This is to certify that the

dissertation entitled

THE STATUS OF AUDIOVISUAL EDUCATION
IN PRESERVICE TEACHER PREPARATION
IN GHANA
presented by

Michael George Afote Laryea

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Educational Systems Development

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Date May 3, 1984

THE STATUS OF AUDIOVISUAL EDUCATION IN PRESERVICE TEACHER PREPARATION IN GHANA

by

Michael George Afote Laryea

A DISSERTATION

submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Educational Systems Development

1984

ABSTRACT

THE STATUS OF AUDIOVISUAL EDUCAITON IN

PRESERVICE TEACHER PREPARATION

IN GHANA

by

Michael George Afote Laryea

This descriptive study was undertaken to determine the nature of the audiovisual training preservice teachers receive in Ghana's initial teacher training colleges. It concerned itself with the following areas: (a) content and duration of the audiovisual course; (b) resources in terms of finance, personnel, physical facilities and equipment, and materials; and (c) official policy regarding the training in audiovisual education for preservice teachers.

Some concern about poor quality of instruction in the elementary schools had been expressed, and it had been suggested that poor training of teachers was a factor. A vacuum in educational media research in Ghana was apparent.

Collecting data involved the following:

1. sending a questionnaire to all 33 initial teacher training college principals in 1976;
2. paying visits to 10 of the training colleges to gather in-depth information in 1977;
3. sending a questionnaire to 210 classroom teachers in 1982; and
4. sending questionnaires to (a) principals as a follow-up; (b) the director of Curriculum, Research, and Development Division, Ghana Educational Service; (c) the secretary of the National Teacher Training Council; and (d) the director of the Institute of Education, University of Cape Coast, in late 1983 and early 1984.

Findings indicated the following.

1. Although official policy expects that every prospective teacher should receive audiovisual training, there is a very wide variety in terms of what type of training is given. Very few of the colleges have a syllabus and some give no formal courses in audiovisual education.
2. Funds for audiovisual equipment and materials are very meager--less than $1.00 per student; there are very few audiovisual specialists in the training colleges and no audiovisual technicians; physical facilities such as electrical outlets and lighting control in classrooms are inadequate; and equipment and materials are in very short supply.
3. Official guidelines prepared for use in the training colleges in 1969 cannot be traced anywhere; induction courses for graduating teachers had been discontinued; and no plan for training media personnel seems to exist as there is for other subject matter specialists like English, physical education, home economics, music, and science.
4. Although the training in audiovisual education is generally deficient, the content of courses offered had changed from being mostly "visual" during the early 1950s to being "audiovisually" oriented in the latter half of the 1960s and 1970s.

DEDICATION

to Theophilus Teffeh-Fio Laryea and Augustina Asi Laryea,

my late parents

to Dora Owusua Laryea, my stepmother

to Rita, my wife

and our children,

Odai Anidaso, Momo Denso, Korklu Abayie,

and Theophilus Teffeh-Fio Laryea, Jr.

ACKNOWLEDGEMENTS

Without the contributions and support in one form or another of various agencies and persons, I could not have come this far in my career. I must pause here and acknowledge the vital role that they played and to thank them from the bottom of my heart.

UNESCO gave the original award that launched me on the educational media career.

The Fulbright Foundation came to the rescue when the UNESCO award ended after one year.

The International Development Research Center, IDRC, in Ottawa, Canada, stepped in with much-needed funds when all hope seemed to have been lost and made it possible for me to work on the dissertation and also complete my course work for the doctorate degree.

University of Cape Coast gave the initial grant in 1975 through its Research and Conferences Committee to enable me to start the research.

The Sage Foundation provided me with a grant towards the completion of my dissertation.

Dr. Paul W. F. Witt, original chairperson of my committee and also adviser, was particularly supportive with his inspiring, fatherly advice and guidance.

Dr. Castelle C. Gentry, my current chairperson, furthered my cause and maintained contact with me during my seven and a half year stay in Ghana. His friendly counsel and support kept me going until now.

Dr. Steve Yelon, the longest-serving member of my original committee; Dr. James Page, and Dr. Lawrence Redd have been willing to make themselves

available whenever I needed them. I was really fortunate to have them serving on my committee. Drs. Alfred Opubor and Curtis McCarty who were also members of my original committee deserve to be mentioned for getting me started in the right direction during the proposal-writing stage.

Professors W. Veenendaal and D. Wilkening are appreciated for suggestions on improvisation and the follow-up questionnaire to the principals of training colleges, respectively.

Mr. Robert Ntumi personally undertook the supervision of distribution and collection of the follow-up questionnaire to the principals of the training colleges and played no small part in getting IDRC to grant me the individual study award.

Dr. George Collison fought relentlessly to obtain my release to enable me to return to the United States to complete my program.

Dr. K. A. Awuku played no small part in getting the IDRC to finance my trip to the United States as well as my course.

Dr. K. Boakye offered his support during negotiations with IDRC.

Drs. S. O. Bortei-Doku, Florentina Gorospe, and Maurice Saah lent their assistance in straightening out my questionnaires to principals and classroom teachers.

Messrs. L. B. Hanson-Nortey and E. O. Adu-Gyamfi provided initial information on the audiovisual situation within the educational system. Messrs. George Hansen, Dovia-Awuku, and william Semordzie helped getting the questionnaires to classroom teachers to be duly filled out and returned.

Mr. S. A. Gyima's no small contribution with valuable information regarding the status of audiovisual education programs and accompanying me on my visits to the training colleges is appreciated.

Messrs. Allen Babugura, Randy Fotiu, Rafah Kasim, and Mark Picciotto provided assistance in sorting out the analyses of the data.

Ms. Barbara Reeves shouldered the immense responsibility for typing this dissertation and making certain that it was in respectable form for presentation.

Through all these difficulty times, none have been more supportive than my wife Rita and children Anidaso, Momo, Korklu, and Theophilus. They have given me sympathy, encouragement, understanding, inspiration, patience, and love.

Last but not least are all those friends and relatives who in diverse ways showed their support for me during the difficult times just past.

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CHAPTER I

INTRODUCTION

The adoption of new ideas, concepts, and practices is a phenomenon that is common to most spheres of human activity. The sphere of education is no exception. The diffusion of innovations and the adoption of new media and techniques of instruction are characterized by many ups and downs. The principal actors in the classroom situation, for instance, live in an environment where they are surrounded by the products of the communication revolution; namely, film, radio, and television. Yet the adoption of these communication media into the teacher's arsenal has not been easy or smooth; and while they are conspicuously absent in the classroom, the traditional media such as flip charts, pictures, models, and specimens are also sometimes lacking and often are ineptly used, thus severely restricting the teacher's communication potential. This situation has serious implications for the quality of instruction, for as Twyford (1969) has stated, " . . . the major use of communications media is to supplement the teacher by enhancing his effectiveness in the classroom." Wittich and Schuller (1973) also affirm that

> . . . inadequate educational communications result in boredom with school, dropping out and entering society ill prepared for the tasks that must be assumed.
>
> Research studies have establsihed definitely that through selection and use of appropriate new educational communication materials--audiovisual media--many obstacles to the creation of an environment for effective learning can be overcome.

The shortage or lack of media in classroom situations in developing countries was noted by the World Bank in 1972 and cited by Nyirenda (1982) who wrote:

> However, these rapid educational expansions later became a source of many new educational problems. The World Bank reported that "on the one hand, this rapid expansion has created a new set of formidable problems, and on the other hand, has failed to achieve many of the benefits which were confidently expected of it" (1972). Resources such as teachers, learning materials, and administrator could not keep pace with both the rising need for education and plans to expand educational facilities.

The educational scenario in Ghana could very well fit into this description. The non-availability or shortage of the supply of resources can affect the quality of instruction.

It was this situation that prompted this investigator to decide to focus his attention on the initial teacher training colleges in order to find out what could be happening there in regard to media training.

Thus, the purpose of this study was to assess the quality of preservice training of teachers in the area of audiovisual education with the assumption that recommendations made would result in the adoption of new ideas in audiovisual education.

Indeed, remarks about the poor quality of instruction in the schools of Ghana have been made from time to time. For instance, Hanson reports thus:

> . . . the length of primary education should be shortened from eight years to six years. It was judged that education of equivalent quality and greater relevance could be provided in the shorter term, partially through use of new media of instruction. Unfortunately, the explosion in enrollments and number of school and classes was so great that the number of adequately qualified staff could not keep pace with it and the expedient of staffing the primary schools with large numbers of essentially untrained teachers ("pupil teachers") had serious qualitative effects, effects which may bear both upon the number of students who have an adequate educational background for secondary education which they are capable of acquiring (1971).

The government itself recommended the establishment of teacher resources centers, one in each educational district. These will enable teachers among other things ". . . to design and improve their own materials for their

classrooms . . ." (Ghana Ministry of Education Report, 1974). This was done presumably to improve the quality of instruction in the primary schools.

The quality of instruction in the primary schools is linked to the quality of training as noted by Hercik (1976).

> As regards the preparation of primary teachers, standards had to be lowered to staff the growing number of new schools with record enrollments. The results of this quantitative expansion was an alarming rate of failure and drop outs. It was soon realized that this situation was due to both underqualified teachers and to new curricula from Western countries which were taught without adaptation to local sociocultural conditions.

Furthermore in 1973, the government of Ghana undertook a major restructuring of the educational system in order to "correct some of the problems and weaknesses in the existing system of pre-university education." Among these "problems and weaknesses" were listed the following: (a) lack of adequate facilities in existing schools in primary and middle school education, (b) low quality of teachers, (c) difficulty of finding specialist teachers, and (d) reluctance (of teachers) to work in rural areas in teacher training education (Ghana Official Handbook, 1977).

A report published in 1974 by the International Council for Educational Media (ICEM) under contract from UNESCO underscores the poor quality of audiovisual training in Ghana's training colleges.

> At teacher training colleges there are no special lectures for audiovisual media and mass media. Attempts have been made at the Faculty of Education of the University of Cape Coast to organize special lectures in the use of AV media. At teacher training colleges, student teachers do no experiments with AV aids in their lessons, because there is only a very small supply of equipment . . . . It can be stated that training in the use of AV media is very inadequate (Jongbloed, 1974).

The Education Review Committee in its report of 1967 notes with some concern that:

> However, the complaints about the lowering of standards cannot be lightly dismissed, since they raise serious doubts about the quality and relevance of public education in Ghana. A considerable proportion of the evidence in the memoranda came from school teachers and college tutors with decades of teaching experience, who share the conviction that the performance of pupils and students in the use of both oral and written English, for example, had seriously deteriorated. They also assert that they now have to teach new pupils from the elementary schools matter that formerly could be assumed to have been learnt adequately during the course of elementary education. In the same way, it has been presented that in the universities valuable time has to be set aside for improving the educational background of some of the newly admitted students in order that they can benefit from degree courses. Employers in the public services and the commercial and industrial establishments give evidence of their experience of the poor comprehension and the unsatisfactory writing of elementary and secondary school leavers they have engaged (Ghana Government, 1967).

It is evident from the foregoing that all is not well with the quality of instruction in Ghana's schools. Efforts to correct this situation with special regard to instructional media have occurred largely in inservice programs.

It is also apparent that a new kind of teacher is needed in this age of communication revolution. A new kind of teacher who is equipped with the skills and knowledges that will enable him to utilize the media, both old and new, to the best advantage--to improve communication and thus learning among his students.

DeBenardis remarks,

> If teachers are to use the newer materials effectively, they must have (1) necessary knowledge and operational skills, (2) a basic understanding of educational principle, and (3) an overall understanding of the learning and teaching situation. To develop this skill and knowledge, teacher training programs should have a setting that encourages and demonstrates the proper use of these materials and a program of training that provides ample practice situations (1945).

And Witt comments:

> There is no doubt about the key role teachers play in determining the nature and quality of the teaching and learning process . . . . Consequently, if we are to have teachers who believe it important to use many different types of materials for teaching and learning and who know how to use these materials appropriately, steps must be

> taken to make certain that teachers develop the values, knowledges and skills essential to this sort of professional behavior . . . . They must be taught how to evaluate, select and use all types of materials (1964).

The need to give teachers a new kind of training to fit them for the new communications technological era could not have been described more appropriately in the following words:

> The new teacher must use the same media that the learner encounters regularly--television, radio, and motion pictures. He must also expose the learner to new media to expand his cognitive and affective capacities . . . . The media have enveloped our society, and the school and the teacher now must employ the most up-to-date, efficient means of communicating and teaching, using all media (Heath, 1973, p. 166).

In the past, inservice courses have been conducted to train practicing teachers in audiovisual education. However, this has not been enough. A more effective strategy is to give training in audiovisual methods of teaching to preservice teachers. Research results seem to suggest that when teachers are exposed to audiovisual methods of teaching during their training, they tend to utilize media more during their inservice days. Kelley (1960) found that teachers with college training in audiovisual education developed a favorable attitude toward the use of audiovisual materials, while Branscombe (1969) reported that the frequency of use of instructional media was significantly higher amongst teachers who had training in audiovisual education than those who had no such training. Streeter (1967) had reported a similar finding. It is such research and experience that has led to the adoption of a number of preservice audiovisual media programs by many colleges of education in many countries.

