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Instructional Television – A Possible Solution to Problems in College Physical Growth

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INSTRUCTIONAL TELEVISION - A POSSIBLE SOLUTION TO PROBLEMS IN COLLEGE PHYSICAL GROWTH

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by

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DEDICATION

This manuscript is dedicated to Vivian Sorenson, a lady whose kindness made a college education possible, and to my wife, Betty, whose assistance, understanding, and tolerance have made every endeavor much easier.

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CHAPTER I

THE PROBLEM

The Need for the Study

The number of students enrolled in higher education is continuing to accelerate at a very rapid pace. The prospect is that the college age population (18-21) will double between 1960 and 1980, to a total of over 17 million youth (6:2).

It is assumed that an increasing portion of those entering high school will graduate and possibly go on to higher learning.

> There will be approximately 18 million students in the secondary schools during the 1960's. This number will increase to approximately 21½ million during the 1970's (22:76).

> During 1953 there were approximately 1,282,000 high school graduates. This increased to 2,315,000 during 1963. It is further estimated that 3,149,000 will graduate from high school during 1973 (15:2).

Building programs have accelerated on many campuses throughout the nation, but they have not been able to keep pace with the demands of an expanding student population. Some institutions have been trying to find an answer to this problem by utilizing their present facilities in different ways.

There is a need to show the effectiveness of utilizing instructional television as one possible solution to

some of the physical space problems. Television is a medium which has extended a gifted teacher beyond the range of a single classroom to a number of individual sections. It has also been an important teaching aid in bringing simultaneously to a large number of students the details of an experiment or operation which otherwise could be reviewed by a single person or small group. Space that is not normally used for classrooms could be utilized for receiving rooms for instructional television. Dormitory lounges, television rooms, gymnasiums, and auditoriums would be included in this category. Therefore, if the cost of instructional television is feasible, it would help alleviate problems of expanding enrollment.

The Purpose of the Study

The purpose of this study is to provide data to aid in providing a solution to some of the instructional space problems at Central Washington State College. This study will explore the feasibility of instructional television as a possible solution to this problem. Due to the nature of television, it is felt that television may be used to more fully utilize the existing physical facilities and provide instructional space that does not exist under the present teaching program. This study does not propose instructional television as the final answer to growth problems, but it may be the means by which existing

facilities can be used for a greater number of students.

In this study the author will attempt to provide answers to the following questions:

1. Can instructional television make better utilization of the existing physical facilities possible?
2. Is the development and use of instructional television more feasible than an accelerated building program?
3. Can instructional television provide instruction for large groups, reducing costs for physical facilities?

DEFINITION OF TERMS

Instructional Television

Any form of television which imparts knowledge or skill by a systematic method is considered instructional television. In this study instructional television will be defined as closed-circuit television programs which provide formal instruction.

Closed-circuit Television

Throughout this study closed-circuit television shall be interpreted as any system which limits distribution of an image to those receivers which are directly connected to the origination point by coaxial cable.

Coaxial Cable

This term refers to a conductor designed to carry many radio, telephone, and television signals simultaneously,

if desired. Technically, it is a central conductor or wire surrounded by some type of insulation over which a wire mesh or tube is placed. The central wire and outside conductors are concentric and serve as conductors.

Video Tape

A video tape is used to record picture and sound from television programs by a magnetic process similar to sound recording but including the reproduction of the picture.

Receiving Room

The receiving room is the area in which the receivers are located, and the students view the televised lesson.

Physical Facilities

This definition will be used to include the entire facilities of the college such as dormitories, classroom buildings, administrative offices, etc.

LIMITATIONS OF THE STUDY

This study is limited to the projected growth at Central Washington State College, the use of instructional television as a possible solution to increasing enrollment, and the cost of instructional television as compared to traditional facilities.

Data has been gathered from the published literature

pertaining to the subject, a questionnaire involving colleges and universities which are teaching via television, the manager of the Ellensburg Television Cable Company, and the administrative services of Central Washington State College.

PLAN OF THE STUDY

Chapter II is a review of the pertinent literature. This presents material supporting instructional television as an effective and feasible instructional medium.

Chapter III is an outline of the methods used in this study, the procedure for selecting the institutions to be questioned, the sources of information concerning growth at Central Washington State College, and a discussion of the questionnaire.

Chapter IV is the section receiving the major emphasis in this study. It is a discussion of the data collected from the questionnaire, the administrative services at Central, and the Ellensburg Television Cable Company.

Chapter V is concerned with a summary and recommendations for Central Washington State College.

CHAPTER II

REVIEW OF RELATED RESEARCH

INTRODUCTION

During the past dozen years a great deal of pioneering was done in the field of instructional television. This pioneering has been a combination of efforts by educational authorities and private organizations seeking new and better ways of providing an education for the nation's youth.

The use of instructional television on the college level is now being explored in greater depth than before. The following statistics concerning educational television were gained from the Compendium of Televised Education for the period 1964-65:

> Enrollments totaled 36,788,625 as reported--enrollments, not students--one student may have been enrolled in one or several classes. Higher education in 39 subject listings accounts for 317,951, representing less than 1% of all enrollments in 166 universities, 524 colleges, 62 institutes, 22 TV stations and 25 state organizations. Highest enrollments were listed for: Health and Physical Education (26,863); English (21,917); Social Science (21,154); Math (20,645); Education (19,439); Business (18,531); Psychology (18,247); Biology (17,484); History (16,605); and Spanish (15,521) (14:i).

The reader is reminded that the term "educational television" in the above reference refers to any form of televised instruction.

The number of courses taught via television is continuing to grow as more schools expand their facilities.

> Those institutions which operate professional schools in the health sciences--Medicine, Dentistry, Pharmacology, and Nursing--almost unanimously use TV in some form of direct teaching. Among the general campus courses of instruction, chemistry is the most popular area (17:85-86).

Many institutions are also using television for observation, practice teaching, instruction and training.

EFFECTIVENESS OF INSTRUCTIONAL TELEVISION

A study (10:61) was undertaken at Fordham University to compare the effectiveness of television, television recordings projected as motion pictures, and conventional classroom instruction. Groups of local Naval Air Reservists were taught a series of training lessons by one of the three methods. Evaluations of the effectiveness of the programs were made by information tests and comments of the trainees. The results showed that:

1. Instruction by live TV and TV recording were superior to local instructors. Live TV and TV recording were about equal in their effectiveness.

2. Direct TV narration, in which the instructor talked directly to the trainees, appeared to be the most effective method of presentation; animated sound film seemed also to be effective, but the combination of dramatic action and narration was not as effective.

3. Comments made by the naval trainees showed that, "on the whole," they liked TV instruction very well, over half of the comments being favorable.

4. The TV evaluation staff observed that the reservists liked the TV programs and remained attentive and interested, that more visual materials and better production techniques should have been used, and that trainee participation by means of talk-back circuits was not satisfactory (10:61).

Another study testing the effectiveness of television (18:71-72) was conducted in the Philadelphia Public Schools and was sponsored by the Ford Foundation. This particular study dealt with large-group instruction in sixth-grade language arts and eighth and tenth-grade mathematics. There were 7,353 pupils in three elementary schools, eleven junior high schools, and two senior high schools involved in this program. The period of the study was for two years. The following are the results of this study:

1. TV teaching in large classes continued to be effective and successful where it was planned to meet a need.

2. Large-class assignments permit more economical use of personnel and classroom space.

3. A continuing plan of orientation of principals, teachers, and parents is desirable as additional personnel and pupils become participants.

4. Additional and continuing assistance by classroom teachers of large classes is of crucial importance.

5. Well-prepared teacher guides and pupil worksheets, used in the TV classes, are considered valuable teaching aids (18:72).

The Florida West Coast Project for the Utilization of Television (21:75-76) was a study dealing with large-

class instruction. The project actively involved seven county school districts, with 22 schools, 76 teachers, and 6,689 students. From 97 to 321 students were enrolled in these large classes.

The objectives of the study dealt with whether television can contribute significantly to the improvement of education, and demonstrated various means of large-class organization, with television as a resource for plant and staff utilization. The following conclusions were derived from this study:

1. Students do learn effectively in large classes using TV as in conventional classes.
2. Students accept large TV classes and say they work as hard or harder than before.
3. Discipline is no problem.
4. Large classes and good organization provide improved class utilization.
5. Large classes prevent double sessions and provide for better utilization of the school plant (19:76).

