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A Study of the Problems of Installing and Utilizing Closed Circuit Television for Observations and Demonstrations in the Teacher Education Program

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A STUDY OF THE PROBLEMS OF INSTALLING AND UTILIZING CLOSED CIRCUIT TELEVISION FOR OBSERVATIONS AND DEMONSTRATIONS IN THE TEACHER EDUCATION PROGRAM

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by

Robert Paul Slingland

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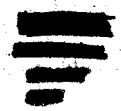

APPROVED FOR THE GRADUATE FACULTY

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DEDICATED

TO

TRUDY

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The writer wishes to express appreciation for guidance, direction, and understanding to the members of his committee: Dr. Maurice Pettit, Dr. Alexander H. Howard, and Dr. Keith Rinehart.

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I. INTRODUCTION

The use of television in teaching is at present the liveliest matter under discussion and experimentation in education.

No new medium of communication has ever been greeted with such enthusiasm by so many. Many writers say experience with radio over thirty years has created an awareness of great potentialities, questions, and even alarm. Currently, tremendous energy is being directed to the important task of adapting television to educational purposes. Presumably, these efforts stem from a desire to use the medium to extend educational opportunities or to improve the quality of the educational process.

No responsible person has suggested to date that television, either closed-circuit or open broadcast, will or should supplant all other modes of education or that the total task of the school could be handled in such a manner.[1]

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[1]Committee on Television of the American Council on Education, In-School Uses of Television (Washington, D. C.: February, 1957), p. 1.

Most educators, however, find it hard to know where to begin in developing and using television.

Those educators who feel that education cannot afford to disregard another means of communication are casting around for ways to carry on instruction through television effectively. One of the newest considerations is the use of closed circuit television in demonstrations and observations in teacher education programs.

A basic requirement in teacher education professional courses is that students shall have ample opportunities to observe public school classes in session and see outstanding classroom teachers demonstrate certain teaching procedures. This helps to make the teaching principles meaningful by showing their application.

Some institutions have been able to provide for this type of experience quite satisfactorily. Many have had to search for new methods to provide for demonstrations and observations because of unique problems in their institutions.

II. THE PROBLEM

Statement of Purpose

It was the purpose of this study to survey the problems of setting up closed circuit television for observations and demonstrations in the teacher education program.

This included a study of the various problems of providing laboratory experiences faced by institutions with teacher education programs.

It also included: (1) a study of planning for closed circuit television to meet the problems, (2) a study of setting up facilities for closed circuit television once the plan was worked out, and (3) a study of the utilization of the system. Point (3) referred to the administration and use of the program in such a way as to insure efficiency in the over-all teacher education program.

Need for the Study

A great deal of activity is in evidence at the present time in the area of experimentation with the medium of closed circuit television in teacher education. Action has been taken by a significant number of institutions in this direction. Many more await results of research. Nothing has been done so far in compiling these problems, principles, and practices into one study. It was hoped that as a result of this investigation tangible evidence would be uncovered upon which other institutions might base decisions.

Perhaps these findings may be even more important to Central Washington College of Education because at the time of this writing the college was embarking on a program

using closed circuit television for observations and demonstrations.

Limitations of the Study

The study was limited to colleges which were using closed circuit television to provide observations and demonstrations in teacher education programs. The number of these colleges was quite small when compared to that of colleges using television in general. The survey was not extended to colleges not using the facilities for teacher education purposes. Such an exclusion would be the use of closed circuit television by certain medical schools in the nation.

The area of the survey was limited by two factors. First, not all institutions which were asked for information replied. Second, more programs than those reported must be considered to be in existence. They remain anonymous because of a lack of published information about their programs. A number of institutions have shown a reluctance to publish data on the current status of their experimentation.

It was impossible, because of financial reasons, time, and travel limitation to make an on-the-job analysis of each program. Individual representatives were interviewed, but the major fact gathering tool became the questionnaire.

Another limitation was that some programs were very new and answers given were based on relatively short periods of experience with television in teacher education programs. As a result, some problems identified as grave for some institutions proved minor in importance to other institutions.

No attempt was made in the study to predict the effectiveness of Central Washington College of Education's use of closed circuit television as a guide for generalizations. Rather, results by other institutions currently using the method were the bases upon which indications of utilization were measured.

III. DEFINITIONS OF TERMS

Words have many connotations, often diverse. The following terms need defining for clarification within this study:

Educational television. This term refers to the use of the television medium by an educational television station to distribute, over the air, courses, programs of general interest, and lessons designed for classroom use. It is interpreted to refer to specific television stations and their programs operated under special

reservations made by the Federal Communications Commission.[2]

Instructional television. The term indicates an important phase of educational television. Any use of television for formal courses for any age group, either for or without credit, may be called instructional television. This term may refer to courses presented on commercial or educational stations or by closed circuit television.[3] It is a formal guided classroom approach to learning in an orderly, systematic sequence of educational experiences, planned and presented by educational institutions to meet the needs of a specific group of learners.[4]

Closed circuit television. This term indicates the pickup and use of a television program without broadcasting it, at least not in the usual sense of the word. It might be in classrooms, laboratories, theaters, or almost any place of group assembly. Closed circuit television may be piped to the receiving points by wire, or it may be transmitted on a strictly local basis by low-

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[2]Kathryn Dye Kendig and Gaither Lee Martin, A Handbook on Instructional and Public Service Programming for Educators, Community Leaders (San Jose: The Spartan Bookstore, 1957), p. 15.

[3]Ibid., p. 16.

[4]Ibid., p. 17.

power radiating devices.[5]

Open circuit television. In opposition to closed circuit television, open circuit televising is broadcasting a video signal and audio signal into the air as a free agent.

College. Within this study the word "college" is understood to mean an educational institution beyond the high school level.

Teacher education program. This term is used in the study when referring to a pattern of general and professional educational work on a college level required to prepare a prospective teacher for service in certain levels of educational work and which results in initial certification for enrollees.

Observation. Throughout this study the term "observation" means the laboratory experiences of a student in a teacher education program where the intent is to watch procedures and techniques of teaching that have not been prepared especially for his viewing.

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[5]Waldo Abbot and Richard L. Rider, Handbook of Broadcasting (Fourth edition; New York: McGraw-Hill Book Company, 1957), p. 46.

Demonstration. A demonstration was interpreted to mean a laboratory experience of a student in teacher education where actual subject matter from a course of study is presented to fit the request of the viewer.

Problems. Funk and Wagnell's New Desk Standard Dictionary, Fifth Edition, defines problem as: "a perplexing question demanding settlement, especially when difficult or uncertain of solution."

Principles. The term "principles" shall be interpreted to mean a fundamental truth or basic law.

Program. Throughout the report of this study, the term "program" shall be interpreted to mean a course of proceedings.

CHAPTER II

BACKGROUND FOR THE STUDY

A considerable body of literature concerning the uses of television in education exists in all types of printed matter. Probably no other area of education today is more widely discussed by writers both in and out of education circles. Since 1953, when educational television was born with the Federal Communications Commission blessing, hundreds of writers have poured out thousands of articles on the pros and cons or potentialities of television in the nation's schools and colleges.

It might be well to note here that with such a staggering amount of literature available in the general area of television in education, limiting boundaries had to be set for reviewing.

The literature that was reviewed for this study is divided into the following topics further elaborated on in this chapter: (1) a history of television, (2) literature on educational television, (3) literature on closed circuit television, and (4) history of closed circuit television at Central Washington College of Education.

The general field of educational television and the history of television were surveyed only for the highlights.

In the particular area of closed circuit television for observations and demonstrations in teacher training programs, a concentrated study for details was done.

Even then it was very difficult to develop a comprehensive treatment of the material as neither commercial nor educational television today "hold still."

As Ross says, educational television, particularly, is too dynamic, is changing too fast.[1]

I. HISTORY OF TELEVISION

Television broadcasting is still an infant compared with the other methods of mass communication. Less than two score years ago, hardly more than a moment in the span of human history, television broadcasting was little understood as a science and even less as an art.[2]

Television is a composite of a thousand inventions and discoveries, most of which seemingly had no relation at one time to the electrical transmission and reception of what we see, but were ultimately related to one another.[3]

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[1]Betty Ross, "Television in Today's Society," Phi Delta Kappan, XXXV (January, 1954), p. 179.

[2]Giraud Chester and Garnet R. Garrison, Television and Radio (New York: Appleton-Century-Crofts, Inc., 1956), p. 3.

[3]Waldemar Kaempffert, We Present Television, ed. John Porterfield and Kay Reynolds (New York: W. W. Norton & Company, Inc., 1940), pp. 15-16.

Actually, a distinct field of development of television did not come about until 1817 with the isolation of selenium by a Swiss chemist, Berzelius. Selenium proved to be the substance making possible the conversion of light energy into electrical energy. This system is the basis for modern television work.

Before 1817 and Berzelius' discovery, men of many nations worked on technicological achievements which later in theory were incorporated into radio broadcasting and still later into the broadcasting system known as television. Men such as Farady, Oersted, Volta and others all contributed scientific discoveries that aided in these developments.

Initial work which aided television Lindsley ventures goes back even further:

> Television, like radio, has a historical heritage which spans hundreds of years--reaching almost to antiquity. The Assyrian knowledge of optics, reflecting mirrors, and refracting lenses; Thales observations on the properties of amber, and William Gilbert's important publication, De Magnete, which stimulated investigations concerning the importance of the magnet, laid an initial foundation on which subsequent scientists built an ever-growing superstructure eventuating in broadcasting.[4]

General scientific discoveries and inventions which

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[4]Charles Frederick Lindsley, Radio and Television Communication (New York: McGraw-Hill Book Company, Inc., 1952), p. 323.

first led to radio were revealed throughout the nineteenth century and the first twenty-five years of the twentieth century.

Television is rooted in the prior art of wire transmission. The phenomenon of photoelectricity brought television out of the Jules Verne fantasy world to theoretical possibility.

A British telegrapher named May accidentally stumbled on the fact that the chemical element selenium possessed the property of transforming changes in light to corresponding changed in electricity.

In 1877 Senlecq, a Frenchman, first proposed a television system. It would be made up of a mosaic of selenium cells, each cell to be connected by a separate circuit to a shutter which would drop down when its cell was illuminated. Behind the shutters was to be a source of light which showed through when the shutters were operated. No record has been kept of the possible construction and testing of the Senlecq system, yet many writers refer to Senlecq as the "Father of Television."

Paul Nipkow, a German, startled the world of science in 1884 with his whirling disk scanning device--a mechanical television system.

Neither Senlecq nor Nipkow would have been able to devise their early systems, however, were it not for the

work of James Clark Maxwell and Heinrich Hertz.

Maxwell, an English physicist, is credited with the discovery of the existence of electromagnetic waves in 1865. Hertz, twenty years later, proved the theory correct and experimented with ways of producing these waves.

The step from wire transmission of sound to wireless was made by an Italian immigrant, Gueliolmo Marconi in 1895.

Rapidly there followed work on various tube complements which aided in wireless broadcasting. Such men as Fleming with his diode rectifier and De Forest with his triode amplifier were important in this area of invention.

Fessenden conducted the first experiment of broadcasting a human voice in 1906. In 1908, De Forest broadcast music from the Eiffel Tower in Paris. It could be heard for a distance of fifty miles, a tremendous achievement of the time.

By 1923, Dr. V. K. Zworykin, an assistant director of RCA laboratories, had filed a patent application for the iconoscope, the eye of the television camera. This marked the end of the mechanical era of television initiated by Nipkow forty years before. However, it was a dozen years before the idea left the laboratory and came into use in practical systems.

One would imagine that the new media would grow by leaps and bounds following Zworykin's work, but this was not true.

The Bell Telephone laboratory sent a telecast over telephone wires between Washington and New York in 1927, the first long distance transmission of a video signal.[5] Two years later, the Institute of Radio Engineers meeting in Rochester , New York, had exhibited certain television pictures. The response from these electronics men still did not seem to warrant a public demonstration of the media.

C. F. Jenkins made the first successful public demonstration of mechanically scanned television in the late 1920's. H. E. Ives, of AT&T's research laboratories, was a pioneer in work on electronic television systems.

Caution was the byword in the budding field of television during these years. Especially was this true because radio was sweeping the nation as the newest mechanical and electronic device to have in the home.

RCA demonstrated an outdoor telecast in 1936, but until 1941 television was restricted to non-commercial operation.

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[5]Walter K. Kingson, Rome Cowgill and Ralph Levy, Broadcasting Television and Radio (New York: Prentice-Hall, Inc., 1955), p. 143.

The year 1939 is considered a milestone in the history of television because of three events.

In that year RCA successfully demonstrated electronic television which approached modern standards at the New York World's Fair. Franklin Delano Roosevelt, then President of the United States, opened the Fair with an address over television. David Sarnoff, RCA head, spoke at the opening and sounded what later turned out to be more than prophecy about the television media:

> Now we add sight to sound. It is with a feeling of humbleness that I come to this moment of announcing the birth in this country of a new art so important in its implications that it is bound to affect all society. It is an art which shines like a torch in a troubled world. It is a creative force which we must learn to utilize for the benefit of all mankind.[6]

During this same year, Dumont marketed the first home television receiver and W2XBS, the National Broadcasting Company's experimental station, began regular telecasting.

Of prime concern during these important years had been the devising of a system whereby a sufficiently precise and rapid scansion of a large number of picture lines took place. The mechanical method was prempted by the electronic era, yet the technological problem of a high-definition picture remained.

It remained for the development of television

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[6]Lindsley, op. cit., p. 321.

standards industry-wide to solve the problem of high-definition pictures.

By 1940 steps were being taken for full-scale commercial television standards. The Radio Manufacturers Association and several companies had proposed standards; none had been adopted industry-wide before 1940.

Limited commercial operation was allowed by the Federal Communications Commission for the sake of experimentation and field testing. It soon led to problems, however, prompting the FCC to order a halt in expansion of television pending completion and investigation to determine the best technical standards for transmission.[7]

By March, 1941, the Federal Communications Commission, acting on the National Television System Committee's recommendations for standards, authorized full commercial operations.

The lifting of restrictions was short-lived, however. World War II brought restrictions on manufacture of television sets since much of the material was of a critical nature for the war effort.

Governmental control of broadcasting, a natural measure in time of national emergency, also restricted

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[7]Chester and Garrison, op. cit., p. 42.

the commercial development of television, although much technical progress was made by the services in the field.

After World War II, technical troubles over the use of color and channels kept advertisers and manufacturers hesitant about exploring much more deeply into television.

Dreams of transcontinental television were not yet materializing with the Bell Telephone Company's coaxial cable laid only between Washington, D. C. and Philadelphia by 1946.

The big break came in 1947.

The Federal Communications Commission was faced then with the decision concerning whether to switch industry-wide television standards from black and white transmission to color.

Columbia Broadcasting System, a giant in the still young industry, had already spent several millions of dollars pioneering experimentation in color. It wished to have the industry set standards for color instead of black and white--CBS color.

In September of 1946 CBS petitioned the FCC to authorize commercial operation on the CBS color system in the Ultra High Frequency band. On March 18, 1947, the FCC gave its verdict: CBS color was not deemed ready for

commercial use, and the monochrome standards were reaffirmed.[8]

All did not go well for the industry even then. It soon became apparent that the channel allocations in the Very High Frequency band (channels two to twelve) were not going to be adequate. Hundreds of applications for station licenses poured in following the March, 1947, verdict.

The mounting tension in the industry was heightened by the fact that as the technology of the industry increased, the color question became more and more a problem.

Realizing that the existing rules were inadequate, the FCC suspended all pending applications on September 29, 1948. This was the start of what was called the "freeze."[9] A total of 108 stations were authorized prior to the freeze and only these were in operation or being built until the freeze was lifted in 1952.

During the four years, the FCC investigated two matters: (1) what frequency allocation plan would best provide a competitive and nation-wide system of television free from signal interference, and (2) what policy should

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[8]Sydney W. Head, Broadcasting in America (Boston: Houghton-Mifflin Company, 1956), p. 158.

[9]Ibid., p. 161.

the Commission take regarding the development of color television?[10]

The Federal Communications Commission issued its final television allocation plan known as the "Sixth Report and Order" on April 14, 1952. In it was stated the assignment of channels two to thirteen in the Very High Frequency band and channels fourteen to eighty-three in the Ultra High Frequency band. The new allocations made over 2,500 possible stations.

From this date on television has made tremendous growth strides. Television is a household word now. More than forty-two million television sets were in American homes in April of 1958.[11]

II. RELATED LITERATURE ON EDUCATIONAL TELEVISION

Today in education, hundreds of colleges, universities, public school districts and other institutions are experimenting with the electronic method of mass communication, television. The applications of use are many and varied. While no attempt was made in this study to include information on the activities of all the educational institutions in the nation, and no attempt was made

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[10]Chester and Garrison, op. cit., p. 43.

[11]Advertizing Research Foundation, "U. S. TV Sets: How Many and Where," Broadcasting Magazine, April 14, 1958, p. 40.

to prove the effectiveness of these educational television (ETV) applications, a study of the literature is of necessity an interim study. Its statistics will in many cases be outdated within a short time due to the quantity of research by an increasing number of institutions.

An overview of the literature available to the writer brought out the fact that emphasis should be placed on materials in the areas most applicable to the problem. Therefore, in order to narrow the amount of material to be handled more effectively in the study, much literature, rightly defined as pertaining to educational television, was not recorded. Instead, only those particular writings bearing directly on the aim of the study were used.

Radio in Educational Broadcasting

In order to more fully understand the extent of the problems faced by educators in the late 1940's and early 1950's in promoting the use of television in education, it is helpful to turn for a moment to consider somewhat parallel events history describes in the field of radio in education.

The growth of television in education began in 1921 when radio demonstrated that broadcasting could be used effectively to accomplish learning.

In that year station WHA, at the University of

Wisconsin, began broadcasting educational radio programs. Other colleges and universities soon followed in the footsteps of Wisconsin. Today more than 160 educational radio stations are operating in either the AM or FM band (or both) in this country.[12]

One of the most argued points of this new method of educating a mass audience was that of the possibility of teaching a skill without the use of visual aids. The National Broadcasting System experimented in 1930 by offering six piano lessons (elementary) via the air waves. No record is available as to the success of the lessons as the "class" was not a controlled group.

Interestingly, the same doubt was expressed in educational circles some thirty years later about abilities to teach skills when the first experiment with television was proposed.

Still, from the very first, there were strong voices supporting a belief that this new medium, radio, should be used in the schools and that it could be used.

During the Congressional debate on the Communications Act of 1934, a proposal to reserve channel assignments for

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[12]Franklin Dunham, Ronald R. Lowdermilk, and Gertrude G. Broderick, Television in Education, United States Department of Health, Education, and Welfare, Bulletin 1957, No. 21 (Washington, D. C.: U. S. Government Printing Office, 1957), p. vii.

education became a major issue.

Passage of the proposed channel reservation section of the bill would have meant turning back some of the original commercially assigned channels. To forestall further delay of passage of the bill, a compromise was reached with ETV channel supporters.

This compromise required the Federal Communications Commission to report to Congress on the advisability of allocating "fixed percentages of radio broadcasting facilities to particular types or kinds of non-profit radio programs or to persons identified with particular types or kinds of non-profit activities."[13]

When the FCC reported in 1935, it stated that in its opinion, present commercial facilities gave ample opportunity to educational institutions. No special allocations were needed, according to the FCC.

Educators were bitterly disappointed. An outgrowth of the report was the formation of the Federal Radio Education Committee composed of more than forty leading education and industry representatives.

This group saw to the task of securing funds from industry and certain foundations to aid educational radio.

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[13]Sydney W. Head, Broadcasting in America (Boston: Houghton Mifflin Company, 1956), p. 401.

The Rockefeller Foundation was one of the most important of these groups.

Money was not enough, however, to guarantee complete success in the venture of educational radio broadcasting. Of the many licenses granted for AM radio to educational institutions, few remained in effect long. Frost adds that over 200 radio licenses were granted to such institutions through 1936, but that only thirty-eight remained in force in 1937.[14]

In summary, the experience of securing, or not securing, federal sanction for educational broadcasting, seems to have been the biggest lesson learned by educators from educational radio. From the unhappy experiences of that early band who hoped for channel reservations came educational television's moment of decision in 1952.

Television in Educational Broadcasting

Educational television is television that seeks primarily to teach. It is non-profit; free of commercials. By definition mentioned in a prior section of this study, it is produced by stations which are locally owned and directed but which have formed a national educational

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[14]S. E. Frost, Jr., Education's Own Stations (Chicago: University of Chicago Press, 1937), p. 3.

network to obtain nationally distributed programs.

A number of factors have influenced the development of the use of television in education. One of the most often referred areas for television is in helping bolster the teacher supply.

