pupils so that all details of the lesson are plainly visible.

Extended during the summer of 1957, the closed-circuit cable included a total of 33 miles. An addition to the center included three more studios. Renovating an adjacent building, the authorities provided space for housing the studio teachers and developing

---

[21]Board of Education, Hagerstown, Maryland, Closed-Circuit Television, pp. 8-9.

a resource center for the preparation and storage of visuals. A special studio with suitable space for the expanding film library housed the equipment for projecting film by television.[22]

Programs in mathematics, geometry, arithmetic, primary numbers, academic English, remedial English, practical arts, music, art, science, social studies, and U. S. history for enrichment are included in the schedule for grades 1-12. A few core programs are developed around these subjects. Some of the lessons, which range in length from 20 to 50 minutes, are telecast daily; others, two or three days a week.[23]

On January 4, 1959, a video tape recorder became a part of the operation. Because this and other electronic devices are essential to television lessons, there is the possibility of mechanical failures.[24]

In teaching biology by television at Keene, New Hampshire, the school system found that most of its problems were mechanical.[25]

In initiating television, administrators have found that designs of today's buildings were not planned for instruction by television, especially in large classes. In Keene, New Hampshire,

---

[22] Ibid., p. 12.

[23] Ibid., pp. 14-15.

[24] Ibid., p. 37.

[25] Muriel Cook, "Do We Dare?," op. cit., p. 14-15.

it was believed that having a room used only as a studio, and not as a classroom as well, would have been more efficient.[26]

The matter of scheduling has been another problem. Keene found this most difficult.[27] In Jefferson County, Kentucky, changes in daily scheduling and use of buildings were made in three schools. Grades 3-6 received programs in rooms with space to accommodate 150 pupils. The pupils in each grade were divided into two groups. In the morning one group attended their regular classes. The other group went to special classes--creative arts, physical education, and television receiving. Pupils from grades 3 and 4 were combined. In the afternoon, the two groups in each grade interchanged programs. Those who had been in the regular classes in the morning went to special classes in the afternoon and vice-versa. The regular classes were of the normal size.[28]

One of the main problems observed was how to fit a 30-minute telecast into class periods of varying length. Television would seem to provide an opportunity to determine what can be taught to large groups. There is the possibility that time can be made available during the day for teachers to work with small groups of students.

---

[26] Ibid., p. 15.

[27] Ibid., p. 16.

[28] Jefferson County Board of Education. Educational Television Project Relating to Teacher Redeployment and Organization 1957-58. Louisville, Ky. Board of Education, 1958, pp. 1-22.

Not to be overlooked is the fact that these problems may be the result of inexperience rather than definite inherent flaws. Because of the fact that television is an innovation, makeshift facilities have had to be used. This always causes problems.

In the production of programs there are legal problems to be considered. The production of certain television programs involves certain legal restrictions. Common law protection, under state control, has the effect of prohibiting the use of materials which have not been printed for sale except with the owner's permission even if the materials have not been copyrighted. Programs containing copyrighted music and non-dramatic literary material may be televised. Provided such material is not for profit, these may be recorded on tape, film or kinescope without the consent of the copyright owner. All dramatic works must be cleared for performance. Stations subscribing to a program service must comply with all conditions placed on the use of such service. As television comes of age, legal questions relating to the use and recording of telecast materials may be expected.[29]

The areas of policy are also affected in the school systems by the introduction of television into the school systems' instructional program. Keeping the local school boards informed of developments in the community and in the schools is important to long term

---

[29]William Y. Elliott, Television's Impact on American Culture (East Lansing, Michigan: Michigan State University Press, 1956) p. 307.

policy planning and is a major responsibility of the superintendents. To meet the varied needs relating to educational television, new policies must be instituted and old policies modified. The school boards must consider program production, the selection of teachers for work before the camera and both procurement and maintenance of transmitting equipment.

In securing the cooperation of a local station there are many steps a school system must take. As described previously, the Richmond Public Schools had to have an outline of the proposed series in some detail.[30] This demonstrated to W R V A, the station presenting the program, the potentialities of the program which was being offered. In the discussion of the Richmond experiment, it has already been pointed out that the succeeding steps of writing the draft into script form and noting production details had to be taken.

In Hagerstown, mobile transmitting equipment (which is a control room on wheels) was sent to the schools for rehearsal.[31] The station man usually takes over, once the program comes into the studio. He has the responsibility for a smooth or successful production.[32] In Richmond this was the procedure when the studio

---

[30] Ibid., p. 123.

[31] Ibid., p. 124.

[32] Ibid., p. 198.

director supervised the rehearsals. The hours of tedious preparation before the lectures were given have also been described. In commercial television a single station can transmit only a single program at a time. Open-circuit television is also subject to static and other forms of interference and frequently to variable reception. The advantages of open-circuit television, a Richmond teacher said, are twofold. In the sampling of opinion she stated that (1) she taught children vital subject matter and (2) at the same time she promoted good will in the community. It was her conclusion that there could be no better public relations for schools than the demonstration of good teaching.

The description given previously does not cover the most complicated format on television, that of presenting a dramatization. The steps involved in this type include arranging for preliminary conferences, preparing the script, listing the personnel, props, furniture, stills, making a floor plan of the set or sets, casting, making arrangements for the music to be used, planning for sound effects, rehearsing, revising, polishing, and cleaning up.[33] Then the administration had to ask itself several important questions. Who shall teach on television? Will teaching on television necessitate changes in salary policies? Should kinescopes and tape recordings of important lectures and worthwhile related

---

[33] Ibid., p. 123.

programs be made available through closed-circuit television for review purposes? One of the simplest approaches is the process of assembling a television series from films. That carried on by the Center, Ann Arbor, Michigan, is worth describing:

> For each series an educational consultant is engaged--an authority in the field to be dealt with by the series--who reviews with a film specialist all of the films available, selects the best and builds them into larger logical sequence. He then prepares a special script which serves as the framework for films in the series and also binds the total together. Currently this script framework also is being filmed so that it is added to the existing material. A complete program package on film is available to the station.[34]

In such a program as the above, the material would seem to be "canned." The University of Pennsylvania made a very interesting and critically unfavorable report on teaching by television as contrasted by direct classroom contacts. That the image on the end of the cathode ray can hardly be an adequate substitute for the teacher is a conclusion of the report of Pennsylvania State University.[35]

In Washington, D. C., scheduling classes at convenient hours, both for the stations and the school system's students and

---

[34] Presenting National Educational Television, Bulletin of Educational Television and Radio Center. (Ann Arbor: The Center, 1955, pages unnumbered.)

[35] An Investigation of Closed-Circuit Television for Teaching University Courses (Pennsylvania State University, College Station, Pennsylvania, 1955).

teachers as a whole, presented real problems. For this reason and because of curriculum conflicts the Washington experiment proved a rather dismal failure. Washington had a definite program of study and television teaching was not in harmony with teaching provided by the school system itself.[36]

The problem of sources must be considered. The programs which have been presented for distribution, have, in general, been obtained from (1) exchange among stations themselves, (2) existing educational film material and (3) production under direct contact.[37] A teacher who is not suited for television may also present an operational headache.[38]

SUMMARY

All of the data recorded in this chapter indicate that television operation does have some drawbacks. Television equipment is

---

[36]Carl F. Hansen, Assistant Superintendent of Schools, District of Columbia, From Boom to Bust in T V Teaching--In One Year. A Report of the Developments in Teaching by Television in the District of Columbia Public Schools. (Washington, D. C.: The District of Columbia Public Schools, 1955) pp. 1-4.