Six case studies (2:372) dealing with closed-circuit television as a teaching device were presented in a conference in Kansas City. The members using television were Stephens College; the University of Akron; Washington County School System, Hagerstown, Maryland; Evanston Township High School, Evanston, Illinois; Conley Hill, Georgia Elementary School; and the University of Missouri.

Reports from all six institutions recognized that closed-circuit television properly used can help solve problems in American education. All institutions felt that through closed-circuit television the problems of increased enrollment could be met. Through this medium the best instruction would be available for the majority of students.

New York State has undertaken the installation of television on a statewide basis (25:1) to solve some of their educational problems. During the years of 1960 and 1961 a great number of students viewed courses on television as an integral part of their regular school program. Many college students and home viewers also watched a variety of programs either for credit or general enrichment.

Television has demonstrated to the people of New York that it can be effective at all levels in helping solve problems dealing with expanding population, shortage of teachers, exploding curriculum, and rising building and operational costs.

In Columbus, Ohio, an experiment was undertaken during 1959-62 to test the effectiveness of television in education (16:79-81).

During the first year of the experiment, the emphasis was on quantitative measurement of the comparative effectiveness of TV and conventional instruction. The

experiment involved tests with large classes in health science in junior high schools, English for tenth-graders, and remedial mathematics and health education at the university level.

Standard achievement tests adapted for the purpose of the project were used to determine students' information gain. Data was also sought concerning students' aptitudes, attitudes, and personal qualities through the use of a number of tests. Approximately 3,000 students were enrolled in the four different courses. Following this initial phase of the experiment, the emphasis was shifted to utilization, the informal evaluation, and further testing.

In 1960 experimentation was begun with a university course in zoology. Comparisons of results of testing the differences between conventional and TV sections at the end of the first spring of use led to the planning of TV lessons four times a week for all students. In addition, they attended a conventional laboratory class once each week, beginning in the fall of 1961. Objective tests were administered to the students throughout 1961-62. The overall conclusions drawn from this experiment were:

1. Television does change the role of the teacher. The classroom teacher becomes a member of a teaching team, sharing with the TV teacher the teaching role in the classroom.

2. Television forces re-evaluation of course content, method and organization. For some departments, this re-examination may prove to have been the most important outcome of the project.

3. Television enriches the content of the course.

4. Important changes in attitude toward television usually result from first-hand experience with its use.

5. Changes in student attitudes were less marked and more difficult to assess. In general, students have a favorable attitude toward television if they are doing well in the course. If they are receiving average or poor grades, there is a tendency to rationalize that television is at fault.

6. Instructional use of TV requires re-evaluation of TV techniques.

7. If television instruction is to be effective, good classroom utilization must be developed.

8. Where a specialist is available as a classroom teacher, there may be less need for television.

9. Most existing classrooms are not technically adequate for good television reception and utilization.

10. Although only minor significant differences were revealed in tests of learning by television there was a notable increase in the general knowledge about television as an education instrument and resource (16:81).

Another experiment testing the effectiveness of television in education (11:81-82) was conducted at the University of California School of Dentistry. The purposes

of this study were (1) to determine if a statistically significant loss of retention of instruction takes place during a two-day period in sophomore dental education, and (2) to compare achievement between groups receiving instruction by televised demonstration and by lecture illustrated with color slides. The results of this study showed that:

1. Dental students forget a significant amount of what they learn from a lecture if they wait for two days before applying it in the laboratory. Television can aid retention of knowledge giving a demonstration to the students while they are at the laboratory table so they can utilize the knowledge immediately.

2. When achievement was compared between groups receiving instruction on crown preparation by televised demonstration and by lecture illustrated with color slides, it could not be shown to differ, despite a televised demonstration that was satisfactory for only some of the steps in preparation.

3. Students who receive satisfactory instruction by television that can be applied immediately will score higher in achievement than those who receive satisfactory instruction by classroom illustrated lecture that cannot be applied for several days (11:82).

St. Petersburg Junior College was faced with one of its largest enrollments in the history of the school. It was decided to inaugurate instructional television in the area of biological science (5:56-57).

Three times each week, 638 students watched television in the auditorium via closed-circuit television. The course was presented on Monday, Wednesday, and Friday

in the morning for 319 students and repeated in the afternoon for the remaining 319 students.

Enrollments that normally require twelve sections and three instructors were sufficiently handled by two sessions and two instructors thereby releasing much needed classroom space and making an additional science instructor available for classroom teaching.

By utilizing the closed-circuit method of teaching biological science, the need for procuring films and visual aids for use over an extended period of time was eliminated. Outstanding authorities in the field of biology appeared before all students taking the course with the convenience of just one presentation. Normally this required a number of presentations as a class would be approximately 50 students. The presentation could also be recorded on video tape for future use.

The following quote expresses the opinion regarding television at St. Petersburg Junior College:

> We feel that television teaching is a step in the right direction which permits us to not compromise our principles and at the same time provide students at St. Petersburg Junior College with the best course material and teachers available (5:57).

Because the University of Akron was feeling "growing pains," it initiated a closed-circuit system to aid its enrollment problems (13:1-4). Thirty-five classrooms were equipped for TV reception with as high as six receivers

placed in a particular classroom. At the present time 1,100 students may view a televised lesson at one time.

The television network was equipped with "talkback facilities" so that students in most of the classrooms could ask the instructors questions.

The University laid more than six miles of cable in order to link the campus, making it possible to transmit nine simultaneous programs over the TV system. There can be three programs originating from the studio and six off-the-air programs going on at once.

While the system is not large, it will be a great aid in the instruction of a large enrollment, as the faculty-student ratio continues to climb.

THE COST OF TELEVISION

Closed-circuit systems within a given school or group of schools are initially expensive but may have a great deal of flexibility. As many lessons can be sent out simultaneously as there are facilities to originate, and the school can custom-tailor its schedule to its own needs. The use of video tape recordings is now eliminating the need for many studios.

In six case studies previously referred to in this chapter, the following initial amounts were spent for closed-circuit facilities:

> Washington County School System--44 schools, 700 receivers, $300,000; Evanston Township High School--one school, $30,000; Conley Hills Elementary School--one school, $35,000; University of Missouri--30 classrooms, $250,000; University of Akron--35 rooms, $64,000; and Stephens College--60 classrooms, $75,000 (2:372).

These prices vary according to the facilities needed, and the extent to which closed-circuit is utilized. In all cases tentative plans called for further expansion of these facilities.

Due to the flexibility of television, school systems and colleges have been able to realize a savings in teacher salaries and construction costs. Anaheim, California, reported the following savings during 1962:

> The plan made possible by television amounted to an annual saving of $115,000 in teachers' salaries over those required for an equivalent number of self-contained classrooms. At least $396,000 in construction costs for new classrooms plus the cost of a new school site already have been saved. Future conversions of five cafetoriums and auditoriums for instructional television save the cost of a new 12-classroom school, or an additional $435,000 (3:13).

In Dade County, Florida, the employment of cafeterias and auditoriums for large TV classes has permitted a huge saving in capital construction costs. Approximately three million dollars were saved as a result (7:6).

Penn State released the following figures during 1961 regarding the cost of television:

> A survey of four courses showed that the cost per student-semester hour was only $5.44 for televised instruction, compared with $9.48 for conventional methods (7:5).

SUMMARY

The review of research indicates that much is being done in experimenting with instructional television. Results either show a positive gain with instructional television or no significant difference when testing the effectiveness of this medium as a teaching method. There have been very few indications of negative findings in the examination of the related research.

The major point influencing the use of instructional television is the initial cost. If a reduction in cost is the only justification, television will have to be used with courses that have large enrollments. The cost per pupil becomes smaller as the number of people being taught via television increases.

Most of the major research indicates a bright and exciting future for the use of television in education. New and revolutionary it is, indeed, and it does have some drawbacks; yet, it offers a great deal to institutions facing problems of expanding enrollment.

CHAPTER III

METHODS USED

The main purpose of this study was to show how instructional television can help solve problems stemming from a lack of adequate physical facilities. The results of this study will be used to formulate proposals to utilize instructional television more efficiently in the present physical facilities at Central Washington State College.

The steps involved in attacking the problem defined in this study were: (1) surveying and analyzing the class sizes in different departments to identify large-class sections and the areas of potential growth; (2) interviewing the Director of Institutional Research at Central for statistics concerning projected growth in enrollment and physical facilities; (3) a review of the literature to determine whether or not instructional television offers possible answers to problems of this nature; (4) devising a questionnaire from the findings and sending it to institutions teaching courses via television; (5) analyzing data from the questionnaires; (6) consulting the Director of Auxiliary Services and head residents for information regarding the number of recreational and lounge areas in the dormitories; (7) interviewing the manager of the Ellensburg Television Cable Company for cost figures concerning

possible alternatives at Central; (8) making recommendations for Central Washington State College based on the data secured.