One has little difficulty today in finding research materials revealing the critical shortage of teachers for an ever-increasing school population. Numerous reports warn of the doubling of numbers of enrolled students by the end of the next fifteen years.

More serious yet is the report of gaps in the ranks of teachers to work with the growing student numbers. According to the National Education Association there will be a net shortage of 135,000 teachers this September.[15] Last September the shortage was 120,000.[16]

Many have expressed the feeling that educational television will aid in stepping up the quantity and quality of education.

In addition there is a reflection of thought in many

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[15]National Education Association, NEA Research Bulletin, XXXVI (Washington, D. C.: Research Division of NEA, 1958), p. 43.

[16]National Education Association, A Brief Summary of the 1957 Teacher Supply and Demand Report, Report of the Tenth Annual National Teacher Supply and Demand Study (Washington, D. C.: Research Division of NEA, 1957), p. 33.

parts of the United States that television can do even more than take the slack up in view of shortages. Some educators feel certain portions of the teaching curricula can be handled more effectively by this media.

Educational and instructional television before 1950. Before 1950, no concerted effort on the part of education as a whole was evident to the layman. Instead individual institutions gingerly "tested the water." Many of these were the very same institutions who had pioneered working with educational radio. They used this experience in planning and operating early ventures.

One of the most extensive early programming attempts was that of the State University of Iowa's experimental station, W9XK. This was between 1932 and 1939.

The transmitter for the station was constructed by the college's electrical engineering department and sound was transmitted by the university's radio outlet, WSUI. The method of transmission was a mechanical scanning system.[17]

Between the years 1932 and 1934, Purdue University and Kansas State College at Manhattan produced experimental

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[17]William Kenneth Cumming, This is Educational Television (Ann Arbor: Edwards Brothers, Inc., 1954), p. 1.

television teaching programs using the mechanical scanning method.[18]

Cumming says one of the early television programs which could be termed educational was produced in 1938 by C. C. Clark when he demonstrated the principles of electronic scanning for some 250 students from New York University science courses.[19]

World War II interrupted the development of television in all areas except those which benefited the war effort. It was not until 1946 that television in a commercial and educational sense resumed development.

From 1946 to 1950 much experimentation was accomplished by the nation's educators in the field of television. No formal representative group had as yet been formed, however, to look out for education's interest in the budding but not yet blossoming field of commercial television.

According to Cumming, small groups had even envisioned a nation-wide network for educational use.[20] Raymond Wittcoff, the president of the Adult Education Council of St. Louis, and a much respected devotee of the use of the media, had reported that unless educational television

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[18]Dunham, Lowdermilk, and Broderick, loc. cit.

[19]Cumming, loc. cit.

[20]Cumming, op. cit., p. 3.

could prove itself first rate it would fail. He contended that unless the stations could get a significant part of their programming from a strong national cooperative network, they would not be able to have first-rate programming.[21]

One of the earliest significant experiments following World War II was carried out by the Philadelphia schools. In 1947 they began limited use of commercial station time to produce educational programs. Five years later, Siepmann reports teacher opinion in that city was favorable for this method of distributing programs. Activity in the area of construction of stations to carry such programming alone--educational stations--was still in the dream stage.[22]

Siepmann also mentions that the objectives of the institutions during these years prior to 1950 were somewhat different. Public relations for the institutions appeared the most important objective, followed by a general feeling that information and enlightenment was of next importance. By then the area of use of educational television in extension work was under close scrutiny by some institutions.[23]

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[21] Ibid.

[22] Charles A. Siepmann, Television and Education in the United States (Paris: UNESCO, 1952), p. 90.

[23] Ibid., pp. 52-53.

The consensus was that certain questions needed to be answered before even the theoretical advantages of educational television could be realized. This prompted many institutions to continue exploring the possibilities of its effective use.

Among puzzling questions to be answered were a group centered around the area of cost. Where was money for equipment to be obtained? Where was the money for renovating or designing buildings to house television?

Also, how could the media best be integrated with the balance of the course work? Few, if any, voices were heard at this time advocating doing more than supplementing the school day with television.

Still unanswered were the questions involving how to train the teaching talent and technicians needed in such programs. And lastly, how could educational television keep up with the educational interests of the relatively inarticulate audience?

A great number of parents were still reluctant at this time to allow their children to be taught by this method, feeling most children would look for entertainment features paralleling the sprouting commercial television field.

Teachers resisted firmly, for the most part, the

intrusion of the mechanical devices needed to produce a program. They felt that sufficient study of possible subjects which best lend themselves to television had not yet been accomplished.

By 1947 and 1948 it became apparent that the twelve channels originally set aside for commercial television were no longer adequate. Serious interference was occurring within the service areas of many stations. Accordingly, the FCC in September, 1948, froze all new channel assignments.[24] This freeze was to allow a complete re-evaluation of the spectrum to be carried out.

Educators around the nation, some having a background of experience in educational radio, began to be aware that now was the time to begin thinking of educational television's place in the new distribution of channel allocations which the FCC was forced to make.

They began urging the Commission to reserve a percentage of the assignments for non-commercial use. Much of their effort stemmed from what they considered to be an unfair situation handed them when AM radio allocations were made some fifteen years before.

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[24]Giraud Chester and Garnet R. Garrison, Television and Radio (New York: Appleton-Century-Crofts, Inc., 1956), p. 43.

A strong movement began to develop culminating in the formation of the Joint Committee (now, Council) on Educational Television in 1950.

This group was representative of all educational interests and was to present the claims of education at forthcoming hearings of the FCC. The members of the JCET were those organizations who had earlier expressed a desire to investigate educational television for possible use.

They included: The National Association for Educational Broadcasting; The American Council on Education; The Association for Education by Radio-Television; The National Association of Educational Broadcasters; The Association of American Colleges; The Association of Land-Grant Colleges and Universities; the National Association of State Universities; the National Council of Chief State Officers; and the National Education Association.[25]

With the forming of the JCET a giant step was taken toward the goal of extensive research and experimentation in television, for it marked the first concerted effort on the part of educators.

Stations from which these first few programs originated were commercial operations. Although the first

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[25]Siepmann, op. cit., p. 28.

educational station was opened in January of 1950 at Iowa State College, it could not be classed as wholly educational. Actually, it was a commercial channel, WOI-TV, which sold advertising but programmed quite heavily in educational format shows. It was also the first channel in the state of Iowa to be allocated and thus for several years had the pick of the network programs included on its broadcast day. Growth of the educational station; the non-commercial, non-profit station, had not begun. From 1952 on, this growth was apparent.

In summary, the years preceding 1950 may be viewed as a period of basic experimentation. Part of this experimentation included progressing from the mechanical to the electronic method of scanning, an important engineering achievement.

During this time such institutions as Iowa State University, Purdue, Kansas State and others pioneered the first types of programs. From their work criteria to judge effectiveness, feasability and advantages of the media evolved.

Many problem areas not anticipated were discovered. Training, costs, preparing for television, all proved important enough to warrant serious consideration.

Objectives, some of which remain today to a greater or lesser degree, came out of these early experiments. Chief among these was the use of the media as a public

relations device.

No educational stations were in operation with the exception of WOI-TV at Iowa State College. In the strictest sense, this station was actually a commercial channel by FCC allocation.

Those who ventured into the field of educational television before 1950 merely scratched the surface. From 1950 on great growth changes took place.

Educational and instructional television after 1950. The JCET, along with the National Citizen's Committee for Educational Television and other interested organizations, began a drive in 1951 to persuade institutions to take advantage of 209 channels set aside tentatively by the FCC. It would seem that these groups felt strongly that to expect a commercial station to broadcast educational programs on an equal or better basis with regular programs was unreasonable. Although FCC regulations hint at the stations' responsibilities to the public, there are no legal obligations forcing the stations to take any and all public service programs.

Hence the powerful JCET was formed to insure the proper handling of educational interests.

Commercial broadcasters are faced with substantial investments in programming. They know to achieve their

goal educational programs should be designed and produced by top-flight professional people with adequate resources for production and supporting promotion.[26] Education usually cannot afford this expense.

Numerous commercial stations have expressed an opinion that merely to give time to educational institutions discharges further station obligation to education.

Commercial broadcasters usually will not schedule low-audience rating programs between high-audience rating shows. Serious inroads on adjacent time segments prompts this reluctance. Educational programs are generally not designed for the large group.

Hence, educational programs on commercial stations are often given low salable times of the day when audience ratings are low.

Everything pointed toward the establishment of a line of educational stations aloof from commercial channeling.

Following release of its Sixth Report and Order on April 14, 1952, the FCC set aside 242 channels for educational use. Subsequent rulings have raised this total to 256 channels.

The Sixth Report document, a compilation of more than

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[26]Head, op. cit., p. 403.

four years' surveying of the broadcasting field, contained 700 pages including testimony and evidence totaling more than 21,000 pages of transcript.[27]

It was felt by many in education that an important victory had been won. Federal Communications Commission Chairman Walker was one of the outspoken champions for education during the drive for channel reservations. At a meeting of the National Association of Educational Broadcasters in 1952 he said:

> This really should be called a victory luncheon. You educators have cause to celebrate. You educators have come into a fabulous inheritance. You are now the inheritors of a highly valuable portion of that etherial public domain--the radio spectrum.[28]

Three days later Walker again asserted what he felt the tremendous significance of educational channels was in an address at Pennsylvania State College:

> After what happened a few days ago, no meeting of the American Council on Education nor any other group of educators will ever again be the same. Something new has been added. That something new is exciting, it is challenging, it is revolutionary. This new element will have to be reckoned with in all deliberations of American educators from now on. I refer, of course, to the reservations by the Federal Communications Commission of the 242 channel television assignments

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[27]Paul A. Walker addressing the annual luncheon meeting of the National Association of Educational Broadcasters, at the Institute for Education by Radio-Television, Columbus, Ohio, April 18, 1952.

[28]Ibid.

for use of non-commercial, educational stations.[29]

During the past eight years, students on all levels have been exposed to television presentations in many categories. Some came from educational stations; others from commercial stations. Uses of the media have been wide and varied; trends in programming have taken on definite structure.

The extent of the subject matter of these programs has been from the United Nations to the Friendly Giant.

Today, thirty-two television stations are classed as educational channels.[30] They cover a geographic area from coast to coast and Puerto Rico. Hundreds of commercial stations, and this number increases yearly, still do considerable programming of an educational nature.

It is apparent that the reason for the increased activity in the media is that research and experimentation have proved in many ways the effectiveness of television.

There remain, however, strong voices in the crowd who do not totally agree.

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[29]Paul A. Walker addressing the Educational Television Programs Institute at Pennsylvania State College, April 21, 1952.

[30]Joint Council on Educational Television, Educational Television Factsheet and Box Score (Washington, D. C., May, 1958), p. 1.

Uses of television. A great deal of experimentation in uses of television has been on the college level where lectures, demonstrations, and visual aids are used on a much wider scale than in many of the nation's public schools.

The flexible means of illustrating a lecture by television has been reported by many writers. Lewis, speaking at the San Jose State College Workshop-Conference on educational television during the 1957 summer session, mentioned three points concerning the effectiveness of television in the lecture situation:

> (1) lecture courses can be given with equal effectiveness on TV as in the usual context.
> (2) television teachers in general spend more time in lesson preparation and utilize more materials and audio-visual devices and they use them more fully.
> (3) television teachers up-grade their own effectiveness.[31]

The use of television in education may be broken into four main areas, with the lecture being only a part of these four. For purposes of instruction, according to the Committee on Television of the American Council on Education, television may be used for total teaching, enriching segments, aid to inaccessible resources and field

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[31]Address by Dr. Philip Lewis at San Jose State College Workshop Conference on Instructional Television, July 19, 1957.

experience.[32]

In the total teaching situation the media is used to present what normally the classroom instructor presents. It allows the institution to extend the services of the instructor to a greater number of students. Proctors, graduate assistants to administer and evaluate examinations, are deviations from the otherwise normal administration of the classroom.

A general area in education requiring supplemental and enrichment work exists in classrooms. Television can bring in these materials to help bulwark the learning process.

Inaccessible resources may now be used to provide a portion of direct teaching through the media of television.

And lastly, medical-dental groups, agricultural extension bureaus, and most recently, teacher education colleges, have experimented with television providing the field experience.

The four criteria mentioned above are somewhat similar to Tyler's four types of instructional television which can be clearly identified throughout the country:

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[32]Committee on Television of the American Council on Education, "In-School Uses of Television," The American Association of Colleges for Teacher Education Bulletin, Vol. X (June, 1957), pp. 3-4.

(1) total television teaching--this is where the entire instructional presentation, as far as the institution is concerned, is by television.
(2) supplemented television teaching--here the lecture demonstrations or illustrated talks are presented by television, but these are supplemented by institution with other planned experiences.
(3) television supplementing the classroom--the typical school telecast, corresponding to the familiar school radio broadcast.
(4) television as a teaching aid--television becomes a tool within the classroom.[33]

In surveying the uses or types of television found in education today it must be remembered that each major area has specific application in one of the several hundred colleges, universities and public school districts applying electronic sight and sound in the classroom.

Public schools in many parts of the nation have in general found three types of programs which have been effective in varying degrees:

(1) direct teaching
(2) supplemental teaching
(3) in-service teaching[34]

Numerous stations, both commercial and educational, are programming the direct teaching program. Stations such

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[33]Address by Dr. I. Keith Tyler at San Jose State College Workshop Conference on Instructional Television, July 15, 1957.

[34]Educational Television and Radio Center, Educational Television and the Schools (Ann Arbor: Educational Television and Radio Center, 1958), pp. 3-5.

as WQED, Pittsburgh, have been used for actual course material.

In the supplementary program area, such stations as KETC, St. Louis, stand out as examples. Each week more than 175,000 students watch supplementary programs from KETC-TV.[35] Supplementary programs are designed to make public school classwork more interesting.

Classroom teachers in many schools of the nation are learning new teaching techniques by watching in-service lectures given via television. Much of this type of televising comes over closed circuit systems owned by the schools.

Although the earliest history of direct teaching in the schools was dependent on the generosity of local commercial stations in donating time, a considerable amount of change can be noted in the area of school programming.

In the earlier years of programming the station established techniques and procedures. As more and more experimentation and research was completed a whole new system of camera techniques and program procedures evolved. As Dunham, Lowdermilk and Broderick have said, "The trend in school programming became definitely directed toward

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[35] Ibid.

a close tie-in with the curriculum."[36]

In a 1956 report the Joint Council on Educational Television published figures showing the steady increase of public school programming via television in the nation.

By years the increases were:

1952-1953 ----------1,019½ hours
1953-1954 ----------1,758½ hours
1954-1955 ----------2,818½ hours
1955-1956 ----------2,858 hours (incomplete)[37]

In addition more than 5,000 hours of public relation or interpretive programming was carried on in the nation's schools.

Four significant conclusions were drawn from the results of this survey:

> (1) school systems have produced an impressive number of hours of television programming in commercial and educational stations.
> (2) evidence points to a steady increase in the number of hours of programming each year.
> (3) establishment of an educational television station in a community offers an opportunity to initiate programming or increase programming service.
> (4) at that time (1956) the hourly relationship of in-school programs to public relations type programs was 2-5. In-school programming was increasing steadily.[38]

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[36]Dunham, Lowdermilk, and Broderick, op. cit., p. 5.

[37]Joint Council on Educational Television, Results of the Joint Council on Educational Survey of School Programming (Washington, D. C.: JCET, 1956), p. 2.

[38]Ibid.

The survey further developed no evidence that in-school programs have in any way replaced teachers in the classroom.[39]

Although most educational or instructional television is designed for small and selective audiences, the audience for any given program may be enormous when compared to the number who would be exposed to the educational offering when television was not available. This is especially true in the area of children's programs.

The Educational Television and Radio Center, since 1954 the unit responsible for bringing the best of programs to the largest possible audience, has classified the success of children's programs under three headings:

> (1) educational television programs are fun
> (2) educational television programs answer children's questions of how and why
> (3) educational television programs introduce the youngster to new hobbies and encourage him to develop his talents.[40]

Children's programs around the nation are designed for many age groups. Some are for the very young; some are to be informative; some are to encourage hobbies, and others are for simple entertainment. That children retain material shown on television seems to be true. In a

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[39] Ibid., p. 6.

[40] Educational Television and Radio Center, Children Turn to Educational Television (Ann Arbor: 1957), pp. 1-3.

recent test of 400 grade school youngsters, eleven-year-olds named from memory an average of fifty products advertised on television.[41]

The Cincinnati Study (1952) by Xavier University is one of many studies completed over the past six years aimed at determining what type of listening and viewing habits children develop from the wealth of material programmed for them. According to Dr. Raymond McCoy, Dean of the Graduate School of Xavier, the study of 1000 sixth and seventh graders found poor television habits, lower IQ's, lower parental control and poorer school achievement tended to be found in the same child.[42]

A review of literature concerning public school uses of television would be incomplete without a discussion of the largest experiment with television in this area now taking place in the Hagerstown, Maryland schools.

Located in Washington County and encompassing the entire school population of that county, by September, 1958, the Hagerstown project will undoubtedly serve as the springboard for information used by many schools in the future. Under a five year project set up by the Radio-

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[41] Ibid., p. 4.

[42] Franklin Dunham and Ronald R. Lowdermilk, Television in Our Schools (Washington, D. C.: United States Government Printing Office, 1952), pp. 24-25.

Electronics-Television Manufacturers Association (RETMA) and The Fund for the Advancement of Education, started in September of 1956, the Washington County schools are now in a study using television for direct instruction in all basic subject matter areas of the curriculum.

Although this project uses closed circuit television, as opposed to open circuit transmission, it is mentioned in this section of the study due to its scope and top position in the work being done in public schools. A more complete discussion of closed circuit television will be found in another section of this study. (See "Literature on Closed Circuit Television.")

The Washington County School System is interested in making a thorough study of the ways television may be used by a public school system as an integral part of the regular program of instruction and in making an evaluation of the various methods that are developed. At its completion forty-eight schools housing 18,000 pupils will have experienced televised instruction.

Data will be gathered to evaluate the effectiveness of television in meeting such current educational problems as:

(1) the enhancing of the status of teaching
(2) the relation of pupil-teacher ratio to the quality of instruction
(3) the continuation of rapidly increasing enrollments

(4) the lack of adequate classroom space
(5) the shortage of properly trained and certified teachers
(6) the organization of the school system to effect savings in personnel
(7) the distribution of the finances available for the school program
(8) the greater use of school, community and county resources.[43]

Emphasis will be placed on developing ways that closed-circuit television may be used under normal conditions.[44]

Since 1956 more schools in the county and additional courses have been integrated into the project.

An analysis of the possibilities of how television might bring about the learning process led to the idea of organizing a teaching team with the television teacher responsible for the items that television can accomplish best, and a classroom teacher caring for those which, at the moment, seem to be better handled by direct contact with pupils.[45] The success of this plan is reported by Hagerstown officials who say, "We are convinced that in using television teacher--classroom teacher teams, we are

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[43]Board of Education of Washington County, Closed-Circuit Television Project Notes (Hagerstown: Board of Education, January, 1957), pp. 1-2.

[44]Ibid., pp. 1-2.

[45]Ibid., p. 7.

strengthening our classroom instruction."[46]

Before surveying the field of the uses of television on a college level, it would seem necessary here to pause for a moment and consider what has been said about public schools and television.

Public schools have been responsible for a great deal of research and early experimentation. From this work has come criteria for judging some areas of effectiveness of television. Other institutions have used these to their advantage. One area is that of developing categories of types of television teaching where direct teaching, supplemental teaching, and in-service training have been evolved from early work.

Integration of programming into the school curriculum is a trend noted in the past few years as opposed to certain commercial stations dictating techniques and procedures.

A steady climb in the number of public school programming hours can be seen when compared from year to year. Audience size also grows though programs of an educational nature do not draw the listeners and viewers in comparable numbers to commercial programs.

Children's programs have enjoyed a wide popularity

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[46]Radio Corporation of America, "One Teacher Sums Up Her Experience at Hagerstown," RCA Educational Television News, No. 19 (November, 1957), p. 1.

because they are fun, they help answer questions in the minds of the viewers, and they are of a format to encourage development of leisure time and talents.

Dunham, Lowdermilk and Broderick take a firm stand on the successes of television in colleges and other educational institutions, saying there is no longer any question as to whether or not students can learn from viewing educationally significant programs, or whether programs designed specifically to supplement regular classroom teaching can be used to motivate student effort.[47]

Instead, the focus of interest now seems to be determining experimentally the extent with which direct teaching can be used effectively. Especially is this experimentation aimed at determining whether or not television can be used to perform teaching functions traditionally done by individual teachers working directly with small groups under conventional classroom conditions.[48]

To discuss in any depth what colleges in the nation are doing in the field of television teaching would be a separate study due to the enormous amount of material available today. Some of the work is of an experimental

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[47] Dunham, Lowdermilk, and Broderick, op. cit., p. 71.