In this study, therefore, the investigator wishes to examine one of the aspects of teacher education that have a direct bearing on the quality of instruction in Ghana's school system, namely the preparation of teachers in the selection, production, and utilization of educational media in the initial training

colleges. To do this, he intends to assess the type of audiovisual training of primary school teachers and the factors that affect the training of teachers in media.

Delimitations of the Study

There are several types of teacher training institutions in Ghana. This study, however, was restricted to those colleges that are classified as initial training colleges that train teachers for first cycle institutions; i.e., grades one through eight.

The research also was limited to the training preservice teachers receive in the selection, production, and utilization of audiovisual instructional materials. And, although mention is made of sophisticated items of hardware and software (such as videotape equipment), the emphasis is more on the basic traditional media--the type that are usually most readily at hand in developing countries and that can be easily afforded.

The research also focused on a period of 30 years, from 1950 to 1980. In the United States, United Kingdom, and France, educational technology really became a force to be reckoned with shortly after World War II. Chroniclers look to 1945 as a landmark in the history of educational technology. Paul Saettler (1968) writes, "Following World War II, a period of expansion began in the audiovisual movement. During the decade 1945-1955, the growth curve of the movement continued at a steady pace with a brief leveling out period between 1950 and 1955 . . . ." There was a flurry of activity in this area of educational technology due to the return from the war of people who had been directly involved in training armed forces personnel and who were intersted in applying their skills of scientific training to education. Hitchens (1979) notes, "As a result

of the World War II experience, a significant number of American educators began to develop an increased sensitivity to the applicability of scientific theories of learning to practical problems in instruction." This investigator argued that a period of five years was a reasonable time within which these innovations in educational thought and practice should gain awareness in Ghana's educational system.

General Statement of the Purpose and Research Questions

The purpose of the study was to assess the status of audiovisual education in preservice teacher preparation in the initial teacher training colleges of Ghana and to determine whether any changes had occurred in this particular field of teacher education over a period of 30 years, from 1950 to 1980. The questions that were addressed during the study were:

1. What is the status of audiovisual education in preservice teacher preparation in Ghana?
2. What changes in audiovisual education, if any, have occurred in audiovisual training in teacher preparation during the years from 1950 to 1980?

The study became necessary for the following reasons.

1. Previous to this study, there had not been any indepth study of audiovisual education in Ghana. Inquiries of the media specialists and inspectors of the Ministry of Education as well as searches in the libraries of the three universities failed to turn up anything of note.
2. There was reason to believe that the training of teachers in audiovisual education was deficient. This was brought out during the investigator's own discussions with inspectors of schools and

colleges from the Inspectorate Division of the Ministry of Education and principals of training colleges as well as experienced classroom teachers. Chasin's (1969) study also confirms this view.

3. It is apparent from the fact that there were so few media specialists in the Ghana Education Service that educational technology has not received attention comparable to what other specialist areas such as mathematics education, physical education, art and craft education, etc., have received. In 1979 there were six specialists--three on faculties of initial teacher training colleges and three in the Curriculum, Research, and Development Division of the Ministry of Education. In 1982 only three were left--one still in the Ministry of Education and two on training college faculties. By contrast almost every district education office has specialists in the following areas: home science education, physical education, music, agriculture, social studies, and mathematics. The majority of these specialists were trained at the Specialist Training College at Winneba, Advanced Teacher Training College at Winneba, Presbyterian Women's Training College at Aburi, and the National College of Music, also at Winneba.

4. A close study of the Ghana government budgets for education for the years 1977/78 and 1978/79 reveals that less than one percent of the appropriations went into educational materials for pre-university education. These amounts included allocations for maintenance of teachers resources centers and maintenance and rental of television and radio sets as well as for the acquisition of audiovisual materials.

Basic Assumptions

A basic assumption in this study is that appropriate and judicious use of audiovisual media enhances learning, irrespective of the cultural background of the learner. Chakrabarti (1962) states that long before the advent of the British, the Indians had been using paintings and puppetry extensively for entertainment, instruction, and information. Horace, an ancient Roman poet, makes the point that "that which enters the mind by the ear, makes less of an impact than that which enters by the trusty eye" (Addison, 1712, p. 157).

Another assumption is that teachers who, during their preservice training, were exposed to audiovisual methods of teaching generally showed a greater tendency to use educational media during their post-training years in the classroom. This can be restated as, "People tend to teach the way they were taught." The study will assume that this finding is also true for persons trained in the Ghanaian milieu.

A third assumption is that the education authorities in Ghana will favorably consider proposals for an audiovisual program for the education system.

Definition of Terms

Primary school: the first six grades of school.

Middle school: the four grades following primary school, known as middle form one to middle form four (M1 to M4). Generally school children begin to sit for the common entrance examination from the sixth year of primary school (P6). This continues until they reach M4.

Secondary school: the general secondary school of grammar school type education. At the end of five years, pupils take the West African Schools Certificate examination and are awarded the School Certificate or the General Certificate in education Ordinary ("O") level. Pupils who excel go on to sixth

form for two years and pass out with the Higher School Certificate or the General School Certificate Advanced ("A") level. The latter examination also serves as qualifying examination for entry into the three universities.

Initial teacher training college: a second cycle institution that offers professional training for prospective teachers. The types of initial training colleges in Ghana are described immediately below.

Four -year training college: offers training to graduates who have completed middle form four from middle school. Entry is by examination. Students successfully completing their courses receive the Teachers Certificate ("A") Post-Primary.

Three-year training college: offers professional teacher training for graduates from secondary schools. Students successfully completing the courses receive the Teachers Certificate ("A") Post-Secondary.

These training colleges offer curricula covering all subjects taught in primary school together with psychology and the methodology of teaching. Some of these colleges specialize in the teaching of agriculture, home science, and French.

Technical training institute: prepares teachers to teach technical subjects in technical and vocational schools. These teachers are also awarded the Teachers Certificate ("A").

Media: the terms media, educational media, instructional media, audiovisual media, and instructional materials are used interchangeably in this study to refer to the complete range of non-print materials available for utilization by teachers for instructional purposes or by students for learning or presentation purposes (McMahan, 1968). Audiovisual instructional materials will also be used to refer to the same terms (Branscombe, 1969).

National Teacher Training Council (NTTC): advises the minister and other persons responsible for pre-university education in Ghana on all matters relating to teacher training. It controls the content of courses, initial training, and certification. It also organizes inservice courses and workshops for college tutors and teachers in elementary schools in areas where deemed necessary.

Principal: used in this study to refer to the "chief executive" of the teacher training college. This position can be likened to that of the chairperson of a teachers' college in the American education system. The counterpart in a secondary school is simply referred to as "headmaster" or "headmistress."

Tutor: an instructor in a training college. His counterpart in the secondary school is referred to simply as "teacher." It will be used interchangeably with the term instructor.

Ghana National Association of Teachers (GNAT): refers to the body representing all members of the teaching profession at the bargaining table.

Related Studies

While there exists a considerable body of literature on professional training of teachers and in particular preparation in audiovisual education in Europe, Canada, the United States of America, and some parts of Africa, there is practically no extant research on audiovisual education in Ghana. Some studies, however, on various aspects of teacher training contain some significant remarks on the status of audiovisual education in that country and are worth taking into account.

Doris Chasin, in her study on "Current Practices in Selected Teacher Training Colleges in Ghana" (1969) noted that generally there was inadequate use of audiovisual equipment and materials. She states,

> Tape recorders, radio, record players, overhead projectors, and picture files constituted the audiovisual equipment of all training colleges, but there was little evidence of their incorporation in the general teaching program (p. 84).

and

> Occasionally a hand-lettered chart would be found tacked to a wall, and more rarely the investigator noted an attempt at an interest center; perhaps a table with assorted stones, labeled, and a student's essay paper lying alongside it. But most often the classroom was bare, unscreened and unshaded.

Two remarks are especially worth noting since they reflect also on the methods of teaching and availability of equipment and materials.

> In summary, two points of emphasis project. The first is that each classroom, with the exception noted below, could have been transformed into a stimulating educational setting with but a few attempts at interest centers, bulletin boards, charts and pictures which command no outlay of funds. Second, the most imaginative classroom settings, the most encouraging educational atmospheres, those places where good teaching practices are most likely to be adopted by the trainees in observance of their own tutors, are to be found in the two training colleges offering exclusively the specialist diploma courses (p. 84).

and

> Most tutors observed were lacking in the skill or the interest, or both to use simple audiovisual equipment to stimulate and enhance learning experience . . . . Most colleges suffer from inadequate or insufficient teaching materials (pp. 94-95).

Chasin's survey covered 22 training colleges, and among those employing innovations she recorded the numbers of those using the following items:

Innovation	Number of colleges in which innovation was observed
Filmstrip projector	1
Tape recorder	3
Overhead projector	1
Television receiver	1
Local field studies and field trips	5
Local materials and visual aids	2
Diorama	1

Later, in 1973, the International Council for Educational Media, in conjunction with UNESCO, carried out a survey of audiovisual services in advanced and developing countries. Its report, released in 1974, contains the following remarks about audiovisual education in Ghana.

> At teacher training colleges there are no general lecturers for training the audiovisual media and mass media . . .
>
> At teacher training colleges student-teachers do no experiments with a.v. aids in their lessons, because there is only a very small supply of equipment. Neither do audiovisual media play a role within the students written and oral examinations. It can be stated that the training of students in the use of audiovisual media is very inadequate (Jongbloed, 1974).

Until the investigator began his research, Jongbloed's was the only serious research focusing on any aspects of audiovisual education.

Despite the near absence of any mention of audiovisual education in early literature on teacher education in Ghana, an entry concerning teacher training in the Gold Coast made by Noel Smith (1966) is significant: "During the '20s and '30s students took the government's 'hand and eye' examination and the Agricultural Certificate . . . . " The "hand and eye" course was training in still drawing that was supposed to be good for coordination of hand and eye; in this way teachers were equipped to make good charts and other visual aids for instructional purposes.

In 1981 Slimming carried out a survey of resources for science education in post-secondary teacher training colleges. Concerning audiovisual materials he wrote:

> Charts
> Most colleges had some charts though the quantity and condition of these was very variable. They mostly deal with human anatomy and physiology and appeared to be in regular use.
>
> A-V Aids
> The science tutors seemed to make little use of a.v. aids, even where these were available. Of the eight overhead projectors found in

> laboratories, only three were serviceable and only one appeared to have been used recently. Four tutors claimed to have access to slide projectors but only two ever used them. Finally, four tutors reported that their colleges had a film projector in working order, but none had shown any science films in the past 12 months.

Awuku, 1975, recommended, among other things, that,

> . . . in planning to institute quality science education in Ghana, careful consideration should be given to . . . instructional efficiency in science education (course content, sequence, methodology, and aids).

The few research projects that have been done on teacher education in Ghana have made few references to audiovisual education. However, these few references have all called for better training in audiovisual education for preservice teachers.

In April 1981 the Ghana Association of Science Teachers (GAST) whose membership is drawn from elementary schools, secondary schools, teacher training colleges, and technical schools, recognizing the need for audiovisual instructional materials in secondary schools and training colleges, set up a committee to carry out a survey of existing materials in the second cycle institutions and make recommendations for the acquisition of such materials and also for their optimum utilization, bearing in mind the meagerness of financial resources facing the country. This committee held one meeting. As a result of the deliberations of this committee, a questionnaire was issued to all heads of secondary schools and training colleges--about 430 in all. Responses to the questionnaire numbered less than 20 and after two reminders! The committee found it difficult to continue working with such a low return.

In summary, there is practically no extant research on audiovisual training in preservice teacher education in Ghana. The present study should lay a foundation for filling that vacuum.

Significance of the Problem

Discussions with principals of initial training colleges, tutors, and inspectors of schools at the Inspectorate Division of the Ministry of Education revealed a sense of dissatisfaction with the training given in audiovisual education. Officials of the National Teacher Training Council and the Ghana National Association of Teachers also indicated their concern for poor quality of training in this area. The absence of official guidelines was lamented. In the absence of guidelines for training in audiovisual education, such training, if offered at all, varies from institution to institution. This study is designed to reveal any discrepancies that might exist in the audiovisual training of the professional teachers. The inadequacies that obtain in physical, financial, and personnel facilities as well as absence of official guidelines should either be confirmed or be disconfirmed. Finally, recommendations will be made for improvement in the quality of audiovisual training given to prospective primary school teachers.

Research evidence supports the view that preservice training in audiovisual education will not only inculcate in teachers a favorable attitude toward instructional media, but also result in greater utilization of media in the classroom (Oliver, 1962; Streeter, 1967; Branscombe, 1969). And greater use in the classroom should result in better quality instruction as summarized by Molstad (1974).

Jongbloed's study indicates that there is evidence that preservice media training in some African countries is deficient and could be improved. Some of these countries could benefit from the findings and recommendations made in this study by either replicating it and/or adopting the recommendations.