The first step was to ascertain which class sections at Central were realizing a rapid increase in enrollment. In determining the areas of large growth, information sheets on the number of class sections in each course offering and the size of individual sections from 1960 to 1966 were studied. The department chairmen of the following departments were interviewed to gain further information on crowded class conditions and the use of graduate assistants and staff: Art, Biological Science, Chemistry, Economics and Business, Education, Psychology, English, Hebeler Elementary, Music, Physical Education, and Speech and Drama. Also interviewed were the Director and Assistant Director of Bouillon Library, the Dean of Men, Dean of Women, Dean of Education, and the Director of Institutional Research.

Dr. Daryl Basler of the Institutional Research Department at Central was consulted for figures dealing with future growth, including projected enrollment, physical facilities, present class size average, present teaching areas, the proposed building program, and cost estimates of the buildings to be constructed.

A review of the pertinent literature was helpful in determining whether or not instructional television was a

possible approach to problems of increasing enrollment. Sources surveyed in the review were books, pamphlets, periodicals, brochures, and articles relating to the history of instructional television and its uses in education.

Following this investigation, a number of colleges and universities teaching courses via television that coincided with the large-class sections at Central Washington State College were selected. Selections of these courses were based on those that had student enrollments of at least 200 for the three quarters of the academic year. This excludes the summer session. Carpenter and Greenhill compared the cost of television instruction with the cost of conventional instruction at Pennsylvania State University and found television saved money when 200 or more students could be taught a given course at a time (12:43). The institutions were chosen from the 1965 Compendium of Televised Instruction published by Michigan State University. The final number selected was thirty-nine (39). To be certain that the courses chosen from the Compendium were similar to those taught at Central, the course descriptions were examined in the individual college and university catalogs.

The plan involved sending a general questionnaire and specific course questionnaires to the institutions

selected from the Compendium (See Appendix A). Each institution received one general questionnaire and as many specific course questionnaires as they had courses similar to those at Central.

The general questionnaire was designed to gather data on the number of full-time and part-time personnel (including student help) involved in the production of televised lessons and how long the lessons have been produced (See Appendix B).

The specific course questionnaire was designed to gather data on whether increasing enrollment was a major factor in utilizing instructional television, whether difficulty in obtaining a teaching staff was a major factor, information on the length of time the course has been televised, whether the course is video taped, class sessions per week and their length, the utilization of full-time and part-time personnel (including student help) in producing the course, and a course evaluation (See Appendix C).

The questionnaire encompasses such a large scope due to the fact that it is also the instrument for a companion study concerning instructional television from the personnel aspect, being conducted by Patrick J. Kennedy.

Conversations with Mr. Wendell Hill, Director of Auxiliary Services, and the head residents of the dormitories

on campus revealed a number of possible classroom areas in these facilities. This information was gathered for possible alternatives in utilizing the present television facilities. This is further discussed in Chapter V.

Mr. Roy Morrison, manager of the Ellensburg Television Cable Company, was interviewed for cost figures relating to installation costs for closed-circuit systems. Information was also gained concerning the limits and possibilities of the present television facilities at Central.

The findings of the study are organized to give a picture of increasing enrollment compared to the growth of the facilities projected for the future. The data gained from the questionnaire is presented in table form providing ready access to primary information. The cost of tentative expansion of television facilities at Central is given along with the cost of future physical facilities. These are presented in a form of comparison to show which is more feasible in the form of capital outlay. Future possibilities for utilizing the present television facilities are given to show flexibility with the use of instructional television.

Chapter V is a review of the findings of this study and presents the author's opinion regarding the feasibility of instructional television at Central Washington State College.

CHAPTER IV

THE FINDINGS

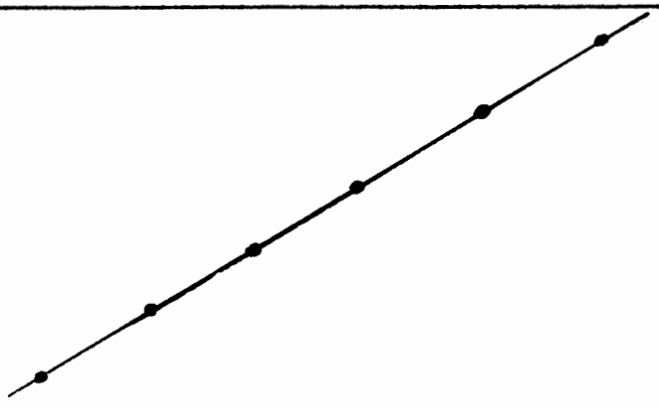
I. ENROLLMENT AND PHYSICAL FACILITIES

The enrollment at Central Washington State College has been steadily increasing in recent years and the administrative staff has predicted a continual increase of approximately eight hundred students per year. A recent factor that could alter the projected enrollment was the passage of the Cold War GI Bill. Table I shows the predicted growth for Central until the year 1970.

TABLE I

PROJECTED GROWTH OF ENROLLMENTS

Number of Students	1965	1966	1967	1968	1969	1970
8550						
7750						
6950						
6150						
5350						
4550						



The building program of the sixties has added much to the available classroom space. During this period the Student Union Building was remodeled; the Bouillon Library was completed; Black Hall was built to house the Education and Psychology Departments; Hertz Music Building was recently completed; the old library and the classroom building were remodeled into the Shaw-Smyser Building; and some World War II prefabricated barracks were reconditioned for additional space.

During this same period, nine dormitories were constructed along with four new dormitories which are presently under construction.

Central Washington State College is presently undertaking a building program that will cost approximately twenty million dollars. The program will provide a fine arts complex, language and literature building, science building, large student housing complex, student union addition, health center and an administrative annex. Construction of this multiphase project will be staggered and influenced by availability of funds, especially passage of Referendum 15 during the November, 1966, election. Table II shows a summary of the buildings that will add instructional space to the physical facilities.

There are also forty-eight other suitable teaching areas at Central that do not fall under the categories of classroom or laboratory.

TABLE II

INSTRUCTIONAL SPACE ADDITIONS

Building	Number of Classrooms	Number of Laboratories	Constr. Date	Est. Cost
Science	7	25	1967	$2,100,000
Administration	6-8	0	1967	$1,012,500
Fine and Applied Arts Complex	4	35-40	1968	$2,883,728
Language Arts	20	2	1968	$1,853,865

Table III shows the growth of instructional space that will result from this program.

TABLE III

GROWTH OF INSTRUCTIONAL SPACE

Facility	1966	1967	1968
Classrooms	72	87	101
Laboratories	33	58	100

The student housing to be added under the building program will cost approximately 3,293,500 dollars. This three-phase project will be on land east of Nicholson Pavilion and will eventually provide for 1,800 students. The first phase provides for 565 students and includes dormitories for 252, four co-operatives for sixty students and seventy-three apartments for single, upper division and graduate students. Construction will begin this summer if funds are available.

A student union addition costing 2,022,500 dollars has also been proposed. The addition is designed for an enrollment of ten thousand and will be built when funds are available on land adjacent to and north of the present student union building.

An industrial arts building costing 1,441,864 dollars is presently in the early planning stages.

In addition to the previously mentioned building program, there are preliminary plans for the expansion of the library, physical education, and education-psychology facilities. If completed, these would add thirty-seven classrooms and sixty-five laboratories besides those already mentioned in the proposed building program.

During the period of 1960 to the present, the number of students per class has remained at an average of twenty-three. The retention of small class sizes plus the increased

enrollment has brought about an increase in the number of sections offered during each quarter. In selecting courses for this study, those with enrollments of two hundred students per year or eight sections were used. Table IV shows the growth trends of these courses since 1960. The reader is reminded that some of the courses are recent additions to the college curriculum.

II. RESULTS OF THE QUESTIONNAIRE

Using the previously mentioned courses, a questionnaire was devised and sent to institutions teaching similar courses via television. Thirty-nine colleges and universities were questioned. Thirty of the institutions returned the questionnaire; one abstained from completing it; and eight did not reply. This gave a seventy-seven per cent return. After evaluation of the questionnaire, Antioch College was eliminated, because television was only being utilized on a part-time basis. This left twenty-nine participating institutions for a percentage of seventy-four. Of the original sixty-six course questionnaires (See Appendix B), forty-five questionnaires or sixty-eight per cent were used in this study. The remaining twenty questionnaires were those that were not returned.