[37]Presenting National Educational Television, op. cit.

[38]Ford Foundation and the Fund for the Advancement of Education, Announcement of Program of Grants, Committee on the Utilization of College Teaching Resources, Fund for the Advancement of Education (New York: Ford Foundation, December 15, 1955).

subject to mechanical failures. Although administrators are finding that today's buildings are not planned for television instruction and this inadequacy will limit its use, through some changes, schools may be converted to television.

The matter of scheduling is also a problem to be worked out individually. By means of new electronics equipment, lessons can capture, broaden and hold interest on a mass scale. Two kinds of operational methods are practiced more widely than others: closed-circuit and open-circuit television. Although makeshift facilities often have to be used, television can deliver certain parts of the subject matter to very large classes. With college and school enrollments doubling and tripling, with a shortage of funds for salaries and classrooms, with professors and teachers leaving the campus and the public schools for industry and government, the problem is that of finding new ways of meeting the needs of additional students. By the time the 1964-65 school year arrives elementary enrollment in Henrico's schools will have increased to more than 3,600, and enrollments in the junior and senior high schools will have gone up by more than 3,200. By then Henrico County Schools will need at least 343 classrooms.

There are legal problems as well as the problems of policy that must be solved by each school board if television is to succeed. If the system works in conjunction with a local broadcasting or television station there are many steps the school system must

take. It has been found that the simplest approach in presenting programs by television is through the use of films.

CHAPTER IV

EFFECT OF TELEVISION ON LEARNING OUTCOMES

In the first year of the National Program for the In-School Use of Television in 1957 the Ford Foundation found there was naturally wide variation among the various schools experimenting with educational television in regard to the kind and quality of tests used and in the statistical treatment of the test results. The applications of the principles of learning to the complex conditions of televised teaching must be analyzed. This study will include the description of the areas of experimentation and critical discussion of the findings.

NATURE OF EXPERIMENTATION

The Norfolk City experimental educational television program is one of 104 being sponsored in local public schools by the Fund for the Advancement of Education.[1] In Norfolk the experimenting is being done with the teaching of plane geometry, American history, and general science classes of larger than normal size. The director of the experiment has stated that the use of direct teaching combined with "follow-up" class instruction creates a

---

[1] Virginia Journal of Education, "The New Teaching Medium," October, 1958, p. 10.

teaching team that works cooperatively to raise the quality of instruction. The leaders and classroom teachers are experimenting with new techniques for working with large groups. They are appraising recent psychological research findings concerning large groups.

The television lessons were planned in the summer in a workshop where the teachers also learned about methods of television presentation. The value in this would appear to be derived from the sharing of the teaching problems by the teachers in a cooperative enterprise.

Although plans were made for standardized testing and comparison of the experimental and control groups, no results have been received. The plan included four elementary schools, two junior high schools, and four senior high schools who would receive the telecasts. Science was taught to the fifth and sixth grades, United States history to the eighth grade and plane geometry to the tenth grade. One television receiver was furnished for every 20 pupils. In the elementary schools the schedule was so arranged that one-half the children in each grade had television and the other half had regular classes. In the afternoon the two halfs exchanged classes. The classes were of larger than normal size, ranging from 75 to 200 pupils. Two thousand students took courses on television beginning September 9, 1957. It has been noted that the television classes are farther into the year's work

than others.[2] The students endorsed this method of instruction, but in 1960 Norfolk area officials and teachers have stated that the last three years of using this medium have been most enriching in all areas of instruction in which they have been used.

An education teacher at Park School in Richmond turns on the television program from a local station every morning at 9 o' clock during the school session. Miss Mary Ann Weaver, the teacher, states that the television class is one that will help her students earn a useful living some day. Thirty of them are learning how to use a typewriter. They are not able to succeed in the regular high school program, but they can be given basic academic and job training. The open-circuit television typing course is offered for optional credit by the Adult Center for Business Education of the Richmond Professional Institute. The course, first used at Park School on February 8, 1960, represents the first time educational television courses have been used in any special education classes in the city. That the class has been a stimulating supplement to the children's training is an opinion of Mrs. M. W. Hudson, director of special education.

"The school's aim," said Mrs. Hudson, "is to teach pupils how to make a living and be a good citizen. We don't teach them

---

[2] Virginia Journal of Education, "The New Virginia Education Facilities Committee," September, 1958, p. 16.

Milton, but now to read directions, write a check, fill out an application form and that sort of thing."[3]

Also in Richmond, classes in Russian were added to the high school curriculum on an experimental basis in February, 1958. The following September, Russian was made a permanent course in the city's four high schools. Heading up the Russian language is Igor Yacenko, a former calvary captain in the Czar's army. Yacenko's first class in Russian began each day at 9:50 A. M. at the Armstrong High School. After the class he drives across town to Maggie Walker High School to make an 11 A. M. class. At 11:53 A. M. he goes to meet his classes at John Marshall High School. When class is over there, he heads west to his last class which convenes at 1:20 P. M. at Thomas Jefferson High School. The possibilities for having these classes recorded by video tape are being studied.

In 1957-58 the Richmond Schools put on two programs, "Art Around Us" and "Let's Study Science." Each class was briefed by its teacher before the program and the television lesson was followed up by the regular teacher.[4] Mrs. Mary Ann Franklin, television consultant for the city schools, said the televised lecture

---

[3]Robert M. Andrews, "Educational T V Used in a Special School Here," The Richmond Times Dispatch, February 10, 1960.

[4]Press dispatch, Richmond News Leader, October 26, 1959.

did not replace the teacher, but helped her supplement and enrich the instruction. Mimeographed guides were sent to the teachers well ahead of time with suggestions for preparation and follow-up work based on the telecasts.

One of the main uses made of educational television by the Medical College of Virginia has been in the School of Dentistry. In a presentation over W X E X - T V the camera looked over the shoulders of dental students learning anatomy; learning the principles of cavity preparation; performing oral surgery and becoming skillful in the delicate art of making a bridge. It was designed to interest students in dentistry as a profession. By accompanying the practising dentist to the hospital or clinic, by observing him in a graduate specialty and by listening to discussion on latest developments, the student interested in dentistry as a profession might find these to be valuable experiences.[5]

RESULTS OF EXAMINATIONS

None of the experiments in the Richmond area has been as extensive as the Washington County experiment by the Board of Education of Hagerstown, Maryland. The learning process was analyzed in detail and various elements were listed. The question arose as

---

[5] Press dispatch, Richmond News Leader, March 19, 1960, p. 14 A.

to which aspects could be handled readily and which seemed difficult or impossible to accomplish by the direct television instruction.

> The group agreed that with television you would probably motivate and stimulate, inform, demonstrate, develop ideas, show application, enrich backgrounds, provide common experiences, suggest activities, challenge pupils to assume more responsibility for their own study, but you could not handle classroom discussion, clear up misunderstanding, provide for the follow-up of the lesson, direct and supervise the activities growing out of the lesson, and help pupils apply what has been learned.[6]

The first studies of student growth in achievement with the use of television were made by standardized tests given in September, 1957 and May, 1958. Mathematics was the first area tested. The retarded pupils, in grades three through eight, were divided into groups according to their intelligence. The Cooperative Plane Geometry Test was given to pupils comparable in ability in two classes, one taught by conventional methods and the other by television. The results indicated the average growth to be generally higher for those receiving televised lessons than for those in traditional classes, but the report warns that it is difficult to know whether the very novelty of the experience stimulated learning or whether the use of better teachers, better organization and presentation of material was more effective.