The record of the Ministry of Education with regard to the training of audiovisual specialists as compared with training of specialists in other subject

areas is dismal. In evey regional education office, there are subject officers who received their specialist training either in Ghana or abroad; these officers are in charge of subjects such as mathematics, science, art education, home science, physical education, music, and social studies. There are no media specialists at any of the regional or district education offices. This study could expose this shortcoming and create an awareness in appropriate circles and, thus, stimulate remedial action.

The revelations and recommendations to be made in the present study will provide suitable guidelines and impetus for adopting feasible programs for audiovisual education in the initial training colleges.

The new policy for audiovisual education for the nation's educational system will cover not only preservice teacher education, but also inservice teacher education and the provision of instructional support services for the teacher in the classroom situation.

This investigator hopes to show that there is too much reliance on the print medium and the "chalk and talk" method of instruction. There are other media such as radio and small, portable taperecorders which are available and which, combined with media improvised from local materials, can help bring about enriched instruction. The recommendations made in this study will address this problem, and they may be found useful by other countries who have problems similar to Ghana's own.

Organization of the Study

The study begins with statements on the need and purpose for the research that has been undertaken, major questions to be answered, and limitations of the research. It then sets out definitions of terms employed. Chapter II reviews the literature on (a) media and teacher training in media, (b) learning effectiveness

and media, (c) similar studies and their relationship to the present study, (d) a brief account of educational media practices in some other countries.

Chapter III presents the design of the study, and Chapter IV analyzes the data collected on media use in pre- and inservice institutions in Ghana. It also deals with the media competencies that have been developed through other studies and are being used by some teacher training institutions surveyed in this study.

In Chapter V, the investigator discusses the findings and summarizes and draws conclusions from the data which were obtained through the survey. He also states implications for further study and concludes the chapter by making several recommendations for adoption based upon the findings of the research.

CHAPTER II

REVIEW OF THE LITERATURE

In this chapter of the dissertation, attention is focused on the review of the literature. This review is divided into five sections, namely: (a) identification of media competencies, (b) media and teacher education, (c) media and learning, (d) media training approaches, and (e) media training practices in some countries.

Identification of Media Competencies

This section is divided into two parts. One part discusses the knowledges and attitudes--cognitive/affective skills--that are deemed desirable in the area of media that teachers should possess. The other area of media competency dealt with that is no less desirable in a teacher is manipulative skills.

Knowledge and Attitudes (Cognitive/Affective Domain in Media Competency)

In 1966, Meierhenry published a document entitled "Media Competencies for Teachers" in which, together with six nationally known leaders in the field of audiovisual education, he dealt with those competencies or skills in educational media that teachers should possess. The leaders were Heinich, Torkelson, Norberg, Kemp, Gerlach, and Curl, and they dealt with the following topics: instructional systems, media utilization, theory of media, production, media selection, and equipment operation, respectively. In summarizing the papers, Meierhenry (1966) discerned the following basic experiences which he regarded as prerequisites to the development of the skills of selection, utilization, and production of media:

1. to develop instructional objectives in behavioral terms followed by specification and arrangement of instructional stimuli upon which the desired behavior is contingent;

2. to gain knowledge about and experience with media so that their respective characteristics might be known. Such knowledge should help the designer of the instructional sequence to make acceptable intuitive judgments as to which medium used alone or in combination with other media will most effectively and efficiently produce the desired behavior change. Where extant media are not available or they exist but require additional elaboration, experience in designing media in order to achieve the desired results should be provided;

3. to try out, analyze, critique, and modify a unit prepared and used with one or more learners possessing the psychological characteristics for which the unit was prepared;

4. to have experience with instructional systems involving man-machine relationships. Television is likely the best medium for most prospective teachers although programmed instruction or learning laboratories might be more suitable for certain content areas; and

5. actual experience with the total range of instructional resources which are available in both substantive as well as professional areas of teacher education programs. The first-hand encounters with the media will enable each prospective teacher to judge the effectiveness of each medium (pp. 225-6).

Meierhenry went further to identify the manipulative skills which he placed under production of audiovisual materials.

MANIPULATIVE SKILLS

A. Using the chalkboard

B. Cartooning and simple sketching

C. Mounting pictorial materials

D. Lettering

E. Making displays

F. Duplicating printed materials

G. Recording on tape

H. Making transparencies (p. 229)

Such a list is far from final or static as Meierhenny himself acknowledged, stating, "One of the difficulties with developing specific competencies is the rapidity with which they become out-of-date and obsolescent" (p. 224).

Pascoe's survey some years earlier showed a striking similarity to Meierhenry's conclusions. In 1957 he had surveyed 190 schools and 63 colleges and universities and obtained their views as to which competencies were most important and which least important. He grouped the competencies under two headings, namely knowledges and understandings on the one hand, and skills and abilities on the other.

Knowledges and understandings

1. Principles of use--philosophical and psychological factors underlying the use of auidovisual materials and equipment in the classroom.

2. Selection of materials--principles of good teaching that affect the selection and use of these materials.

3. Types of materials and equipment--nature of the common types of materials and equipment, including the educational values and limitations of each.

4. Sources of materials and equipment--local, national, and international.

5. Services of the audiovisual deparment--services of the audiovisual department and its personnel, the best ways of using that service, and the teacher's responsibility for cooperating with the department.

6. Materials for specialists--types of audiovisual materials available in the specific area of the teacher's interest and their potential educational worth and uses.

7. Production of materials--processes involved in the production of the more simple materials such as mounted prints, handmade slides, filmstrips, and photographs.

8. Results of research--studies, past and present, in the field and their implications for instruction.

9. Single school services--principles and procedures for setting up an audiovisual education service in a single school or in a school district.

10. Administering of aids--methods of procuring, storing, filing, and maintaining various kinds of materials and equipment.

11. History of AV--background and development of audiovisual education that has relation to current trends and practices in the field.

Skills and abilities

1. Utilization--to use each audiovisual tool effectively in a classroom situation.

2. Selection--to select audiovisual materials to meet pupils' needs and purposes of instruction.

3. Evaluation of use--to evaluate the effectiveness of the use of these materials and to modify and improve future instructional practices on the basis of this evaluation.

4. Equipment operation--to assemble and operate various kinds of equipment and to perform simple servicing operations such as lubrication and replacement of lamps.

5. Appraisal--to appraise the educational worth, technical quality, photographic characteristics, and commercial aspects of audiovisual materials.

6. Display--to display materials effectively on bulletin boards, in the classroom, and in other appropriate locations.

7. Production--to produce simple materials such as mounted prints, slides, posters, charts, graphs, models, collections of natural science materials, and to prepare exhibits and displays.

8. Best physical conditions--to provide and arrange the best physical conditions possible for using audiovisual materials.

9. Field trip--to plan and successfully execute a field trip.

Regarding the content of the manipulative aspect of the program in audiovisual education, opinion again has crystallized. The works of Comenius, Pestalozzi, Montessori, Rousseau, and Froebel in the theory and practice of instruction provided early direction. Dale and Olsen put these ideas into pictorial form with their cone and pyramid, respectively (Dale, 1969; Kinder,

1959) (see Figures 1 and 2). As new media and equipment have emerged, they have found their places in the continuum described by MacMahan (1968) which is an adaptation of Dale's cone of experience (see Figure 3, McMahan's continuum).

A survey by Oliver to ascertain which competencies were thought desirable by beginning teachers and supervising teachers in the State of Georgia produced information to support Dale's ideas.

Teacher Education and Media Training

It is a commonly accepted statement that teachers teach the way they were taught. This is especially significant to teacher educators and adminstrators who are concerned about the quality of instruction. It suggests that in order to ensure that teachers entering the system utilize media, they must be equipped to do so and they must be given sufficient exposure to audiovisual methods of teaching during their preservice days. There is evidence to support these views.

Maurice Camp (1957), in a study on factors affecting the utilization of audiovisual instructional materials, reported, among other things, that "there was a significant positive relationship between administrators' ratings of teacher competency and the extent of audiovisual utilization and between the level of audiovisual training and the extent of audiovisual utilization." In an earlier study, Harris (1953) had also found that teachers with audiovisual training made about twice as much usage percentage-wise of these media as those with no training. This study involved 5,000 teachers in adult schools in the state of California.

Kelley (1960) made the following observation after an extensive study of teachers' attitudes toward audiovisual materials in 1959:

> The old saying "teachers teach as they have been taught" comes to mind when it is noted that there is a highly significant relationship

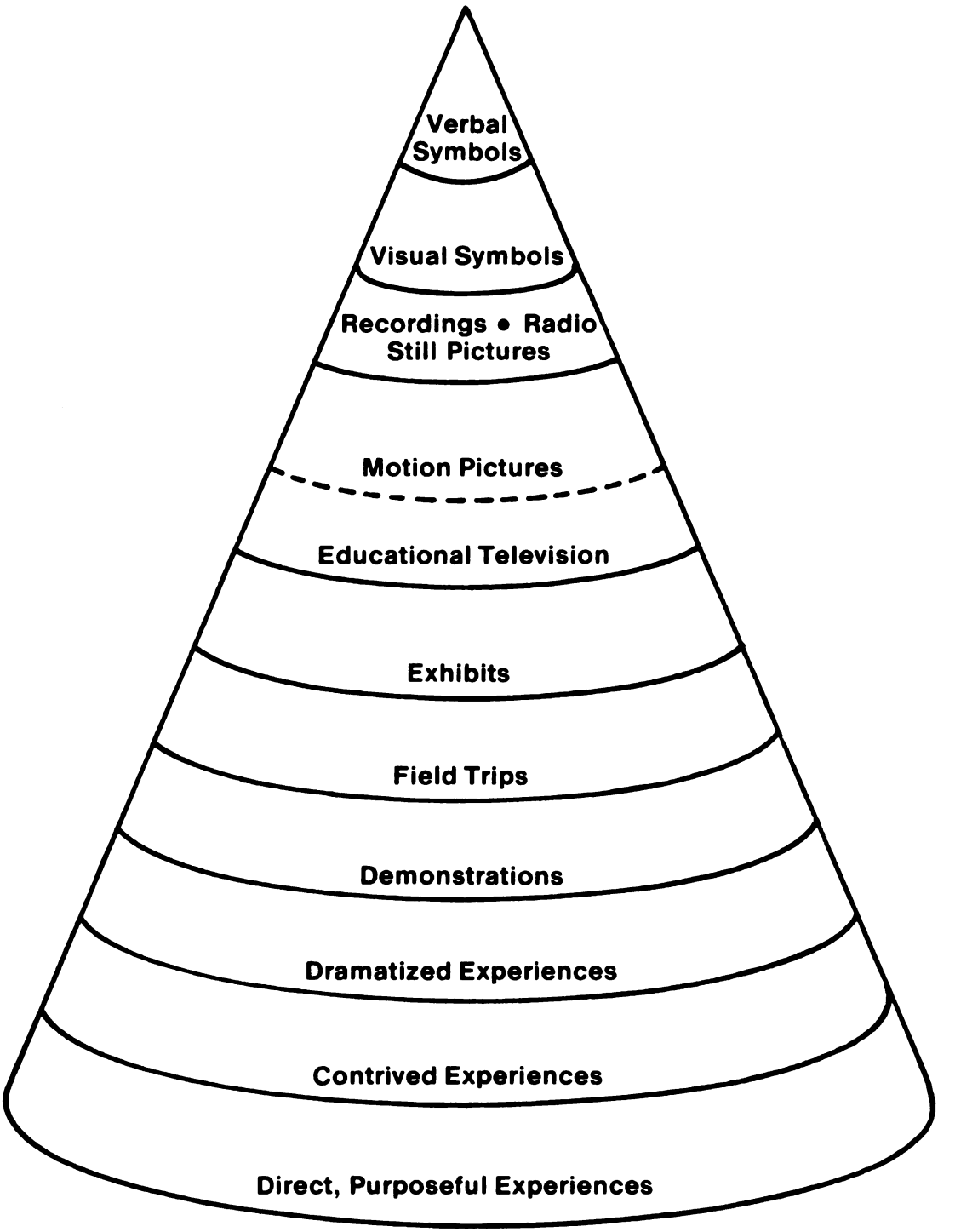
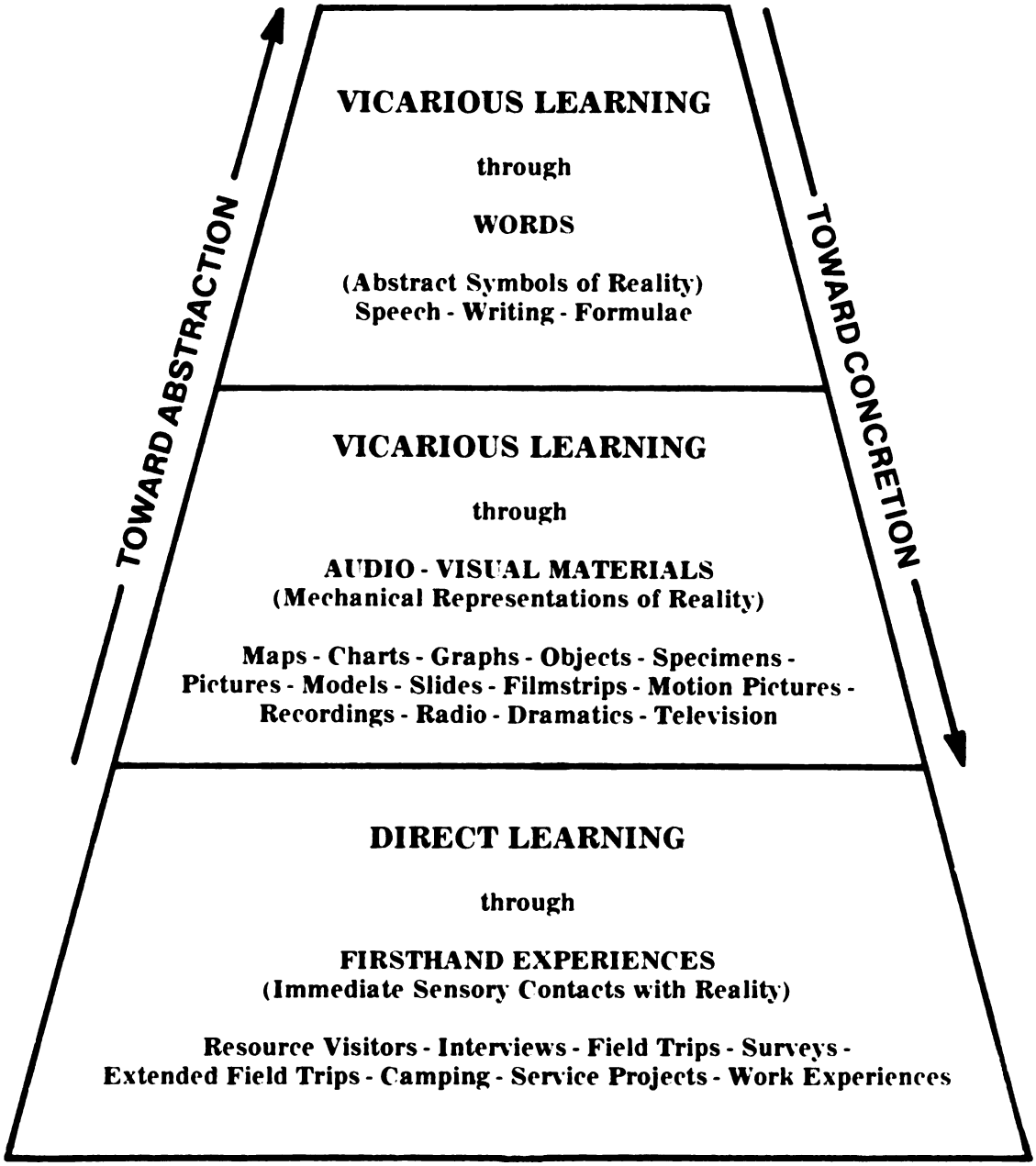