The courses in this study vary greatly in the number of years that they have been taught via television. Some

TABLE IV

GROWTH TRENDS OF COURSES

Course Number	Number of Section per Year					
	60-61	61-62	62-63	63-64	64-65	65-66
Art 100	23	24	22	5	11	16
Biology 102			7	7	11	12
Education 207	14	15	11	13	14	17
Education 314	14	19	15	16	16	19
Education 319	6	6	11	12	12	15
Education 322	7	6	8	10	13	14
Education 323	6	0	0	7	10	12
Education 420	5	4	6	6	9	11
Education 490	11	24	22	21	23	26
English 101	23	30	34	27	42	44
English 105					9	13
English 201	15	15	15	19	20	22
English 301	10	10	10	11	15	17
Geography 100	12	14	14	14	13	15
Health 100	21	23	22	22	11	14
Home Economics 200	14	18	18	15	9	9
Psychology 100	15	12	14	16	16	18
Psychology 309	9	15	15	15	18	26
Psychology 310	12	15	13	15	19	24
Sociology 107				3	12	17
Speech and Drama 201	15	18	17	19	20	21
History 252, 253, 254					17	19

of the courses have been taught via television since 1955, while others started as late as 1965.

Primary reasons given for initiating instructional television at the institutions questioned are shown in Table V.

TABLE V

PRIMARY REASONS FOR UTILIZING TELEVISION

Reason	Yes	No
Increased Enrollment	29	15
Lack of Space	9	33
Insufficient Staff	19	25

A number of secondary factors were also reported for utilizing instructional television. These are shown in Table VI.

Courses that are being taught via television are often repeated during the school year. This is especially evident when a video tape recorder is utilized. Table VII shows the distribution of these courses.

Twenty-five of the courses were repeated by the use of a video tape recorder. Twenty-one were repeated during the same day as the origination of the lesson. Schedule flexibility, remedial help, and flexible review were listed

TABLE VI

OTHER FACTORS FOR UTILIZING TELEVISION

Reason	Number of Times Reported
Improving Quality of Instruction	21
Opportunity for Demonstration	4
Lack of Facilities	1
Increased Enrollment	4
Standardization	1
Released Time	1
Lack of Faculty	1

TABLE VII

ANNUAL REPETITION OF COURSES

Times Offered	Number of Courses
1	2
2	27
3	9
4	1
6	1
8	1
12	2

as reasons for the daily playback of the televised lessons. These were in addition to the regular playbacks necessary in teaching the course.

Individual course enrollments reported in this study were very large. During the fall quarter of the school year the average enrollment per course was 584, winter quarter enrollment was 431, and spring quarter enrollment was 456. The course average for the year was 507. Summer quarters were not included.

The televised courses are being viewed in four types of receiving rooms. Table VIII shows the number and types of receiving rooms that were reported.

TABLE VIII

TYPES OF RECEIVING ROOMS

Facility	Number
Small Classrooms (30-60)	33
Large Classrooms (60-100)	14
Auditoriums	18
Gymnasiums	1

Within each receiving room, the size of the class varies greatly. Table IX gives a summary of the group sizes and number in each category reported.

TABLE IX

RECEIVING ROOM GROUP SIZES

Group Size	Number of Viewing Groups
Under 50	30
50-100	17
100-150	10
150-200	5
200 plus	6

One of the chief criticisms of television has been the lack of personal contact between the instructor and student. Of the courses in this study, only fourteen had facilities which allowed the student to question the television instructor. Four of the questionnaires indicated that the lack of these facilities hindered successful teaching. Thirty-eight others indicated that successful teaching was not hindered.

In the final evaluation of the courses being taught via television, the majority reported a favorable attitude towards the use of instructional television. Table X summarizes these findings.

TABLE X

ATTITUDES TOWARD INSTRUCTIONAL TELEVISION

Attitude	Student Opinion of Televised Courses	Opinion of Entire Faculty of Teaching Via Television
Strongly Approve	5	2
Approve	29	19
Disapprove	3	11
Strongly Disapprove	0	1
Total	37	33

This data indicates ninety-two per cent of the students either approved or strongly approved of televised lessons in the course or courses they attended. Sixty-four per cent of the entire faculty either approved or strongly approved of teaching via television. The reader is reminded that these figures are a result of the consensus of opinion as reported by the person completing the questionnaire.

IV. ALTERNATIVES WITH TELEVISION

It was learned through conversations with Mr. Wendell Hill, Director of Auxiliary Services, and the head residents of the dormitories on campus that a number of areas are available that could be used for instructional television viewing rooms. Most of these areas are not used parts of the day and are situated so that they can be isolated for this use. Televised courses could then be transmitted to these areas for student viewing.

The previously mentioned rooms are recreation rooms, lounge areas, and TV rooms located throughout the dormitories. They are located in basements, on main floors, or upper stories of each dormitory. They are not to be confused with the individual study rooms that exist in many of the newer dormitories.

An interesting feature of the two new high-rise dormitories is that each floor has a lounge that can be readily equipped for television. These lounges are to be utilized by the thirty people living on each of the eight floors. There are also two large recreational areas located in each dormitory.

Table XI shows a summary of the potential classrooms that exist in the dormitories. The seating capacity is an estimated number based on fourteen square feet per student. This figure could be increased or decreased by the types of furniture used in these lounge areas.

TABLE XI

POTENTIAL CLASSROOMS EXISTING IN DORMITORIES

Dormitory	Number of Rooms	Approx. Seating
Anderson	1	56
Beck	7	94
Barto	1	155
Building E (Not Named)	6	77
Building F (Not Named)	6	77
High-Rise Dorms (2 Units)	20	350
Hitchcock	7	89
Jennie Moore	1	56
Kamola	2	133
Kennedy	2	59
Meisner	7	89
North	3	110
Sparks	5	66
Stephens	1	71
Sue	2	84
Whitney	1	71
Wilson	3	116
TOTAL	75	1,753

The only problem for transmitting programs would be the ease and cost of wiring the dormitories with coaxial cable. The new dormitories are being constructed with conduit for any future electrical or electronic expansion. The Director of Auxiliary Services felt that the older dormitories could be wired with very little difficulty.

Instructional television can also be utilized in a dormitory by the individual student. As long as the dormitory is wired for television, the only additional expense would be for receivers. A small receiver such as a five or nine-inch model would cost a little more than one hundred dollars if purchased in large quantities. To give an example, Radio Corporation of America makes a twenty-three-inch model adaptable for closed-circuit television that sells for approximately 150 dollars (20:1).

Individual instruction would eliminate the need for much classroom space and utilize the already existing dormitory facilities. Central's dormitories now house 1,742 students and with the completion of the four new dormitories for next fall, student housing will accomodate 2,800 students.

The public school facilities are another instructional area that college classes might use. The use of these facilities will require mutual cooperation and the resolving of many legal problems. If it were possible, there

are approximately 110 classrooms available in the Ellensburg Public Schools along with six gymnasiums and an auditorium that could be available practically every evening. This could provide a telecasting period of six hours beginning at 4:00 p.m.

All of these schools are presently equipped with coaxial cable that allows transmission from the individual school. The manager of the Ellensburg Television Cable Company indicated that a price between ten to twenty thousand dollars would be required to equip these schools with both transmitting and receiving facilities. They could be equipped for receiving only by utilization of the present maintenance crew for a few hours during the day. There is also the possibility of installing a switching device to allow one school, such as the senior high school, to switch back and forth between transmission and receive. This device would cost approximately twenty-five hundred dollars to install.

III. COMPARISON OF COSTS

Recently the Aero-Marc Company of Seattle, Washington, prepared a cost statement for a closed-circuit television studio at Central Washington State College (1:1-20). This studio would have full facilities whereby briefings, lectures, conferences, programmed performances, video

tape, and film series could be presented to classrooms through the medium of closed-circuit television. With these facilities it would be possible to control and transmit the following types of programming:

A. Live programs utilizing all forms of visuals.

B. Film and slide presentations.

C. Pre-recorded video tape programs.

D. Combinations of A, B, C, above, through special switching circuits.

This system would enable individual viewing rooms to select from any of five simultaneous closed-circuit channels. The system could easily be altered to include all twelve channels of the VHF spectrum.

The total cost of this system is eighty-two thousand dollars. Included in this amount are two video tape recorders which would add a great amount of flexibility to the programming. These recorders originally would have cost twenty-five thousand dollars, but this price has been reduced to approximately eighteen thousand dollars (23:1).