---

[6] Washington County Board of Education, Closed-Circuit Television: Teaching in Washington County, 1958-59 (Hagerstown, Md.: Board of Education, March, 1959, p. 6.

The methods used in this evaluation were surveys to determine student reaction and participation, community reaction, reaction of classroom teachers, and extent of the use of the television guide. A fifty-item questionnaire was distributed to a 32% sample of 2,567 students who were chosen at random by numbering, consecutively, the total student body in each school. Then those students, whose numbers corresponded to a set of numbers previously selected from a table of random numbers were selected to answer the questionnaire. The opinion polls which were made were generally favorable. A questionnaire was distributed to every teacher to survey their opinions. These, too, were generally favorable.[7]

Biology lessons were telecast to 14 schools in the Cincinnati system. Many outside resource people were called in to appear on the program and elaborate visual properties were used.[8] According to the experimenters, results must be taken with a great measure of caution. The following summary of their findings is given:

> In the first semester, students of high-level ability tended to benefit more from the television instruction than did below-average ability students, and boys more than girls. In the second semester, however,

---

[7]Washington County Board of Education, Closed-Circuit Television, op. cit., pp. 17-21.

[8]Cincinnati Public Schools, Report of an Experiment in Teaching Biology and Driver Education by Television (Cincinnati, Ohio: Board of Education, July, 1958) 69 p.

> all groups instructed by television achieved higher average scores than did students in the regular classrooms although this difference was statistically significant only for the above-average ability group.[9]

In the Cincinnati system, four of the 14 schools were designated as experimental schools. In two of these (schools) television and laboratory instruction were used on alternating days. Three tests were given to evaluate this program. One measured general achievement in biology. Another tested scientific disciplines in general. A third measured attitudes toward school subjects. Results indicated that a combination of television and laboratory instruction was most profitable to students of high ability. Student attitudes favored classes taught in the conventional manner. From a survey in the conventional classes these students commented that they seemed "to like biology more," had a greater "opportunity to ask questions," felt biology less a "waste of time," felt teaching "got across" better, felt more "serious discussion took place," thought that their minds "wandered less," and that they "learned more."[10]

Certain observations are apparent as data are collected and this medium is investigated. Teachers expressed their appreciation of having learning experiences presented that they could not have

---

[9]National Education Association, Research Report 1959-R17, p. 35.

[10]Ibid., p. 36.

provided because of limited equipment, time or resources. Educators are being challenged to explore the use of television as an important resource in education.

William H. Allen reports in Teaching Tools for Fall, 1959, on the subjects that can be taught by television and how to use television in teaching. He states that 45 surveys were made in the elementary grades, 24 in junior high schools and 67 in high school. He notes that in 21 per cent of the comparisons the groups taught by television learned significantly more information; in 72 per cent of the comparisons the conventionally-taught groups learned significantly more. These results were about the same for all grade levels. He indicates four different ways in which television can be used in teaching: for enrichment to supplement the classroom teacher's regular instruction; for direct instruction in normal classroom situations where the television studio teacher presents basic subject matter which the teacher incorporates into instruction; for large class groups where the course of instruction is built around the television teacher presentation, with the classroom teacher supplementing, clarifying and extending; for out-of-school viewing assignments to support the school work.[11]

The enrichment possibilities for the teaching of literature and history are being advanced by the experimental programs which

---

[11]William H. Allen, Teaching Tools, Fall, 1959, p. 3.

are financed by a grant of $12,900 made to the University Center in Virginia by the Fund for the Advancement of Education, a non-profit organization established in 1951 by the Ford Foundation.

Three colleges--Mary Baldwin College for women, Virginia State College and Hampton Institute--are offering courses on "A changing world in light of history." The lecturer, Arnold Toynbee, famed British historian, taught the lesson which was filmed and later was televised and edited. The Center issued transcripts, side reading assignments and other supplemental materials. The courses, using films from a year's series of lectures that Arnold Toynbee gave at Washington and Lee University in 1959, are a part of the experimental program designed to test the effectiveness of a course based on film lectures and question and answer periods.

Colonel Herbert W. K. Fitzroy, administrator of the University Center in Virginia, said that about 150 students at eight Virginia institutions would have taken the course by June, 1960. In the course Toynbee discusses the Middle and Far East from such points of view as history, philosophy and religion. Professor Manning B. Voorhis of Randolph-Macon Woman's College is evaluating the effects of the course for the University Center in Virginia, and is using questionnaires filled out by the students and instructors.

Five institutions tried the course in the spring term of 1959, and in general the courses have consisted of a weekly film

presentation--featuring Toynbee's lectures at Washington and Lee--plus subsequent classes or seminars on topics he raised in the lecture. Filmed question and answer periods complete the program.

Planned for upperclassmen, the courses have been offered with full accreditation, and are being used successfully to enrich the course and make it significant for the student.[12]

SUMMARY

The reports of experiments given are representative of a much larger number of experiments in instruction by television. The subject matter, in most cases, is planned in advance to be learned as uniformly as possible. From the findings one might make the following summary:

1. The dentistry presentation from the Medical College of Virginia served as an effective means of presenting factual material.

2. In the Medical College report it would seem that there was no evidence of making learning permanent and nothing is noted about the lack of two-way communication between the teacher and the students.

3. A generalization cannot be formulated about the class at Park School, Richmond, because of the opinion element present, but the implications are that attitudes and appreciations of the students have been strengthened.

4. Hagerstown noted that teachers should challenge pupils to assume more responsibility for their own study, which in turn could stimulate thinking and the ability to think.

---

[12]Press dispatch, Richmond News Leader, December 3, 1959.

5. The inference from the group at Hagerstown was that television could be a powerful means of gaining and holding the interest of the learner and compelling his attention.

6. Although as previously mentioned, a generalization cannot be made, there are implications that television can be of assistance in developing a skill. In considering the classes that Yacenko has been teaching in the Richmond Public Schools, the leaders in the city schools may find a video tape recording of his Russian classes could be a supplement in the development of language skills.

7. From Hagerstown there would also be an indication that television can bridge the inequalities of pupils' experiences by enriching backgrounds and providing common experiences.

8. Dade County, Florida, has substantiated the theory that television can be used to teach large groups effectively. The results of Norfolk's experiment in teaching large groups was so effective that area superintendents met to plan ways of making television a permanent part of Norfolk's program of instruction.

The chief concern of leaders in Norfolk, Richmond, and Cincinnati was to affirm their belief that educational television should be offered as another audio-visual resource, supplementing classroom instruction by bringing in materials not otherwise available. The classroom teacher is indispensable in helping students learn from their classroom experiences. Richmond and Hagerstown also made adequate advance preparation. Hagerstown did not seem satisfied with the follow-up. According to the data collected from the Washington County System, the development of study guides both for pupils and teachers involved an unusual amount

of interaction between administrators, curriculum specialists, classroom teachers, the television teacher and the program supervisor. In the use of television the teacher and class, in many instances, did not have the freedom to vary the emphasis and treatment of the topic being studied.

Henrico County might benefit from these inferences that television can be of value for public relations and for presenting any factual material. There is the element of potential value for strengthening pupil skills and attitudes to be considered. The fact that the medium can stimulate thinking and is a powerful means of getting and holding the attention of the students and compelling attention have already been established as worthy objectives of education. The enrichment potential is decidedly a factor to be weighed. An example of enrichment would be the Arnold Toynbee films. "Continental Classroom" is an illustration of the use of television for the basic subject matter areas of chemistry and physics. Norfolk has found value in the use of televised instruction for large class groups. For out-of-school viewing assignments by a high school English teacher, "Oliver Twist" and "Ethan Frome" and similar classics might be used.