[48] Ibid.

nature; some is past the experimental stage and serves a definite need at a given university. Colleges and universities mentioned in this study, although a small portion of the actual number engaged in teaching via television, are sufficient to serve as a representative group.

These colleges use the different types of stations to get their programs on the air. Many use the growing number of educational channels; still more use the older method of working with commercial channels.

One of the outstanding areas where television has been successful has been in telecourse work. These are actual college and university courses taught via television with or without credit.

Universities and colleges pioneering in granting credit toward degrees by television were: Western Reserve; University of Michigan; Michigan State College; Wayne State University; Butler University; University of Toledo; Quincy College; Iowa State College; University of Houston; University of Bridgeport; Indiana University; University of Wisconsin; Illinois Tech; James Millikin University; University of Georgia; San Diego State College; and the University of Kansas City.[49]

Western Reserve University, benefiting from work

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

started on television in 1942, began offering courses in 1951 over local channel WEWS. Today, 600 subjects later, Western Reserve has a large and varied program of subjects via television.[50]

The University of Michigan offered courses in television a full year earlier than Western Reserve, but no credit was given for the completion of the work.

Other institutions also giving telecourses for credit include: the University of Omaha; University of Washington; University of Nebraska; University of Southern California; UCLA; University of California at Berkeley, the University of Alabama; Tulane; and New York University.

Since 1954, the University of Houston has been giving credit courses via television. Work is mostly in the freshman level area and is given over the educational channel, KUHT-TV. At the University of Detroit a complete freshman course program is given over WTUS-TV.[51] KUHT-TV, in addition to doing Houston's credit courses, also televises every regular Houston school board meeting.

Harvard, through WGBH-TV, offers programs on literature, music appreciation, and analytical discussions of

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[50] Ibid.

[51] Educational Television and Radio Center, Educational Television and the Schools (Ann Arbor: Educational Television and Radio Center, January, 1958), p. 6.

issues and current events.

An effective program of low cost education to train adults who are unable to attend classes, or reluctant to attend, can be found at the University of Minnesota; University of Houston; University of Washington; Indiana University; Michigan State University; University of Wisconsin; and the University of Omaha.

The Gesell Institute at Yale regularly programs material on the study of child development over WBZ-TV, Boston.

Four stations reported in May, 1957 that they offered complete plans for junior college credit courses on the air. They were: KETC-TV, St. Louis; WTTW-TV, Chicago; WTVS-TV, Detroit; and KQED-TV, San Francisco. All have moved into television teaching to help expand possibilities of handling enrollments at colleges without expansion of college physical plants.[52]

By far the most ambitious program has been the "Television College" on WTTW-TV, sponsored by Chicago's Board of Education and the Chicago City Junior College. Here the student may earn a junior college diploma without leaving home for class. Courses in English, physical

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[52]Radio Corporation of America, RCA Educational TV News, No. 16 (May, 1957), p. 1.

science, biology, humanities, slide rule usage, accounting, psychology, Gregg shorthand, and mathematics are taught via television. Students register and take examinations at one of the city junior college branches. Otherwise they never see the regular college classroom.

At the University of Wisconsin, telecourse work has been done in the very specialized field of speech therapy and St. Louis University has telecoursed global geography.

Veterans may earn a high school diploma in one year through work over WQED-TV, Pittsburgh.

The most frequent areas carrying college credit courses have been science, music, art, languages, English literature, and mathematics. This does not imply, however, that these courses are the only courses to be seen. Each year more and more colleges experiment with a more diversified pattern of courses.

Station WKNO-TV, Memphis, has experimented with programs to help the illiterate learn to read and write. Begun in 1956, the program has been extended over a fourteen week period for this year.[53]

In all more than 400 courses were taught in 1957 via television. Many were on commercial channels, even more were on channels designated as educational. Not all can

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[53] Ibid., p. 9.

be mentioned in this study, but mention should be made of those courses and general activities in the field of teacher education.

Again, it is necessary to note that a great deal of activity in work with television in teacher education institutions is being done via closed circuit. This is treated in a subsequent section under the closed circuit heading.

The American Association of Colleges for Teacher Education has reported 189 teacher education institutions by 1957 utilizing or planning to use commercial broadcast facilities.[54] Among the conclusions drawn from the survey were two indicating in general what can be found in the nation concerning location of stations and amount of cooperation between college and station.

It is reported that AACTE member institutions located close to commercial television stations are interested in television and are attempting to utilize these resources. Commercial stations, the report adds, have demonstrated an interest and willingness to assist educational institutions.[55]

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[54]Hilton C. Buley, "Present and Anticipated Utilization of Commercial Broadcast Facilities and Programs by 189 Teacher Education Institutions in the United States," The American Association of Colleges for Teacher Education Bulletin, X, Number 1 (Oneonta: AACTE, 1957), p. 1.

[55]Ibid., p. 2.

Perhaps one of the greatest values of the AACTE study is the fact that it points out the failure of member institutions to give students and teachers-in-service proper instruction for the utilization of commercial broadcast television programs. "At a time when every practical resource is being utilized to increase the effectiveness of our teachers, Teacher Education Institutions would seem to be remiss if they do not include, on a systematic and definitely scheduled basis, instruction which will enable teachers to take advantage of many excellent commercial programs to enrich and supplement the regular instruction of the classroom."[56]

Among the AACTE member institutions offering credit courses by television in the fall of 1956 were: East Carolina State; Fresno State College; Indiana University; Iowa State Teachers College; Michigan State University; New Haven State Teachers College; Pennsylvania State Teachers College (Indiana); Pennsylvania State Teachers College (Slippery Rock); San Diego State College; Southern Oregon College of Education; University of Alabama; University of Cincinnati; University of Nebraska; University of North Carolina; University of Omaha; University of Wisconsin (Madison); University of Wisconsin (Milwaukee);

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[56] Ibid., p. 4.

Washington University; and Wayne State University.[57] Several more colleges reported they had offered courses by television broadcast at some time during the past two years. A considerable number of institutions reported they are and have been offering non-credit courses by television.[58]

Areas covered in the many courses varied from Shakespeare to principles of arithmetic. Course credit given varied from one semester hour to three semester hours.[59]

One of the most extensively planned programs of possible utilization of television in teacher education is underway in northern California. Lewis and Harcleroad report the California Council on Teacher Education has maintained a statewide committee studying television and teacher education since 1952.[60]

In 1956 teachers colleges of Texas, in cooperation with local commercial stations, televised courses in teaching techniques for college graduates. The step was

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[57]Daryl Pendergraft, "Credit Courses Offered by Broadcast Television in AACTE Institutions--Fall, 1956," The American Association of Colleges for Teacher Education Bulletin, Vol. X (Oneonta: AACTE, 1957), p. 1.

[58]Ibid., p. 2. [59]Ibid.

[60]Richard B. Lewis and Fred Harcleroad, Television in Teacher Education, Pictorial Survey of Current Developments in Educational Television in Relation to Teacher Education in Northern California (San Jose: April, 1956), pp. 3-19.

aimed at increasing teacher recruitment. During the 1957 year, these same colleges allowed college graduates to begin teaching at once using their teaching certificates given on condition they enroll in a televised education course meeting once a week.

WOI-TV, Ames, Iowa, offered a series of courses designed to bring up-to-date the certificates of former teachers who desired to return to service, but could not attend campus courses.[61]

College graduates can earn credit toward an Illinois teaching certificate by taking course work over WTTW-TV, Chicago.[62]

Perhaps the most significant compilation of the value of television in teacher education up to that time was the DeKalb report of 1955. Here a special group was charged with the task of compiling their convictions in an extraordinary report of the conference on teacher education and television.

The report contains seven significant points which educators today are reflecting in their experiments with

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[61]Harold C. Hunt, "Television and Formal Education," Television's Impact on American Culture (East Lansing: Michigan State University Press, 1956), p. 312.

[62]Radio Corporation of America, "College Graduates Earn Credit Toward an Illinois Teaching Certificate by TV," RCA Educational Television News, No. 18 (October, 1957), p. 1.

the media:

> (1) the use of television will not reduce the number of teachers needed, but can assist in increasing the supply of teachers by more effective use of teacher education facilities.
> (2) in pre-service teacher education consideration should be given to using television in college classes, both general and professional, either as a complete course or combined with other methods.
> (3) observation of classroom teaching lends itself to the use of television.
> (4) in in-service education opportunities are present:
> a. courses for college credit
> b. curricula and methods improvement
> c. programs for faculty meetings
> (5) television can be used to help in teaching extension courses.
> (6) teacher recruitment can be aided.
> (7) public understanding of teaching as a profession can be aided.[63]

Tinterra, commenting on the report of the DeKalb Conference says, "Sociologically television is our most potent medium of education and propoganda." He further states that the reason educators have taken so long to realize this is that they have been looking at television as a method of sugar coating a disciplined activity.[64]

Many more significant studies have been completed or are in progress in the nation's institutions of higher

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[63]National Commission on Teacher Education and Professional Standards, The Uses of Television in Teacher Education: A Report of Special Group D, the DeKalb Conference (Washington, D. C.: NEA, June, 1955), p. 25.

[64]James Tinterra, "The Uses of Television in Teacher Education: The Decade Ahead," The Uses of Television in Teacher Education: A Report of Special Group D, the DeKalb Conference (Washington, D. C.: NEA, June, 1955), p. 5.

learning. Notably those done by Pennsylvania State University, Iowa, New York University, Miami University, Stephens College, and more, but these were in the realm of using closed circuit television and are to be covered in that section of this study.

In summary of the uses of television in educational or instructional situations it is of interest to note in passing that a completely separate area of high quality programs exists which does not originate with institutions of higher learning. These are the programs in art, science, literature and drama sponsored by commercial networks or educational organizations such as the Educational Television and Radio Center at Ann Arbor. "You Are There," "Odyssey," "Omnibus," "Richard II," "A Place in the Sun," and others fall into this category. They have met with considerable success.

An indication of the strength of the movement of programming educational material of many types over commercial and educational channels perhaps could be summarized by reference to the trend today in the growth of statewide networks for educational television. Already Alabama, Georgia, Oklahoma, Nebraska, and North Carolina have such networks.

A proposal of the Southern Regional Educational Board, comprised of 16 states, has indicated it would like

to build a microwave link to blanket these sixteen states and costing $240 million.

On July 30, 1957, the Southern Regional Educational Board presented testimony at an FCC hearing concerning the microwave relay uses. The network would link 309 institutions of higher learning, including thirty-two institutions used as origination points.[65]

California recently passed a bill authorizing school district governing boards and county superintendents of schools, acting for school districts, to enter into contracts for participating in, or producing, television programs. As a result, extensive experimentation is expected in the use of television in public schools and state colleges.[66]

Financing such projects as statewide networks can be accomplished in a number of ways. State legislatures may appropriate public funds, such as the Oklahoma and Alabama networks, or educational institutions may make money available as in the case in Wisconsin, Michigan (East Lansing), and Chapel Hill. In some cases independent

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[65]Radio Corporation of America, "Proposed Microwave Relay Network to Link 309 Institutions," RCA Educational TV News, No. 18 (October, 1957), p. 1.

[66]Radio Corporation of America, "California Legislation Authorizes ETV," RCA Educational TV News, No. 17 (September, 1957), p. 1.

agencies have been created relying upon the community for funds. This is true of the St. Louis Educational Television Commission and Pittsburgh.[67]

All may or have relied on outside organizations to help. One of the most important has been the Ford Foundation.

Educational television stations. As has been mentioned previously in this study, the early growth of the use of television in education was visible on the screens of the commercial stations before the tempo in building educational stations picked up and more and more programming came via these channels. Several reasons were mentioned including a need to integrate more the techniques and procedures of production which best fit educational curricula rather than commercial broadcasting. The small and select audience which views an educational or instructional program does not fit well into commercial television where the general philosophy is to program to the largest audience possible each hour on the air.

Distinct disadvantages have been found for using commercial stations to program instructional material.

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[67]Raymond H. Wittcoff, "Television Without Commercials," The Saturday Review, XXXVIII (July 17, 1954), p. 38.

The uncertainty of time assignments is not the least important of these. Many educational programs of considerable worth have lost their impact in low-audience rating times assigned them on commercial channels. Secondly, with a heavy daily schedule of network, local programs, and the life-blood of the commercial operation, commercials, these stations have limited time to offer educators seeking commercial time.

However, with the construction of an educational channel, time assignments can be matched with known audience rated times.

Also, complete programming of an educational nature is the format of such stations and a wide variety of these programs can be presented.

Dunham, Lowdermilk and Broderick offer a long list of types of programs which an educational station may use. They include:

(1) Programs to supplement schoolwork
(2) Programs to help youth adjust to adult life in the community
(3) Continuation courses for out-of-school people
(4) Programs for shutins, physically handicapped and aged
(5) Programs of community information, how-to-do-its, and cultural needs
(6) Programs in formal adult education
(7) Programs for occupational and vocational groups
(8) Programs for vocational rehabilitation
(9) Programs in psychiatric therapy

(10) Parent education programs
(11) Youth programs for adequate preparation for life and citizenship.[68]

Although approximately twelve per cent of the television spectrum has been set aside for building educational stations--a total of 256 channels are available--just over ten per cent have been activated. It is necessary to go back to criteria under which these stations may operate to find why.

Educational stations are non-profit educational organizations. They transmit educational, cultural, and entertainment programs. They need not operate on a regular schedule or be on the air a minimum number of hours per broadcast day as their sister commercial stations must do.

Probably the largest single element holding back construction of more educational stations is that two-thirds of the allocations are in the ultra high frequency range. Educators have the same UHF coverage problem as commercial channels. There are 1,800 commercial channels available for commercial television and 1,300 are UHF. Only ninety are in use.

A second question of whether the educational station

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[68]Franklin Dunham, Ronald R. Lowdermilk, and Gertrude G. Broderick, Television in Education, United States Department of Health, Education, and Welfare, Bulletin 1957, No. 21 (Washington, D. C.: United States Government Printing Office, 1957), p. 24.

movement will live and grow centers around finances.

Since an educational station cannot be supported by advertising finances, support must come from organizations, both local and national, individual citizens, state governments, and institutions such as schools and colleges.

Building a station is very expensive. Cost of construction will run from $100,000 - $300,000. No set formula can be devised for this cost as the availability of a tower, type of transmitter used and how flexible the studios must be vary from situation to situation, increasing or decreasing the cost.

Operational costs yearly for the station also vary. Depending upon the size of the installation they may run from $40,000 to $150,000.

One of the rare exceptions found in the literature of a station being proposed for less than figures quoted above was the announcement by Clover Park School District of Pierce County, Washington of its application for a permit to construct a station at a total cost of $78,645. This included the acquisition of studio equipment.[69] The school district also operates an educational FM radio station making it one of the more fortunate groups in

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[69]Joint Council on Educational Television, Educational Television Factsheet and Box Score (Washington, D. C.: March, 1958), p. 2.

public school work today. The permit had not yet been granted by the FCC at this writing.

However, as expensive as it may appear to be to construct and run an ETV station, the number of stations has spiraled upward.

In 1953, the first year when channel allocations were made available to education, there was one station on the air. This was WOI-TV, at Ames, Iowa. Since that time the growth has been:

1954-------- 8
1955--------17
1956--------22
1957--------28
1958--------(42 predicted)[70]

The 1958 prediction appears a trifle high, yet more than twenty other applications for construction permits were either on file with the FCC awaiting processing or had been granted and construction had not been completed.[71]

The first station to open under a non-commercial license was KUHT-TV, at the University of Houston. KUMO-TV, University of Missouri, followed. It was a commercial station operated by the school for education and training purposes. In rapid order followed, WQED-TV, Pittsburgh;

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[70]Joint Council on Educational Television, Educational Television Factsheet and Box Score (Washington, D. C.: January, 1958), p. 1.

[71]Ibid.

WHA-TV, University of Wisconsin; KQED-TV, San Francisco; WCET-TV, Cinncinati; KETC-TV, St. Louis; KUON-TV, University of Nebraska; and KCTS-TV, University of Washington. In all thirty-two educational stations are on the air today.

The extent of their programming is evident in an example of the activity of one station, WQED-TV, Pittsburgh, where in November of 1957 it was feeding in-school instruction to more than 300 classrooms in seven western Pennsylvania counties, fifty-one public school districts, twenty-two parochial schools and two private schools.[72] It has been estimated that the amount of programming on ETV stations tripled between 1954 and 1957.

Wittcoff adequately summarizes what non-commercial television should do with these increasing numbers of hours on the air.

> Non-commercial television stations should acquaint us with the best in music, drama, literature, and the fine arts. They should introduce us to some of the fields of science, history, and philosophy. They should deal fully and forthrightly with the important problems that face our communities, the nation, and the world.[73]

By way of summary it would seem that the manifold job of programming all the various types of material to viewers falls on the shoulders of three major types of stations:

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[72]"ARF, Census Breakdown U. S. TV Figures," Broadcasting and Telecasting, November 14, 1957, p. 48.

[73]Wittcoff, loc. cit.

the commercial station, the commercially licensed station by educational institution, and the non-commercial station. Each appears to fill a specific need in the geographic area where it is operating.

Central educational television agencies. The National Association of Educational Broadcasters is the oldest of three central agencies concerned with educational television. Its membership includes educational institutions which own and operate educational radio and television stations, and institutions which produce programs for educational television.

It helps in the following ways from its headquarters at Urbana, Illinois:

> (1) provides consulting service on legal aspects of operating ETV stations for its members
> (2) provides advice on technical and engineering matters through its Engineering Service to all operating ETV stations
> (3) maintains an educational radio and television personnel placement service
> (4) conducts research in educational broadcasting
> (5) provides station management consulting service
> (6) conducts workshops, seminars and conventions to encourage the exchange of information among established and new stations.
> (7) publishes a monthly newsletter and other publications
> (8) operates a radio network using taped programs.[74]

The Educational Radio and Television Center at Ann

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[74]Joint Council on Educational Television, Educational Television Factsheet and Box Score (Washington, D. C.: January, 1958), p. 32.

Arbor, Michigan is an organization whose job it is to see that all of the best programs developed by other stations are available to all. Also, program ideas of merit are encouraged and developed into reality. Some seven and one-half hours of kinescope and film programming goes weekly to network stations serviced by the Center. The Center maintains liaison with the 106 national organizations which have formally resolved to support ETV.[75]

As the NAEB, the Center has a governing Board of Directors. The Educational Radio and Television Center Board is made up of leaders in education, business, and civic affairs.

Three general broad categories of programs emanate from the Center. They are programs produced by ETV stations and distributed through the Center; programs produced by ETV and commercial stations for the Center, and programs selected from film resources which have been cleared for television.

The Joint Council on Educational Television, mentioned elsewhere in this study, is concerned with the preservation and utilization of ETV channels.

All appearances before the Federal Communications Commission and other committees associated with the ETV

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[75] Ibid., p. 30.

movement are made by the JCET as the representative of the many organizations who support it.

In addition, the Joint Council does the following:

> (1) Serves as a source of information on channel allocations and government regulations
> (2) provides speakers and field workers for groups planning to establish stations
> (3) supplies information on legal, technical and engineering matters
> (4) maintains legal representation for educational television in the nation's capital
> (5) provides a consulting service on legal and engineering aspects of construction and operation of ETV stations.[76]

A fourth organization which has a wide representation in its membership is the National Citizens Committee on Educational Television. This group was formed by the Fund for Adult Education and the Educational Television and Radio Center in 1952.[77]

The Committee has been formed to help strengthen public support, speed planning and make suggestions concerning fund planning. Its members hail from all sections of the United States, and have distinguished records in programming, financing, and development of ETV.[78]

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[76] Ibid., p. 31.

[77] William Kenneth Cumming, This Is Educational Television (Ann Arbor: Edwards Brothers Inc., 1954), p. 4.

[78] Jennie Waugh Callahan, Television in School, College, and Community (New York: McGraw-Hill Book Company, Inc., 1953), p. 17.

Pros and cons of television in education. What roles, if any, do classroom television, telecourses, adult education courses, "great programs," and all the other applications of television in American education have to play? Is it just another expensive frill?

This study does not show the effectiveness of television in education as a major study problem. It is necessary, however, to give an overview of what is being said in the area.

Much of the agreement or disagreement by educators and laymen about the good points or bad points can be summarized in the area of recognized problems of educational television.

A number of these problems are of a technical nature. Cost ranks high in this category. Money to equip and in many cases to build particular types of structures to house the equipment is often sadly lacking.