The tape recorders mentioned in this cost estimate are SONY PV 120U models. They are capable of playing a seven-inch reel of tape for a maximum of eighty-four minutes. Video tape for a sixty-minute presentation can be purchased for seventy-five dollars a reel (23:4), or in lots of twenty-five which receive a five per cent discount. This would make the price of the individual reel approximately

seventy-one dollars. Video tape can pass the recording head approximately 1,000 times before becoming ineffective.

Utilizing the previous figures, a five-credit course based on the quarter system would cost thirty-five to forty-three hundred dollars in tape alone. This price takes into consideration that a course would be from ten to twelve weeks in duration and would meet five times a week. Each lesson, therefore, would require seventy-one dollars for video tape.

Normally coaxial cable would have to be installed in selected areas for transmitting and receiving programs. Central, however, already has a dual system which allows programs to be transmitted and received simultaneously at Black Hall, McConnell Auditorium, Shaw-Smyser Building, Hebeler Elementary School, Bouillon Library, and Hertz Music Building. (See Appendix D). This system allows programs to be transmitted from the Bouillon Library to any one of the previously mentioned buildings. Equipment can also be moved to any of these buildings for the origination of a program.

The original cost for wiring is quite expensive, but it will last for fifteen to twenty years. The Jerrold Electronics Corporation has estimated that inter-school cable can be installed for thirty-five hundred dollars per mile (8:16). In addition, each individual building would

have to be wired as this cost estimate only covers the cable leading to each building. To wire a classroom building of approximately twenty rooms would involve an expense of about two thousand dollars. A dormitory system to serve individual students would involve a sum of about four thousand dollars. The reader is reminded that these costs are only estimates for a basis of comparison.

The receivers for the receiving room are another cost to be considered. Most classrooms will need at least two receivers. In large classrooms or auditoriums, the number will be determined by the coverage needed. James Tuck stated that at Buena Vista High School in Saginaw, Michigan, 130 students utilized six receivers (12:105). A receiver, then, would serve approximately twenty-one students. As previously mentioned, RCA produces a twenty-three-inch model for closed-circuit television costing one hundred fifty dollars.

Two final costs must be considered for equipping a receiving room. The first would be the price of coaxial and audio cable utilized in the receiving room to connect the receivers to the source of the incoming signal. This wiring for two receivers at Central consists of approximately thirty-six feet of coaxial cable and eighteen feet of audio cable. It is presently being used in classrooms which have dimensions of approximately twenty-seven by

thirty-five feet and seats forty-five to fifty students. This cable is also used in lecture classrooms of amphitheater style measuring approximately thirty-one by thirty-seven feet and seating eighty people. The cost of this cable and connections are estimated at a cost of not more than ten dollars per room. The final cost for the receiving rooms would be the receiver stands. A stand can be purchased from RCA for approximately thirty-five dollars (19:1).

To compare the cost of television to traditional instructional space, the Office of Institutional Research at Central was consulted for figures concerning the present building costs. The present requirements list that twelve to fourteen square feet is necessary for the individual student in the classroom. The price of a square foot of classroom space ranges from twenty-two to forty dollars with an average of twenty-five dollars. This means that the individual seating space in a classroom costs approximately three hundred and fifty dollars per student. If an average of thirty-five students is considered when building a classroom, the student area alone would be about 490 square feet. At this cost per square foot, a small twenty by thirty or six-hundred-square-foot classroom would be approximately fifteen thousand dollars. A large twenty by forty or eight-hundred-square-foot classroom would cost approximately twenty thousand dollars.

When comparing the cost of building television studio facilities at Central, the studio could be built at a cost of sixteen dollars per student for a one-year period. This is based on the entire enrollment for the fall of 1966, not just those using the television facilities. This amount would be in addition to the funds already proposed for the building program.

The cost of television is an additional expense when the traditional facilities on campus are used. However, on an amortized basis the cost is not prohibitive. In this way, a cost is spread over a consecutive quarter basis, and the longer it is used, the more the cost decreases.

If a course of two hundred students is taught in small groups of twenty-five, it will require eight sections per quarter and total twenty-four for the year. To instruct these students would require the use of one classroom for eight periods. The school day at Central is presently ten periods long, so eight sections would require eight-tenths use of the facilities.

To find the average cost per quarter of one classroom for conventional methods, the price of a small classroom (15,000 dollars) is amortized over a period of twenty years, each year is divided into four quarters, and then further divided into ten parts to get the cost for one class period. To arrive at a cost per student requires

dividing the number of students (average of twenty-five per class) into the cost for one period. The reader is reminded that the figures on the following tables are based on a total number of two hundred students.

The life expectancy of all facilities and television equipment is figured into the cost. Life expectancy is based on an approximate time that the facilities and equipment can be used without replacement. Using the previously mentioned method of amortizing, the cost per quarter and student for each item is gained.

The price for wiring was previously quoted as two thousand dollars for a twenty-room classroom building, so the cost for one classroom is one hundred dollars. The average distance from the studio to the classroom is considered one-eighth of a mile for a cost of four hundred thirty-eight dollars for the building. This requires dividing thirty five hundred dollars, the cost of one mile of installed cable by the number eight. The cost for cabling is then further divided by twenty to get the cost for the individual room.

The cost of receivers would total twelve hundred dollars per room over a twenty-year period. This would be utilizing two receivers in each room, and the period of life expectancy of the receivers is estimated at five years.

The cost of studio facilities and video tape are

two additional costs that are involved with television teaching. The eighty-two thousand dollar cost of the entire studio facilities is spread over a fifteen-year period, but the cost of only one quarter is charged since video tape is used to record the original lesson allowing the lesson to be repeated any number of times. This cost is further divided in half since each televised lesson would require about four hours studio time and another lesson could be produced during the same day.

The price of video tape is based on a maximum of forty-three hundred dollars for a five-year period and a total of 17,200 dollars for a twenty-year period. This cost is for taping a course of twelve weeks which meets five days a week.

Table XII summarizes this data and presents a comparison of facility costs for conventional and televised teaching in small groups.

Using the same enrollment of two hundred students, the costs for a large classroom are now considered. This classroom is capable of seating a maximum of eighty students, so the same number of students can be accomodated in only three periods of the day. The costs are computed the same way but the cost of a large classroom (30,000 dollars) and the addition of two receivers for added coverage must be considered. Table XIII summarizes this data and presents a comparison of facility costs for conventional and television teaching in large groups.

TABLE XII

COMPARISON OF FACILITY COSTS OF CONVENTIONAL AND TELEVISION TEACHING BASED ON SMALL LEARNING GROUPS (25 STUDENTS)

		Fall	Winter	Spring
Conventional Teaching	Cost per Consecutive Quarter	$150.00	$150.00	$150.00
	Cost per Student	.75	.75	.75
Television Teaching	Classroom (20)	150.00	150.00	150.00
	Wiring (20)	1.20	1.20	1.20
	Receivers (5)	12.00	12.00	12.00
	Studio (15)	683.00	---	---
	Video Tapes (5)	860.00		
	TOTAL	1,706.20	163.20	163.20
	Cost per Consecutive Quarter	1,706.20	934.70	677.53
	Cost per Student	8.53	4.67	3.39

TABLE XIII

COMPARISON OF FACILITY COSTS OF CONVENTIONAL AND TELEVISION TEACHING BASED ON LARGE LEARNING GROUPS (80 STUDENTS)

		Fall	Winter	Spring
Conventional Teaching	Cost per Consecutive Quarter	$112.50	$112.50	$112.50
	Cost per Student	.56	.56	.56
Television Teaching	Classroom (20)	112.50	112.50	112.50
	Wiring (20)	.45	.45	.45
	Receivers (5)	9.00	9.00	9.00
	Studio (15)	683.00	---	---
	Video Tapes (5)	860.00		
	TOTAL	$1,664.95	$121.95	$121.95
	Cost per Consecutive Quarter	$1,664.95	$893.45	$636.28
	Cost per Student	8.32	4.47	3.18

The reader is reminded that the cost of revising video tapes has not been included in the previous two tables. Evidence from the questionnaire indicates this is usually done on a quarterly or yearly basis. An estimate of one-third to one-half of a quarter's use of the studio facilities should be allowed for revision of tapes.

Two other types of facilities are considered but only for the use of television. These are dormitory facilities for groups and individual rooms for viewing.