Not to be overlooked is the opportunity to get "close-up" views of operations in dental and medical schools. These were formerly restricted to the surgeons performing the operations and such other personnel as were able to crowd around the operating

table or operating room. Now through educational television students in a large class may observe closely. Effort, however, is necessary as the student uses this aid to strive for permanent learning. The elements of handling classroom discussion, clearing up misunderstandings, supervision, and the application of principles would seem to be weak areas in televised instruction. If Henrico used educational television, these weaknesses would need to be strengthened by other methods. The enrichment value and the bridging of gaps in the experience of students would seem to be key factors in outweighing these liabilities. By this means resource material might be provided by Henrico County as a supplement for the regular instructional units.

CHAPTER V

PRACTICAL WAYS OF INCORPORATING TELEVISION INTO CLASS INSTRUCTION

Not all technological developments urged upon teachers may be satisfactory educational tools. It is necessary to explore their implications, to modify them according to the demands for good learning and re-assess present educational practices. The medium of print, with the notable exception of drama, directly conveyed "the best expression of the best thought" to its audience. It was, therefore, only essential that the medium of print be considered in the development of literacy. However, print no longer is the sole conveyor of the best thinking. Sight and/or sound recordings and live television, radio, and theatre have now emerged as extremely important media through which the best thinking must be conveyed to its audience. This means that educators must concern themselves with development within the society of this kind of "multi-media" literacy. It means that just as the individual is brought to an awareness and appreciation of print, so must he be educated to understand and critically interact with other media of communication.[1] Two questions immediately arise: Can the curriculum be implemented by the new medium of television? Can it be organized and programmed?

---

[1]Shelton L. Root, "Children's Literature and Children's Literacy," Elementary English, May, 1959.

IMPLEMENTING THE TEACHING OF SCIENCE

Private industry and foundations have joined forces with several educational organizations to seek improved education on a world basis. This jointly sponsored Resources Institute is a co-sponsor of the two "Continental Classroom" Courses now being offered. An effort to bring about a swift and substantial improvement in the teaching of physics and chemistry in American public high schools began in the fall of 1958. In 1900 these subjects were required in nearly all tenth or eleventh grades, but recently they have become elective subjects and have steadily lost ground. In many high schools they are either not taught at all or are taught by teachers who are not properly qualified to teach them. In other courses being taught there are qualified teachers who have fallen behind the recent developments in this field.

A college-level course in physics over television, intended primarily for high school physics teachers, began October 6, 1956. The lectures were presented by a professor at the University of California, Harvey E. White, who had presented a full-length course in high school physics over television and on film. Televised over the nation-wide television network of the National Broadcasting Company and jointly sponsored by the American Association of Colleges for Teacher Education, the Ford Foundation, and the Fund for

the Advancement of Education, the program received substantial financial support.

The course consisted of 160 half-hour lectures and laboratory demonstrations presented each Monday through Friday from six-thirty to seven. Although White was the principal teacher, several scientists, including six Nobel Prize winners, participated as guest lecturers.

Although the course was designed primarily for high school physics teachers, it had a much wider response and exceeded all expectations. The number of viewers, according to the Nielson study, was approximately 300,000. One hundred and forty-nine N B C stations throughout the country carried the same course. The number of students who registered for credit was estimated at 5,000, with more than 250 colleges and universities offering the course for credit. Evaluation studies of the achievement of those who took the course for credit are underway and will be published later. It is interesting to note that during the year, Continental Classroom received many of the highest awards bestowed in the broadcasting industry.

The sponsors then reached the conclusion that it would be desirable to offer a course in chemistry, designed for bringing high school chemistry teachers up to date on recent developments in the field and for disseminating the subject matter content. A professor at the University of California, and one who had the

experience of recording a full year's course in the subject on film, was available. He worked closely with the advisory committee of the American Chemical Society in developing the course content.

In addition, steps were taken to have a textbook and study guide prepared for publication. With the assistance of two collaborators, Dr. Baxter undertook the preparation of two books which were printed late in the summer and made available for distribution by Prentice Hall. Modern Chemistry was prepared with the aid of Luke B. Steiner and A Guide to Modern Chemistry was prepared with the assistance of Jay A. Young.

In the fall semester of 1959-60, Continental Classroom went on the air September 28 between the hours of six and seven in the morning. At 6 A. M. the course in Atomic Age Physics by Professor White is being repeated by means of video-tape. At 6:30 A. M. the course in Atomic Age Chemistry is being offered. As with the physics course, a number of distinguished guest lecturers will appear throughout the year, and this time it will be broadcast in color.[2]

A National Education Association department, the American Association of Colleges for Teacher Education, will continue to be the National Broadcasting Company's co-partner in presenting the

---

[2] National Education Association News, 13: 22, September 18, 1959 (Washington, D. C.: National Education Association).

series along with the American Chemical Society, the Ford Foundation and ten major corporations. Each course, offered through the academic year to May 27 five times a week, included a total of one hundred sixty lessons on the college level (eighty per semester). "Modern Chemistry" will be the first educational television course for credit to be shown in color.

Three hundred and twenty-seven colleges and universities offered credit for the two courses in 1959-60, and one hundred and fifty-eight N B C affiliated stations carried them.[3]

As collection of data is made, one observes that six principles have been utilized in presenting successful television courses. These are (1) qualified and outstanding leader for the class, (2) continuous, long-term planning, (3) accessible textbooks and study guides as raw materials for learning experience, (4) variety in presentation, (5) in-service growth for teachers, and (6) new methods in scientific learning.

The Learning Resources Institute mentioned in the first part of this chapter, is undertaking the production of a variety of other courses for secondary schools and colleges. At Princeton the Institute will establish a research center for the advancement of technological improvements for the learning process. Dr. John Ivey is the president.

---

[3] A Report for 1957-58, The Fund for the Advancement of Education established by the Ford Foundation, pp. 34-35.

CONTEMPORARY MATHEMATICS

A college-level course, Contemporary Mathematics, consisted of Modern Algebra, given the first semester, and Probability and Statistics, presented during the second semester. This 1960-61 Continental Classroom presentation is sponsored by the Conference Board of the Mathematical Sciences, the Learning Resources Institute and the National Broadcasting Company. The contributors are the Bell Telephone System, E. I. duPont de Nemours and Company, The Ford Foundation, General Foods Fund, I B M Corporation, Radio Corporation of America, Union Carbide Corporation, and United States Steel. Dr. John L. Kelly, University of California, Berkeley, and Dr. Julius H. Klavaty, DeWitt Clinton High School, New York City, are teaching Modern Algebra. Dr. Frederick Mosteller, Harvard University, and Professor Paul C. Clifford, Montclair (N. J.) State College are teachers for the course in Probability and Statistics.[4]

ENRICHING ENGLISH AND HISTORY

In order to learn, the student's attention must be captured. Television, it has been found, has the capacity for supplying the greater variety of more realistic cues, especially when it makes use

---

[4]Pamphlet from Dr. John J. Kelley, National Coordinator, Continental Classroom, 680 5th Avenue, New York 19, N. Y., September, 1960.

of kinescope and other recorded materials which would be difficult to reproduce in every classroom. In the teaching of biology time lapse photography can show the growth of plants, and microscopic objects can be enlarged. In the English courses, drama can be recreated. By bringing the world into every classroom, television can vitalize the study of history. For example, the documentary film now being written by Clifford Dowdy about Richmond from 1861 to 1865 could be utilized.