Figure 1. Dale's Cone of Experience



Learning can be reduced to three basic types - direct experiencing, vicarious experiencing, and symbolized experiencing. These types are analogous to three layers of a pyramid.

Figure 2. Olsen's Pyramid

A Continuum of Audiovisual Media[1]

Community Resources	Dramatization Devices	3-D Devices	Demonstration Devices	Display Devices	Projected Devices	Still Picture Devices	Audio Devices	Graphics Devices	Teaching testing Devices
Educational Tours	Dramatic Play	Objects	Chalkboards	Bulletin Boards	Motion Pictures	Flat Pictures	Disc Recordings	Maps	Teaching Machine Programs
Resource People	Dramatization	Models	Flannel Boards	Pegboards	Television	Filmstrips	Tape Recordings	Charts	Programmed Text
Museums	Puppets	Dioramas	Plastic Boards	Hook and Loop Boards	Videotape	Slides	Radio	Graphs	Scrambled Books
	Marionettes	Mock-ups	Magnetic Boards	Displays		Transparencies		Diagrams	Electric Boards
	Simulation	Specimens				Stereographs		Cartoons	Computer-Assisted Instruction
		Globes				Microprojector Slides			

[1]Media arranged in a general way from those which are concrete to those which are abstract.

Figure 3. McMahan's Continuum of Audiovisual Media, adapted from Dale's Cone of Experience

> between the type of learning experience the teachers have had during their training and their attitudes toward audiovisual materials. If their college instructors used audiovisual materials often, they tended to have a higher attitude toward their use . . .

One of the questions that a project conducted by Oliver (1962) sought to answer was, "What factors influence the effective use of instructional media in teaching?" He states in his report, "It became apparent at this point in the study that preservice teacher education in the classroom use of instructional media could not be developed independent of the student teaching experience," and went on to conclude that those who had received training used media which required specific information and skills more frequently than did those of the control group with no pre- or post-graduation training.

Streeter (1967) and Branscombe (1969) arrived at similar conclusions in their researches. Streeter found that:

1. there was a positive correlation (.41) between teachers' media competency scores and total media frequency of use scores, and
2. teachers with media training in college had significantly higher media competency scores than teachers who did not have such training.

His data were collected from teachers teaching in school systems considered outstanding in the use of educational media.

Branscombe, whose study was conducted in Ontario, had surveyed the preservice professional training of teachers as it relates to instruction in the selection, production, and utilization of audiovisual instructional materials. He concluded that there was a positive relationship between preservice professional training in the selection, production, and utilization of audiovisual instructional materials on the one hand and subsequent professional utilization of these

materials. Hence the evidence adduced here indicates that preservice training in media tends to ensure proper and greater use during service.

Media and Learning

For centuries, people have assumed that there was a positive relationship between media and learning and, consequently, have used some kind of pictorial symbols to back up verbal ones. The Chinese are credited with the following sayings:

> "A picture is worth a thousand words" and
>
> "I hear and I forget,
> I see and I remember,
> I do and I understand.

The latter saying particularly underscores also the value of learner participation in the teaching-learning process.

The words of the Roman poet Horace are equally forceful regarding visual messages:

> "Segnius irritant animos demissa per aurem
> Quam quae sunt oculis subjecta fidelibus . . . " (Addison, 1712)

which translates as

> "The mind is more slowly stirred by the ear than by the eye" (Gombrich, 1974).

He, too, recognized the importance of the use of visuals in conveying messages.

The significance of pictures was not lost on the great teacher Comenius; his book Orbus Pictus (The World in Pictures) was lavishly illustrated with pictures. Paul Saettler (1968) describes it as a visual aid textbook and as "without question the most popular illustrated textbook ever written for children" (p. 22). Published in 1658, it was still being purchased in 1810 in the United States.

It was not until this century that empirical studies began to be carried out to support the view held for so long that visual images make more powerful and

permanent impressions than verbal ones. Early educators had, out of experience, accepted the value of media in instruction. Now the media are used because their role in the teaching-learning process has been fully established; instruction thus has ceased to be just an art; it has become a science also (Snelbecker, 1974). Today there is a constant reference to a technology of instruction (Saettler, 1968) in which there is great emphasis on systems approach to instruction and great reliance on media. The role of the media in instruction is now supported by results of many researches (p. 80).

What the research says. Audiovisual instructional materials are used widely because they make teaching and learning more effective and efficient.

Molstad (1974), in an extensive review of research on the value of audiovisual instructional materials, summarized the research claims as follows:

1. significantly greater learning often results when media are integrated into the traditional instructional program.

2. equal amounts of learning are often accomplished in significantly less time using instructional technology,

3. multimedia instructional programs based upon a "systems approach" frequently facilitate student learning more effectively than traditional instruction, and

4. multimedia and/or audiotutorial instructional programs are usually preferred by students when compared with traditional instruction.

A more recent review of selected research in six media formats led Peterman (1982) to the conclusions that:

1. the use of classroom media (in each of the six media formats reviews) can assist students to attain cognitive, affective, and psychomotor learning objectives,

2. classroom media can be as effective as (and in many cases more effective than) traditional, non-mediated instructional methods, and

3. in most cases the use of classrom media can help bring aobut as much or more learning in less time with less cost than in required by traditional instructional methods.

The media formats he reviewed were motion pictures, television, computer assisted instruction (CAI), audio format, multimedia, and still projection format.

In the following discussion, some of the researches mentioned by Molstad (1974) and Peterman (1982) will be reviewed. Some of them indicated a positive relationship between media use and learning while some others recorded a negative relationship.

In 1933 in one of the earliest media researches on record, Arnspiger showed that the use of motion picture film increased cognitive learning and retention. In that same year, Rulon also demonstrated that film-enriched instruction produced enhanced learning. A 14.8% superiority and 24.1% superiority were recorded for "rote" learning and "educative" learning respectively for text-plus-film groups over text-only groups. Three months later when tests for retention were carried out, 33.4% and 41% superiority respectively were recorded for "rote" learning and text-plus-film groups over the text-only group (Moldstad).

When overhead transparencies, specially prepared, were used in teaching, Clayton Chance (1960) found that groups did significantly better than those taught by the traditional method. Chance and his fellow researchers also found that there was a considerable savings in class time (Moldstad).

Kelley (1961) reported that when he used filmstrips to teach reading, youngsters who had the benefit of this mode of instruction did significantly better than those who did not. There was considerable improvement in word recognition as well as sentence reading. Other areas in which positive gains were observed were student interest, classroom discussion, fixation of basic vocabulary, reduction of timidity amongst pupils, reduction in lesson-preparation time. The technique also helped phonetic and structural analysis. Kelley used first graders for his experiment.

Lorge (1963) performed research into the effectiveness of language laboratories and concluded:

1. ninth grade students using the language laboraotry proved significantly superior to the non-laboratory groups in French speech fluency,

2. tenth grade laboratory groups proved significantly superior in both fluency of speech and intonation than the non-laboratory group, and

3. eleventh grade laboratory groups proved significantly superior to the non-laboratory groups in French comprehension at both slow and fast speeds.

Chu and Schramm (1967) carried out a comprehensive review of research on the effectiveness of television as an instructional tool. They summed up their findings with the following words:

> There can no longer be any real doubt that children and adults learn a great amount from instructional television, just as they do from any other experience that can be made to seem relevant to them--experiences as different as watching someone rotate a hula hoop or read the encyclopedia. The effectiveness of television has been demonstrated in well over 100 experiments and several hundred comparisons performed in many parts of the world, in developing as well as in industrialized countries, at every level from preschool through adult education and with a great variety of subject matter and method (p. 1).

Silberman (1962), Lysaught and Williams (1963) and, finally, Schramm (1964) in separate reviews of research on programmed instruction seem to concur on the following points: (a) students can learn effectively, often more effectively, from all types of programmed materials, whether in the form of linear or branching programs, and from programs in machines or programmed texts, than from more conventional instructional stimuli; and (b) frequently students learn equal amounts in far less time (Moldstad, 1974).

Other researches into the contribution of programmed instruction to learning were conducted by Roe (1962), Fincher and Fillmer (1965), and Attiyeh, Bach, and Lumsden (1969). Aittiyeh, Bach, and Lumsden used a group of 4,121

students spread out through 48 states across the United States. They summarized their conclusions thus:

1. on average, by expending 12 hours studying programmed learning texts, students learned pratically as much micro- and macro-economics as did students in seven weeks of a conventionally taught elementary course;

2. on the basis of test question breakdowns, students who used only programmed learning materials, as compared to conventionally taught students, performed better on "applications" of theory than on simple "concept recognition"; and

3. students had a generally positive attitude toward programmed instruction (p. 217, from Molstad).

Programmed instruction has been demonstrated with mentally retarded students. Price (1963), working with students with IQs ranging from 42 to 66, reported that those taught with programmed texts spent considerably less time than the control group learning the same material (Moldstad, 1974).

Multimedia--combination of two or more media. Using combinations of two or more media in the instructional situation does improve learning. Louis Romano (1955), using two different groups from 5th, 6th, and 7th grades from two schools and alternating their roles from experimental to control from time to time, measured the performances on vocabulary tests. On retention tests, the experimental groups recorded gains in all except two tests. The research covered several months. The materials used with both control and experimental groups were chalkboards, bulletin boards, charts, models, flat pictures, and field trips; the following media were used only with the experimental groups: motion pictures and projected still pictures.

Sparks and Unbehaum (1971) compared the performance of students taught by the audiotutorial method to that of conventionally taught students in a biology course. They reported that the experimental group using the

audiotutorial method did significantly better at the 0.05 confidence level than the control group.

Separate experiments performed by Meleca (1970), Hinton (1970), and Brewer (1970) all confirmed the superiority of the audiotutorial approach over the traditional method.

Experiments with the audiotutorial approach were not confined to the sciences and social studies. Business students were subjected to experiments by Edwards, Williams, and Roderick (1968) in which several media alternatives were made available to the students in an open-laboratory situation. They concluded that:

1. students of the experimental group expressed a preference for the audiotutorial, open-laboratory method of instruction; and

2. students of the experimental group using the audiotutorial approach learned significantly more--at the .05 confidence level--than the control group, as indicated by their perforamnce on and off term examinations.

Stuck and Manatt (1970) investigated another audiotutorial approach with 219 preservice teachers at Iowa State University. It was a simulated "in basket," problem-solving approach. They found that the performance of the audiotutorial group on a carefully validated criterion test was significantly better than the conventionally taught group. The former group also spent much less time mastering the same concepts.