The size of lounge areas in the dormitories vary, but a number are capable of seating one hundred students at a time. This would allow a group of two hundred students to view a televised lesson in two periods. In computing the costs for dormitory facilities, the cost for classroom space is not considered and the telecasting time is reduced to six hours since these areas are used for recreational purposes after two p.m. The price for the studio and video tape remains the same as for the other facilities. Other costs to consider are an average dormitory wiring fee of two thousand dollars, one-fourth mile of installed cable at eight hundred and seventy-five dollars, and a cost of three thousand dollars for five receivers over a twenty year period. Five receivers allow for the increased number of students viewing the lesson.

Utilizing individual dormitory rooms requires a

receiver for at least every four students. This would be a cost of twenty thousand dollars over a twenty year period. Wiring all of the individual rooms would be estimated at a cost of four thousand dollars per dormitory, and the distance would be estimated at one-fourth of a mile for a cost of eight hundred seventy-five dollars for installed cable. Again there is no price involved for classrooms, and the cost for studio facilities remains the same. It would now be possible for all two hundred students to view the televised lesson in one period since dormitories such as the new high-rise accomodate more than this number. It would be relatively easy to telecast lessons to individual rooms during any hour of the day, reducing the cost of television facilities even more. To make a final comparison, however, a ten-period day will be considered.

The costs for all of the previously mentioned facilities are summarized in Table XIV.

TABLE XIV

COMPARISON OF FACILITIES' COSTS FOR CONVENTIONAL TEACHING AND TELEVISION TEACHING FOR SMALL OR LARGE GROUPS AND TELEVISION TEACHING UTILIZING DORMITORY GATHERING AREAS AND INDIVIDUAL ROOMS

			Fall	Winter	Spring
Conventional Teaching	Small Groups	Classroom Cost	$150.00	$150.00	$150.00
		Cost per Student	.75	.75	.75
	Large Groups	Classroom Cost	112.50	112.50	112.50
		Cost per Student	.56	.56	.56
Television Teaching	Small Groups	Classroom Cost	1,706.20	934.70	677.53
		Cost per Student	8.53	4.67	3.38
	Large Groups	Classroom Cost	1,664.95	893.45	636.28
		Cost per Student	8.32	4.47	3.18
	Dormitory Rooms	Equipment Cost	1,567.50	796.00	538.83
		Cost per Student	7.84	3.98	2.69
	Dormitories Indiv. Rooms	Equipment Cost	1,574.10	807.60	548.77
		Cost per Student	7.87	4.04	2.74

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The results of this study show that Central Washington State College is presently experiencing a period of rapid growth that will continue for some time. Predicting future enrollment is difficult, but the present trend indicates that Central will have a student body of ten thousand by the early 1970's.

During the years 1967 and 1968, a building program intended to keep pace with the expanding enrollment will be undertaken. The building program will add classrooms and laboratories for science, art, home economics, and language arts. Included in the program are plans for housing additions, a health center, a student union addition, and an industrial arts building. Not considering an industrial arts building, which is only in the very early planning stages, these facilities will bring the total classrooms to 111 and laboratories to 100.

The building program is needed to provide classrooms and laboratories, but the number could possibly be reduced by the use of instructional television. It is true that some subjects require traditional space for practical laboratory work, but possibly the number of areas could be reduced by the use of television.

One of the items discussed in Chapter IV was the use of dormitory facilities which are presently not used for instructional purposes. These areas are not utilized until approximately two p.m. each day. The major change that would be needed to equip these buildings for instructional television would be the installation of coaxial cable for the viewing areas. Many of the dormitories are equipped with conduit and would be relatively easy to cable for television. The remaining dormitories would not present a difficult or expensive problem. As previously mentioned in Table XI, the space in these areas could seat over 1,700 students at one time. This figure represents 75 sections based on the student class average of twenty-three found at Central.

The public school system could provide approximately 110 classrooms, providing all legal aspects could be resolved. These facilities could be utilized from 4:00 to 10:00 p.m. almost every day. This program would provide far more classrooms and teaching areas than the building program for 1967 and 1968. Such a program is a revolutionary step, but one which could possibly present a saving in cost.

Instructional television makes it possible for students to view televised courses in their individual dormitory rooms. Central presently has dormitory facilities

for 1,742 students and will reach a total of 2,800 students with the addition of four new dormitories next fall. This possibility should be considered for the savings involved. These costs are summarized in Table XIV of Chapter IV.

The results of the questionnaire and review of literature show that large groups can be taught effectively by instructional television. The questionnaire revealed that the number of students in televised courses averaged 507 students per quarter during the regular school year. Central has five courses that have an enrollment this large.

The building of lecture auditoriums seating 300 to 500 students, such as the one at the University of Texas, is another approach to handling large-class enrollments (24:1-16). This teaching auditorium was built specifically for large-class instruction with ideal acoustics, seating patterns, lighting, communications system, etc. This could possibly be a trend that will be adopted by many institutions as enrollment increases.

A major point to consider is the flexibility which a video tape recorder gives television teaching. Conventional teaching methods have no way of repeating a lesson for remedial help or review unless the instructor presents the lesson again or makes an audio tape of the lecture. Video tape can be used to record the original presentation and can be played back any number of times with the

instructor acting as a discussion leader, individual tutor, researcher and planner for revising a video tape, or the instructor for new recorded lessons.

The use of video tape could extend the school day until 10 p.m. without utilizing a full faculty in the evening hours. With conventional teaching methods, each time an instructor presents a lesson, time must be allotted for lesson plans, class preparation, and the actual preparation itself. Video tape, however, captures the original presentation and allows the lesson to be played many times without duplication of this effort. This flexibility then brings about greater use of the facilities and provides a reduction in cost.

The number of institutions questioned in this study is not large, but they are representative of colleges and universities that have had experience with teaching via television. Central has an advantage over many colleges because it has much of the necessary equipment and the technical knowledge necessary to start a program.

Studio facilities which were discussed in Chapter IV provide the major obstacle for initiating a program of teaching via television. The cost of a studio is small when compared to the major building program scheduled for Central. For the cost of 3,600 square feet of classroom space or six classrooms twenty by thirty feet, the necessary studio facilities could be provided. The cost can be

illustrated by a one-year payment of sixteen dollars per student during the school year 1966-67.

The questionnaire responses revealed increasing enrollment as only one of the reasons for utilizing instructional television. A number of responses indicated that improvement in the quality of instruction was a major reason for using instructional television. This is a very favorable statement because the lack of personal contact with students has been considered one of the liabilities of television teaching.

In summary, large enrollments and the lack of physical facilities will require colleges and universities to develop a new philosophy toward the use of instructional media. Conventional methods of teaching will have to be changed to more effectively utilize physical facilities. Superior teachers will be able to use instructional television to reach large numbers of students, wherever they are on campus, for longer periods during the day.

The following recommendations are furnished from the data gathered in this study:

RECOMMENDATIONS

1. It is recommended that Central Washington State College appropriate funds for studio facilities and initiate a program of teaching courses via television.

2. An examination be made of class scheduling and the possibilities of programming with recorded instructional television.

3. An investigation be made concerning the possibility of utilizing dormitory space for teaching via television.

4. An investigation be made concerning the possibility of utilizing the Ellensburg Public Schools for possible classroom space.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Aero Marc Company. Complete Studio System, Budgetary Proposal. Seattle: Aero Marc Company, 1966.

2. Balanoff, Neal. "Six Case Studies in CCTV," Audio Visual Instruction, June 1962. p. 372.

3. Bell Telephone Company. New Focus on ETV. Detroit: Bell Telephone, 1962.

4. Blonder-Tongue Laboratories, Inc. A Guide to Educational Television. Newark: Blonder-Tongue Laboratories, Inc., 1964.

5. Bohan, Robert C. "CCTV Proves Itself," NAEB Journal, November--December, 1962. pp. 56-57.

6. Brown, James W., and James W. Thornton, Jr. (ed.). New Media in Higher Education. Washington D.C.: Association for Higher Education and the Division of Audiovisual Instructional Service of the National Education Association, 1963.

7. Burns, John L. Closing the "Educational Gap" (Statement before Senate Interstate and Foreign Commerce Committee), Washington: March 2, 1961.

8. Clarke, R. Walton. Schoolman's Guide to ETV Communications. Philadelphia: Jerrold Electronics Corporation, 1966.

9. Educational Facilities Laboratories, Inc. New Buildings on Campus: Six Designs for a College Communications Center. New York: Astoria Press, Inc., 1963.

10. Fordham University. "Training by Television: The Comparative Effectiveness of Instruction by Television, Television Recordings, and Conventional Classroom Procedures," AV Communications Review, Winter, 1953. p. 61.