Mr. Dowdy has been commissioned by W R V A - T V to write a two-hour documentary film on Richmond during the Civil War. The script will show Richmond as the Capital of the Confederacy and target of Northern arms. The film will be strictly factual for use whenever an accurate picture of Richmond from 1861 to 1865 is needed. The project has been endorsed by both Virginia and national Civil War centennial commissions. The story will be woven around a minor cabinet official in the Confederate States government and interior shots of a home of that period, appropriately furnished, will be required. Other buildings that might appear in the film are the White House of the Confederacy, the State Capitol, St. Paul's Episcopal Church and the Lee House. Mr. Dowdy explained that he is writing a series of vignettes of the period, and the minor cabinet official provides a thread upon which to string them. He is at work now on a commemorative volume of R. E. Lee's war-time papers.[5]

---

[5]Press dispatch, Richmond News Leader, October 31, 1959.

The National Educational Television and Radio Center is making many excellent programs available. For instance, a series on Americana might feature Independence Hall and Valley Forge from Philadelphia; Old North Church and Plymouth Rock from Boston; Nob Hill and the Golden Gate from San Francisco; or the Statue of Liberty, Grant's Tomb, and Wall Street from New York.[6]

An English teacher would also find Dupont's "Oliver Twist" of assistance in the teaching of Dickens. Robert Morley, Eric Potman, Inga Swenson, and John Golicos starred in the Columbia Broadcasting System Television Network's Dupont "Show of the Month" dramatization of Charles Dickens' "Oliver Twist," December 4, 1959. A speaker at the television seminar of the National Education Association states that through the use of such presentations "change of pace" can be provided.[7]

An examination of the cast has revealed that it is made up of professional and experienced actors who can vitalize the teaching of this classic, which lasts for ninety minutes.[8] The teaching of reading received a boost with the launching of another television series, called "Reading Out Loud," which was initiated the third week of January, 1960. The Westinghouse Broadcasting Company,

---

[6]National Education Association, N E A Seminar Report, Opportunities for Learning (Washington, D. C.: Division of Audio-Visual Instruction Service, May, 1959) pp. 47-48.

[7]Ibid., p. 46.

[8]Richmond Television Corporation, W R V A - T V Telelog, 1959, p. 1.

in cooperation with the American Library Association, showed such personalities as Eleanor Roosevelt, Jose Ferrer, Archibald MacLeish, Pearl Buck. President John F. Kennedy read an account of Lincoln's nomination at the 1860 Republican convention from Allen Nevins' work of history, The Emergence of Lincoln.

Jose Ferrer will appear from time to time. In the first of the series he read to his wife, Rosemary Clooney, and their children high lights from Mark Twain's classic, Huckleberry Finn. Pearl Buck, Nobel Prize-winning author, read aloud Chinese fables from the book, Folk Tales from China by Lim Siantek. Mrs. Roosevelt read her favorite, "The Butterfly That Stamped" from Just So Stories by Rudyard Kipling.

"Reading Out Loud" was telecast on Westinghouse Broadcasting Company Stations W J Z - T V, Baltimore; W B Z - T V, Boston; K D K A - T V, Pittsburgh; K P I X - T V, San Francisco; and K Y W - T V, Cleveland. It was also seen on 54 educational stations, and kinescopes of the shows were available later for use by organizations and groups.[9]

For teachers of elementary children there would be enrichment for language arts classes in Shirley Temple's "Storybook" programs over W T V R. Beginning September 28, 1959, and continuing every

---

[9]National Education Association, N E A News, 13: 34, December 18, 1959, p. 3.

third Monday thereafter, the childhood sweetheart of America, screened the cream of folk-lore, fairytales and children's classics to present her own favorites, many with special music. "Ali Baba and the 40 Thieves" was her first presentation.[10]

From Station W B O E in the Administration Building on the sixth floor, the Cleveland Public Schools presented a Junior High School Series. "The American Story" dramatizes short stories by American writers dealing with the American scene.[11]

Rudyard Kipling's Kim was televised on Shirley Temple's N B C show at 7 o'clock Sunday night, September 25, 1960. Michael Rennie, Joseph Wiseman, Arnold Moss and Tony Haig (in the title role) were given the starring roles. Rennie starred as Captain Creighton, British secret agent in the Kipling story. Wiseman appeared as Lurgan, who taught Kim the "game" of being a counterspy. Moss portrayed the treacherous "White Suit" and fourteen-year-old Tony Haig played Young Kimball O'Hara--Kim.

Featured in Richard Allan Simmons' adaptation of the Kipling classic were E. J. Andre as the ancient lama, Alan Napier as Colonel Devlin, and Luis Van Rooten as Huree Chundar.

Sunday, September 18, 9:00 P. M. (C B S - T V) General Electric Theater launched a new policy of quality drama with such

---

[10] W R V A - T V Telelog, op. cit., p. 4.

[11] William B. Levenson, op. cit., p. 478.

writers as Budd Schulberg, William Faulkner, and Jessamyn West on the roster for production this season with a special on November 13, 1960 on new experiments in American education.

Monday and Tuesday, October 24-25, 1960, 7:30 P. M. (C B S - T V) All Family Classics presented a new series of two-hour dramatic specials based on such classics as "The Three Musketeers," adapted by Michael Dyne; "The Man in the Iron Mask" (Dale Wasserman); "Vanity Fair" (Roger O. Hirson); and "The Scarlet Pimpernel" (George Baxt).

Monday, October 24, 9:30 P. M., (N B C - T V) Hallmark Hall of Fame presented "Shangri La," a musical play based on the James Hilton novel, "Lost Horizon."[12] "Macbeth," starring Judith Anderson and Maurice Evans, was presented Sunday, November 20, 1960, 6:00-8:00 P. M.[13]

Another program, "Fun from the Dictionary," provides a systematic development of vocabulary through brief scenes which are analyzed for word meanings by a pupil panel. Teachers received in advance an outline of the program content and supplementary material. "Great Expectations," by Charles Dickens, broadcast from 3:15 to 3:45 over W B O E is used for supplementary listening.

---

[12]Press dispatches, Richmond Times Dispatch, September 25, 1960 and October 23, 1960, pp. 6-L and 8-L.

[13]Press dispatch, Richmond Times Dispatch, November 20, 1960, p. 9-L.

"Treasure Chest of Poetry" is brought to classes at 2:20 Tuesdays from the same station.[14]

The following are typical subject matter objectives:

OUTLINE FOR TELEVISION ENGLISH

(one semester, one period daily for high school level--W B O E)

1. To furnish an introduction to television.
2. To improve voice and spoken English.
3. To develop an appreciation of the best by learning to criticize, judge and enjoy.
4. To prepare talented and ambitious pupils for English II.
5. To discover talented pupils.[15]

A quiz format is used for "Storytime" in Wiffe Schoolhouse, a fourth, fifth and sixth grade series presented in Philadelphia. Five students, "Quiz perts," as they are termed, answer questions about scenes and characters dramatized from such books as "The Prince and the Pauper" and "The Yearling."[16] On February 3, 1960, "The Tempest" was presented on C B S Network. Teleguides were distributed to teachers and administrators through Scholastic Teachers Magazine. "Ethan Frome" was presented on the same network February 11.

---

[14] William B. Levenson, op. cit., p. 478.

[15] Ibid., p. 480.

[16] Ibid., p. 142.