Computer assisted instruction (CAI). Doubts about the effectiveness of computer assisted instruction have been put to rest as a result of experiments conducted by several groups of people.

Hansen (1966) concludes: "One of the most consistent findings with CAI tutorial applications is the marked saving in instructional time along with no loss in post-instructional achievement test performance" (p. 596, in Moldstad, 1974).

Grubb and Selfridge (1964) reported that the experimental group performed much better on the mid-term tests and also spent considerably much less time learning the material than the control group. The subject studied was descriptive statistics (Moldstad, 1974).

Goodman (1964) made similar findings when he experimented with two groups of airline ticket agents in training. Using CAI, the experimental group spent half the time taken by the control group and performed better by about five percent on their final tests.

Cartwright, Cartwright, and Robine (1972) compared two groups of college students as they learned to identify children with problems expected to adversely affect school progress. One hundred, fourteen students were involved in this experiment; one group received instruction by CAI and the other by conventional methods. The experimental group performed much better than the control group. The mean score of the experimental group ws 24% higher than that of the control group and completed the course in one-third less time than the control group (Molstad, 1974).

Not all of the researches on the effectiveness of media in instruction yielded positive results. In some instances there were no significant differences between mediated instruction and the traditional method, while in some others the traditional method was reported to be superior to the mediated instruction although these are few and far between.

For instance Drury (1959), Montgomery, Anderson, and Moore (1961), Champa (1958), Anderson and Montgomery (1959), McElroy (1959), Castelli (1970), Pothoff, Larson, and Patterson (1940), Heidgerken (1948), Freeman and Hoefer (1931) all reported in their experiments that they found no significant differences between traditional instruction and film supported learning in the cognitive domain (Peterman, 1982).

Peterman reported that only three studies showed that traditional methods of instruction were more successful than film instruction methods in bringing about learning and retention of factual information. Peterman's review of researches was grouped under six media formats summarized below.

Motion pictures. Research supports the use of motion pictures in the classroom when compared to traditional methods and/or other media formats. Their use produces as much or more learning in less time than traditional methods.

Television. Studies with television show that its use can improve educational efficiency by producing the same results at lower costs. "This can primarily be done by increasing the number of students per instructor" (p. 140). It can be used for large or many groups without reduction in effectiveness.

Computer assisted instruction (CAI). Conclusions of researches in this area indicate that CAI among other things bring about learning and the retention of that learning and that there is a saving in time on the amount of learning.

Audio methods. Peterman's review revealed that audio instructional methods in combination with traditional methods can be at least as effective and in some cases more so than traditional methods alone. Radio in combination with traditional methods can be at least as effective as other media formats and traditional classroom instruction alone. Compressed speech was found to result in significant savings in time.

Multimedia. The use of multimedia in instruction was found to be at least as effective as traditional methods and/or single media. A saving in time as well as cost was also recorded.

Still projection. The evidence of the review indicated the following:

1. still pictures (slides and filmstrips) are as effective as motion pictures when used in the classroom, and
2. use of the overhead projector can facilitate effective and efficient learning.

The results of all the hundreds of researches done in learning from media are summarized by Schramm (1977) in the following words: "We have thousands of years of educational history to tell us that teachers themselves believe multimedia instruction is more effective than a single medium" and " . . . students can learn a great deal from any of the media. Under most of the conditions tested, they could learn as much from face-to-face teaching, about many subjects" (p. 34).

Strategies for Training in Media (Media Training Approaches)

In December 1958, the Okoboji Conference devoted much of its time to discussing the various methods of audiovisual training for preservice teachers. The conferees, all of whom were leaders in the audiovisual field and committed to its promotion, identified four strategies and discussed their advantages and limitations. Their objective was to make available to interested persons the various training methods, not to promote one method over another, their reason being that the choice of one approach was determined by existing local conditions in teacher preparation institutions.

The Completely Integrated Approach

The development of competencies can theoretically best be accomplished through a completely integrated course where the use of audiovisual techniques permeates all professsional courses and particularly methods courses. Its success depends upon effective participation of all instructors of professional courses, a

method of evaluating the students' accomplishment, involvement of all students, and ample opportunity for laboratory experience as needed.

Advantages	Limitations
Theoretically all students get it.	Dependent upon team approach and seems to work best when content is organized into large block of time rather than courses.
Closely related to interests and needs.	
Inservice opportunities for all education instructors.	
Longer contact with AV.	
More flexible in terms of individual interests and needs.	Each member of the team must be able to carry his/her share of the load.
Overcomes limitations of separate course structure.	
Presents AV concepts with a larger and more realistic frame of reference.	Difficult to evaluate AV competencies.
	Difficult to handle transfer student.

Integrated Methods Materials Course

Here the audiovisual competencies would be achieved within the framework of the methods course or in cooperation with the audiovisual staff.

Advantages	Limitations
Theoretically all students get it.	Too little time to cover all competencies.
Closely related to interests and needs.	Teachers lack AV knowledge.
Inservice opportunities for methods professor.	Works best with team approach--not always evident at college level.

Formal Course Approach

The success of this approach is contingent upon completion of the course by all students, adequacy of the components of the course to provide the needed competencies, and ample opportunity for practical application through

laboratory experiences. (As far as possible, all audiovisual experiences in other courses should be exploited in connection with this laboratory activity.)

Advantages	Limitations
Presentation of AV content and experiences more fully organized.	Difficulty of adapting courses to wide range of students' interests and needs.
Instructor more likely to be better qualified and facilities more adequate.	Course apt to be elective and thus reaching only a small percentage of students.
More time to achieve objectives.	Difficult to present in terms of solution to learning problems.
Concentration in depth of student effort.	
Better opportunity to influence students' attitudes toward AV.	
Initial experience for potential AV specialists (recruitment).	

Laboratory Project Approach

This is a program which gives all students sufficient time in an audiovisual laboratory to complete projects involving competencies applicable to their teaching interests. Success is contingent upon acceptance and participation by entire facutly, the requirement that all students complete the program, the services of professionally qualified laboratory assistants, and a method of evaluating students' accomplishment.

Advantages	Limitations
Introduces AV to students and faculty who may not otherwise take AV courses.	Requires added facilities.
Operates on a problem solving level (high interest).	Requires added staff and budget.
Development of new skills and techniques gives student added confidence.	Reaches limited number.

The above summary of the 1958 Okoboji Leadership Conference report, quoted from Audiovisual Instruction (January, 1959), concludes with the suggestion that some combination of the approaches indicated in the foregoing "may prove to be the most realistic means of achieving desired goals." This view is further strengthened by detailed descriptions of the various approaches by Howard in 1959.

The different approaches are dealt with in separate articles. Howard describes the integrated audiovisual program conducted at Central Washington College; Vandemeer, Torkelson, and Oxhandler discuss the separate course; the laboratory course is dealt with by Sherwin Swartout; Fulton discourses on the multiple approach. Each approach developed in such a way as to suit the conditions obtaining in the institution has worked satisfactorily (AVI, 1959). The report by Torkelson and Reeves (1960) on research into self-instruction and audiovisual education is significant. Their study concerned itself with the four patterns for audiovisual education identified above, namely (a) separate course, (b) integrated (with general methods), (c) student teaching (taught at teaching locations), and (d) self-study (laboratory), for preparing preservice teachers to use audiovisual materials of instruction. Among other things, they concluded that "the self study group did as well as students taught by other methods on written tests on course information."

A conclusion arrived at by Oliver (1962) is also of significance at this time. He wrote:

> It was apparent throughout the project that emphasis on instructional media during preservice teacher education could not be divorced from other phases of the undergraduate professional sequence. As instruction progressed, it became clear that emphasis on instructional media could best be developed on a team basis through cooperation among the professional staff, with an appropriate allotment of time for the study of instructional media and with established objectives for instruction and laboratory opportunities.

Preservice Educational Media Training in Some Countries

In this section, the investigator gives brief accounts of the practices in audiovisual education in some countries.

United States of America

In 1934, the state of Pennsylvania made audiovisual education an integral part of the training of teachers and required all "applicants for permanent teaching certificates on and after September 1, 1935, to present evidence of having completed an approved course in visual and sensory techniques" (Saettler, 1968, p. 143). This move to make audiovisual education a compulsory and integral part of the teacher education program was followed by other states. However, by 1967 only three other states had made it a requirement for teacher certification (deKieffer, 1970). In 1926 a committee on teacher education had "recommended to the Department of Visual Instruction of the National Education Association that a definite laboratory course be established for student teachers and teachers in service" (Saettler, 1968, p. 135). It noted also that several institutions were offering courses in visual instruction.

Although the need is recognized by most teacher institutions, audiovisual education is not a requirement for certification in all states of the United States.

The basic content as well as the duration of the courses varies from institution to institution and from state to state.

The Association for Educational Communications and Technology and its predecessor organizations have made available guidelines that teacher training institutions could adopt for their audiovisual programs.

United Kingdom

In the United Kingdom the audiovisual course is recognized as an important and necessary part of the teacher training program; however, the Council for National Academic Awards (CNAA), the validating body which approves teacher training courses, has yet to make a policy statement on its place in the curriculum. A 1980 survey by Winders revealed that 20% of colleges surveyed had no courses in audiovisual education, 15% offered introductory courses of 1-7 hours, 40% gave a basic course of 8-15 hours, those offering extended courses (16-25 hours) formed 15% of the colleges covered in the survey, and 10% gave indepth courses of over 25 hours.

A national policy regarding educational technology training in teacher education has yet to be formulated. Until this is done, teachers' colleges and polytechnics will continue to offer courses that differ greatly in content and duration. However, the Council for Educational Technology (CET) has the mechanism for making recommendations for the audiovisual component of teacher training.

France

In the mid-fifties, France increased its budget for audiovisual education by huge amounts. The money was to be used to pump audiovisual materials and equipment into the schools. At the same time, the French education authorities embarked upon a plan of "training which will produce teachers capable of putting it to good effect; an appliance is useless unless people are trained to use it" (Mariet, 1978). Audiovisual training is, therefore, compulsory in the teacher education system.

A basic training is required for all, followed by special training in which special emphasis is laid on certain aspects depending on the subject area. The

special training is given to teachers who are specially selected on account of their proficiency in the use of media in the classroom; they become "master teachers" and are utilized to conduct workshops, seminars, and inservice courses for other teachers in the system. This special training is of a year's duration (Lefranc, 1959).

Zambia

Courses in educational media are mandatory for all students in teacher training colleges. Specially made programs in film, radio, and television, some of them videotaped, are utilized. Student teachers are encouraged to experiment with audiovisual materials in their lessons.

The audiovisual course is part of the general course in methodology (Jongbloed, 1974).

Nigeria

Audiovisual education courses in training colleges are taught by specialist lecturers in educational media who are invited for that purpose. Training films and filmstrips specially made for teacher training are used. Student teachers are encouraged to experiment with audiovisual materials in their teaching. Audiovisual education forms part of the written and oral examinations of the students (Jongbloed, 1974).

It is doubtful how effective these methods are for Agun (1976) noted two years later that, "Although the majority of our primary school teachers have undergone some form of training which should have included tuition in making simple visual aids, teaching at classroom level is rarely supported with such aids."

In regard to the importance and desirability of exposing preservice teachers to some form of training in media, there seems to be little doubt.

Practices regarding whether or not such training be considered a necessary requirement or a compulsory course for every prospective teacher vary greatly from country to country and even among states, regions, or provinces within a single country.

Summary

In this chapter, the investigator has reviewed the literature in the following areas of educational media: teacher preparation and educational media training and how they are related; patterns of educational media training--their advantages and limitations; different media formats and learning; identification of media competencies; and a brief review of practices in audiovisual training in some countries.

It has been shown that when teachers are exposed to media during their training, they tend to use them more and with greater expertise during their inservice days. Four methods of training were discussed, and it was suggested that the choice of one method over another was determined by conditions existing in the college and that the success or failure of the program hinged largely on the support of other faculty, reflected in how they themselves utilized the media and on the adoption of a standard of evaluation. It was also shown that the majority of media formats generally enhance learning. Media competencies that teachers need were identified, including McMahan's adaptation of Dale's Cone of Experiences.

These media competencies were arrived at after a careful search of the literature in which lists by Kemp, Curl, Torkelson, Norberg--all writing in Media Competencies for Teachers, edited by Meierhenry--were reviewed. McMahan's continuum incorporates all the media that could be conveniently taught in a media program at the preservice level.

In the opinion of this investigator, the preceding discussion provides the framework and experiential basis drawn from authoritative sources for any recommendations for a media training program that will be arrived at as a result of this study.

CHAPTER III

DESIGN AND METHODOLOGY OF THE STUDY

Introduction

The study was designed to assess the nature of the preservice teacher preparation program in the initial teacher training colleges of Ghana. The investigator focused attention on the type of training that the prospective teacher received in the selection, production, and utilization of educational media. In this task he examined the factors that, in his view, would have a direct influence on growth or success of the program--namely, (a) financing, (b) staffing, (c) administrative leadership, (d) availability of equipment and materials and (e) physical facilities.