In some types of applications of television in education there are problems in sound reproduction. This problem is more acute in the closed circuit system application.

One of the most serious of the technical problems is that of a reduction in communication between teacher and students. It is accepted that the best climate for learning is one in which an atmosphere of give and take between teacher and student exists. Technical problems

of microphone usage cut this to zero in some cases. This would be true of telecourses beamed into the home from the campus of a nearby college or university.

It is interesting to note, however, that in the use of a televised teacher in certain public school applications, both the room teacher and the students report a feeling of the television teacher "looking each student directly in the eye" from the screen. In some instances, room teachers have reported that students have raised their hands when the televised teacher has asked a question.

Many colleges and universities supply "talk-back" microphones in receiving rooms to allow questioning and to supply the interaction between instructor and student. Successes have been limited.

A large technical problem exists in the area of the design of classrooms for television teaching. Few are today already built with adequate lighting, ventilation and seating for television instruction. More and more are planned specifically as television rooms in the newest school plants. This activity is both on the college and public school level.

Television, because of its very nature of being a system depending upon light to operate, often poses a problem in such a simple teaching task as using the blackboard. Work is not always clear due to the factors of

contrast in modern blackboards which are strengthened or weakened for a television camera by the amount of light on them.

Another area of criticism of television has been that of students not being challenged to think as much. This again refers to possible lack of exchange between student and instructor.

One of the strongest forces holding back faster expansion of television in education is the educators themselves. Mabley faces this issue squarely by stating that educators themselves will acknowledge there is probably no group in the country which is slower to move or to change than the teaching profession.[79]

In general it appears students are generally willing and able to accept television teaching of one form or another; teachers at first tend to dislike it and administrators are curious.

Criticisms by teachers seem to be concentrated in three areas:

(1) it is an innovation in education
(2) it is a dehumanizing threat to education
(3) it may take over all teaching.

Without a doubt television poses more problems for

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[79]Jack Mabley, "Television: Teaching's Newest Tool," Saturday Review of Literature, Vol. XL (February, 1957), pp. 31-33.

educators than any other single innovation in education since the motion picture was introduced as a teaching device.

Its very newness as a broadcasting media, plus its extreme infancy in use in education make educators suspicious of its value.

Not only do problems exist in convincing faculties about the worthy points of television, but these faculties must then be trained to handle situations for which they have no background of experience before a camera. Whole new philosophies of learning are being developed from the past experiences of others. Techniques have not always proved out worthwhile.

Although technical problems may seem insurmountable at this point, there are still numerous educational problems in the application of television. The principal roadblocks seem to be practical consideration involving how to use this new medium.

Criticism has been leveled at the media for its method of integration into the total pattern of instruction. A whole range of problems exist in the selection of content of televised teaching.

Educators are asking what relation should television have to other particular instructional methods? Problems in the pattern in the use of instructors exist.

What personal qualities must he have? Can any good teacher work well before the television camera?

Although many authors report the suitability of certain subject matter over television, definite problems still exist.

Whether it (television) can solve the teacher shortage is a matter of interpretation. If one considers the shortage to be the availability of certain excellent teachers in specific fields instructing before more students, then the statement is true. If, however, the statement is interpreted to mean will television replace the teacher, the literature indicates a trend proving this to be untrue.

A number of authors believe that the worth of television comes from the understanding that it is a carrier system, essentially, and hence a means of communication.[80]

Head in turn points out that educational broadcasting can mean many things, but that educators would probably agree it should be limited to the following considerations:

(1) a definite educational goal
(2) an organization of subject matter consistent with its goal
(3) skillful presentation effectively employing broadcasting techniques without sacrificing educational integrity

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[80]Franklin Dunham, "How Educational Can Educational TV Be?" School Life, XXXVII (March, 1955), p. 83.

(4) a chance to be seen or heard at convenient times when the target audience is available
(5) sufficient frequency of scheduling and individual program length to make the educational goal obtainable
(6) sufficient stability of scheduling and audience promotion give audiences a chance to learn of its existence and to build cumulatively
(7) a target audience for each program sufficiently homogeneous (and hence limited in size) for the program to achieve its purpose.[81]

Writing in Nation's Schools in 1953, Hull spoke of the potential of television, but tempered it with a warning. "Television," he said, "will reach more citizens more often with more information and entertainment than any other device and with tremendous impact."[82] He also warned that television might become just a master duplicator if it was not handled carefully.

Van Bortel claims education needs television. It has the capacity to bring education to the public with more vigor and salesmanship.[83]

Cooley speaks of the problems of educating the bulk of the people about educational television. She says

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[81]Sydney W. Head, Broadcasting in America (Boston: Houghton Mifflin Company, 1956), p. 403.

[82]Richard B. Hull, "The Promise and Danger of Television," Nation's Schools, XLI (June, 1953), p. 44.

[83]F. J. Van Bortel, "Is Television and Academic Responsibility?" American Association of University Professors Bulletin, XXXIX (Summer, 1953), p. 265.

misconceptions abound about the need for it, about its possibilities and about who is going to support it. "But one thing is certain; it is not a failure."[84]

In an address at the Conference on Teaching by Television in Colleges and Universities in 1957, Clarence H. Faust, the vice president of the Ford Foundation, posed an interesting question about the place of television in education: "What role can television play in the systematic stimulation of fruitful inquiry and reflection, the stimulation of this internal dialogue which is the very essence of education?"[85]

Wittcoff warns that if we are to use it (television) wisely, we must recognize the limitations as well as the potentials of television as an instrument of liberal education.[86]

Among the many writings on the potentialities of television are the statements of policy by the National Citizens Committee for Educational Television. Made in 1953, the statements include reference to the fact that television is more than the addition of sight to sound

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[84]Hazel Cooley, "Schoolroom on the Air," The Nation, CLXXX (May, 1955), p. 461.

[85]Address by Clarence H. Faust at University Park, Pennsylvania, before the Conference on Teaching by Television in Colleges and Universities, October, 1957.

[86]Raymond H. Wittcoff, "Television Without Commercials," The Saturday Review, XXVII (July, 1954), p. 9.

and that its opportunities are underestimated because we are looking at it through the frames of old concepts.

Another enthusiastic writer about the potentialities of television in education is Zorbaugh, who states that while exploration is only beginning, already it is evident that television is improving the quality of instruction in such specific fields as science, medicine, and dentistry.[87]

Beck, in an address to delegates to the 1957 Summer Workshop Conference in Instructional Television at San Jose State College, spoke optimistically about what he saw during a year spent visiting educational institutions in the nation where television experimentation was moving forward. From this personal survey, he said, he gathered four main points:

> (1) educational television is here to stay. Our job is to learn to use it wisely and well.
> (2) Educational television provides a strong incentive to better teaching. Not only do TV teachers report more time spent on preparation, but the TV monitor allows the teacher to see himself as others do, and thereby to engage in continuous self-appraisal, and self-improvement.
> (3) Student achievement in televised classes compares favorably with that in standard classes. Students seem to adapt readily and without handicap to TV teaching and learning by television.

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[87]Henry Zorbaugh, "Television-Technological Revolution in Education?" Journal of the Society for Motion Picture and Television Engineers, LXIV (November, 1957), p. 673.

> (4) Faculty skepticism is a significant factor influencing the adoption and widespread use of classroom television. Faculty members enthusiastic about TV teaching constitute a minority group.[88]

Greenmeyer, Inglis, Lewis, and Mattison report three basic facts as having emerged from the extensive experiments by educators during the past several years. These facts, they say, again point up television's potentialities.

> (1) Teaching by television compares favorably with the conventional method of classroom instruction and, in certain instances, is much better.
> (2) The most effective presentation of a subject is made by using a teaching studio rather than by bringing TV cameras into the ordinary classroom.
> (3) The Type of equipment best suited to teaching by television is that which enables the educator to utilize all the potent forces of TV in making his presentation.[89]

Dr. W. R. G. Baker, General Electric Company president and president of the Electronics Industries Association has said, "The use of television in education is controversial mainly to those who have never seen it in operation."[90]

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[88]Address by Dr. Lester F. Beck at San Jose State College Workshop Conference on Instructional Television, July 15, 1957.

[89]P. A. Greenmeyer, A. F. Inglis, L. L. Lewis, and V. S. Mattison, "Television as a Teaching Medium," College and University Business, April, 1957, p. 1.

[90]"ETV: 5 Years and $60 Million Later," Broadcasting, Vol. 53 (November, 1957), p. 3.

Since this study is not concerned with conclusions of the effectiveness of educational television, it need only be mentioned here that statistics of this nature are contained in such writings as Kumata's "Inventory of Instructional Television Research," in which seventy-one abstracts of research completed are listed. Here also may be found an annotated bibliography of additional readings in the same area numbering more than 160.[91]

There are many misconceptions about the need and worth of television in education. They color, or discolor, potentialities. It is safe to say there are certain limitations to effective use of television in classrooms on all levels.

No definite stand by educators in general is evident. Individual institutions and groups doing research have in many cases given glowing summaries of successes. Others have reported not so successful results.

It would seem that problems that arise fit into two categories: mechanical and instructional in nature.

Those of a technical nature include cost--cost of equipment, buildings, training of special technicians, etc. Certain techniques of operation pose problems. Not

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[91]Hideya Kumata, An Inventory of Instructional Television Research (Ann Arbor: Educational Television and Radio Center, 1956), pp. 31-B12.

the least important of these is sound reproduction. Here also should be included the problem of carrying interaction of instructor and student. Building and room design to complement the use of television equipment is still another technical problem.

A great many more problems exist in the realm of educational feasibility.

Some writers report that a lack of challenge to think is observable in televised education. Many faculty members at all levels are not convinced of the worthiness of the medium in the profession. They hold back much development in many areas. Likewise the training of faculties poses critical problems when it is observed that not every teacher works well on or in television.

It is apparent that in many cases educators are still struggling to find the best way to place television into the curriculum and are hard-pressed in deciding what courses fit best into the use of television.

Educators are proceeding carefully but are convinced ETV is not a failure. It is apparent that a great many gaps exist in the knowledge about teaching by television. Some are known but there is a need to know more.

Summary of related literature in ETV. Reading the literature dealing with educational television and

instructional television suggests a great deal about the future of its use. Neely expressed this attitude when he said, "Today the question is not whether it (TV) will survive, but how far will it go."[92]

Through specific research reports and materials describing individual applications there appear to be several major problems facing ETV and certain definite ways in which it can be used. First, some method of long term financial support for ETV must be found. This is especially true for the area of ETV stations.

Professional technicians and educational personnel need to be attracted into the field for training, then encouraged to continue experimentation. Continuing research practices and techniques need to be applied to ETV--ways to use television at all levels of the school system need to be revealed.

A growing program of educating the public and school personnel about ETV needs broadening. There are still many to be convinced of its potentialities.

The problem of competition between commercial and educational programs still exists.

Administrative problems in the use and production

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[92]Uberto T. Neely, National Educational Television News (Ann Arbor: ETRC, November-December, 1957), p. 2.

of ETV programs bear heavily on the final outcome of the question of the future.

And lastly, evaluating ETV's effectiveness in the light of the most troublesome problems in American education today--teacher shortages and growing enrollments--is yet to be accomplished.

Thus far research has uncovered several ways in which ETV can be effective. One is in enriching classroom experience. It is here that the television camera, television teacher, and viewing set may score ETV's greatest victory in the future.

Formal course work toward degrees or for credit has been successfully demonstrated. Television can be used to effect a change in attitude or arouse interest in a subject.

One of the best things it has done is direct attention toward education in general and teaching more specifically.

III. RELATED LITERATURE ON CLOSED CIRCUIT TELEVISION

History of Closed Circuit Television

Transmission of video and audio signals directly to one or more special audiences rather than to the public is closed circuit television (CCTV). Its adoption has been steadily increasing, but indications are that

CCTV is still not fully understood.

Unlike open-circuit television, CCTV consists of equipment which carries the signal to the viewer by a wire. Only those receivers connected to that wire may receive the signal.

Compared to open circuit commercial broadcasting, closed circuit television is an infant. It was born shortly after World War II and had some of its earliest trials in the areas of medicine, business, and the armed forces.

In 1945, a single camera monochrome chain was installed in the University of Kansas Medical School Center. This is believed to be the first permanent facility for televising surgical operations in the world.[93]

As a service function, CCTV came to life in 1946 when the Chevrolet Division of General Motors signed a contract with the broadcasting division of Allen B. DuMont.[94]

While the general manager of the Chevrolet Division was attending a dealer meeting in Washington, D. C., the president of DuMont was in New York. Although separated

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[93]Morris A. Mayers and Rodney D. Chipp, Closed Circuit TV System Planning (New York: John F. Rider Incorporated, 1957), p. 37.

[94]Ibid., p. v.

by 250 miles, the two men signed in front of television cameras. Each was able to see the other while he signed. By certain camera techniques, the two signatures were superimposed on the same copy of the contract to complete the effect of a single signed contract. A photographic record was made of the dual signing as the official record.

In 1949, the Special Devices Center (now the Naval Training Devices Center) used CCTV for a series of 130 telecasts between the Center and the Merchant Marine Academy at Kings Point. The experiment was in classroom training of reservists and regular Navy personnel. The course was Naval Ordnance and Gunnery.

Closed circuit television's many applications were demonstrated when pharmaceutical manufacturer Smith, Kline & French presented the annual meeting of the American Medical Association in 1949 via television.

In September, 1950, Schenley Distillers held what is believed to be the first intercity sales meeting conducted by CCTV. It was televised from the stage of a television theater studio in New York to more than 1,800 distributors and dealers in eighteen cities.

Further evidence of the power of CCTV came in 1952 when Lees, a rug manufacturer, and Armstrong Cork staged telecasts successfully to hundreds of administrative employees of the two organizations. The Armstrong Cork

telecast was one of the first of its kind in color.

Esso Standard Oil used CCTV to introduce a new premium gasoline to its sales and dealer organizations in 1953. The aircraft industry, automobile manufacturers, home appliance companies, and many more groups have used CCTV in introducing new products to their personnel.

From 1953 on CCTV sprouted into so many areas that an accurate accounting of its course is almost impossible.

It should suffice to say at this point that during the history of the growth of CCTV there occured significant changes in the development of equipment.

Basically, closed circuit television consists of a camera, power supply, a pulse-generator, and a viewer.[95] Thus several complicated steps needed in broadcast television are eliminated. The history of the growth of equipment moves from the use of one fixed camera and heavy camera chains requiring several technicians to more than 100 cameras with tiny self-contained units the size of cigarette packs controlled remotely by one non-technical person. In addition the newest equipment includes arrangements to remotely control selection of lens and iris openings.

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[95]Edward M. Noll, Closed Circuit and Industrial Television (New York: The MacMillan Company, 1956), p. 2.

Closed circuit television experienced a rapid growth period much as the general field of television did.

The reactions to two potential factors television embodies, intimacy and immediacy, were many and varied in the early history of closed circuit television. It is becoming evident that closed circuit television in certain kinds of experiences has a greater chance for early acceptability. One is the fact that over the years more and more interest has been shown in the peculiarity that it (CCTV) is really closed circuit.

A major item in the rising number of applications of CCTV today is the item which plagues non-closed circuit projects--cost.

Cost is considerably less in CCTV partly due to the amount and physical size of equipment used and partly due to the type of applications in which it is found.

Whereas almost all commercial channels, and a good portion of educational channels, use the image orthicon camera, closed circuit work is mostly done with vidicon cameras. The image orthicon camera is a much more expensive camera due to its particular type of pickup tube. During the history of the growth of closed circuit television there was developed the cheaper, industrial-type tube called the vidicon. The term "vidicon" is used because

of the image producing electron tube within the camera.[96] This camera is smaller, easier to handle by less experienced technical personnel, more rugged, and quite a bit more adaptable to a variety of situations.

It cut its teeth on industrial type jobs where ruggedness, inexpensiveness, and size were most important.

Although costs vary using vidicon equipment, just as they do in using image orthicon equipment, considerable amounts are saved by using the former type of equipment. It has been estimated that from $3,000 to $30,000 or more, depending on budget limitations, will bring vidicon equipment to fit the job.[97] How much expected out of the system is the major determinant of cost.

In Schenectady, N. Y., installation of CCTV equipment of the vidicon variety cost $3,000. With this equipment televised lessons by special resource teachers were given in science, nature study, music, use of the library, and geology to 150 fifth and sixth graders. At Miami University, Oxford, Ohio, a much more elaborate CCTV system included a $135,000 grant from the Fund for the Advancement of Education and more than $34,000 for

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[96]Raymond L. Garman, "Closed Circuit Television: Facilities, Equipment and Costs," School Executive, July, 1956, pp. 66-69.

[97]"What School Managers Should Know About Closed-Circuit TV," School Management, March, 1958, p. 55.

equipment.[98]

Uses of Closed Circuit Television

The uses to which closed circuit television can be put are many and varied. Many more uses are being found. The only limit to the number and kinds of conditions under which closed circuit systems can prove their value appears to be the imagination.[99]

Mayers and Chipp list twenty-two applications of closed circuit television. There are rather broad area applications, not specific individual examples:

(1) business meetings
(2) sales meetings
(3) sales training
(4) sales promotion
(5) merchandising broadcast TV programs by closed circuit
(6) management training and communications
(7) stockholders meetings and plant tours
(8) overflow audiences
(9) fund raising by closed circuit TV
(10) entertainment, public relations and information
(11) medical education: post graduate
(12) medical education: institutional
(13) general education
(14) military applications
(15) industrial uses: hazardous operations
(16) industrial uses: surveillance of material handling
(17) industrial uses: production supervision
(18) industrial uses: tests, inspection and research
(19) remote surveillance and communications

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[98] Ibid., pp. 55-56.

[99] Noll, loc. cit.

(20) bank administration and protection
(21) advertising production and communication
(22) human relations.[100]

Noll divides all the above categories into two major areas: monitoring and communication.[101] As a monitoring device television is very effective in close observation of operations. This type of observation is often done because of dangers involved. In some cases it would be awkward to have an individual involved in the observation.

Applications of CCTV for monitoring. One of the most obvious of the applications of a closed circuit is that of viewing remote locations. The armed services have used CCTV in this application for a number of years. It is used to view weather maps and other weather information sent by television to alert rooms assuring up-to-the-minute information for a constant state of flight readiness at strategic air bases. At one base a CCTV system is installed to permit remote observations of a group of widely separated radar screens. Extension of runways at large bases may be observed via such systems.

At posts scattered around the United States field

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[100] Mayers and Chipp, op. cit., pp. 7-94.

[101] Noll, loc. cit.

training classes view on-the-spot firing, assembling, disassembling, et cetera, of weapons. The Signal Corps has done considerable experimentation with small hand-carried cameras and back-pack transmitter for use with field units. Small, light weight cameras such as these have made it possible to transmit picture information from a jeep in a forward area to a command post as much as twenty to thirty miles to the rear. The control of artillery fire can be directed from drone planes mounting closed circuit cameras. Undoubtedly there are many more applications used by the armed forces not yet revealed because of their classified nature.

Industry has made wide use of CCTV for remote viewing, too. Such installations as the United States Steel Corporation's sheet and tin mill in Gary, Indiana, uses it to keep a constant check on the movements of materials down processing or assembling lines many feet distant.

The Weyerhaeuser Timber Company at Longview, Washington uses CCTV to do a more efficient job of controlling the flow of mill ends and edgings to chipping machines. A power company has used television to view every phase of operation of gauges in power plants. Railroads have used cameras for traffic monitoring in railroad stations or yards. Motor traffic can be monitored in small

communities or at crucial locations in larger communities. Banks have experimented with cameras to aid in administration of central record files.

At the New London, Wisconsin, High School a study hall is under the eye of the closed circuit camera. A monitor in the school superintendent's office carries the picture for administrative surveillance.

General Motors uses a television camera suspended under the bumpers of its new cars when testing suspension action at the factories.[102]

The surveillance aspects of television are used in the city jail of one southwest city to take the place of an auxiliary guard in the cell blocks. Plant guard forces may also be somewhat supplemented by the use of this system.

Closed circuit television cameras have been found helpful in prevention of breaking in and pilferage of plants and businesses.

Certain hazardous operations in industry, such as at the Ford Pilot Gas Turbine Laboratory, use cameras to provide remote observations of engine performance. An ordnance depot in the midwest uses ten cameras to monitor

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[102]Mayers and Chipp, op. cit., p. 78.

dangerous milling operations. Work with radioactive substances can be viewed remotely this way also.

Observation under water has always been dangerous and difficult. A type of industrial television (still CCTV) has been proved an inexpensive substitute for a diver many times. Areas inaccessible to divers can be viewed. The British Navy was able to locate and rescue personnel from a disabled submarine 280 feet off the Isle of Wight by use of this equipment.[103]

Many more applications could be stated in the study of use of CCTV for remote observation. However, it is necessary here to mention only that in many areas of business, industry, the armed forces, protective organizations and transportation, closed circuit television is making inroads as an efficient device to save money and do a better job than heretofore.