SUPPLEMENTING HISTORY

For history classes "Not So Long Ago" was presented January 31. It is a report of the U. S. A. during the years 1945-50. "Our American Heritage" with the story of John Charles Fremont, was presented on January 24 and Ulysses S. Grant on February 21.[17] "The American Civil War" presented thirteen episodes of the war on Sunday afternoons at 4:30 P. M. on W T V R, Channel 6, Richmond, until May 21. This series began on January 15, 1960.[18] Other C B S productions are "The Twentieth Century," "Eye-witness to History," and "Winston Churchill."[19]

SUMMARY AND CONCLUSIONS

From the present study it would seem that television can bring to the classroom a variety of learning situations in every subject area. The viewing of some commercial programs can be related to topics studied in the classroom, especially in the fields of science, English and history. "Continental Classroom" has been used successfully to bring about a substantial improvement in the

---

[17] "Hearing and Seeing," California Teachers Association Journal, February, 1960, p. 30.

[18] Leaflet from Virginia Trust Company, Richmond, Va.

[19] Scholastic Teachers Magazine, February, 1960, p. 15 T.

teaching of physics and chemistry in American public schools. These are some of the possible ways in which television can contribute:

Providing motivation and stimulation. Television can be used effectively to transmit experiences often novel to the classroom, which can be highly stimulating both to teachers and pupils. It can, for example, bring a documentary television series of the War Between the States.

Showing drama of life. Television can be a key to new doors in literature by the dramatization of such classics as "Oliver Twist," "Great Expectations," "The Prince and the Pauper" and "The Yearling."

Developing attitudes. Television can be particularly valuable in providing concrete experiences which will help to mould constructive attitudes. Good citizenship, understanding of people of different backgrounds, appreciation for the value of teamwork are some of the highly intangible, vitally important attitudes which can be directed through the television presentations, "Not So Long Ago" and "Our American Heritage."

Developing intellectual skills. Television can serve as one means of acquiring data on a subject or provide a systematic development of vocabulary through brief scenes which analyzed for word meanings by a pupil panel in a program such as "Fun From the Dictionary."

Stimulating interest. Television can provide an insight into areas otherwise unknown.

CHAPTER VI

SUMMARY AND CONCLUSIONS

I. GENERAL SUMMARY

Television installation and operation are costly. According to the data presented, basic station equipment may cost from $250,000 to $350,000. The average annual cost of operating a station may approximate $150,000. Because of the amount of time necessary for preparing lessons, administrators must solve the problem of how to compensate instructors for the added work load and how to make a suitable return to resource people for their professional services. The aid of national and local foundations may not be available after the experimental set-up and the various stages of investigation have served the initial purposes. Despite the above problems there are the elements of enrichment and variety which may be offered by the use of television. These two elements are of such import that the enrichment and variety potential for the curriculum may offset the costs.

There are problems to be faced in staff utilization. Some administrators are finding that contemporary buildings are planned so that units may be added for televised instruction. Before the units can be added, lack of space may limit its use. Conflicts may arise between teachers and aides. Change in class size and

personnel may be necessary because of the fact that teleteaching is a full-time job and requires persons who are able to give their undivided attention toward this end. The teachers should be specially trained, giving their services full-time and growing with the art of teleteaching. The team approach may give the individual teacher more time for preparation. Equipment is sometimes subject to mechanical failures. There are legal problems as well as problems of policy that must be solved by each school board if television is to succeed. If the system works in conjunction with a local broadcasting or television station, there are many steps the school system must take. It has been found that the simplest approach in presenting programs by television is through the use of film.

The subject matter, in most cases, is planned in advance to be learned as uniformly as possible. The dentistry presentation from the Medical College of Virginia served as an effective method of presenting faculty selection of factual material. From the present study it was found that with television teachers can motivate better than with other techniques of teaching. With this medium educators may develop ideas, show applications, enrich backgrounds, provide common experiences, suggest activities, and challenge pupils to assume responsibility for their own study.

Other results noted were: (1) more experimentation, (2) improved teaching techniques in the classroom and (3) better attention

among pupils, improved note taking and more responsibility assumed by the pupils. The subject most frequently offered and requested, and the one rated most successful by teachers, is science. Television does not produce or teach lessons but depends on a teacher, along with associated personnel, who plan, organize and follow through in the learning situation. When television with its attention-holding features is used, it needs to be coordinated with other types of learning experiences. In providing a central point of concentration for group instruction, it implements the development of good habits of sustained attention, careful observation and attentive listening.

The chief concern of leaders in the experiments studied was to affirm their belief that educational television should be offered as another audio-visual resource, supplementing classroom instruction by bringing in materials not otherwise available. Eighteen of the twenty divisions reported in Virginia reported that television instruction tended to increase pupil interest in the subject taught. Thirteen divisions said the program spurred reading in the subject. The viewing of some commercial programs can be related to topics studied in the classroom, especially in the fields of science, English and history. "Continental Classroom" has been used favorably to bring about a substantial improvement in the teaching of physics and chemistry in American public high schools.

The teaching of the classics may be vitalized by such presentations as "Oliver Twist," the television series, "Reading Out Loud," and "The American Story," presented by the Cleveland Public Schools.

According to the data presented, there are limitations to the contributions television can make to education. There is a lack of communication between teachers and pupils. Unless the lessons are well-organized and well-planned, the results will not be effective. To keep the lesson from being a passive experience, further discussion and other classroom activities need to follow the lesson. The lesson should be supplemented with materials containing self helps for pupils, additional materials about the lesson and suggestions for doing something with the knowledge that has been acquired. There are many far-reaching problems other than the purely instructional involved in undertaking television, such as the rate of compensation to the instructor, copyright of material used, and interaction of the teaching medium with labor-controlled apparatus and time. Since television is an innovation, leaders must overcome the attitudes of educators not experienced in television.

II. CONCLUSIONS

In drawing conclusions from the present study, the findings fall into two categories, the limitations and the advantages. On the positive side, television creates a feeling of being an important

part of a system-wide group for a part of the school day instead of just a member of one school. Television in schools and colleges gives the students an opportunity to become familiar with techniques and methods of production, problems of transmission, and the care, operation and care of equipment. This type of experience might serve as a period of apprenticeship for a career in television. Television can be used in public relations areas to inform the public of the aims and purposes of the school system. Television may be used for other purposes during the day such as directing the attention of pupils to a section of a famous painting in art class or drawing it to selected geographic locations or topography in history. There are possibilities for the use of television in adult education. Through television outstanding resource people are brought to all pupils, regardless of the location of a school. Television can broaden and enrich education. It can provide time for planning, stimulate the use of a variety of resources, and act as an effective in-service teacher training device. Excellent teachers like Arnold Toynbee can be made available. Good education films that enrich the curriculum can be presented. Expensive resource materials that could not be used otherwise can be a strong contribution. Unusual resource people like Robert Frost and the great modern poets may be used in the study of English to vitalize the course of study. Detailed demonstrations can be given

in scientific courses like biology. The advantages could be most worthwhile in isolated parts of the country. Certain subjects and certain grade levels are better adapted to educational television than others.

The limitations are not insurmountable. As technical equipment is improved and better ways of working with the medium are developed, these limitations may be eliminated. It is a one way channel of communication which informs but cannot answer questions. Televised lessons canreadily turn into passive experiences. Many people object to changes in established routine. There is danger of covering too much territory too quickly in educational television. This medium may provide "being told about" experiences instead of sending pupils out to find their own answers. In Virginia, according to statistics from the Virginia Education Association, 77.8 per cent of the homes had television in 1957-58, and education is striving to combat the passive tendencies of the viewing processes.