As part of the study, answers were sought to certain questions. These questions and how the investigator went about seeking answers to them are discussed in this chapter.

The research task which was a descriptive one was based on the following design: (a) search of the literature for studies of a similar nature and other writings relative to the concerns of the investigator and development of questionnaires to be administered to identifiable groups, (b) review of the questionnaires by professionals knowledgeable in audiovisual education and research methodology, (c) field testing of the questionnaires with subsequent revision, (d) administration of questionnaires with reminders to recipients at appropriate intervals, (e) visits to some selected teacher training institutions for interviews of heads of institutions and firsthand observation, (f) collection of

data and analysis, and (g) comparison of findings with recommended practices collected from documents.

Implementation of the Research Design

1. In order to assess the teacher education audiovisual program, it was necessary to develop criteria which set appropriate parameters for an acceptable training program (see recommendations in Chapter V). While no single ideal program could be identified, several programs which had stood the test of time and had been found satisfactory were found to have been developed by leaders in the educational media field, state departments of education, researchers as well as professional associations, and colleges of education. Recommendations by the Audiovisual Leadership Conferences (1959), studies by McMahan (1968), Branscombe (1969), Fulton (1959), Oliver (1962), Winders (1980), and deKieffer (1970) are just a few of the materials that contained questionnaires that had been used for similar research and for programs in teacher training. These formed the basis for the questionnaires for this study.
2. A questionnaire to be directed to principals of training colleges was prepared, pretested, reviewed, and mailed (see Appendices A and B). Reminders were sent out until about 90% response return had been achieved.
3. Visits were then made to 10 training colleges (see Appendix J) for the purposes of meeting with principals and getting in-depth information through interviews and examination of facilities.
4. Documents in the Ministry of Education were searched for information regarding an audiovisual program for the training colleges. Except for a syllabus on audiovisual education and the information that the audiovisual

specialist used to conduct induction courses in the training colleges toward the end of the academic year, and the fact that there had been audiovisual workshops for training college faculty--three between 1968 and 1971, nothing else came to light. The audiovisual specialist's induction courses had been discontinued for some years. L. B. Hanson-Nortey, inspector of schools (administration), E. O. Adu-Gyamfi, a science specialist with audiovisual training, and S. A. Gyima, audiovisual specialist at CRDD, were the officials who assisted in the search. Mr. Gyima accompanied the investigator during his visits to the training colleges in 1977 and was co-director with the investigator of the audiovisual workshop held in September, 1979, for training college faculty. He has since retired.

5. Classroom teachers were the next group to whom questionnaires were mailed. As consumers of the audiovisual education program, their opinions regarding the type of training they received were considered essential to obtaining a true assessment of the state of affairs.

6. Another questionnaire to gather follow-up data from the principals of the initial training colleges was mailed in December, 1982 (see Appendix B). This was meant to bring up to date the information collected in 1976-7. There was the possibility that a change in attitude by the education authorities both on the micro and the macro levels had occurred which might influence policy on audiovisual education. There was also the possibility of changes in the college administrations. For instance, an inservice training program for training college tutors was held in 1979, and this could bring about a change in thinking and attitude among the more innovative and progressive of the principals.

7. Visits to some North American universities known for their outstanding audiovisual education programs were made (see Appendix K). These visits,

and the discussions with the professors in charge of the programs, provided the investigator with additional insights into what exists and what could be done in the area of preparing teachers to select, produce, and utilize instructional media in Ghana.

8. Finally, some top officials in the Ghana Education Service who, on account of their positions, might have some decision making roles in formulating policy in curricula for teacher training colleges were sent questionnaires (see Appendices C, D, & E). These questionnaires requested the officials to supply information regarding the existence of any governmental policy on a standardized audiovisual education program in the teacher education curriculum. The officials were (a) the Director of the Curriculum Research and Development Division in the Ministry of Education, (b) the Secretary of the National Teacher Training Council, and (c) the Director of the Institute of Education, University of Cape Coast.

9. Analysis of the data collected from questionnaires, visits and dicussions, publications and unpublished research projects, and documents enabled the investigator to develop recommendations to be incorporated into the existing audiovisual program by the Ghana Educational Service.

Questions to Be Answered

The study sought to answer certain questions in order to assess the status of audiovisual education in the teacher education program as a whole and enable the investigator to make recommendations. The research addressed the following questions.

1. Does government policy exist regarding basic audiovisual training for all prospective teachers in the initial teacher training institutions that is comparable with what is accepted as desirable?

2. Do appropriate facilities exist in these institutions in terms of human, physical, and financial resources for training in audiovisual education?

3. Are there syllabi in audiovisual education in the institutions and to what extent are they being followed?

4. Have developments in educational technology in the Western world, particularly since the end of the Second World War, exerted any influence upon the field of teacher education in Ghana?

5. What should be the characteristics of an audiovisual training program for an initial teacher training college?

Research Populations and Sample

The following is a description of the populations and samples used in the study, with a rationale for the choices made.

Principals of Initial Teacher Training Colleges

Principals usually hold degrees in the social sciences and have had considerable teaching experience in elementary schools as well as teacher training institutions. Those who hold no university degrees have the associate certificate in education along with a diploma in the teaching of one of the following: English as a second language, mathematics education, science education, music, child psychology, or social sciences. These diplomas are usually acquired from a commonwealth university outside of Ghana. More often than not, each of these principals has been a head of department in a training college and has risen to the rank of assistant director in the Ghana Education Service.

Principals are expected to have shown considerable interest in the growth of the profession and to have participated actively in the affairs of a subject association.

All principals belong to the Conference of Principals of Teacher Training Colleges (CPTTC) that meets at least three times a year to consider ways of improving the professional preparation of teachers.

The principal, more than any other person in the training college, should know what conditions exist that are conducive, or not, to the maintenance of a satisfactory audiovisual program. He or she is the "chief executive" and should be in a positionn to answer the questions posed in the questionnaire.

Principals of all 33 initial teacher training colleges were served with the questionnaire.

Classroom Teachers

A sample of 210 classroom teachers were selected out of about 51,000 trained teachers. The population of elementary school teachers in these educational districts across the country was chosen. In each of the three districts, 70 teachers were randomly selected for the stratified sampling so that they would be evenly distributed between the years 1950 and 1980 when they obtained their certificates. This would be representative of the total classroom teacher population, and their responses would provide a picture of the nature of their training in the selection, production, and utilization of audiovisual instructional materials. The three local districts involved in the survey were Cape Coast Municipality in the Central Region; Accra City Council, Greater Accra Region; and Bimbilla Education District in the North. In all three cases, the help of the Assistant Director in charge of the district was enlisted in making the selection of the teachers.

In the Cape Coast Municipality, the investigator's assistant visited the teachers and solicited responses to the questionnaires. This took place between November, 1981, and March, 1982. At Bimbilla and Accra, the assistant directors

attended meetings at which the teachers were gathered in order to solicit their responses to the questionnaires at one sitting. These meetings occurred in July and October, 1982, respectively. See Figure 4 for projected distribution by district and by interval.

	Cape Coast	Accra	Bimbilla
1950-55	11	12	12
1956-60	11	12	12
1961-65	11	12	12
1966-70	11	12	12
1971-75	11	12	12
1976-80	11	12	12

Figure 4: Projected distribution of teachers in districts by intervals.

In 1976-77 the investigator had a great deal of contact with the principals by means of the questionnaire, reminders, messages, and, in some cases, personal visits. It was reasonable to assume that those principals who were progressive, innovative, and had the means at their disposal would attempt to introduce or emphasize training in audiovisual education in their institutions. In September, 1979, the investigator, with four colleagues from the Ministry of Education, successfully conducted an inservice training course for training college tutors. Seventeen out of 33 colleges were represented. By 1979 graduates from the University of Cape Coast who had been exposed to the strengthened audiovisual program, and who had joined the faculties of the training colleges since 1977, could be expected to influence them in developing a program oriented towards audiovisual training. If these three factors really had any impact on the quality of audiovisual training, it should become apparent from the responses of those whose training occurred within the 1977-80 period.

The investigator recognized that the teachers would be in a good position to judge from their professional training, as well as from personal experience, whether their preparation in audiovisual education was satisfactory. They were in a good position to tell why they were unable to perform satisfactorily in the selected competencies. Their anonymity was protected by their not having to give their names. Their training was already completed, and they were thus free to give their opinions without fear of intimidation or reprisals.

The period of 1950-80 was chosen for survey period because the years immediately following the end of the Second World War saw a great deal of activity in the field of audiovisual education (Hitchens, 1979). Those who were in charge of training programs in the armed forces found their skills in great demand in business, industry, and education. The investigator reasoned that five years from the end of the Second World War was enough time to allow the new ideas spawned during this active era in the history of educational technology to disseminate far and wide and begin to influence educational thought and practice in a developing country like Ghana (Hercik, 1976).

During a 30 year span, the Ministry of Education would have had ample opportunity to develop an audiovisual training program as it had done for physical education, mathematics and science education, home science education, and social studies education. The responses would indicate whether the Ministry was sufficiently sensitive to the changes taking place in this particular area of the education enterprise and whether it was willing to do something about it.

Instrumentation

Design and Development

During the design and development of the project, the investigator relied a great deal on precedent research in the area of preparation of teachers in media

selection, production, and utilization. Notable research reports consulted were by the following investigators: de Kieffer (1947), Meierhenry (1966), Oliver (1962), McMahan (1968), Branscombe (1969), Fulton (1959), Pascoe (1960), Saettler (1953), and Imbrock (1951).

State boards of education and the United States government had funded research projects on audiovisual education in teachers' colleges. The federal governmented research projects, and documents enabled the investigator to develop proposals for establishing an audiovisual program for use by the Ministry of Education.

Books on the subject of audiovisual education by authors who have made significant contributions to the field of educational technology were consulted for their contribution to precedent theory for the present research. Dale (1969), Brown, Lewis, and Harcleroad (1973), Erickson (1968), Wilkinson (1971), Cable (1965), Kinder (1959), Coppen (1969), and Wittich and Schuller (1973) were a few of the texts consulted.

A study of a survey by the National Council for Audiovisual Aids in Education (NCAVAE) in the United Kingdom, as well as programs in audiovisual education offered in some North American universities, were also of great help.

These documents and materials enabled the investigator to identify certain basic audiovisual skills that a teacher should possess, some basic audiovisual equipment and materials that a training college might do well to acquire for its training program, different types of courses in audiovisual education run by colleges of education, and factors that tend to inhibit the adoption of audiovisual instructional materials in an institution as well as in an educational system.

The information obtained from these studies formed the framework around which the questionnaires to the principals of training colleges, classroom

teachers, and officials in the Ghana Education Service were prepared and pretested and then distributed.

Questionnaire for principals of the initial teacher training colleges (see Appendix A). The investigator posited that a successful program in audiovisual education would depend largely upon the extent to which the following factors identified by Hoban (1949) were addressed: (a) staffing, (b) physical facilities, (c) financial resources, (d) facilities for operation and maintenance of equipment and materials, (e) curriculum, (f) support by administration for operation and maintenance of equipment and materials, and (g) availability of media. The questionnaire was designed to elicit from principals information on these variables.

Some of the questionnaire items asked for multiple choice responses along a semantic differential scale, while others involved yes/no responses. The questionnaire also had an open-ended section in order to allow principals to supply whatever additional information they felt to be important.

In order to reduce the possibility of errors in the interprepration of terms, a brief glossary was included at the end of the questionnaire, and reference was made to it in the introductory letter.

The original draft questionnaire was prepared in consultation with professors at Michigan State University knowledgeable in audiovisual technology. They made recommendations for rephrasing some of the items and satisfied themselves that (a) an important aspect of the teacher preparation program was being addressed and that (b) principals should be able to provide the information required in the questionnaire.

Two professors at the Faculty of Education of the University of Cape Coast made useful suggestions about the format of the semantic differential items as well as the content and its relation to the proposal.

Three principals were used to pilot test the questionnaire. Their responses and comments were used for revising the questionnaire.

The questionnaire for the follow-up study was also validated by professors from Michigan State University, and the instrument was revised before being released, based on their recommendations.

The questionnaire addressed to classroom teachers was also based upon previously conducted studies on the preservice training of teachers in selection, production, and utilization of audiovisual instructional materials (see Appendix F). The works of Oliver (1962), Streeter (1967), Branscombe (1969), and Tibbs (1974) were consulted. After the questionnaire had been prepared, two professors of the University of Cape Coast made comments about its content and structure which resulted in appropriate revisions. A pilot study was conducted with it among 15 elementary school teachers in the Cape Coast Municipality. This also resulted in appropriate rewording of some of the questions.

The questionnaire was designed to seek from the teachers their opinions about the type of training they had received in audiovisual education. Some of the items demanded a simple yes/no response; others called for a short essay-type answer. The questionnaire was open-ended. The anonymity of the teachers was preserved by not requiring teachers to supply their names. The content of the audiovisual courses to which classroom teachers were exposed during their training from 1950 to 1980 would give an indication as to the influence of developments in educational technology had on the field of teacher education in Ghana.