11. Grant, Theodore S., Raymond L. Blancheri, Stanley F. Lorencki, and Irving R. Merrill. "Effectiveness of Television Within the Dental Laboratory," NAEB Journal, March--April, 1963. pp. 81-82.

12. Griffith, Barton L. and Donald W. MacLennan (ed.). Improvement of Teaching by Television. Columbia: University of Missouri Press, 1964.

13. Mavrides, William. "Closed-Circuit Television Facilities at the University of Akron," The Ohio Edisonian, February, 1961. pp. 1-4.

14. McKune, Lawrence E. (ed.). Compendium of Televised Instruction. East Lansing: Michigan State University Press, 1965.

15. National Industrial Conference Board. Road Maps of Industry. School Enrollment. New York: National Industrial Conference Board, 1965.

16. Ohio State University Research Foundation. "Greater Columbus Area ETV Project, Final Report 1959-1962," NAEB Journal, September--October 1963. pp. 78-81.

17. Paltridge, J. G. "Educational Television in the Leading Universities of the United States," NAEB Journal, November--December 1962. pp. 85-86.

18. Philadelphia Public Schools. "Supplementary Report of the National Experiment of Television Teaching in Large Classes," NAEB Journal, March--April 1962.

19. Radio Corporation of America. RCA ETV Stand. Camden: Service Company.

20. Radio Corporation of America. ETV Receivers. Camden: RCA Service Company. (Price quotation from sales representative).

21. Rothchild, Thomas H., and R. Leroy Lastinger. "The Florida West Coast Project for the Utilization of Television," NAEB Journal, January--February, 1961. pp. 75-76.

22. Saylor, J. Galen, and William Alexander. Modern Secondary Education. New York: Rhinehard and Co., Inc., 1959.

23. SONY Corporation of America. Price Schedule. Inglewood, Calif.: SONY Corporation, 1966.

24. University of Texas. An Auditorium Teaching Facility. Austin: University of Texas Press, 1963.

25. University of the State of New York. The Plan of Action for Extending and Improving Educational Opportunities Through Television. Albany: The State Department, 1961.

26. Vogelsang, Robert. A Report on the Development and Current Status of Television in the State of Washington. Olympia: State Superintendent of Public Instruction, 1965.

27. Yakima Daily Republic, May 9, 1966.

APPENDICES

APPENDIX A

INSTITUTIONS RECEIVING QUESTIONNAIRES

Antioch College, Yellow Springs, Ohio

Ball State University, Muncie, Indiana

Central Connecticut State, New Britain, Connecticut

Central Michigan University, Mt. Pleasant, Michigan

College of San Mateo, San Mateo, California

East Carolina College, Greeneville, North Carolina

Eastern Michigan University, Ypsilanti, Michigan

Indiana State University, Terre Haute, Indiana

Indiana University, Bloomington, Indiana

Jacksonville University, Jacksonville, Florida

Kent State University, Kent, Ohio

Marietta College, Marietta, Ohio

Michigan State University, East Lansing, Michigan

Millersville State College, Millersville, Pennsylvania

Northwestern State College, Natchitoches, Louisiana

Oregon State College, Corvallis, Oregon

Pacific Lutheran University, Tacoma, Washington

Pennsylvania State University, University Park, Pennsylvania

Pensacola Junior College, Pensacola, Florida

Rensselaer Polytechnic Institute, Troy, New York

Sacramento State College, Sacramento, California

San Diego State College, San Diego, California

State University of New York, Albany, New York

State University of New York, Brockport, New York

State University of New York, Oswego, New York

St. Mary's College, Winona, Minnesota

St. Petersburg Junior College, St. Petersburg, Florida

Southern Illinois University, Carbondale, Illinois

University of Akron, Akron, Ohio

University of Colorado, Boulder, Colorado

University of Dayton, Dayton, Ohio

University of Detroit, Detroit, Michigan

University of Georgia, Athens, Georgia

University of Miami, Coral Gables, Florida

University of Minnesota, Minneapolia, Minnesota

University of Missouri, Columbia, Missouri

University of Omaha, Omaha, Nebraska

University of Texas, Austin, Texas

Western Michigan University, Kalamazoo, Michigan

APPENDIX B

A FEASIBILITY STUDY CONCERNING INSTRUCTIONAL TELEVISION AT CENTRAL WASHINGTON STATE COLLEGE - FACILITIES CLASSROOMS, AND FACULTY REQUIREMENTS

QUESTIONNAIRE

Institution _____

Address _____

_____

Individuals will not be identified with their responses. The results will be combined with other answers and presented as group data.

☐ Please check here if you wish to receive a summary of this survey.

Name _____

Address _____

_____

Your participation in this study is greatly appreciated.

PLEASE MAIL QUESTIONNAIRE TO: Audiovisual Library
Central Washington State College
Ellensburg, Washington

GENERAL PRODUCTION INFORMATION

PRODUCTION

Indicate the number of full-time personnel involved in the production of television lessons.

Number	Title
_____	Producer-Director
_____	Producer
_____	Director
_____	Floor Director
_____	Audioman
_____	Cameraman
_____	Engineer
_____	Graphic Artist
_____	Photographer
_____	Other (please specify)

Indicate the number of part-time personnel (including student help) involved in the production of television lessons.

Number	Title
_____	Producer-Director
_____	Producer
_____	Director
_____	Floor Director
_____	Audioman
_____	Cameraman
_____	Engineer
_____	Graphic Artist
_____	Photographer
_____	Other (please specify)

How long has your institution produced instructional television programs?

1 year _____ 2-3 years _____ 4-5 years _____ 5-10 years _____

APPENDIX C

DEFINITION OF TERMS

Television Instructor - The instructor who appears before the television camera.

Classroom Instructor - The instructor who meets with the class face to face.

Question and Answer Period - A period to allow students to ask specific questions and receive specific answers.

Discussion Period - A period for interaction between students, instructors, or graduate students.

COURSE NUMBER_____ COURSE TITLE_____

GENERAL INFORMATION

1. What year did you first televise this course?_____

2. Was increasing enrollment a major factor for televising this course?

   Yes_____ No_____

3. Was a lack of adequate classroom space a major factor for televising this course?

   Yes_____ No_____

4. Was the difficulty of obtaining a teaching staff a major factor for televising this course?

   Yes_____ No_____

5. What other major factor was instrumental for the televising of this course?

   Please state _____

6. How many times each year is this course offered via television?

   1_____ 2_____ 3_____ 4_____ Other (please specify)_____

7. What is the average enrollment per quarter in this course?

   Fall_____ Winter_____ Spring_____ Summer_____

8. Is this course recorded on video tape?

   Yes_____ No_____

9. If the answer to the above question is "yes", is this course repeated during the day of origination via video tape?

   Yes _____ No_____

A. If so, for what purpose?

Schedule flexibility_____ Remedial Help_____ Further

Clarification_____ Other_____

B. Is this course repeated via video tape during other quarters or semesters?

Yes_____ No_____

10. Do the facilities allow students to question the television instructor during the television lesson?

Yes_____ No_____

11. Are separate question and answer periods (as defined) provided for classes taught via television?

Yes_____ No_____

12. Do students meet in separate discussion periods (as defined) following the television lesson?

Yes_____ No_____

13. What supplemental materials are used by the students during the television lesson?

Lesson Outline_____ Study Questions_____ Others_____

14. What is the length of each television lesson in this course?

15 min._____ 30 min._____ 45 min._____ 60 min_____

15. What is the length of each lesson in this course when it is taught conventionally?

15 min._____ 30 min._____ 45 min._____ 60 min._____

16. How often are the video taped lessons revised or brought up to date?

Some every quarter_____ Some every year_____

Some every two years_____ Other (please specify)_____

PERSONNEL UTILIZATION

Concerning the weekly work schedule of full-time employees, check the fractional amount of time involved in producing this course.

Title	Full-time	4/5	3/5	2/5	1/5
Producer-Director					
Producer					
Director					
Floor Director					
Studio Teacher					
Audioman					
Cameraman					
Engineer					
Graphic Artist					
Photographer					
Other (please specify)					

Concerning the weekly work schedule of part-time personnel including student help, check the amount of time (in hours) involved in producing this course.

Title	5 Hrs.	10 Hrs.	15 Hrs.	20 Hrs.	25 Hrs.	30 Hrs.
Producer-Director						
Producer						
Director						
Floor Director						
Audioman						
Cameraman						
Engineer						
Graphic Artist						
Photographer						
Other (please specify)						

1. How many television instructors (as defined) are used to present this course (exclude professors in the classroom)?

   1._____ 2_____ 3_____ 4_____ More_____

2. How many lessons per week does each television instructor present via television?

   1-3_____ 4-6_____ 7-10_____ 11-15_____

3. In addition to his television teaching, how many lessons per week does each television instructor teach conventionally?