Applications of CCTV for communication. When the emphasis is on transmitting information rather than a continuous observation of an operation or scene, communication is the result. Some of the previously mentioned applications may be viewed as instances of communicating information also.

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[103]Mayers and Chipp, op. cit., p. 63.

Convenient and detailed viewing makes CCTV's use in instructional instances almost always quite suitable. Many experiments with closed circuit television have been carried on in many levels of education. The direction appears to be that of discovering selective ways in which we may help to get the basic educational job done, much as it has been said about the various open circuit applications of television.

Among the earlier uses of CCTV in the area of education has been work done in the medical field in training doctors, dentists, or students in both professions.

As previously mentioned, Smith, Kline & French, a pharmaceutical manufacturer, presented the first program of operations and clinics to be televised in color. This same company has presented programs from coast to coast and in Canada and Europe since the first presentation in 1949. By their application of CCTV, close-up views of live operations can be seen by both professional and student personnel. The American Cancer Society used the Smith, Kline & French facilities in conjunction with the Columbia Broadcasting System in 1953 and 1954. Overall reactions to the thirty programs were highly satisfactory.

At medical-dental schools such as Kansas University's School of Dentistry; the University of Washington School of

Dentistry; Albany Medical College; Nebraska Psychiatric Institute; and the University of Texas' School of Dentistry, observation of fine details and "live" operative techniques can be viewed by large classes without duplication of techniques by instructors. In February of 1956, according to the American Dental Association, eight dental schools of forty-four in the country were using CCTV for regular teaching.[104]

Considerable work has been done with television cameras as image intensifiers. Radiation therapy is viewed in Cedars of Lebanon Hospital, Los Angeles, by this method. One midwest metropolitan city physician has even used television to teach his patients relaxation of nerves. His method is to note points of muscle tension on a television screen while the patient views the screen.

The applications mentioned are only a few examples which point out the evidence of value CCTV has provided in medical training and research. These applications, however, have been very important in prompting educators to consider the method for use with other types of instruction at all levels.

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[104]Mayers and Chipp, op. cit., p. 39.

One of the most hotly contested areas in education today, as was mentioned at the beginning of this chapter, is the area of the use of television as an educational medium. The strength of arguments on both sides, proponents and opponents, at times is equally strong. Within the next section of the review of literature are contained examples of the use of closed circuit television for training in college, university, and public school areas. There is no intent to prove the worthiness of television, CCTV or open circuit, but rather a reporting of applications.

The Pennsylvania State University in 1954 began conducting an extensive program of research on the application of closed-circuit television to university teaching. Today it is considered one of the most extensive, comprehensive, and indicative studies done in this area.

The principal purpose of the project was to study the effectiveness of unmodified or conventional courses when taught for a full semester over closed circuit television using moderate cost equipment when compared with the same instruction in the usual manner.[105] It was also

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[105] C. R. Carpenter and L. P. Greenhill, An Investigation of Closed-Circuit Television for Teaching University Courses, Instructional Television Research Project Number One (University Park, Pennsylvania: The Instructional Film Research Program, 1955), p. 12.

decided to collect information on the acceptability of televised instruction to administrative officers, the faculty members, and to students. In addition a study of the problems of the feasibility of instructional television, as far as this would be possible within the project, was planned.

Secondary objectives included familiarizing faculty and students with closed circuit systems in anticipation of becoming involved later in educational broadcasts. It was believed that attention would be focused on problems of improving instruction, means of introducing more realism and concreteness into courses and emphasizing the needs and possibilities of methods research applied to college and university courses.[106]

Three courses, General Chemistry, General Psychology, and Psychology of Marriage, were used as the televised courses. Careful control of what is probably the most extensive research program in college level television to date produced the following results:

> (1) overall measurements yielded no significant differences in informational learning by students in two different courses of psychology and general chemistry.
> (2) instructional television was acceptable to students as taught in the experiment and students'

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[106] Ibid.

attitudes were neutral or slightly negative toward televised instruction compared to direct instruction.

(3) no statistically significant trends in effectiveness or acceptance were found over the course of a full academic semester.

(4) vidicon closed circuit equipment was found practical under the conditions of the experiment--problems of cost and feasibility need further study.

(5) acceptance by administrators and faculty members; are willing to accept the method on an experimental basis; see promises in applications but in general would prefer their accustomed teaching procedures.

(6) the use of multiple systems of closed circuit vidicon television to channel instruction to a large number of students shows potentialities.[107]

Moderate cost vidicon equipment plus two low cost "industrial" model systems were purchased and used in the experiment. A number of advantages of use of the vidicon equipment were also reported by the Pennsylvania State study.

New York University in 1955-1956 began experimentation with the teaching of courses by closed circuit television. Two courses, a freshman course in College Composition and a sophomore course in Literature of England, were conducted via CCTV. The experimentation had the broad purpose of enabling the university to discover as soon as possible the potentialities of closed circuit television for higher education. Again, as at Pennsylvania State University, the enrollment increase and teacher shortage

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[107] Ibid., p. i.

in the next ten years were factors causing the experiment to be closely watched.[108]

Conclusions were that for the most part college instructors were quite unprepared to teach via television, and students at New York University, during 1955-56, assumed that television was more an entertainment device than a teaching medium. At the end of the experiment, less than half the instructors responded with a favorable opinion about the possibility of acquiring new information by television.[109] These faculty members were the English department only of New York University. It was concluded that students had approximately an equal opportunity for learning in the first year of television courses and that A and B students profited as much in the television situation as they did in the regular class. Approximately $125,000 was spent for studio, classroom, and operation of the system.

The rapid increase of CCTV operations in colleges and universities is in definite proportion to the amount of concern being shown by these institutions about the

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[108]Thomas C. Pollock, et al, A Report on New York University's First Year of Experimentation with Television in College Classrooms (New York: Fund for Advancement of Education, 1956), p. 5.

[109]Ibid., pp. 15-16.

enrollment and teacher shortage crises which are occuring and will continue to occur for a number of years yet.

Such colleges as Kansas State College, New Jersey State Teachers College, Purdue, University of Iowa, Stephens College, and Miami University, Oxford, Ohio, have all tested CCTV for its application in the impending enrollment and teacher shortage crises.

At the New Jersey State Teachers College a proposed five year study was launched in 1953 when it offered to the Fund for the Advancement of Education a proposal for a project costing approximately a million and a half dollars called, "A Study of the Effectiveness of Television in Relation to the Current Problems in Teaching."[110]

The impact of television on twelve areas was to be studied:

(1) the pupil
(2) the individual teacher
(3) the teaching profession
(4) methods of teacher education
(5) school administration
(6) the constituent community
(7) ancillary educational specialties
(8) the curriculum
(9) school architecture
(10) educational television equipment
(11) educational television transmission
(12) educational television production[111]

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[110] G. A. Kelly and Lawrence H. Conrad, Report on Classroom Television 1954 (Montclair: 1954), p. 1.

[111] Ibid.

Among the conclusions reached following completion of the first year of work were those pointing out that it was very difficult for television to make everything clear to the pupil, although teachers generally agreed that the educational objectives were apparent in the televised lessons.

At Purdue University, where two courses in engineering and physics were televised, results were negative. A report of the study revealed that Purdue students felt the televised lessons were not as interesting as regular classes. There was no evidence of an inclination to do more home work nor take better notes in class. Significantly, students felt that through their television classes they did not get to know the instructor as well as in the usual classes.

In 1955 Stephens College inaugurated a new course for all entering students which was taught over CCTV. The project, supported by grants from the Fund for the Advancement of Education and the Radio Corporation of America, had small groups of students meeting in fifty classrooms throughout the campus twice a week to hear twenty minute lectures by master teachers over closed circuit television. Lectures were to provide stimulus to independent discussion following under the leadership of other faculty members. The course, called, "Ideas and Living Today," had several

goals. Its concentration was on major ideas important to civilization. Stephens chose the CCTV manner of presenting the course because it felt studies had shown that retention from television is greater than that resulting from face-to-face contact with the lecturer. Stephens is one of the few colleges where faculty acceptance seems to be rather general.

Miami University's project in CCTV has been important because it compared CCTV with large lecture classes. Student reactions to use of CCTV for courses in educational psychology, psychology, sociology, and human biology included statistics that students who dislike television do as well as those who like it, and better students ordinarily dislike television and large classes more than poorer students. Lack of contact with instructors was a major dislike of the students.

A large scale United States Army experiment at Camp Gordon, Georgia resulted in the conclusion that television instruction is generally more effective, at least for certain levels, than the regular method. Faculty members of George Washington University compared testing results of 15,000 trainees participating and found television instruction was particularly effective for the trainees with lower aptitude averages.

Case Institute of Technology has somewhat solved the problem of communication between instructor and student with a two-way communication system both visually and audibly. In the future Case hopes to have remote controlled cameras that allow the instructor to press a button which will aim the camera at the student who wants to ask a question. Case has been using CCTV with greatest success in the area of courses in graphics.

Other colleges successfully using CCTV have been Idaho State College, Syracuse University, Michigan State, and Cornell University. All had experimented with CCTV before 1953 with Idaho State College being the nation's first CCTV system linking a college and an entire public school system.

Idaho State College at Pocatello, Idaho began experimental televising as early as 1941. In 1946 a Television Technician's course in the School of Trade and Industrial Education was established, and by 1950 sufficient equipment had been built to begin programming on a closed circuit on the campus.[112]

The televising equipment was designed and built by faculty and students of the college, perhaps the only such

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[112]Carl L. Isaacson and Roger L. Walters, Educational Television Report Number One (Pocatello: Idaho State College, 1957), p. 1.

facility developed in this manner. Course work began in 1952.

A community antenna system gave Idaho State College an educational link with the public schools in Pocatello by running a trunk line to the college and connecting it to the main trunk feeding the city. The cable was then strung to designated points of reception in each public school. A full-time television coordinator was also hired by the college by the use of funds offered by the cable company and a national electronics manufacturer. Programs were designed for use by teachers in schools provided with receiving sets.

In 1955-1956 the superintendent of the Los Angeles City Schools and his staff undertook to explore the use of television in the city's junior colleges. A study of commercial stations, educational channels, and ultra high frequency techniques evolved a plan to use closed circuit television for a short-term limited experiment.

General objectives included:

(1) to determine the effect of the instructional project on the student
(2) to determine the effect of the project on the instructor
(3) to determine which courses could be taught most satisfactorily by the use of instructional television
(4) to estimate costs necessary to expand long-term television project . . .

(5) to establish basic relationships between the staff of the television program and the administrators of the colleges which will participate
(6) to determine through accepted methods of evaluation the value of instructional television as a teaching medium.[113]

Classes televised included physical education, geography, and physics. The project was unique from a technical viewpoint as the instructor selected one of four pre-set cameras by a push-button system on his desk. Several technicians were thus eliminated.

A continuing program of investigation following the 1956-1957 experiment was recently dropped by this college when it was found that the particular method under which it was being run was too expensive. It is interesting to note that the City of Los Angeles is also the only city thus far to lose its educational station due to non-support.

Interest in the use of closed circuit television in public schools is evident in current literature. The most notable experiment in this area is the Hagerstown, Maryland, project which will cover an entire county by September of 1958 (see "Uses of Television").

Other public schools recently reported using CCTV

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[113]Los Angeles City School Districts, Division of Extension and Higher Education, An Evaluation of Closed Circuit Television for Teaching Junior College Courses (Los Angeles: Office of the Superintendent, 1957), p. 11.

were: West Phoenix High School; Denver Public Schools; Conley Hills Elementary Schools, Georgia; Evanston Township High School, Illinois; Division Avenue High School, Levittown, New York; Pearl River High School and Port Chester High School, New York; Poughkeepsi Public Schools, New York; South High School, Columbus, Ohio; and New London High School, New London, Wisconsin.[114]

Stoddard, in his provocative Schools for Tomorrow, has a possible administrative pattern at the elementary school level using television. He feels that this plan will relieve teachers of some time consuming duties and possibly lessen the number of teachers needed.

The plan requires dividing the school day into two sections. Half the children in a given school work in smaller than normal sized classes involving subject matter best adapted to teacher-class procedures. The other half of the children participate in class experiences in a resource room, in the auditorium, library, music room, or on the playground. Following lunch, the two schedules would be reversed.[115] Stoddard's plan has met considerable criticism

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[114]Joint Council on Educational Television and Committee on Television, American Council on Education, Educational Institutions Using Closed Circuit Television (Washington, D. C.: July, 1957), pp. 1-4.

[115]Alexander J. Stoddard, Schools for Tomorrow: An Educator's Blueprint (New York: The Fund for the Advancement of Education, 1957), p. 44.

from educators. Many feel it is too drastic a change in education today. Television's role of lessening and substituting for current teacher duties in the present classroom setup is believed to be much too far advanced for our present knowledge of the medium.

Miscellaneous uses of CCTV include sending English lessons into the living rooms of foreign-born residents of an apartment project in the East. One unique use for CCTV took place in the New York Public School system where 720 teachers aspiring to be principals simultaneously observed and evaluated a single classroom session. Exactly the same strengths and weaknesses in teaching techniques are viewed by all in such a demonstration. Within two hours after the demonstration, applicants wrote examination papers on the session. The single examination replaced the forty previously required.

The cities of Detroit and Chicago studied the possibilities of using closed circuit television in the control of traffic on high speed expressways.

The Memorial Hospital in Morristown, New Jersey, has designed a CCTV system which allows children under 14, not normally given visiting privileges, to "see" the patients.

One midwestern college has used closed circuit television to serve as an administrative convenience during

registration time. Rooms in which students plan their programs are equipped with television receivers connected to a camera focused on a master class board. As classes fill and are closed, a memorandum is placed on the board to this effect. General communication to the students in other parts of the campus is then instantaneous.

With the development of large screen (wall size) projecting devices, CCTV can be used in large auditoriums, halls and other meeting places to bring in speeches, sporting events, or educational programs. One company sells a television projector that will show a sixteen foot picture suitable for viewing by several hundred people.

Considerable work is being done today in the area of developing television teaching centers within the audio visual departments of colleges and schools. Lewis says that such an area utilizes the potentialities of television for teaching purposes to the utmost. His projected design for such a center includes all the facilities and personnel coordinated to make the most effective use of television. All that is known about light, acoustics and arrangements of teaching aids is incorporated into the construction of the building which serves a function of studio, control room, film workshop, graphic shop and all the other

particular departments.[116] Very often such a building has been used effectively as a place for sending films to all parts of the campus via the film projector equipment of the center. Considerable saving is reported in material and manpower when this has been tried.

CCTV for observations and demonstrations in teacher education. Much has already been said and written about the predicament colleges and universities faced with climbing enrollments and a shortage of teachers. We find ourselves in this position in education today because of our basic philosophy of higher education. That is, every high school pupil should have the opportunity for some kind of further education.

Teacher education, with its beginnings in Europe by Father Demia in 1672, has moved from the simple improving of teaching of reading and the Catechism to children to a complex program involving many areas of study and practical experience.[117]

Since Samuel R. Hall opened the first U. S. normal

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[116] L. L. Lewis, "The TV Teaching Center," The AERT Journal, January, 1957, pp. 4-7.

[117] William R. Lueck, An Introduction to Teaching (New York: Henry Holt and Company, 1953), p. 368.

school in Concord, Vermont in 1823, the American teachers college has been in fairly rapid evolution.[118] By 1952, the number of degree granting colleges, primarily teacher preparatory in nature, had reached 144, according to the U. S. Office of Education.[119]

One of the distinctive features of teacher training in normal schools and teachers colleges lies in practical activities, observations, participation, and practice teaching. In 1890 the typical normal school required 131 periods of practice teaching averaging forty-five minutes each. In addition fifty to seventy periods of observation were required. These were periods when aspiring teacher-trainees viewed certificated teachers working with actual classes.

More recently, state educational systems have enforced specified general requirements for issuance of teachers' certificates. In these states professional educational requirements still require some hours of observations. These requirements vary from a low of five semester hours in South Dakota to thirty-five hours in Indiana for elementary school certification and from a low of twelve

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[118]Karl W. Bigelow, "The American Teachers College," Journal of Education, LXXXVII (January, 1955), p. 13.

[119]Ibid.

semester hours to twenty-seven semester hours in Washington State.[120]

Ogilvie reports a survey of 280 teacher education institutions found seventy-five per cent said observations and demonstrations were required within certain courses.[121]

In addition to specific requirements in teacher training sequences it must be remembered that the number of students that can be expected to enroll in them will increase somewhat in proportion to the projected overall college enrollment increase. College enrollment is expected to double by 1967, moving from three million to almost six million.[122] Today we enroll slightly more than three out of ten youths of college age.

In an attempt to find a solution to the impossible arithmetic, as Walter Lippman has called it, of the teacher problem, teacher education institutions have cast around for a further method of bringing observations and demon-

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[120]National Commission on Teacher Education and Professional Standards, A Manual on Certification Requirements for School Personnel in the United States (Washington, D. C.: 1957), p. 19.

[121]William Kay Ogilvie, "An Analysis of the Organizational Pattern, Purposes and Content of the Introductory Course in the Pre-Service Professional Education of Teachers," (Unpublished dissertation, Indiana University, Thesis Abstract Series - Studies in Education, 1956), p. 233.

[122]Council for Financial Aid to Education Incorporated, The Closing College Door (1957), p. 1.

strations to students. Public schools are crowded; space is at a premium in many observing stations near teacher training colleges. What to do?

One of the newest and in some ways most promising applications of closed circuit television exists in a small number of colleges with teacher education programs.

Using low cost vidicon equipment, linking public school and campus school classrooms with college "viewing" rooms, a significant number of colleges have successfully conducted observations and demonstrations for teacher trainees.

Starting with Kansas State Teachers College at Pittsburg, Kansas, in 1954, more than a dozen colleges in the nation by January of 1958 had moved into the area of using or experimenting with CCTV for observations and demonstrations.

Although this number may at first not seem significant, it should be noted here that information on the existence of such programs is very limited. Institutions discovered in the literature review as programming observations and demonstrations via CCTV included the University of Chicago, University of Minnesota, San Jose State College, and several others scattered around the country. A further elaboration of these institutions is left for succeeding chapters where details of installations will be noted.

An indication of the lack of information about such installations is the March, 1957 report on closed circuit installations in such institutions by Lewis. He reported twenty-three responses from AACTE-institutions, but only seven reported using CCTV for observations and demonstrations.[123] It is believed that a subsequent report by the AACTE in this same area, released after the completion of this study, will reveal an additional number of institutions contemplating CCTV for this area.

A typical installation of CCTV for observations and demonstrations contains three basic parts: the program-origination facilities, the distribution cable system, and receiving facilities. Such an installation is found at Chicago Teachers College.

Equipment used and methods employed to use television for teacher-training purposes are the result of two years of experimentation with portable equipment and temporary cables. The new vidicon television camera, small in size, but very rugged audio mixer, and camera chain make up the program-origination facility. Because of its size (slightly larger than a shoe box) the vidicon

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[123]Philip Lewis, "Closed Circuit Television Installations in Teacher Education Institutions," The American Association of Colleges for Teacher Education Bulletin (Oneonta: Subcommittee on Television in Teacher Education, 1957), pp. 1-11.

camera is most used in these applications. Cost is considerably lower than for the large image orthicon camera. Vidicon camera images appear to be adequate for observing techniques in classrooms.

Distribution systems for CCTV are done via coaxial cable carrying the video and audio messages. Receiving facilities include regular classrooms, auditoriums, laboratories, and shops equipped with standard size television sets.

Because of their size, vidicon CCTV cameras and camera chains can be stationed in fixed positions or can roam in a typical classroom sending the observation to any view room from a few feet to several thousand feet away.

Recently, remote camera equipment has been placed on the market allowing installation of equipment in a given room prior to the observation. Technical help needed to monitor the observation may remain in another room away from the observed students. By certain electronic devices the movements of any camera or cameras can be effected even to the point of changing lenses.

An indication of the importance educators are placing on CCTV for use in developing adequate observation and demonstration programs in teacher training institutions is

somewhat reflected in the recent (summer 1957) AACTE-sponsored Workshops.

Pendergraft reported on the workshops which were held at the State University for Teachers at Albany, New York; the Kansas State Teachers College at Pittsburg, Kansas; and San Jose State College, San Jose, California. The California workshop was co-sponsored by that state's Department of Education.[124]

The essential purpose of the workshops was to give representatives of teacher-education institutions the opportunity to appraise the feasibility in using CCTV equipment as a means of observing children in classroom situations.