Questionnaires addressed to Ministry of Education officials (see Appendices C and D). In considering how government policy has provided leadership in audiovisual training in teacher education, the investigator reasoned that seeking information from teacher training college principals alone was insufficient, and

that supplementary information from inside government would help in forming a more balanced conclusion. Two officials who are in a position to influence policy with respect to training college curricula and teacher accreditation standards were earmarked as recipients of these questionnaires. For guidance in drawing up the questionnaire, documents by the American Association of Colleges of Teacher Education (AACTE) (1969), the National Education Association (NEA) (1967), and Britain's Council for National Academic Awards (CNAA) (1982) were consulted.

In order to validate them, their design was kept close to the main ideas in the questionnaires to the principals. These questionnaires were also seen by knowledgeable professors in the audiovisual field at Michigan State University and their recommendations incorporated. The investigator was handicapped by distance and could not test the reliability of these instruments.

The questionnaires developed focused on these issues: (a) whether there was a government policy concerning audiovisual education in training colleges, (b) whether a syllabus exists, (c) whether some form of assistance in the way of guidance and consultancy has been established, (d) how standards are maintained in the training colleges, and (e) whether audiovisual education forms part of accreditation requirements.

Copies of all the questionnaires used in data gathering in the study are in to appendices to this report.

Data Collection Procedures

Resources Required

Initial funding for the survey research was provided by the University of Cape Coast out of its research and conferences fund with a grant of $300 in 1976. The amount was designated for the following expenses: (a) investigator's travel,

(b) remuneration and travel for assistants during the survey, (c) remuneration for typists, (d) telegrams and postage, and (e) stationery.

The investigator was assisted in his research by an assistant director, himself an audiovisual specialist, from the Ghana Education Service. He accompanied the investigator on his travels to the colleges to conduct interviews and inspect facilities. One graduate assistant and one diploma student were instrumental in administering the questionnaire in two districts. One district education officer--an assistant director of education--was also responsible for administering the questionnaire to classroom teachers in his district. The Director, Curriculum Research and Development Division (CRDD) of the Ministry of Education, was responsible for distributing and collecting the follow-up questionnaire.

Training

The assistants required little training because of the self-explanatory nature of the covering letter to the questionnaire for classroom teachers. The assistants were instructed to answer any question the respondents might have. The investigator discussed the questionnaire item by item with the assistants. The assistants were urged to not convey their own views about preservice audiovisual training to the respondents. The briefing sessions with the assistants took no more than 10 minutes.

Administration of Questionnaires

Letters, telegrams, and messages of reminder to training colleges took roughly three months. Toward the end of the 1976-77 academic year, the investigator took two weeks to tour the training colleges in the following regions: Volta, Ashanti, Accra, and Central--with the express intention of carrying out indepth interviews and inspecting facilities.

Time Frame

The sending of questionnaires to practicing teachers occurred according to the following schedules:

December, 1981: pre-testing of questionnaire

February, 1982: administration of revised questionnaire in Cape Coast Municipality

July, 1982: administration of questionnaire in Northern Ghana; they were returned in October, 1983

October, 1982: administration of questionnaire in Accra Municipality

The mailing of questionnaires to the officials in the Ghana Education Service, as well as the sending of follow-up questionnaires to principals, took place in December, 1982, and January, 1983. The returns were received in June, 1983.

Plan for Analyzing Data

Questionnaire for Principals

The data collected were manually tabulated to facilitate extraction of summary statistics in mainly percentage ratings. The results were tabulated to provide the following information:

1. number of pieces of equipment and materials per college, per faculty member, per student;
2. hours spent on audiovisual education by students in (a) theory and (b) practical work;
3. number and percentage of colleges with qualified audiovisual staff and educational media programs;
4. factors affecting media acquisition and utilization in the colleges as identified by principals;
5. number of principals who recognize the need for an audiovisual education program;
6. number of colleges with adequate funds, sources of funds, and amount per student; and

7. numbers and percentages of colleges reporting adequate faciliities for media utilization by staff, and also storage facilities.

Questionnaire for Teachers

Responses to questionnaire B were also manually tallied and summary statistics computed to provide information on the following areas:

1. numbers and percentages of classroom teachers reporting on the nature of the use of audiovisual instructional materials and processes by their tutors during preservice training,

2. numbers and percentages of classroom teachers reporting on the content and pattern of their preservice training,

3. numbers and percentages of classroom teachers reporting on nature of the media qualifications of the tutors who taught them audiovisual education,

4. their perceptions of the status of audiovisual education in the training college curriculum,

5. numbers and percentages reporting on their experiences with inservice training in the media, and

6. recommendations for improving the audiovisual programs in the training colleges.

Questionnaire to Government and Quasi-Government Personnel

The responses to these questionnaires were simply tabulated to reflect the position of government on the following:

1. whether a syllabus for audiovisual education existed, and

2. whether a mechanism existed for giving guidance in audiovisual education and for monitoring it at the teacher training college.

Briefly, the responses should reveal the existence or non-existence of a policy in respect of preservice preparation of teachers in the field of audiovisual instructional materials as there is in other subject areas.

Criteria for Interpreting Data

The following criteria have been developed to be used as guidelines for judging the acceptability of conditions in the training colleges.

1. A college was considered (a) well equipped, (b) reasonably equipped, or (c) poorly equipped according to the quantities of items that it possessed on the list of equipment provided (see Table 76).
2. If the course in audiovisual education were either only theoretical or practical, it was considered unsatisfactory; if it were a combination of both, then it was judged satisfactory.
3. A program would not be considered satisfactory or unsatisfactory depending on whether it was restricted to the nature of the course--a laboratory type, separately, or as part of a methods course. Its content would determine whether it was satisfactory. It should be an audiovisual course, not a visual or an audio course.
4. Every classroom should be provided with electrical outlets to enable media utilization during the day. At least one classroom in the college should possess blackout facilities to enable films to be screened during the day. Without these, the facilitites for media utilization during the day were regarded as poor (Wilkinson, 1971; Faris, 1965).
5. Financial resources would be considered along with these criteria:
   a. $4.00 or more per student would be adequate,
   b. $2.00 - $4.00 per student would be fair, and
   c. less than $2.00 per student would be inadquate.

Considering that in 1954 the French government decided to spend $8.00 per elementary school pupil on school equipment, eight-tenths of which went into audiovisual equipment, and also that Ghana is not terribly well off, then $4.00 per teacher training student would be reasonable. This amounts to $1200 for a college with 300 students. If $300 were used for the purchase of materials, while $900 went towards acquiring equipment and maintenance, a college should be able to utilize this amount to build up its stock of audiovisual equipment.

6. For the purposes of practical significance, all percentages below five percent will be regarded as negligible; i.e., all percentages of five and above shall be regarded as practically significant.

Summary

This chapter has discussed the design of the study. Questions to be addressed by the study have been stated in detail. The populations and samples have also been described. The instruments, how they were developed and validated, have also been dealt with. The establishment of reliability of two of the questionnaires by pilot testing was also described. Reasons why the reliability of the three questionnaires to the officials in government and quasi-government officials could not be fully established were also given. Also discussed were criteria for judging the acceptability or otherwise of an audiovisual program, data collection procedures, and methods for analyzing the data.

In the following chapter, the data were tabulated using summary statistical procedures. All values below five percent were to be regarded as negligible for the purposes of this study.

In order to answer the question regarding the existence of government policy on basic audiovisual training for prospective teachers, questionnaires were addressed to the following personnel: (a) the director of the Curriculum Research and Development Division (CRDD), (b) the secretary of the National Teacher Training Council (NTTC), and (c) the director of the Institute of Education, University of Cape Coast (see Appendices C, D, and E).

To the question regarding appropriate facilities such as human, physical, and financial resources, a questionnaire and its follow-up were sent to all principals of the 33 initial teacher training colleges (see Appendices A and B).

To respond to the question of whether there is a syllabus in the training colleges and to what extent it is being followed, questionnaires were sent to the following: principals of initial teacher training colleges, (b) the director of CRDD, (c) the secretary of NTTC, (d) the director of the Institute of Education, University of Cape Coast (see Appendices A, B, C, D, E, and F).

The questionnaire to classroom teachers trained during the period 1950 through 1980 was meant to elicit information that would reveal differences in coursework they were exposed to. This is considered a major indicator in responding to the question regarding the influence of developments in educational technology in the Western world on media training in teacher education in Ghana (see Appendix F).

Recommendations for audiovisual training and its supportive services were obtained from studies of reports by Meierhenry (1966); Pascoe (1959); the American Association for Colleges of Teacher Education (1968); and dissertations by McMahan (1968, Branscombe (1969), and Streeter (1967). Studies of programs being administered at Western Michigan University, the Univeristy of Ohio and Michigan State University provided useful information. Also valuable were

recommendations found in books by Dale (1969), Wittich and Schuler (1973), Brown, Norberg, and Srygley (1972), and Wilkinson (1971).

CHAPTER IV

PRESENTATION OF THE DATA

Introduction

The preceding chapters dealt with the following aspects of this research project: a description of the problem, its significance, questions to be answered, and how the project was designed. These were followed by a review of the literature describing similar research done and of research evidence supporting the views that relate media and instruction and their place in teacher preparation. Then followed a description on how the study was implemented and how the data would be analyzed.

This chapter contains a compilation of the findings of the study and an analysis of the data. It is divided into the following categories: (a) data collected from principals by means of the first questionnaire, (b) data collected from principals by means of a follow-up questionnaire, (c) data collected from practicing teachers or classroom teachers, and, finally, (d) data obtained from government and quasi-government officials. The analysis is discussed, and the chapter concludes with a summary. For purposes of practical significance, values below five percent will be regarded as negligible.

Analysis of Questionnaire Issued to Principals of Initial Teacher Training Colleges (1976-77)

Twenty-seven of the 33 questionnaires sent out were completed and returned, accounting for 81.82%.

Overview of Audiovisual Program

Number of minutes and duration of the audiovisual education courses offered by colleges. This information discloses that three colleges offer no courses at all, while two others offer a total of 48 hours each. Table 1 reveals that there is very little uniformity among the colleges regarding the amount of audiovisual exposure in hours that students receive.

Table 1
Number of Hours and Duration of Audiovisual Education Courses Given by Colleges

Number of Minutes	Duration (Hrs.)	No. Colleges	%
0	0	3	11
40 min. per week for 1 term	8	1	4
60 min. per week for 1 term	12	1	4
120 min. per week for 1 term	24	4	15
40 min. per week for 2 terms	16	1	4
60 min. per week for 2 or 3 terms	24/36	2	8
80 min. per week for 3 terms	48	2	8
Unspecified		6	22
Declined information		7	26

Table 2 shows that in some colleges, an audiovisual course is given only for part of the duration of the teacher training program, while in others, it is taught throughout the duration of the program.

Table 2
Duration (in years) of audiovisual Courses as Specified by Principals

Duration (years)	Number of Colleges	%
1	3	11
2	5	19
3	4	15
4	4	15
Nil	5	19
Declined information	6	22

Information revealed by Table 3 also indicates that there is no uniformity in the amount of practical work in audiovisual education.

Table 3
Amount of Practical Training as Judged by Principals

Amount of Training Adjudged Practical (%)	Number of Colleges	%
25	1	4
40	3	11
50	2	8
60	8	30
Nil	3	11
Declined information	10	37

According to Table 4, the following topics feature prominently in the practical experiences provided for teachers in training: chart making, lettering techniques, improvisation using local materials, clay modeling, chalkboard use, and picture mounting. Forty-four percent of colleges provide a certain amount of training in model making and papier mache use. Improvisation in the science laboratory, carpentry, painting, educational visits, puppetry, and equipment operation are given attention only by a mere handful of colleges (22% or lower). The last four items were suggested by four colleges as being offered for students' practical experience.

Table 4
Content of Training in Audiovisual Education
(Practical Learning Experiences Provided in Courses)

Content	Number of Colleges	%	Declined Information	%
Equipment operation	3	11	15	56
Chart making	15	56	3	11
Model making	12	44	10	37
Papier mache	12	44	11	41
Lettering techniques	20	74	4	15
Clay modeling	14	52	9	33
Puppetry	6	22	12	44
Improvisation (using local materials)	18	67	3	11
Chalkboard use	19	70	4	15
Picture mounting and preservation	14	52	8	30
Visits (educational)	1	4		
Painting	1	4		
Carpentry	1	4		
Science laboratory improvisation	1	4		

Table 5 reveals that 15 tutors among all the training college tutors--673 in the responding colleges--had participated in audiovisual seminars, workshops, or inservice training.

Table 5
Principals Reporting a Certain Amoung of Faculty
Exposure to Some Kind of Audiovisual Education

Exposure to A-V Seminars/Workshops/Inservice

Yes: 12

No: 11

Nil response: 4

Type of Exposure	No. Principals	%
Workshop	8	30
Seminar	4	15
Inservice	3	11
Nil response	12	44
Total number of tutors with inservice exposure	15	22

Thirteen training colleges receive a number of professional journals, among them six receive Audiovisual Education, two receive Educational Slides and Filmstrips, and one receives Educational Media International (see Table 6). Even if all the journals were directly related to educational media, there would still be fewer than one journal per college.