   1-3_____ 4-6_____ 7-10_____ 11-15_____

4. What assignments do the television instructors have during the following quarter (semester) after the course has been video taped?

   _____ Revises television lessons

   _____ Prepares new television course

   _____ Teaches conventionally

   _____ Serves as a discussion leader for students enrolled in his video taped course

   _____ Meets the class in question and answer sessions for students enrolled in his video taped course

5. How many classroom instructors (Not graduate assistants or students) are utilized in each receiving room to help teach this course?

   0_____ 1_____ 2_____ 3_____ More_____

   A. How many class hours per week do these classroom instructors work with discussion groups (as defined)?

      1-3_____ 4-6_____ 7-9_____ 10-12_____ 13 plus_____

   B. How many class hours per week do these classroom instructors work with question and answer periods (as defined)?

      1-3_____ 4-6_____ 7-9_____ 10-12_____ 13 plus_____

6. How many graduate students are used in each television receiving room to help teach this course?

   0_____ 1_____ 2_____ 3_____ More_____

   A. How many class hours per week do these graduate students work with discussion groups (as defined)?

      1-3_____ 4-6_____ 7-9_____ 10-12_____ 13 plus_____

B. How many class hours per week do these graduate students work with question and answer periods (as defined)?

1-3_____ 4-6_____ 7-9_____ 10-12_____ 13 plus_____

7. Graduate students are also utilized as:

_____ Teachers of the televised lesson

_____ Grading Duties

_____ Other Duties

8. What is the normal number of class hours assigned per week to a classroom instructor who teaches strictly by conventional methods.

7-9_____ 10-12_____ 13-15_____ More_____

USE OF CLASSROOMS

1. The lessons are viewed in:

Academic Buildings	Dormitories
_____ Small classrooms (30-60)	_____Dormitory lounge areas
_____ Large classrooms (60-100)	_____Dormitory classrooms
_____ Auditoriums	_____Student living quarters
_____ Lounge areas	_____Other (please specify)

2. Students view the televised lesson in viewing groups of:

_____ Under 50

_____ 50-100

_____ 100-150

_____ 150-200

_____ 200 plus

EVALUATION

1. In your opinion, if no immediate feedback techniques are used, do television instructors believe that this lack hinders successful teaching?

Yes_____ No_____

2. In your opinion, what is the consensus of students' attitude towards having this course taught via television?

Strongly Approve_____ Strongly Disapprove_____

Approve_____ Disapprove_____

3. In your opinion, what would be the consensus of faculty opinion towards the teaching of this course via television?

Strongly Approve _____ Strongly Disapprove_____

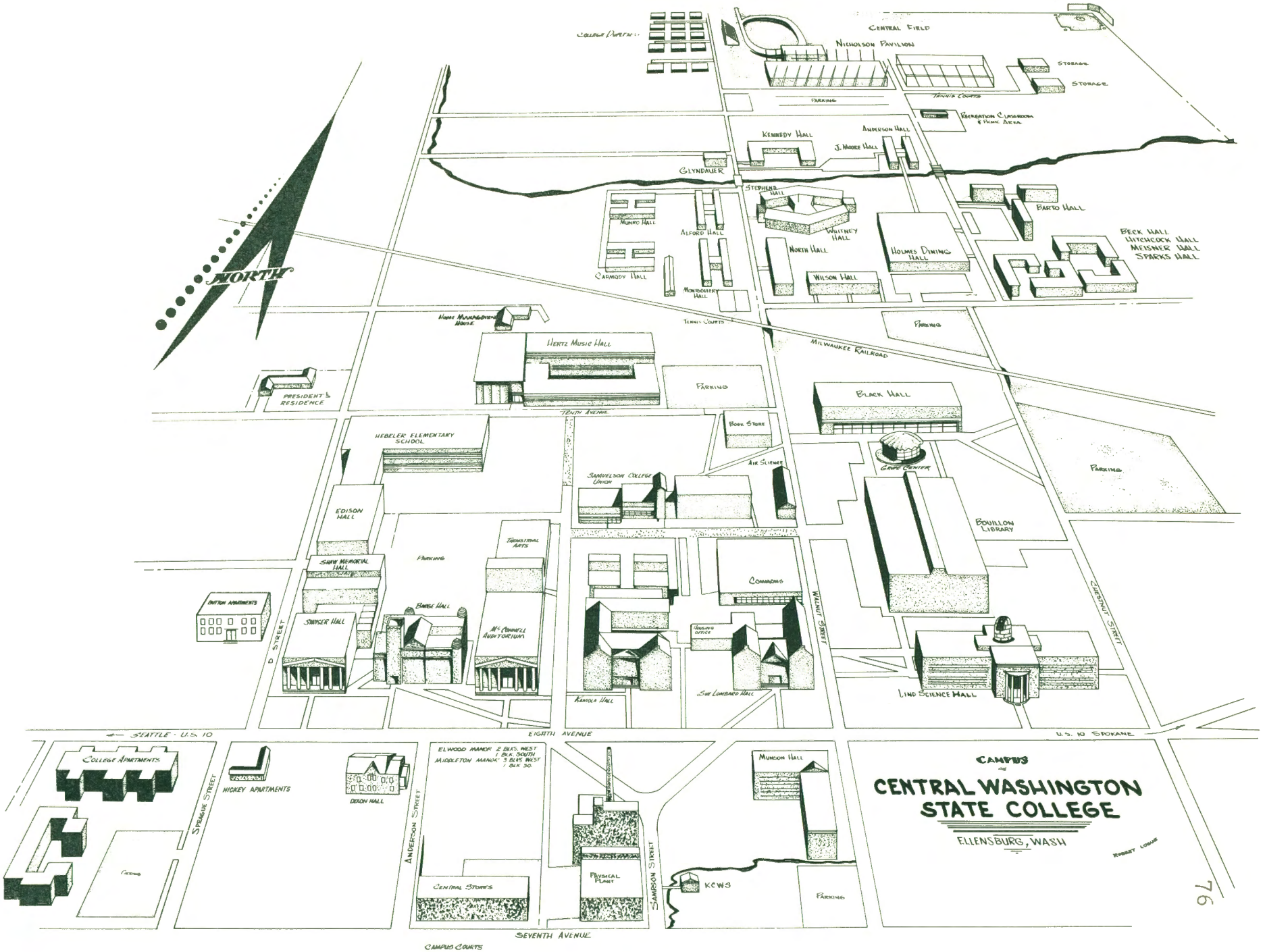
Approve _____ Disapprove_____

4. In your opinion, what would be the consensus of faculty opinion towards teaching via television?

Strongly Approve _____ Strongly Disapprove_____

Approve_____ Disapprove_____

APPENDIX D


NORTH
College Drive
Central Field
Nicholson Pavilion
Storage
Storage
Parking
Tennis Courts
Recreation Classroom & Picnic Area
Kennedy Hall
Anderson Hall
J. Moore Hall
Glyndaler
Stephens Hall
Whitney Hall
Barto Hall
Munro Hall
Alford Hall
North Hall
Holmes Dining Hall
Beck Hall
Litchcock Hall
Meisner Hall
Sparks Hall
Carmody Hall
Monroe Hall
Wilson Hall
Home Management House
Tennis Courts
Parking
Milwaukee Railroad
Hertz Music Hall
President's Residence
Parking
Tenth Avenue
Black Hall
Book Store
Air Science
Grupe Center
Parking
Hebeler Elementary School
Samuelson College Union
Edison Hall
Parking
Industrial Arts
Bouillon Library
Sarah Memorial Hall
Dutton Apartments
Barge Hall
Commons
Sampser Hall
McConnell Auditorium
Walnut Street
Chestnut Street
Veterans Office
Sue Lombard Hall
Rankin Hall
Lind Science Hall
← Seattle - U.S. 10
Eighth Avenue
U.S. 10 Spokane →
College Apartments
Sprague Street
Hickey Apartments
Dixon Hall
Elwood Manor 2 Blks. West
Middleton Manor 3 Blks West
1 Blk. South
1 Blk 30.
Anderson Street
Central Stores
Physical Plant
Sampson Street
Munson Hall
KCWS
Parking
Seventh Avenue
Campus Courts
CAMPUS OF
CENTRAL WASHINGTON STATE COLLEGE
ELLENSBURG, WASH
Robert Logue
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