A variety of possible uses of CCTV equipment to observe children as part of professional laboratory experiences included:

> (1) CCTV may be used as a supplement to classroom visits. It may provide an extended program of selected observations of children and classroom procedures.
> (2) Distractions of children caused by TV equipment are a concern of many teachers. However, some teachers' experiences in such surroundings indicate that children tend to overcome these distractions more quickly than those caused by the presence of large numbers of observers in the classroom.

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[124]Daryl Pendergraft, "The A.A.C.T.E. Workshops on the Use of Closed-Circuit Television in the Preparation of Teachers," The American Association of Colleges for Teacher Education (Oneonta: Subcommittee on Television in Teacher Education, 1958), p. 1.

(3) College classes observing children by means of CCTV may, collectively and in large numbers, enjoy better views of the children than if they were all crowded into a live observation room.

(4) The professor and the students in the observing class can freely raise questions about and discuss particular points while the observation is in progress. The professor thus has an immediate opportunity to direct the students' attention to and assist them in making judgements about the children's actions and reactions.

(5) CCTV can assist the professional staff in orienting students to the values of observation prior to their own live classroom observations.

(6) Kinescope recordings of an observation can be made for use with teacher education students in other professional classes.

(7) Some teacher education students indicate a preference for observing by CCTV; the reasons for such preference should be subjected to careful analysis as they have both positive and negative ramifications.

(8) Many of the professional education instructors attending the workshops who have had observations both by TV and by actual classroom visits seem to feel that in some instances and for certain purposes the TV observations are of equal or greater value than live observations.

(9) Some demonstration teachers prefer observation by CCTV over the preference in the classroom of an entire class of college students.[125]

History of CCTV at Central Washington College of Education

Since 1890, when the first Washington State legislature passed a law establishing the Washington State Normal School at Ellensburg, Central Washington College of Education has been an integral part of the system of higher education in Washington.

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[125] Ibid., pp. 3-4.

Central Washington College of Education, the name given the institution in 1937, performs a number of functions. One of the most important is the professional preparation of teachers and administrators for the elementary, secondary, and extended secondary schools. For the past twenty-five years it has been authorized to grant the Bachelor of Arts in Education degree. Since 1947 it has granted the Master of Education degree, as well as the Bachelor of Arts and Science degree.

It is a small college compared to most state universities, but larger than a number of teacher education colleges. It was one of fifty-three institutions called teachers colleges with a resident enrollment between 1,000 and 2,499 in 1953.[126]

It is necessary to review briefly the nationwide picture of enrollments and teacher supply on all levels in order to more thoroughly grasp the significance of Central's move toward CCTV. Central is but one college of many reflecting nationwide trends in these areas.

Central Washington College of Education has experienced "growing pains" as have most of the colleges and

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[126]United States Department of Health, Education and Welfare, Statistics of Higher Education: Faculty, Students, and Degrees 1953-54 (Washington, D. C.: United States Government Printing Office, 1956), p. 12.

universities of the nation. Enrollments at Central Washington College of Education have gained more than thirty-three per cent since 1953. It has been predicted that enrollment will be doubled by 1970. Except for World War II years, the college enrollment has made a steady gain over the last twenty years.

While the nation's colleges including Central Washington College grew, enrollment trends in public and nonpublic elementary and secondary schools in the nation raced to new highs. By 1950, almost 28,000,000 students were in attendance in elementary and secondary schools.[127] An Office of Education report issued for the 1957 school census listed the total at 32,834,000.[128] Almost two million of this total were in excess of the normal capacity of publicly owned school plants in use.[129]

The shortage of classrooms was acute in the nation; additional classrooms needed in the fall of 1957 amounted to 142,300.[130]

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[127]National Education Association, "Schools and the 1950 Census," National Education Association Research Bulletin, XXIX (Washington, D. C.: Research Division, 1951), p. 164.

[128]United States Department of Health, Education and Welfare, Enrollment, Teachers, and Schoolhousing in Full-time Public Elementary and Secondary Day Schools: Fall 1957, Circular 513 (Washington, D. C.: United States Government Printing Office, 1958), p. 1.

[129]Ibid., p. 2.

[130]Ibid., p. 3.

A shortage of 120,000 teachers by 1957 was also reported.[131]

What accounts for the unprecedented enrollments on all levels? In 1870 only fifty-seven per cent of the children between the ages of five and seventeen were enrolled in public schools.[132] Today more than eighty per cent of this age group attend school.

The rising educational status of the nation, a decline in illiteracy and a rise in educational attainment have contributed to this gain. Secondly, a steady increase in the birth rate has helped bring about such large gains in school enrollments. Lastly, the percentage of seniors going into college has now moved to approximately three out of every ten high school graduates.

It has been estimated that college staffs would need to increase two and one half to three times in the next fifteen years to keep up with the climbing enrollments. A number of suggestions have been formulated to ease the severity of the problem. Stricter entrance requirements

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[131]National Commission on Teacher Education and Professional Standards, NEA, A Brief Summary of the 1957 Teacher Supply and Demand Report, Report of the Tenth Annual National Teacher Supply and Demand Study (Washington, D. C.: Research Division, 1957), p. 33.

[132]National Education Association, op. cit., p. 165.

shutting out certain lower ability students have been suggested. Some colleges have tightened requirements considering the higher caliber of students graduated to be worth the cost of keeping others from obtaining a college education.

Year-round schools have been proposed. No data is available in this study on their success. The use of technical assistants and advance students as helpers to the teacher has been considered. Independent study, where the student works on his own, is another possible answer. The final possibility is that of having larger classes.

Central Washington College of Education has been aware of the impending problems of increased enrollment and has endeavored to meet them with answers which will ensure a continuing program of excellent training for teachers.

This college was first mentioned in connection with television in education when the Washington Statewide Committee on Educational television recommended that Central be a key spot in a statewide ETV system. In 1954 the committee, appointed by Governor Arthur B. Langlie, proposed the statewide link with stations at Seattle (the University of Washington), Pullman (Washington State College), and Ellensburg (Central Washington College of Education).

Bills introduced in the 1955 session of the State Legislature involving setting up this "State of Washington Plan" were left in the Senate Rules Committee at adjournment time.

About this time the first problems of providing enough observations and demonstrations in teacher education appeared. During the period 1955-1956, Central's enrollment increased from 1,443 to 1,685. In addition, seven courses requiring observations in the teacher education sequence were experiencing larger enrollments. This required that additional sections be added. Between the school years of 1953-1954 and 1957-1958 a sixty per cent increase in sections of all teacher education courses occured.

In addition, the establishment of the General Certificate requirements by State Board of Education regulations in 1949, effective in 1951, included more reference to the importance of observations and demonstrations. As much opportunity as possible was to be given students to observe and work with children prior to their experience in directed teaching.

Possibility of the use of CCTV to answer this need had not escaped the consideration of college authorities.

Meanwhile the Ellensburg Public Schools were

experiencing problems in providing for the requested observations and demonstrations for the growing college classes.

Mr. Edward K. Erickson, Superintendent of Schools in Ellensburg, felt keenly the obligation to provide opportunities to the college for training teachers, and met with Dr. Maurice Pettit, Chairman of the Education and Psychology Division at Central, to explore in the winter of 1955-1956 the possibility of using CCTV for part of the observations. Mr. Erickson agreed it was necessary to do something about the program. "We understand," he said, "it is an effort on the part of the college to alleviate the strain on our facilities and to make the courses more worthwhile."[133]

A television committee was appointed. Included on its roster were Pettit, Dr. A. Hamilton Howard Jr., Director of Audio Visual Aids; Dr. J. Wesley Crum, Dean of Instruction; and Kenneth Courson, Business Manager. Meetings were held to discuss the feasibility of a CCTV system and to draw up a budget request for 1957-1959.

J. Wesley Crum, chairman of this committee, then went to the Board of Trustees in the spring of 1956 to request permission to go ahead with plans for CCTV and

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[133]Personal interview with Edward K. Erickson, Superintendent of Schools, Ellensburg, Washington, August, 1957.

preparation of a budget request.

The item for close to $50,000 for closed circuit television at Central Washington College of Education received approval of the State Legislature in the winter of 1957.

Since the money would not become available until after July 1, sufficient time was available to do a very careful screening of all available equipment for CCTV work before final specifications were drawn up. This was done by the CCTV Coordinator and the Director of Visual Instruction. Progress was reported to the television committee.

A franchise from the city of Ellensburg allowed coaxial cable to be strung on city light poles from a point where the system leaves the campus to each of the five schools.

Final specifications were submitted to the Purchasing Department at Olympia. This department then advertised for bids on the specifications. The State awarded the bid to Jerrold Northwest of Seattle early in 1958.

A preliminary survey of underground conduit, steam tunnels, and other passageways for stringing the coaxial cable had been completed previous to forwarding the specifications to Olympia. College precedent had already been

set restricting all cable installation on the campus to underground installation. Workmen began pulling cable following official notification of the bid award.

Equipment inventories were not received until spring. Initial testing of the system began in April.

Further discussion of the history of closed circuit television does not go beyond this point as April was the cutoff date selected for receiving data.

The Board of Trustees approved of the plan. During the summer of 1956, an electronics firm offered to help draw up a preliminary budget for a CCTV installation. The plan was to link all the schools in the Ellensburg Public School District and the College Elementary School with college observation classes. Working with the preliminary study, a plan was developed to have four viewing rooms located on the campus. This would make it possible to have two observations at one time. A two-way communication system was included in the plan. A total of $49,336 was requested for the system (Appendix A) during the 1957-1959 biennium.

Before reaching the final stages of planning the system facilities, the college television committee met with the public schools to discuss again how the system would be used. The school board of the Ellensburg Public

Schools looked upon the introduction of CCTV favorably, and felt that it would not require significant changes in the instructional program.

In reviewing the need for CCTV at Central Washington College of Education the committee kept in mind that a saturation point for observations and demonstrations had already been reached in the junior and senior high schools. Also, Superintendent Erickson had notified the college that a way had to be found to reduce interruptions caused in classroom programs. At one point in the 1956-1957 year all observations had been temporarily suspended because of the interruptions in the classroom.

CHAPTER III

PROCEDURES USED

The problem of this study was first considered by the writer following an administrative assignment in the spring of 1957.

The writer was assigned part-time (one half day) duties as "Closed Circuit Television Coordinator" for the operation of the CCTV system. His duties were supervised by the Director of the Office of Visual Instruction, the unit under which the CCTV system was to operate.

The various functions of scheduling, operating the system, and training personnel were assigned to the Coordinator.

The first step in the plan was the drawing up of specifications. A search for information concerning similarly constructed systems, which was to be used for background, was not particularly rewarding. In fact, in the specific area of installations and facilities for observations and demonstrations, almost no information could be discovered. An indication came out in early letters to institutions that such information, properly researched, would be valuable to three groups of institutions: (1) those wishing to learn of the feasibility of such a system but not committed to its use, (2) those

committed to its use but not constructing yet, and (3) those using it who might benefit by revisions in their system.

It was at this point that the writer began plans to develop a study which would supply the necessary information. A preliminary survey showed that some material in the general areas was available.

Since the use of educational television and the findings therefrom in other areas of the country were of value, and since these could be related to Central Washington College of Education's practical needs, the normative-survey method of research was chosen.

The procedure used in this study involved several major areas.

First, to become better acquainted with the prevailing conditions in the use of television in education today, the writer surveyed information in four major areas: (1) the literature on history of television itself, (2) the literature on television in education, (3) the literature on closed circuit television, and (4) the history of closed circuit television at the Central Washington College of Education. This systematic survey served to give the writer an over-all picture of the birth, growth and problems of the medium of television and a historical

reference point with regard to Central Washington College of Education. The latter search was designed to assist in identifying the problems of setting up closed circuit television for observations and demonstrations in teacher education.

Since particular information on construction, cost, utility of equipment, et cetera, could not be found in the literature in sufficient quantities to be helpful, a questionnaire was designed as the major data-gathering device to disclose the current trends and methods of application of operating systems.

Seven major categories for data were included in the questionnaire (Appendix B): (1) observation requirements in teacher education programs, (2) problems of providing laboratory experiences, (3) planning for closed circuit television to meet the problems, (4) installation and specifications for closed circuit television, (5) setting up the facilities, (6) administration of the closed circuit system, and (7) problems peculiar to the institution.

The previous survey of related literature had disclosed that certain colleges were using CCTV for observations and demonstrations. A report by Lewis named such

institutions.[1] Early correspondence by the writer with various institutions before the study started was the means of determining still more colleges and universities using educational television.

A total of fourteen known institutions actively engaging in this work was arrived at by the above methods. These institutions were sent copies of the questionnaire. In addition, six more questionnaires were sent to colleges revealed by the earlier search to be seriously considering or already organizing such work. All six later proved not to be using CCTV in this particular way, but all returned the questionnaires with suitable explanations.

In addition to letters appending the questionnaires, followup letters were sent ten days later (Appendix C). A followup card was sent three weeks from the initial mailing to those few who had not returned the questionnaire (Appendix D). Two colleges of the fourteen were later sent letters concerning the urgency of returning their questionnaire after more than five weeks had passed. This was to no avail, however, as neither questionnaire was returned.

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[1]Philip Lewis, "Closed Circuit Television Installations in Teacher Education Institutions," The American Association of Colleges for Teacher Education Bulletin, Vol. X (Oneonta: Committee on Television in Education, 1957), pp. 1-12.

The per cent of return, 85.7, was encouraging. All respondents showed great interest in the study and requested a summary of the data when completed. Several included short letters or wrote remarks on the margins of the returned questionnaires expressing interest in the work.

In addition to letters sent prior to the study which later became research documents, the writer wrote to several national and state organizations for information on census reports of enrollments and teacher supply.

Finally, the writer attended an Instructional Television Conference, sponsored by the American Association of Colleges of Teacher Education at San Jose State College in July, 1957. Appraising the feasibility of using CCTV to observe children in classroom situations was one of the major purposes of the conference.

Consultants on the conference staff included top people in the field of educational television and instructional television. Personal interviews were held with a number of these men--most specifically, with representatives from the University of Minnesota, Chicago Teachers College, and San Jose State College. These three colleges were among the twelve used for data in the study.

The data in this study are based on the reports of twelve institutions returning the questionnaires. This

was not felt to have limited the data. At the time of research for data only fourteen institutions were known to be using CCTV for observations and demonstrations in teacher education. Nine months were spent in researching for questionnaire respondents.

The data was analyzed by grouping materials from each college into the seven major categories of the questionnaire. Trends or practices prevalent within each category are explained in Chapter IV.

Chapter V contains the summary and conclusions drawn from the data and implications for further study within the area.

CHAPTER IV

ANALYSIS OF THE QUESTIONNAIRE DATA

This study was designed to identify and analyze the problems that exist in providing laboratory experiences in teacher education programs, and to discover what problems exist in using closed circuit television to solve the laboratory experience problems. This chapter presents data obtained by means of the questionnaire, and what seem to be the significant inferences that may be drawn from an analysis of these data.

A basic requirement in teacher education programs is that students shall have ample opportunities to observe public school classes in session and see outstanding classroom teachers demonstrate specific teaching procedures. Some institutions continue to provide these laboratory experiences with few interruptions. The method generally used is that of seating the college students in the room. This may mean sitting at the back or sides of the room, viewing from a balcony above the room, or viewing from an adjoining room partitioned with glass or screening.

Not all institutions however can provide these opportunities. Many have had to search for new methods unique in the past for training teachers.

There is presently great activity in the area of experimentation with closed circuit television in meeting these problems. This thesis report is concerned with this phase of experimentation.

Three basic areas to be explored in the study were: (1) locating common problems in providing laboratory experiences, (2) locating problems in using closed circuit television for providing the experiences, and (3) locating possible solutions for the latter. The solutions to the problems of uses of CCTV for observations and demonstrations were those related to planning, setting up, and administering the systems. No attempt was made in the study to evaluate the use of CCTV for observations and demonstrations.

In Chapter III, considerable material is presented reviewing literature basic to the general field of television. This survey of reports discloses that satisfactory answers to every question on these problem areas are not available.

When it became evident that more material on CCTV work was needed, a questionnaire was designed to gather this type of information. It was circulated to appropriate institutions, and the results were analyzed. These data are summarized here.

I. THE QUESTIONNAIRE RESULTS

The overall data reflect a great deal of dissimilarity among institutions. One of the major differences is that of the size of enrollments. Table I shows enrollment figures ranging from a high of 24,000 students to a low of 465. This indicates that problems of providing observation programs affect institutions of all levels of enrollment.

It is significant that not all of the institutions surveyed are primarily teacher education colleges. Five institutions, Kansas State Teachers College; Central Washington College of Education; State Teachers College, Millersville, Pennsylvania; New York State Teachers College, Brockport, New York; and Concordia Teachers College, Seward, Nebraska, are shown in Table I as having a sufficient proportion of total enrollment in education to be considered primarily teacher education institutions. All but Central Washington College of Education have the words "Teachers College" within the title of the institutions signifying again the area of concentration of the curriculum at those institutions.

The fact that seven of the twelve colleges are not basically teacher training colleges bears scrutiny. It seems significant that all types of institutions experience

TABLE I

NAME OF INSTITUTION, APPROXIMATE TOTAL ENROLLMENT, AND APPROXIMATE ENROLLMENT IN TEACHER EDUCATION OF INSTITUTIONS REPORTED IN THE STUDY

NAME	TOTAL ENROLLMENT	TEACHER EDUCATION ENROLLMENT
University of Minnesota	24,000	2,300
University of Illinois	22,500	2,733
Western Illinois University	10,000	3,000
San Jose State College	9,363	3,566
San Diego State College	9,000	1,500
University of Chicago	5,750	200
Texas Western College	4,000	600
Kansas State Teachers College	3,000	2,000
Central Washington College of Education	1,650	1,200
State Teachers College, Millersville, Pennsylvania	1,200	1,200
New York State Teachers College, Brockport, New York	1,150	1,150
Concordia Teachers College, Seward, Nebraska	465	465

problems in providing programs of observation. Overall, problems that are parallel are not peculiar to any single type of institution. When the total number of institutions of higher education are considered, it is suggested that the possibility of the extent of the problems may be quite severe.

It is reasoned that some of the dissimilarity of responses to certain of the questions is due to the newness of the CCTV programs. Several of the colleges have had a relatively short time to test the use of closed circuit television.

State requirements for certification are not standard throughout the country. Certain credential requirements pose different problems for various institutions. Because this study extended to the Atlantic Seaboard, different state requirements can be expected to exist. The states included are California, Illinois, Kansas, Minnesota, Nebraska, New York, Pennsylvania, Texas, and Washington.

Lack of communication has restricted findings concerning the extent of success of these programs. This means that most institutions have lacked sufficient research data in approaching the use of CCTV and have initiated programs on an experimental basis. Often such pioneer attempts have resulted in conditions considered

quite unorthodox for training teachers. This perhaps suggests one of the reasons introduction of television at many colleges has not always met with faculty approval. Where faculty approval is in evidence, or where it is possible to turn to valid research, success of the experiment appears to be more assured. For example, the University of Chicago, one of the survey respondents, has a total of 5,750 students enrolled. Two hundred of these are teacher education students. Considerable closed circuit experimentation has been carried on in and around the Chicago public schools and institutions of higher education. This past experience, it can be surmised, has helped in instituting the University of Chicago's program.

Another important factor to consider is that larger colleges perhaps find it easier to incorporate CCTV into teacher education because a relatively small percentage of the faculty is involved in the experimentation. Faculty approval or disapproval is somewhat a bellweather of success or failure.

Television is an expensive device. Large colleges have in most cases more opportunities to supplement the budget. Hence, it would appear larger colleges might more easily afford CCTV. Table I shows eight of the twelve colleges with enrollments of 3,000 or more. Six

colleges report more than 5,000 students. The University of Minnesota (24,000) and the University of Illinois (22,500) are among the largest universities in the nation.

One question received unanimous agreement. All twelve institutions require four years of training for graduation. This is encouraging in the light of a growing need for better trained teachers. Many states have permitted, and still do permit, teaching with less than a four year training period. This does not eliminate the possibility of teaching with an emergency certificate. The data indicated that much diversity exists in the number of quarters or semesters required for certification.

The University of Illinois, Western Illinois University, San Jose State College, the University of Chicago, Texas Western College, Central Washington College of Education, and New York State University Teachers College at Brockport, New York, all require eight semesters or twelve quarters of work for certification. Two colleges, San Diego State College and State Teachers College, Millersville, Pennsylvania, require more than four years of work for certification. The California school requires two extra semesters for secondary level certification. The basic requirements for certification based on different teaching levels is not shown in the Millersville response.