III. RECOMMENDATIONS

This is appropriately the time to consider the role of television in Henrico County and how televised experiences, properly applied to the total teaching-learning process, may be used. From the collected data, one observes that it is an expensive and complicated method of instruction involving a huge initial investment,

high operation costs, and specialized staffs containing all the elements of commercial television programming. The simple proposal of cooperating with the City of Richmond can be offered. The city's only charge to Henrico previously has been $25 a year per school for supplementary course outlines supplied on request, but it has been suggested in September, 1960, that Henrico pay a dollar a year per course for each pupil. County leaders state that counting pupils in Henrico and Chesterfield, the figure for those being served by television is 26,741. Beyond this, the outline of a five-year study might be formulated to provide education of teachers in television usage and the education of teachers through television.

The following ways of using educational television are recommended:

1. Television must be a means to supplement and not supplant conventional teaching methods.

2. Teaching by television requires special training. Training all teachers for using television would be worthwhile. The first year should be devoted to the orientation of teachers, with a six weeks workshop planned during the first summer.

3. Television may be used for teaching large groups. Careful plans should be made for the conclusion of each lesson.

4. The study should be continuous. There should be a long range investigation to find areas of the subject matter most suitable for this means of instruction when used for enrichment.

5. Television may be used as a public relations instrument.

6. Television may be used for adult education.

IV. FURTHER STUDIES NEEDED

After this investigation, the writer finds that the following is needed: (1) additional information concerning the transfer of values of television instruction in reading skills relating to their content, (2) information regarding the physical effects of watching television, such as eyestrain, etc., (3) information to classroom teachers who wish to know if opportunities are offered by television to develop self-direction and self-reliance, and (4) a study in the way television can help a student to evaluate his own learning. These are suggestive of the fields in which research and experimentation are needed in the immediate future.

VITA

Born June 3, 1920, in Richmond, Virginia, Anne Morton Fitzgerald is the daughter of the late Henry Fitzgerald, of Nottoway, Virginia, and Lillian Barnwell Fitzgerald, Falling Springs, Virginia. Her education includes graduation from Blackstone High School, 1939; Blackstone Junior College, 1941; and Farmville State Teachers College, 1943, with a B. A. Degree in Education. She has done graduate work at the following institutions: journalism at Richmond Professional Institute, 1945; religious education at Presbyterian School of Education, Richmond, summers, 1947-49; religious education at Biblical Seminary, New York, summer of 1948; a course in family finance at the University of Virginia, Charlottesville, Virginia, summer of 1957; University of Richmond, summers, 1958-61, and is a candidate for the M. S. degree in Education, August, 1961.

The candidate's professional experience includes teaching mathematics at Davy Junior High School, 1942-43; English at Kenbridge High School, 1943-45; English and history at Glen Allen High School, 1945-46; director of religious education at Westminster Presbyterian Church, Lynchburg, Virginia, 1946-49; director of religious education at First Presbyterian Church, St. Petersburg, Florida, Feb., 1949-Mar. 31, 1950; director of Sunday School Extension for Presbyterian Synod of Virginia, Apr. 1, 1950-Sept., 1951;

teaching English and history at Varina High School, 1951-52; director of religious education at First Presbyterian Church, Richmond, Virginia, 1952-54; teaching mathematics, algebra, and English at Highland Springs High School, Highland Springs, Virginia, 1954-61.

A member of the Personnel and Policies Committee of the Virginia Education Association, she has membership in the National Education Association, the Classroom Teachers Association, the National Council of Teachers of English, the Henrico Education Association and the Virginia Museum of Fine Arts.

BIBLIOGRAPHY

A. BOOKS

Bettinger, Hoyland. Television Techniques. New York: Harper and Brothers, 1947.

Callahan, Jennie. Television in School, College, and Community. New York: McGraw-Hill, 1953.

Conference on Teaching by Television in Colleges and Universities. University Park, Pennsylvania, 1957.

Duerr, Edwin. Radio and Television Acting. New York: Rinehart and Company, Inc., 1950.

Dunlap, Orrin E., Jr., The Future of Television. New York: Harper and Brothers, 1947.

Elliott, William Y. Television's Impact on American Culture. East Lansing, Michigan: Michigan State University Press, 1956.

Grinnell, J. E. and Young, Raymond J. The School and the Community: Educational and Public Relations. New York: Ronald Press, 1955.

Kempher, Staneley. Television Encyclopedia. New York: Fairchild Publishing Company, 1948.

Kumata, Hideya and Deutschman, P. J. An Inventory of Instructional Television Research. Ann Arbor, Michigan: Educational Television and Radio Center, 1956.

Levenson, William B. and Strashuff, Edward. Teaching Through Radio and Television. New York: Rinehart and Company, Incorporated, 1952.

Moehlman, Arthur B. and Van Zwoll, James A. School Public Relations. New York: Appleton-Century Crofts, 1957.

Poole, Lynn. Science via Television. Baltimore: Johns Hopkins Press, 1950.

Siepman, Charles Arthur. Radio, Television and Society. New York: Oxford Press, 1950.

Siepman, Charles Arthur. Television in Education. New York: Dodd, Mead, 1958.

Zworykin, V. K.; Ramberg, E. G.; and Flory, L. E. Television in Science and Industry. New York: John Wiley and Sons, Inc., 1958.

B. PUBLICATIONS OF THE GOVERNMENT, LEARNED SOCIETIES, AND OTHER ORGANIZATIONS

American Council on Education. College Teaching by Television. Report of a Conference Sponsored by the Committee on Television of the American Council on Education and the Pennsylvania State University at University Park, Pennsylvania. October 20-23, 1957. Washington, D. C.: American Council on Education, 1958.

American Council on Education and the State University of Iowa. Teaching by Closed-Circuit Television. Summary report of a conference sponsored jointly by the Committee on Television of the American Council on Education and the State University of Iowa, Iowa City, Feb. 26-28, 1956.

Bureau of Labor Statistics, U. S. Department of Labor. Occupational Outlook Handbook. Washington, D. C.: U. S. News Publishing Corporation, 1960.

Carpenter, William G. and others, "Closed-Circuit Television at Evanston Township High School. Bulletin of the National Association of Secondary School Principals. 43: 75-78. January, 1959.

Cincinnati Public Schools. Report of an Experiment in Teaching Biology and Driver Education by Television. Cincinnati, Ohio: Board of Education, July, 1958.

Ford Foundation and the Fund for the Advancement of Education. Teaching by Television. New York: Ford Foundation, 1959.

Fund for the Advancement of Education, Committee on the Utilization of College Teaching Resources. Announcement of College Teaching Resources. New York: The Fund, 1955.

Fund for the Advancement of Education. Schools for Tomorrow by Alexander J. Stoddard. New York: The Fund, 1957.

Fund for the Advancement of Education. The National Program in the Use of Television in the Public Schools. A Report on the First Year, 1957-58. New York: The Fund, January, 1958.

Hylton, Helen. The First Year of Educational Television, Suburban Park School. Norfolk, Virginia: Board of Education, June, 1958.

Jefferson County Board of Education. Educational Television Project Relating to Teacher Redeployment and Organization, 1957-58, Louisville, Kentucky, Board of Education, 1958.

Mitchell, Wanda B. "Evanston, Illinois, Township High School Expands Use of Closed-Circuit Television in 1957-58." Bulletin of the National Association of Secondary School Principals 43: 75-78; January, 1959.

National Education Association, Executive Committee, Information Item F of Grants and Special Contracts. Washington, D. C.: The National Education Association, 1960. No. 9.

National Education Association, Graphic Communication and the Crises in Education. Washington, D. C.: The Commission, 1958.

National Education Association, "Instructional Technology and the Teacher," National Education Association Convention Issue. Washington, D. C.: The National Education Association, 1960.