Here a general nine semester requirement is reported. Minnesota's requirements, although based on the level of work, are similar to San Diego State's. At the University of Minnesota six quarters fulfill secondary level certification requirements while six to twelve quarters are satisfactory for elementary certification. Two midwestern colleges, Kansas State Teachers College at Pittsburg, Kansas, and Concordia College at Seward, Nebraska, require considerably less than four years of work. Each allows certification at the end of five semesters. No stipulation was made on the questionnaire concerning the reporting of the type of certification awarded at these institutions.

There is no evidence to indicate the larger the college the more requirements necessary. This would indicate the influence of the National Commission for Accreditation of Teacher Education.

The five institutions predominantly teacher training in nature report no particular data to indicate they require more training.

The balance of this chapter will be devoted to an analysis of the answers to questions under the seven major categories of the questionnaire.

Observation Requirements in Teacher Education Program

In order to locate the extent of problems existing in institutions providing laboratory experiences in teacher education, it was necessary to discover what the requirements were at these institutions.

Table II shows that requirements range from a high of twenty courses to a low of two courses. (The University of Chicago and Western Illinois questionnaires failed to answer this question.) If examined in the light of the number of sections of each course which may be scheduled each year, the high and low take on more importance. If, for example, an increase in the number of sections, such as reported for Central Washington College in Chapter II, is also taking place at the eleven other institutions, greater problems can be foreseen.

Table II reveals that most institutions have class enrollments averaging between twenty to forty students. It appears this is an attempt to keep the classes of a size which will be more easily accommodated physically within the room to be viewed. The University of Minnesota reported that enrollments average above 100 students during the junior year and from ten to twenty students during the senior year. Undoubtedly, during the junior year introductory work of a general nature and massing of sections of the same class are taking place. Teachers

TABLE II

COURSES INCLUDING OBSERVATIONS AND AVERAGE ENROLLMENT OF COURSES

NAME	COURSES INCLUDING OBSERVATIONS	AVERAGE ENROLLMENT
University of Minnesota	*	**
University of Illinois	15	20-40
Western Illinois University	no answer	no answer
San Jose State College	4	20-40
San Diego State College	8	20-40
University of Chicago	no answer	20-40
Texas Western College	20	20-40
Kansas State Teachers College	2	40-60
Central Washington College of Education	7	20-40
New York State University Teachers College, Brockport, New York	2	over 100
State Teachers College, Millersville , Pennsylvania	4	20-40
Concordia Teachers College, Seward, Nebraska	5	20-40

*Junior year sequence - 2; senior year sequence - 2-3
**Above 100 during junior year; 10-20 during senior year

colleges do not seem to have particularly large or small class enrollments.

Some of the widest variances of requirements appear in the number of actual observations required within the course sections prior to student teaching. Forty-five hours at San Jose State College are the highest reported. Texas Western College stated no set number. It may have been that failure to define an "observation" lessened the number of significant responses in the questionnaire.

During student teaching, some colleges require the student teacher to do supplemental observations often at another level. With this in mind, respondents were asked to note observation requirements during student teaching. Again, a wide variance of replies is noted. Concordia Teachers College reported forty days required. San Jose State and Minnesota reported none. Others indicated either no set number or varying amounts between the high and low. The question parallels the replies received concerning the total number of clock hours for degree qualification. Whereas it had been thought effective to include queries on (1) observations prior to student teaching, (2) observations during student teaching, and (3) total observations, all three failed to indicate conclusively any set pattern. The total number of clock hours required range from a high of sixty to a low of none. This is puzzling,

since one would take for granted that some time must be spent in all teacher preparatory work watching certified personnel teach.

Facilities available for observations and demonstrations on the campuses are shown in these results:

	Yes	No	No Answer
Have campus school	10	2	
Used for observation	10	2	
Used for student teaching	10	1	1

The reference to student teaching is important when considering that the presence of the student teacher may eliminate that station as a viewing spot. A "No" on the question concerning the availability of campus schools eliminated replies from those two colleges on the next nine questions referring expressly to campus schools.

Indications are that at nine of the ten colleges with campus schools problems of supplying observations are partially lessened in the elementary level. All colleges except San Jose State and Texas Western College, both without any campus schools, and the University of Illinois, have campus schools on the elementary level. Illinois has only a secondary level campus school. Five institutions; Western Illinois, Kansas State Teachers College, the University of Minnesota, Concordia College, Nebraska, and the University of Chicago report having schools on all three

levels: elementary, junior high, and secondary. "Secondary" was defined as grades ten through twelve.

Smaller colleges have fewer levels represented in their campus schools. This in turn would necessitate relying more on the public schools for assistance. It perhaps also suggests that the small college may not be feeling the weight of problems of providing observations as much as larger colleges. However, it must be remembered that the availability of public schools varies from one school community to another. Public schools traditionally furnish classrooms in communities where the college cannot supply adequate observation stations. They, however, often must refuse some direct personal observations due to overcrowded conditions.

Several of the institutions allow personal observations as well as closed circuit telecasting, although not concurrently. This is interpreted to mean that the availability of stations was a problem and that good observation rooms could not be set aside solely for one purpose. All ten colleges reported they allowed student teaching also in the rooms of the campus schools.

All this indicates that problems could arise when student teaching assignments increase along with increased observations. The University of Illinois has only a campus secondary school but has more than 2,700 teacher

education enrollees. Consequently, students are sent to all parts of the state during student teaching.

Texas Western College, Western Illinois College, and State Teachers College, Millersville, Pennsylvania, all report rooms used for student teaching are not used also for observation stations. This suggests a philosophy of the college that student teachers should not be subjected to outside observation during training. It may also suggest that sufficient additional stations for observing exist. One could question, however, whether the seven colleges allowing observation in rooms with student teachers feel that it would be best not to have observers in the room. Observers need to see the best teaching techniques. Very few student teachers are this gifted so early in their training careers.

One of the standard problems of observations has been the loss of the natural situation when observers are brought into a classroom. The introduction of a television camera into a room can be expected to somewhat disrupt, at least at first, the natural atmosphere. It is not surprising then to learn from the study that television cameras were not taken into the rooms where student teachers were assigned unless used as part of an in-service training program. All these restrictions tend to narrow the number of possible observation stations, and in turn, create the

problems which will be discussed under the topic of "Problems of Providing Laboratory Experiences."

In attempting to decrease the possible observation stations per institution, it was necessary to ask for the number of classrooms in the campus schools. Responses ran as high as "all" and as low as one. At Kansas State Teachers College it is possible to set up a "televiewing" room in the campus school. This college is the only college which does all its observations by CCTV. Before the CCTV system, Kansas also had observers in the campus school rooms.

A variety of seating arrangements within the classrooms is reported with most colleges. This allows locating observers in the same room but separated from the children.

The number of public schools and public school rooms available for observations is proportional to the population of the town or city in which the public schools are located. Colleges such as the University of Minnesota near the metropolitan areas of Minneapolis and St. Paul have access to many schools and school rooms. Several colleges have problems due to a combination of a heavy enrollment in teacher education, numerous courses requiring observations, and little or no opportunities to observe in the public schools. San Jose State College has more

than 3,500 teacher-trainees, four courses requiring observations, yet observations are done in only four public schools. Central Washington College of Education with its more than 1,000 teacher education students has but five public schools in which to schedule observations. This number includes one secondary and one junior high school. On the other hand, Concordia College at Seward, Nebraska has six public schools available for 465 students.

A wide difference in opportunities to observe has tended to bring about certain problems in giving students as fine a general program of observations as some colleges would desire.

Problems of Providing Laboratory Experiences

All twelve respondents said they have now, or have had previously, problems of supply and demand concerning stations for observations. Thirteen possible situations causing these problems were included on the questionnaire. All colleges indicated they had more than one problem. A summary of responses appears in Table III.

It is interesting to note that three out of the first four problems listed are associated with enrollments. It is also of interest to note that the most troublesome problems appeared to be in the areas of scheduling and increasing enrollments.

TABLE III

NUMBER OF INSTITUTIONS HAVING THE VARIOUS PROBLEMS OF PROVIDING LABORATORY EXPERIENCES

PROBLEM	NUMBER OF INSTITUTIONS
Scheduling problems due to class hour differences	10
Increasing college enrollment	10
Lack of observing stations in the community	8
Crowded teaching conditions	8
Transportation difficulties	7
Lack of control of observation by instructor	6
Schools not cooperating in the program	3
Public relations problems	2
Large yearly turnover of public school faculties	2
Classroom teacher shortage	1
Increased college faculties	1
School organization changes	1
Curriculum changes causing modifications	1
Others (please describe) "Administrative red tape in securing observation"	1

Colleges schedule a much longer day than the average public school and experience many conflicts with the time schedules at the local schools. Interruptions occur throughout the hour the public school meets when college groups arrive and depart. In addition the college class often misses the very important introductory remarks by the classroom teacher. Some colleges surmount this problem by arranging particular scheduling to match the public school schedule for sections of teacher education methods courses.

The problem of growing college enrollments will be with institutions of higher education for many more years. When this and the lack of observing stations are considered, it would at first seem to be an insurmountable problem. Institutions surveyed have fixed their sights upon this situation and hope to prove that CCTV will in some way or degree solve the problems. Both large and small colleges report varying opportunities to do observations and demonstrations. Although several large colleges report numerous opportunities for observations in the nearby public schools, they still indicate serious problems exist. This is a tribute to the public schools when it is remembered that the problems reported are of significance to the smooth operation of a school. Only three colleges

report that public schools were uncooperative in the program.

Seven institutions checked that they are having transportation difficulties concerning their observation programs. Four, the University of Minnesota, the University of Illinois, Western Illinois College, and San Jose State College have the highest total enrollment and are located near large metropolitan centers suggesting observers must travel considerable distances to insure having the required number of observations. Three institutions, Texas Western College, Central Washington College of Education, and Kansas State Teachers College, are located in smaller towns. There are indications that considerable time must still be spent traveling to the location of the observation. Loss of time getting to and from observations could seriously hamper a program.

Surprisingly enough, only one half of the institutions checked lack of control of the observation by the instructor as a problem. It would seem that the control of the situation by the college instructor at the time the observation is taking place would be an ideal situation. Closed circuit television allows this to be done in several ways. Either the instructor or an engineer remote from the room can direct mobile or remote cameras to pick camera shots

freely. Comments may be direct from the instructor or to the instructor at will in this CCTV situation.

The first six problem areas indicated by the frequency of response to the item, are most frequently checked as shown in Table III. All these other problems received at least one check. This perhaps indicates the problems are more local in nature. Only one problem, administrative red tape involved in securing observation stations, was added to the prepared list. Respondents were urged to add additional problems not previously mentioned.

No degree of severity of any of the thirteen problems was asked. Several institutions double checked certain problems indicating such a degree.

The problems of providing laboratory experiences are many. A persistance of problems exists in the twelve institutions as evidenced by the pattern of checks for supplied problems. The pattern includes the general area of mounting college enrollments with correlated problem areas such as scheduling, lack of space, and crowded conditions. Individually, depending on size and intensification of the teacher education program, colleges have areas of trouble aside from the general problems. The dominant area, however, is that of enrollment.

Planning for Closed Circuit Television to Meet the Problems

The questionnaires disclosed several ways in which the responding institutions felt CCTV could help solve problems previously mentioned. Two-thirds of the respondents indicated large enrollment as one of the serious problems. Typical of the type of replies to this section of the questionnaire were those of Concordia College which listed the following reasons for turning to CCTV: (1) CCTV increases number of observation possibilities, (2) CCTV allows larger class sections for observation, (3) CCTV allows discussion while observing, and (4) CCTV allows a closeup picture of a youngster. Although Concordia is the smallest school in enrollment, it is significant to note that the college is attempting to increase the number of observations and the size of the individual observing class. Two colleges, San Diego State and Western Illinois University, appear to be looking beyond the problems mentioned in the questionnaire. These two institutions are attempting to improve the public school instructional program also. Western Illinois states that CCTV will afford a more nearly "natural" situation for observing and San Diego State believes that supervision of the student teacher can be effectively handled by using television. Both cite these not as primary reasons for installing CCTV,

but in association with the general trend of all twelve colleges.

There is an indication that colleges are concerned with the burden placed on the public school. Relieving the congestion in the classroom by taking out observers was one expression of this concern. This suggests the possibility of achieving a more natural situation and better observations.

Installation and Specifications for Closed Circuit Television

Among the colleges returning the questionnaire it is evident that the installation of CCTV to deliver observations and demonstrations is rather new. The earliest reported use in the study was Pittsburg, Kansas in 1954. The University of Minnesota installed such a type of television in 1955. Four institutions: Western Illinois University, Concordia Teachers College, New York State University Teachers College at Brockport, and Texas Western College began using CCTV for teacher education in 1956. With the exception of the University of Illinois (no date indicated), the rest of the colleges began using it during the past two years. This further suggests why information on the programs, and especially their effectiveness is difficult to locate in the literature.

Organizing the initial planning for CCTV was done predominantly by committees. Only at Kansas State College and Texas Western College was this not true. At Pittsburg, the education department and the Audio-Visual Center did this planning while at Texas Western the department of journalism and radio-television was in on the initial planning. Although its size varied from institution to institution, the structure of the committee almost always included the following: some member(s) of the education division, the audio-visual division, and college administrative personnel such as the college president, dean of instruction, director of campus school, or business manager. Underlying the selection of these people is the indication that CCTV will serve several areas, but still is a tool which must be handled with care, not sprayed around like DDT.

After setting up a committee or group to handle initial planning of the system, the problem of where to obtain funds to build and install closed circuit television confronted these people. Six colleges obtained funds from the particular state governments in which they are located. They were Western Illinois, Central Washington College of Education, State Teachers College at Millersville, Pennsylvania, San Diego State College, San

Jose State College, and Texas Western College. This leaves those colleges not tax-supported to find other methods to obtain funds. Concordia College and Kansas State Teachers College report the use of local funds to set up the system. New York State University Teachers College at Brockport, reports the use of state and local funds. The channeling of funds in the form of grants from organizations evidently has not been as prevalent in CCTV for teacher education. Only one of twelve reporting colleges, the University of Minnesota, mentions receiving a grant. The Universities of Illinois and Chicago did not answer this question.

Colleges appear to be divided on the method of developing a system design for limited allocations. The use of college personnel and consultants is mentioned about equally. This would suggest that many colleges wish to retain an independence from commercial design which engineering consultants might incorporate into the system. However, a significant number of institutions evidently felt they must turn to professional consulting staffs for help. Undoubtedly, the larger institutions were able to go to colleges of engineering within the institution for assistance. It is heartening to see that educational institutions are remaining firm in their desire

for systems designed around educational needs. In the early days of the use of ETV, very often the "E" was patterned to fit into the "TV."

It may be significant to note that the same institutions reporting funds received from the state to build the systems report that college personnel designed the system. This may mean that a limited amount of funds at state-supported institutions does not allow the additional expense of an engineering consultant.

More than three-fourths of the respondents said paper specifications were drawn up for the system. In the case of state-supported institutions this would be required by law to qualify for the publication of bids. It may mean colleges felt purchase and installation would progress more smoothly with a blueprint from which to work. The consultant service and college personnel were used predominantly in drawing up the specifications. The specifications are used also as guides in assuring delivery of equipment designed to fit the system need.

Some respondents were evidently puzzled by the request for information about the quantity and quality of equipment. One-half of the colleges answered by checking an appropriate item rather than showing the number of cameras and camera control units.

Colleges with large systems purchased several types of cameras ranging from the cheaper industrial type to the professional (commercial) models. Here the evidence strongly indicates that cost and application are important factors. Smaller colleges have fewer cameras and ones of the less-expensive industrial type. The degree of observation problems in a smaller institution would tend to determine the number of cameras needed, and the number of television origination points planned for the system also has a bearing on cameras procured.

Table IV shows the number of television origination and reception points. It also shows the data on the number of viewing sets and size of set screens.

Because of the flexibility of the answers concerning where individual institutions originate a signal, where the signal is viewed, and number and size of sets per viewing station, it is necessary to mention certain institutions.

The largest college sending data, the University of Minnesota, uses a variety of situations in its CCTV observation program. It is one of two schools, Western Illinois being the other, that has twenty origination points. When it is recalled that Minnesota has more than 2,000 teacher education students, it is easy to see why so many origination

TABLE IV

NUMBER OF TELEVISION ORIGINATION POINTS, NUMBER OF TELEVISION RECEPTION POINTS, NUMBER OF SETS PER RECEPTION POINT, AND SIZE OF SCREEN

NAME	ORIGINATION POINTS	RECEPTION POINTS	SETS PER RECEPTION POINT	SIZE OF SCREEN
University of Minnesota	20	*	1-6	21-24-27"
University of Illinois	n.a.	n.a.	n.a.	n.a.
Western Illinois University	20	20	2	21"
San Jose State	4 schools	27	1-3	21-24"
San Diego State	3	8	3	21"
University of Chicago	10	10	6	21"
Texas Western College	1	5	1	21"
Kansas State Teachers	5	5	3	24"
Central Washington College of Education	6 schools	4	2	21"
State Teachers College, Millersville, Pennsylvania	7	2	6	24"
New York State, Brockport, New York	4	20	2	24"
Concordia Teachers, Seward, Nebraska	4	1	2	27"

*All high school rooms and college education auditorium
n.a. = No answer

points are used. A reflection of this need for many observation pickup points is shown in the figures indicating the number of sets used per reception point and the sizes of the screens. Table II discloses that in the junior year students at this institution are in classes of more than 100. This would account for the large number of sets shown in Table IV. Secondly, the use of sets with screens as large as twenty-seven inches indicates again the size of the group viewing. Literature in the area of the ideal number of students to watch a set mentions fifteen to twenty students per twenty-one inch set.

Western Illinois University, Kansas State Teachers College, and the University of Chicago report an equal number of origination and reception points. No reason is given for this fact. San Jose State, because of its lack of an on-campus school, shows an unusually high number of reception points for video signals from four schools. Faced with a problem of transportation to schools in the larger city, that college has tended to group observations in several view rooms at a given hour. In some cases the size of the classes has indicated the use of more than one or two sets varying from twenty-one to twenty-four inches in screen size.

Texas Western College is indicated as an example

of a college which has turned to the use of one room, specifically set up with lighting and special acoustical treatment for observation. Classes to be observed move to that room for the hour of the observation. This is one method used by some colleges to insure good sound and picture. It somewhat destroys the natural atmosphere one finds when classes remain in their own rooms.

An example of one college's method to accommodate extra large classes is shown in the figures for New York State Teachers College at Brockport. This institution has two courses carrying enrollments of over 100 students. By dividing these groups into smaller sections to sit in the twenty view rooms, it would appear the original size of the class may now be less of a problem. Again the size of the screen, twenty-four inches, appears to be a method of assuring the groups an adequate screen image. Small, in comparison to the rest of the institutions, Concordia College has but one reception point for average (twenty to forty) groups and hence must turn to a larger screen.

Table IV shows a tendency for larger colleges to have more viewing points than smaller colleges. However, some of the small colleges are among those having the largest viewing screens. Generally, the screen size most often used is twenty-one inches.

The location and service problems of a given CCTV system at an institution are determining factors in the number of feet of coaxial cable found in that system. Since cost is a major item in the installation of the system, a number of institutions have restricted the system to adjacent buildings or even within one building. This accounts for the low figures of 200 feet given for the length of the system cabling. San Jose State, again partly because of its lack of a campus school, has a system spanning more than one and four-tenths miles off-campus and two miles on-campus. This is the largest cable net reported. All of the cable systems were fastened on poles, or buried underground, or run through a building passageway.

Setting Up the Facilities

In order to more fully cover the problems in all phases of the introduction of CCTV on institution campuses, respondents were asked a general question concerning specific problems unique in the construction of the system.

With one or two exceptions construction problems mentioned are of small significance in the overall scope of the study. Unfortunately, the answers do not tell why these problems arose.

Among the answers considered significant are those

pointing out difficulty in obtaining technical help. Lack of funds to hire such personnel appears to be the main problem. For the most part answers tended to group in the area of general technical "bugs" and electronic adjustments which might be experienced in any application of CCTV equipment.

Expected information concerning such areas as the problem of where to place the master control center did not materialize. Plans for administration of the systems are much more significant in the overall review of the data.

Administration of the Closed Circuit System

Individuals responsible for the administration and the leadership of the CCTV systems bear an interesting variety of titles. Most frequently mentioned is a reference to the Audio-Visual Instruction area. This is significant in that it points to the trend to look first upon television as a service function. Audio-Visual Instruction departments with a background of experience in maintenance of electrical equipment present an ideal location for authority. The second most popular title is in the area of the education department. Academic rankings within the department designate the title of the person responsible for the direction of the system.