National Education Association, Interaction in Learning: Implications for Television. Washington, D. C.: The National Education Association, 1959.

National Education Association and American Association of School Administrators, Educational Policies Commission, Mass Communication and Education. Washington, D. C.: The Commission, 1958.

National Education Association, New Horizons in Staff Utilization. Washington, D. C.: The National Education Association, 1958.

National Education Association, Planning Schools for the Use of Audio-Visual Materials. Washington, D. C.: The National Education Association, 1958.

National Education Association, Proceedings of the N E A Seminar on the Role of Television in Teaching and Learning. The National Education Association, 1958.

National Education Association, Report of N E A Board of Directors, June, 1959. The National Education Association, 1959.

National Education Association, Research Report 1959-R-17. Washington, D. C.: The National Education Association, 1959.

National Education Association, Report of the Resolutions Committee, 98th Annual Convention, Los Angeles, July 1, 1960. Washington, D. C.: The Committee, 1960.

National Education Association, Television in Instruction: An Appraisal. Washington, D. C.: The National Education Association, 1958.

National Education Association, The A V Instructional Materials Center. Washington, D. C.: The National Education Association, 1959.

National Education Association, The Audio-Visual Center in Colleges and Universities. Washington, D. C.: The National Education Association, 1960.

National Education Association, The Cooperative Approach to Audio-Visual Programs. Washington, D. C.: The National Education Association, 1958.

National Educational Television and Radio Center, National Educational Television and Radio Center, 1959-Year of Progress, New York: National Educational Television and Radio Center, 1959.

National Educational Television and Radio Center, Presenting National Educational Television. Ann Arbor, Michigan: The Center, 1955.

New York Society for the Advancement of Education, School and Society. 88: 2176. Summer, 1960.

Washington County Board of Education, Closed-Circuit Television: Teaching in Washington County, 1958-59. Hagerstown, Md.: Board of Education, March, 1959.

C. PERIODICALS

California Teachers Association Journal, "Hearing and Seeing," Santa Cruz: California Teachers Association, 1960.

Cook, Muriel K. "Do We Dare?" New Hampshire Educator, 38: 14-15, March-April, 1958.

de Zafra, Jr., Carloss. "Some Pros and Cons of C C T V." Clearing House. 32: 152-54. November, 1957.

Faulkner, Nancy. "The State of Educational Television." Senior Scholastic, Vol. L X I V, No. 13, May 15, 1954.

Forbes, "The Strong Medicine of R C A" February 15, 1960.

Hansen, Carl F., "From Boom to Bust in One Year in T V Teaching by Television in the District of Columbia Public Schools," Washington, D. C.: The District of Columbia Public Schools, 1955.

Hazard, Leland. "Educational Television," The Atlantic Monthly. Volume C X C V I, No. 5, November, 1955, pp. 61-64.

Kelly, Fred C. "What Television Might Do for the Schools," Virginia Journal of Education, October, 1958.

Lumsdaine, A. A., "Teaching Machines and Self-Instructional Materials," Audio-Visual Communication Review, Summer, 1959.

National Education Association Journal, "Can T V Teaching Make a Difference?" Washington, D. C.: The National Education Association, October, 1957.

Perry, Arnold. "Teaching by Television in Today's Schools." The Educational Forum. Vol., XXIV, No. 4, Part 1, May, 1960.

Shelton, William D. "Television and Reading Instruction." Education, May, 1960.

Virginia Journal of Education, "The New Teaching Medium," October, 1958.

Virginia Journal of Education, "The New Facilities Committee," September, 1958.

Wrightstone, J. Wayne. "Evaluating the Production and Use of School Broadcasts." The Phi Delta Kappan. March, 1939.

D. NEWSPAPERS

Richmond [Virginia] News Leader

October 1, 1959.

October 8, 1959.

October 26, 1959.

October 31, 1959.

December 3, 1959.

March 19, 1960.

June 17, 1960.

October 1, 1960.

November 20, 1960.

Richmond [Virginia] Times Dispatch

November 8, 1959.

December 24, 1959.

January 4, 1960.

February 1, 1960.

February 10, 1960.

October 1, 1960.

October 23, 1960.

Richmond [Virginia] Times Dispatch (cont'd)

November 20, 1960.

December 20, 1960.

December 21, 1960.

National Education Association News

13:26, October 16, 1959.

13:29, November 6, 1959.

13:34, December 8, 1959.

14:1, January 8, 1960.

14:8, March 11, 1960.

14:22, September 18, 1960.

Bristol [Virginia] Herald Courier

December 24, 1959.

B. MISCELLANEOUS

Announcement of Program of Grants, Committee on the Utilization of College Teaching Resources, Fund for the Advancement of Education, December 15, 1955.

Barrow, Lionel C. and Wesley, Bruce H., "Television Effects," Research Bulletin, No. 9, Madison, Wisconsin, 1958.

An Investigation of Closed-Circuit Television for Teaching University Courses. Pennsylvania State University, 1955.

APPENDIX

PERSONS CONSULTED FOR INFORMATION ABOUT TELEVISION EXPERIMENTS

COLLEGES

Pennsylvania State University

C. R. Carpenter
Director, Division of Academic Research and Services
Pennsylvania State University
University Park, Pennsylvania

San Francisco State College

Leo F. Cain
Vice-President
San Francisco State College
1600 Holloway Avenue
San Francisco 27, California

South Carolina University

Columbia 1, South Carolina

Stephens College

Ralph C. Leydon
Assistant to the Dean
Stephens College
Columbia, Missouri

University of Virginia

Charlottesville, Virginia

Virginia Polytechnic Institute

Blacksburg, Virginia

SCHOOLS

Cincinnati Public Schools

Robert P. Curry
Assistant Superintendent
Department of Instruction
Cincinnati Public Schools
608 East McMillan Street
Cincinnati 6, Ohio

Evanston Township High School

Wanda B. Mitchell
Director, T V Teaching Project
Evanston Township High School
1600 Dodge Avenue
Evanston, Illinois

Henrico County Public Schools

Mrs. Vera Palmer Morton
Junior High Supervisor
22nd and Main Streets
Richmond, Virginia

Jefferson County Public Schools

Kenneth P. Lam
Director, Jefferson County Educational Television
Hawthorne School
Clarendon and Spencer
Louisville 5, Kentucky

Miami Public Schools

Cliff Mitchell
Director, E T V Project
Dade County Public Schools
County School Administration Building
275 N. W. Second Street
Miami 36, Florida

New Jersey State Teachers College

E. DeAlton Partridge
President, New Jersey State Teachers College
Montclair, New Jersey

Norfolk City Schools

Grace Johnson
Norfolk City Schools T V Center
Patrick Henry School Building
Colley and Pembroke Avenues
Norfolk 7, Virginia

North Carolina Schools

Charles W. Phillips
Director, North Carolina In-School Television Project
Woman's College
University of North Carolina
Greensboro, North Carolina

Pittsburgh Public Schools

Charles Hettinger
Supervisor of Television Education
Pittsburgh Public Schools
Administration Building
341 South Bellefield Avenue
Pittsburgh 13, Pennsylvania

Richmond Public Schools

Mrs. Mary Ann Franklin
Television Consultant
Richmond Public Schools
Richmond, Virginia

St. Louis Educational Television Commission and St. Louis Public Schools.

Earl G. Herminghaus
Research Consultant
Board of Education of the City of St. Louis
1517 South Theresa Avenue
St. Louis, 4, Missouri

Washington County, Maryland, Public Schools (Hagerstown)

William Brish
Superintendent of Schools
Board of Education of Washington County
Box 730
Hagerstown, Maryland