It is significant to note that the newer entrants

into the field are developing a category of titles including the words "TV Project Supervisor," or "CCTV Coordinator." This suggests particular training, and closely parallels the development in commercial television of a line of young television actors, directors, producers, and technical personnel who have been entirely divorced from radio. In the early years of television, radio funneled the largest number of individuals into television positions.

Although these new coordinators and project supervisors have training in the area of CCTV, most of this training is in the administrative portion of the program and technical help must still be found to supervise the maintenance of the systems. Minnesota and Western Illinois are the only institutions reporting that technical personnel were on the staff prior to the inception of the CCTV system. It is suggested that following a few more years of research, a considerable number of trained administrators and technicians will have been prepared and this problem should not be as weighty as it is today. A wide variety of training is in evidence for technicians hired by the colleges. They include a chief engineer of a radio station, a student from a radar school, a technician with two years of electronic training, and a man with a Master's

degree in Audio-Visual Instruction. This poses a question concerning the amount of training necessary for such a job as technician when considering the case of Minnesota where high school students serve as student technicians.

A problem area of administration exists in gaining faculty support for the use of television. Throughout the history of television at institutions of higher education, a small band of representatives at each college has championed the possibilities of television. Where strong faculty support has been gained there is evidence of considerably more success with the project. Where faculties have been adamant, resultant outcomes of such projects have often been disappointing and even failures.

In a field as new as the use of CCTV for observations and demonstrations it is impossible to gain enough knowledge before surveying particular projects to insure that questions asked will cover any and all problems. It was for this reason that the final section of the questionnaire was devoted to discovering by voluntary information any problems unique to each respondent's project.

Problems Peculiar to the Institution

One of the areas not specifically covered in the questionnaire that was mentioned by respondents concerned the lack of an adequate budget to do an adequate job. No

information was requested concerning the total cost of each system. Undoubtedly, however, these expenses covered a wide range. Indications of this are noticeable throughout the study when it is recalled that the amount and type of equipment varied with each institution. The size of the systems was not uniform, and personnel, both administrative and technical, varied in title and assignment. The biggest problem, according to the Brockport college is that of adherence to tradition. "Once the break away is made, however, the newer method of observing and teaching seems effective."

A problem peculiar to one very small college was that of having to use student operators and cameramen. Minnesota, however, reports that they have achieved successful results with senior high school technicians and operators.

An area of concern at San Diego State College is that of delegating the responsibility for CCTV. At this college the job of administering the system is handled by an associate professor of speech. No definite indication is given for this assignment. A departmental assignment would seem to automatically delegate the necessary responsibility.

No additional problems either unique or significant were mentioned.

CHAPTER V

SUMMARY AND INTERPRETATIONS

I. SUMMARY

The purpose of this study was to survey the problems of setting up a closed circuit television system for observations and demonstrations in the teacher education program.

Three hypotheses were formulated to guide the investigation. These hypotheses were: (1) there are common problems in providing laboratory experiences in teacher education, (2) there are problems in the use of closed circuit television as it serves to provide experiences in teacher education, and (3) there are possible solutions to the problems of providing laboratory experiences by the use of closed circuit television.

Sources of data came from a review of the literature covering the history of television, educational television, closed circuit television, and the history of closed circuit television at Central Washington College of Education. In addition, to gather other data, fourteen colleges in nine states were sent questionnaires. Only fourteen institutions qualified under the limitation imposed by this study, the limitation that respondents must be using

closed circuit television to provide observations and demonstrations in teacher education programs. The survey was not extended to colleges using CCTV for other purposes. The deadline set for data to be included in the study was April 7, 1958.

No attempt was made to evaluate the instructional effectiveness of CCTV programs.

The small number of institutions discovered in this study can only mean that CCTV, for the purpose of providing a substitute for live observations, is still in its infancy. It was found that the institutions range in size from 465 to 24,000 students. It was also found that the size of cities where these institutions were located parallel the sizes of the institutions. The problems involved in teacher education are not limited to the size of the institutions.

The observation requirements are not similar either in terms of hours or academic courses. One institution requires observations in twenty courses while another indicates that they only require observations in two courses. Class enrollments at most institutions studied are from twenty to forty students. The University of Minnesota reflects the problems they face in handling class loads by indicating that they average 100 students

per class in the junior year. It is readily apparent that they cannot find a sufficient number of classrooms to take care of very many sections if the sections average 100 students. Another interesting fact is that ten of the twelve institutions have their own laboratory school. All ten of these use their laboratory school for observations and for student teaching. These dual purposes may well be studied in the near future if enrollment continues to create the myriad of problems it apparently does in higher institutions.

The most critical problem reported was the shortage of observation stations because of the increasing demands made upon them. Another problem revealed was the schedule difference that continues to exist between the colleges and the public schools. Their classes not only do not occur at the same hours, but they also are held for different length periods. Most college classes are for the duration of fifty or sixty minutes. Public school classes on the junior-senior high level do not always correspond to this arrangement. Another critical problem cited was that college classes are increasing in size at the same time the public school classes increase in size. This inevitably means that fewer college students can be moved into public school classrooms. In summary, it can

be said that all of the problems contained in the questionnaire represented to a greater or lesser degree, obstacles which most institutions feel important.

The installation and administration of CCTV services present many similar problems. Most institutions established steering committees to work out the details involved in the installation of CCTV. Some of the institutions also hired consultants to advise the committee on technical questions. A few institutions had members on their staff with backgrounds sufficiently broad to advise the committees.

In financing these CCTV installations, most institutions resorted to state money. Several private colleges relied largely upon grants for such purposes. One significant finding was that the CCTV installations maintained an independence from commercial design wherever possible. It was apparently felt that the college problems were unique and that different purposes were to be served by this expensive equipment. The data also showed that many types of equipment are being used. It was not possible to ascertain which type of equipment is proving to be the most satisfactory. The size of the receiving sets is predominantly twenty-one inch dimension. Two institutions utilize the twenty-seven inch screen while seven

institutions utilize the twenty-one inch screen.

Most institutions administer the CCTV system out of the Audio-Visual office. This can logically be defended. Because it is an Audio-Visual instrument, it seems logical that the director of Audio-Visual Education should be responsible for its administration, maintenance, and repair.

II. INTERPRETATIONS

Based on the data derived from the questionnaire the following interpretations are advanced as they relate to the hypotheses.

<u>There are common problems in providing laboratory experiences in teacher education</u>. Although it was not possible to compare all participating institutions from the standpoint of size, teacher education enrollment, geographical location, type of college, et cetera, extremely important parallels are indicated early in the data. All institutions have had problems or are currently having problems of providing adequate observations and demonstrations. Each indicated at least two specific problems from a prepared list of thirteen. Most institutions indicated many more problem areas. Because of the frequency of responses to seven of the items, it can be interpreted that these are the most common problems pertinent at the twelve institutions surveyed. They include: enrollment

increases, scheduling, class hour differences, crowded teaching conditions, lack of observing stations, lack of control of observation by the instructor, and schools not cooperating in the program.

It can be postulated that most institutions of higher learning are or will be facing similar problems in their teacher education programs. Increasing numbers of students are attending institutions of higher learning. Increasing demands upon limited facilities can only mean that newer methods, different schedules, instructional changes, and administrative procedures will have to be studied to meet these demands. How these problems will be solved is at this time only a guess, but it would seem logical to assume that educators will turn to the fields of electronics for part of the answers. Because television makes use of both the visual and auditory processes, and learning is so closely related to these processes, it is very likely that the media of television will be more widely used in colleges throughout the country.

<u>There are problems in using closed circuit television for laboratory experiences in teacher education.</u> It can be concluded that significant problems in application of CCTV, as the title of the study suggests, are concerned with at least three basic areas: planning,

installing, and administering the completed system.

Each institution mentioned in the report has suggested problems that arise out of these three areas. The designing, drawing up of specifications, and the choice of equipment are serious problems, according to the respondents. Often the extent of the problem appears to be related to the size of the institution.

The construction of the system requires sound technical advice and assistance. No college should attempt to set up a CCTV system without some professional consultant help.

It should be pointed out that the CCTV system does not hurdle the problem posed by different class schedules existing between the origination point and the reception point. The use of these audio-visual aids also cannot eliminate completely the problem existing in scheduling observations. Many times it may seem to complicate the situation. It would seem that better cooperation between the public schools and higher institutions would develop because of the emphasis for such growing out of the utilization of CCTV.

The technician skills required to correctly focus on the important work at the moment in the classroom is one that will need great emphasis and lengthy study.

Good cameramen have always been hard to find, and to have sufficient numbers for the increasing demands will pose serious problems. Educational classes for the specific purpose of training individuals for this important function may be necessary in larger numbers.

The maintenance of this technical equipment was not mentioned as a serious problem. This was perhaps due to the fact that virtually all of the equipment was new when put into operation. How long this equipment can be used without encountering major maintenance is difficult to predict. It would seem inevitable that the maintenance of this equipment will sooner or later pose many problems.

<u>There are possible solutions for the problems of providing laboratory experiences by the use of closed circuit television</u>. The very fact that twelve institutions, dating back to 1954, are now successfully running CCTV systems for observations and demonstrations, is a strong indication that there are possible solutions to problems of providing laboratory experiences. Its future use seems full of promise. Continuing research practices and techniques will need to be applied to fulfill this promise.

It is becoming more evident each year that television furnishes great opportunities to achieve considerable value at the college level. This would seem to be true

because the colleges have done much experimenting in these areas. This study shows that the problems imposed by the transportation of students to the classroom to be observed is being attacked by the media of communication.

The problems arising out of increased enrollments are being met by CCTV. It cannot be said that this approach will completely solve the problems generated from larger enrollments, but the institutions can certainly be commended for attempting to solve such problems by turning to the most recently developed technical devices designed for mass media.

Comments on the questionnaire also indicate some satisfaction with the manner in which televiewing lessens the number of interruptions in the classrooms. By omitting the need for large numbers of students to be seated in the classroom, there is much less disturbance in the teaching situation. This could eventually mean that youngsters may only be studied directly where one-way vision observation arrangements exist, or outside of the classroom where interruptions are not quite so detrimental.

It can further be interpreted that only a few of the major problem areas are being diminished by the use of CCTV. Colleges apparently are only beginning to define all of the problems associated with providing adequate

learning experiences for the preparation of teachers. It is anticipated that many new and unique applications of CCTV will be found.

It is strongly recommended that the administration of the Central Washington College of Education continue to keep abreast of future intensive studies of CCTV as they concern the improvement of the observations and demonstrations program. Such research as that being carried on by the American Association of Colleges of Teacher Education should be carefully studied for it may open doors to better teacher preparation programs.

The study was begun with the idea of providing the author with information that would enable him to actively and intelligently participate in Central Washington College's CCTV program. From it was learned that television is neither a promised land nor patent solution. Rather it is a powerful tool. The author now will endeavor to wield the instrument with better skill.

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APPENDIX

APPENDIX A

ORIGINAL BUDGET REQUEST FOR CCTV AT CENTRAL WASHINGTON COLLEGE OF EDUCATION

Closed Circuit TV Installation-

Purpose: Will be used to permit Teacher Education classes to observe all elementary and high school classes and special demonstrations in the Ellensburg Schools. This will permit entire classes to observe the same lesson, thus saving staff time, decrease congestion in the public schools, and improve teacher training.

Project cost:

8	1985A TV cameras and control arms with 10" monitors plus 3" turret and lenses	$28,920.00
8	custom audio preamplifiers	640.00
8	custom equipment racks and tripods	2,320.00
8	collapsible dollies	720.00
8	camera mounts	656.00
12	24" table TV monitors	2,880.00
	Engineering and installation	7,200.00
	Cable lease	6,000.00
		$49,336.00

APPENDIX B

RESPONDENT NUMBER_____

AN IDENTIFICATION OF MAJOR PROBLEMS RELATED TO THE INSTALLATION AND ADMINISTRATION OF CLOSED CIRCUIT TELEVISION

Directions and explanations: When the questionnaire has been filled out, please return in the self-addressed envelope to Robert P. Slingland, Box 48, Administration Building, Central Washington College of Education, Ellensburg, Washington.

Where insufficient information at hand hampers giving the exact data requested, make as close an estimate as possible. Please do not omit any of the questions. Use ample space to clarify answers where the questions are not completely applicable.

GENERAL INFORMATION Date_____

This questionnaire submitted by _____
Title_____Educational Institution_____
City_____State_____Population of town in which your institution is located_____Approximate enrollment in teacher education_____Approximate total enrollment_____
Years required for graduation_____Number of quarters (semesters) for certification_____

Observation Requirements in Teacher Education Program

1. How many courses in the teacher education program include observations?_____
2. What is the average student enrollment for these courses? (Check the nearest enrollment average.)

0-10	_____
10-20	_____
20-40	_____
40-60	_____
60-80	_____
80-100	_____
above 100	_____

3. What is the approximate number of observations required during the educational program sequence of a student prior to student teaching?_____

4. What are the observation requirements during student teaching other than the major assignment?
   Number of days _____ per quarter
   _____ per semester
   Number of hours _____ per quarter
   _____ per semester
5. What is the approximate total number of clock hours of observations required for degree qualifications?_____
6. Do you have (a) campus school(s): YES ___
   NO ___ If answer is YES, check the space(s) applying to your institution:
   ____Elementary ____Junior High ____Secondary
7. Are you using campus school(s) for observation stations? YES____ NO____ If YES, do observers in campus school sit in with pupils? YES____ NO____
8. Are observers in campus school in another room watching over closed circuit television? YES____ NO____
9. Do you use campus school for student teaching stations? YES____ NO____
10. Are rooms assigned for student teaching stations also used for observation stations? YES____ NO____
11. Are television cameras in rooms where student teachers are assigned? YES____ NO____
12. How many classrooms in campus school are used for observing? _____
13. What is the total number of classrooms in the campus school? _____
14. Where are observers located for in-class observation in the campus school? ____a. In the same room, but are separated by divider or other arrangement
    ____b. In an adjoining room. Is the partition (___ 1-way glass?) (___clear vision glass?) (___ other) Please describe _____
15. How many public schools are available for observations?
    ____Elementary ____Junior High ____Secondary
16. How many rooms are available for observations?
    ____Elementary ____Junior High ____Secondary

Problems of Providing Laboratory Experiences

1. Do you have now, or have you had previously, problems of supply and demand concerning stations for observations and demonstrations? YES____ NO____

2. Were these problems due to (check as many as apply to your situation)
   _____a. increasing college enrollment
   _____b. lack of observing stations in the community
   _____c. transportation difficulties
   _____d. schools not cooperating in the program
   _____e. lack of control of observation by instructor
   _____f. scheduling problems due to class hour differences
   _____g. public relations problems
   _____h. crowded teaching conditions
   _____i. classroom teacher shortage
   _____j. increased college faculties
   _____k. large yearly turnover of public school faculties
   _____l. school organization changes
   _____m. curriculum changes causing modifications
   _____n. Others (please describe)

(Use other side of page for extension of remarks)

Planning for Closed Circuit Televison to Meet the Problems

Please describe what particular problems you hope to solve by the installation of closed circuit television.

Installation and Specifications for Closed Circuit Television

1. What year was your closed circuit television project initiated? _____
2. Is it an ongoing project? YES____
   NO ____
   If answer is NO, how long was project conducted?____
3. Who was in charge of organizing initial planning?
   ____a. a committee (composed of whom?)_____
   _____
   ____b. a particular administrative office (which one?)
   ____c. the education department
   ____d. other (please describe)

4. How is (was) financing of the project carried out?
   ____a. separate college funds (local)
   ____b. state funds
   ____c. grants from organizations (Ford Foundation, etc.)
   ____d. a combination of (a, b, c, e, etc.) (what % of each?)
   ____e. other (please explain)
5. Was system designed by:
   ____a. college personnel?
   ____b. engineering consultants?
   ____c. other (please explain)

6. Were paper specifications drawn up for the system?
   YES____ NO____ If YES, by whom?
   ____a. college
   ____b. engineering consultants
   ____c. both college and consultant service
   ____d. other (please explain)

7. What quality and quantity of camera and camera control equipment were requested? (Place number in appropriate blank(s).)
   ____a. industrial
   ____b. "semi-professional"
   ____c. professional (commercial)
8. How many television origination points were planned? __
9. How many television reception points were planned? ____
10. How many television sets per reception point? _____
    What size screen? _____
11. What was the approximate number of feet of the distribution system? _____
12. Is the distribution system:
    ____a. on poles?
    ____b. buried?
    ____c. both on poles and buried?
    ____d. other (please explain)

Setting Up the Facilities

Please describe briefly any problems in actual construction of the system.

Administration of the Closed Circuit System

1. Who was placed in charge of administering the closed circuit system for observations and demonstrations?
   Name_____Title_____
2. Was technical assistance obtained for supervision of maintenance? YES ____
   NO ____
3. Were technical personnel already on the college staff?
   YES ____
   NO ____
4. If technical personnel were hired for the job, how was the selection made? Please explain.

5. Please describe briefly any administrative problems which occurred prior to actual use of the system. (Developing a routine of scheduling observations; personnel to do camera work; counseling with teachers and college faculty prior to televised observation, etc.)

PROBLEMS PECULIAR TO THE INSTITUTION

Please list any problems unique to your institution which were not covered in previous questions. Please list them in order of importance, giving your biggest problem top ranking.

(Use other side of page for extension of remarks.)

APPENDIX C

DIVISION OF EDUCATION
CENTRAL WASHINGTON COLLEGE OF EDUCATION
Ellensburg, Washington

Dear Sir:

As a part of my graduate work at Central Washington College of Education, Ellensburg, Washington, I am attempting to define the problems of setting up closed circuit television for observations and demonstrations in the teacher education program. Included also will be a study of the many problems of providing laboratory experiences in this program. A questionnaire is being sent to institutions found to be utilizing closed circuit television in teacher education courses.

It is hoped that as a result of this investigation, tangible evidence will be uncovered upon which other institutions can base decisions concerning the use of such facilities.

My duties at Central Washington College of Education include those of coordinating the utilization of these facilities in our teacher education program.

We urgently request your assistance in this survey. The questionnaire may seem at first to be an excessive demand upon your time, but I am certain, however, that you will agree a thorough survey of the problems associated with installation of closed circuit television for observations and demonstrations would be interesting and valuable data to you and others in similar capacities. The survey report, of course, will be sent to you as soon as it is ready if you so desire.

We ask that you observe an April 7, 1958 deadline for return of the questionnaire to allow sufficient time to collect and interpret the data. A self-addressed envelope is enclosed for returning the questionnaire.

Your cooperation on this project is greatly appreciated. Because of the small number of institutions having this

information, I know you can understand my eagerness to have a complete return of all questionnaires.

Sincerely yours,

Robert P. Slingland
Closed Circuit Television
Coordinator

- -

DO YOU WISH A SUMMARY OF THE DATA WHEN COMPLETED? YES____ NO____

MAY YOUR NAME AND THAT OF YOUR INSTITUTION BE MENTIONED SPECIFICALLY IN THE STUDY? YES____ NO____

APPENDIX D

DIVISION OF EDUCATION
Central Washington College of Education

Dear Sir:

Ten days ago you received a letter and an enclosed questionnaire from me. In the letter I tried to explain that I was attempting to define the problems of setting up closed circuit television for observations and demonstrations in the teacher education program.

As a result of this investigation, I hope to be able to present conclusions which might help other institutions solve their problems if the sources are the same as mentioned in the study.

To this date I have had no reply from your college. May I re-emphasize once again the importance of getting in as many returns as possible.

To date, approximately 70 per cent of the colleges have either returned the completed questionnaire or have written to indicate that for some reason their school does not qualify under the delimitations of my study.

Could you please then do one of three things? If at all possible, please fill out the questionnaire at your earliest convenience. Enclosed you will find a second copy of the questionnaire, if the first may have become misplaced. If the survey should not happen to apply to your situation, could you please notify me of this by filling in as much of the information as possible. Or, if for some other reason you do not intend to complete the questionnaire, please notify me by return mail in the envelope enclosed.

Sincerely yours,

Robert Slingland, Coordinator
Closed Circuit Television
Central Washington College of Education
Ellensburg, Washington

RS:gh
Enclosures 2

APPENDIX E

EDUCATION DEPARTMENT

Central Washington College of Education

Dear Sir:

Three weeks ago you received a letter from me in which I requested that you fill out the enclosed questionnaire which pertains to closed circuit television at your institution.

I hope that you will regard this card as a gentle reminder that I am trusting solely in your professional spirit to help complete this work.

If you have already returned the questionnaire, please accept my gratitude. If through some mistake on my part you have received a questionnaire and you are unable to complete it under the limitations of the questions, please notify me.

Yours sincerely,

Robert P. Slingland
CCTV Coordinator
Central Washington College of Education

RS:gh