Table 6
Educational Journals Received by Colleges
(Number of Colleges Receiving These Journals: 13 out of 27)

Title of Journal	No. of Colleges
Arts and Crafts Education	2
Educational Media International	1
Industrial Arts and Vocational Education	1
Teachers' Journal (UK)	1
Ghana Journal of Education	1
Look and Learn	1
Audiovisual Education	6
School Science Review	1
Teachers' World	1
Pictorial Education	1
Educational Slides and Filmstrips	2
Educational Equipment	1
Nil (those receiving nothing at all)	9
Those declining to respond	5

Table 7 reveals that the content of the audiovisual programs offered by colleges is far from uniform. For instance, 19% of the colleges include radio programs in their courses, while the remaining do not; 59.6% of the colleges treat charts while 41% do not. The flannel graph and the bulletin board receive little attention. The numbers of colleges that declined to respond or do not cover items such as drama, models, flip charts, three dimensional displays, charts, flash cards, flat pictures, and chalkboards are significantly large.

Table 7
No. of Colleges Providing Training in Selection, Production
Utilization in Audiovisual Instrucitonal Materials

Item	Positive	%	Negative or Nil Response	%
Chalkboard	13	48	14	52
Flat pictures	11	41	16	59
Flash cards	13	48	14	52
Charts	16	59	11	41
Three dimensional displays	7	26	20	74
Puppets/marionetts	6	22	21	78
Tape recordings	5	19	2	82
Disc	1	4	26	96
Filmstrips	3	11	24	89
Slides	3	11	24	89
Films (8mm)	2	7	25	93
Films (16mm)	2	7	25	93
Radio	5	19	22	82
Television	5	19	22	82
Flip charts	6	22	21	78
Modeling	8	30	19	70
Drama	10	37	17	63

The following were mentioned by a number of colleges in parenthesis:

Overhead projector (1), flannel graph (2), lettering (1), sketching (1) bulletin board (1), map making (1), drawing (1), camera (1)

According to Table 8, principals ascribe the following as reasons why their colleges are unable to provide training in audiovisual education for their students: scarcity of audiovisual equipment and supplies, poor repair facilities and lack of spares, lack of inservice training for their staffs, poor financing, lack of policy on audiovisual education and nonavailability of qualified staff. Those reasons were given by 52 to 81% of the principals responding.

Table 8
Reasons Why Pre-Service Teachers Get Poor Training (Numbers Show Those Principals Indicating Factors to Be Moderately to Extremely Important)

Reasons	Number of Colleges	%
Scarcity of A-V equipment and supplies	22	81
Lack of spares and repair facilities	19	70
Lack of inservice training program for staff	18	67
Lack of financing by education authorities	16	59
Lack of policy on A-V teacher education	14	52
Non-availability fo qualified A-V staff	14	52

Principals rated the following as only slightly important reasons for the poor training students receive: poor educational qualifications, poor attitude of staff towards audiovisual education, lack of relevance of audiovisual education courses, and heavy teaching schedules (see Table 9).

Table 9
Factors Judged by Principals as Not Important or Slightly Important Reasons for Students Getting Poor Training

Factors	No. of Classes	%
Poor educational qualifications of tutors	12	44
Poor attitudes of tutors toward A-V	10	37
Lack of relevance of A-V	14	52
Heavy teaching schedules	10	37

Syllabus of Audiovisual Education

Only 11% of the training colleges had a syllabus for audiovisual education. One training college supplied a copy of its syllabus. The practice appears to be that audiovisual instructional materials are treated as they are mentioned in the syllabi of other subjects and discussed during methodology classes (see Table 10).

Table 10
Principals Indicating That There Was an A-V Syllabus in Use in the College

Yes	3	11%
No	24	89%

(One training college provided its syllabus)

In 1976-77, only one training college (4%) had a tutor who had received a year's training in audiovisual education (see Table 11).

Table 11
Number of Tutors with Special Training in Audiovisual Education

One year training in A-V	1	4%
Inservice	2	8%
No training	17	63%
Declined to comment	7	26%

Table 12 is meant to give a more comprehensive list of the content of media programs. Some media that are excluded by a significantly high number of colleges do not require sophisticated equipment. Examples of these are radio (excluded by 67% of colleges), flat pictures (excluded by 63%), resource

persons, cartoons, and bulletin boards (neglected by 63%, 85%, and 81% of colleges, respectively).

Table 12
Content of the Audiovisual Course Offered in Training Colleges

	Treating Topic		Not Treating It		No Response	
	#	%	#	%	#	%
Flat pictures	10	37	8	30	9	33
Slides	7	26	11	41	9	33
Disc recordings	0	0	18	67	9	33
Charts	18	67	0	0	9	33
Diagrams	18	67	0	0	9	33
Radio	9	33	9	33	9	33
Resource persons	10	37	8	30	9	33
Dramatization	14	52	4	15	9	33
Marionettes	2	7	16	59	9	33
Models	12	44	6	22	9	33
Mock-ups	1	4	17	63	9	33
Flannel boards	16	59	2	7	9	33
Motion pictures	7	26	11	41	9	33
Videotape	1	4	17	63	9	33
Filmstrips	7	27	11	41	9	33
Transparencies	3	11	15	56	9	33
Tape recordings	5	19	13	48	9	33
Maps	18	67	10	37	9	33
Graphs	13	48	5	19	9	33
Cartoons	4	15	14	52	9	33
Educational trips	13	48	9	33	9	33
Museums	5	19	15	56	9	33
Puppets	4	15	14	52	9	33
Simulation	3	11	15	56	9	33
Three dimensional displays	6	22	12	44	9	33
Specimens	6	22	12	44	9	33
Chalkboards	15	56	3	11	9	33
Bulletin boards	5	19	14	52	9	33
Television	7	26	11	41	9	33

Seventy-four percent of colleges treat audiovisual education as part of regular methods courses, while 7.4% treat audiovisual education both as a separate course and also as part of a regular methods course (see Table 13).

Table 13
Numbers and Percentages of Colleges Adopting
Strategies for Audiovisual Training

Strategy	Number of Colleges	%
AV as part of methods course	20	74.0
AV as part of methods course and separate	2	7.4
AV as part of art and crafts course	1	4.0
No response	4	15.0

A significant number of principals (26%) were of the opinion that the content of their audiovisual courses was not comprehensive enough. Two (7%) of the college principals thought their programs were comprehensive. Only one of the principals had a staff member who had received an audiovisual course (two weeks long), and it was this person for was responsible for preparing the syllabus.

Staffing for Audiovisual Education

Only one training college had an audiovisual specialist holding a diploma in audiovisual education (see Table 11), yet seven colleges (26%) had assigned a staff member who was responsible for teaching it. Seventeen colleges (63%) did not assign the subject to anyone (see Table 14).

Table 14
Presence of A-V Education Tutor or Specialist on the Staff

Situation	No. Colleges	%
Having tutor/specialist	7	26
Not having tutor/specialist	17	63
No response	3	11

This information reveals the deficiency in the audiovisual staffing situation because not all of those individuals assigned to teach the subject were considered qualified to teach it (see Table 15).

Table 15
Opinions of Principals about the Suitability of
Those Assigned to Teach Audiovisual Education

Description of those assigned to teach A-V education	No. Principals	%
Very adequately qualified	2	7
Adequately qualified	4	15
Barely adequately qualified	1	4
Inadequately qualified	0	0
Very inadequately qualified	3	11
Declined comment	18	67

Financial Resources

Table 16 shows 22% of colleges receiving between $0 and $185.19 and 26% receiving between $185.19 and $370.38 per year. If each of the six (22%) were awarded the maximum $185.19, then their total funding would be $1,112.28; the maximum possible funding for the seven colleges (26%) receiving between $185.19 and $370.38 would be $2,592.59. The total grant from the government for audiovisual education would then be $3,703.70. This would amount to $137.17 for each of the 27 training colleges. A significant number of colleges (22%) is revealed to be receiving no funding at all. Three principals described their allocations as very inadequate. Eleven thought theirs were inadequate, and two thought theirs were barely adequate; 11 declined to answer. One principal observed that funding for audiovisual education had been increasing yearly for the five previous years, seven said there had been no increases, and for four colleges funding had been fluctuating. Three principals (11%) thought that

obtaining funding from the government was easy, eight (30%) declared that it was difficult, eight (30%) did not see any problem since it formed part of the institution's budget, and six (22%) declined to respond to this question.

Table 17 indicates that government is the main source of funds for audiovisual education. Forty-one percent obtain funds for supporting audiovisual education; 30% utilize their own resources, i.e., there is no special request for funds for audiovisual education; two of the colleges (eight percent) supplement whatever they get from the government with private donations.

Table 16
Budgetary Allocation for audiovisual Materials and Equipment

Amount ($ per annum)	Number of Colleges	%
0	6	22
0 - 185.19	6	22
185.19 - 370.38	7	26
No response	6	22
Difficult to assess	2	7

Table 17
Sources of Funds for A-V Equipment and Materials

Sources	Number of Colleges	%
Government grants	11	41
Out of college's own resources	8	30
Private donations	2	8
Declining information	6	22

Eight principals (30%) declared that obtaining funds from government for audiovisual education was not easy. This is a significant proportion since no college should experience any difficulty with obtaining needed funds. For a significant number of colleges (seven or 26%), there had been no increases within five years.

Availability of Media in the Training Colleges

This section was designed to elicit information about quantities of equipment and materials available in the system. The information would help the investigator determine areas of deficiency and reasons for such a state of affairs. It is upon such information that recommendations can be made.

The availability of the following were considered to be fairly satisfactory to very satisfactory: chalkboards (78%), globes (59%), charts (55%), flat pictures (59%), and television (52%) (see Table 18).

The following were considered to be unsatisfactory to very unsatisfactory in terms of availability: flannel boards (41%), magnetic boards (37%), peg boards (45%), models (26%), tape recordings (56%), and radio (26%). The percentages enclosed in brackets refer to the proportions of principals responding and expressing their opinions on availability of the media. These figures are especially significant because, with the exception of tape recordings, all the other media are unsophisticated and their installation cannot be said to involve heavy sums of money.

Principals gave the following reasons for non-availability, arranged in descending order of seriousness as a problem: lack of funds or high cost of equipment, lack of spares, lack of foreign exchange, distance from source of supply, and lack of transportation (see Table 19).

Table 18
Availability of Media in the Training Colleges

Medium	A(%)*	B(%)*	C(%)*	D(%)*	E(%)*	F(%)*
Chalkboard	10(37)	6(22)	5(19)	2(7)	2(7)	2(7)
Flannel board	2(7)	3(11)	2(7)	7(26)	4(15)	9(33)
Magnetic board	0(0)	1(4)	0(0)	3(11)	7(26)	16(59)
Peg board	0(0)	1(4)	0(0)	5(19)	7(26)	14(52)
Models	2(7)	7(26)	0(0)	4(15)	3(11)	15(41)
Globes	5(19)	9(33)	2(7)	4(15)	1(4)	6(22)
Charts	2(7)	10(37)	3(11)	3(11)	1(4)	8(30)
Specimens	2(7)	10(37)	1(4)	2(7)	3(11)	9(33)
Flat pictures	2 (7)	10(37)	4(15)	5(19)	2(7)	4(15)
Flim strips	1(4)	5(19)	1(4)	5(19)	2(7)	14(52)
Slides	0(0)	5(19)	1(4)	3(11)	5(19)	13(48)
Transparencies	1(4)	0(0)	0(0)	2(7)	9(33)	15(55)
16mm film	2(7)	4(15)	1(4)	2(7)	7(26)	11(41)
8mm film	0(0)	0(0)	0(0)	5(19)	6(22)	16(59)
Tape recordings	1(4)	2(7)	0(0)	8(30)	7(26)	9(33)
Disc recordings	0(0)	0(0)	0(0)	2(7)	9(33)	16(59)
Radio	2(7)	3(11)	4(15)	5(19)	2(7)	11(41)
Television	2(7)	8(30)	4(15)	4(15)	3(11)	6(22)
Museum	0(0)	2(7)	2(7)	2(7)	5(19)	16(59)
Overhead projector	1(4)					

*A - very satisfactory
B - satisfactory
C - fairly satisfactory
D - unsatisfactory
E - very unsatisfactory
F - declined to respond

Os indicate no responses from principals

Table 19
Reasons for Non-Availability of Media

The reasons for non-availability of the media are arranged according to which was considered the most serious down to the least serious problem or obstacle.

Lack of funds or high cost

Lack of spare parts

Lack of foreign exchange

Distance from source of supply

Lack of transportation

In Table 20, the numbers listed indicate the totals of the materials for all training colleges.

Table 20
Materials Available in Colleges by Numbers

Medium	Quantity	Number per College
Charts	39	1.44
Slides	18	.67
Filmstrips	15	.55
Globes	30	1.11
Models	9	.33
Specimens	21	.77
Tape recordings	12	.44
Disc recordings	8	.29
Flannel board	16	.59
Overhead transparencies	7	.26
8mm film	1	.04
16mm film	3	.11

The quantities and condition of equipment available in all training colleges are shown in Table 21. Each training college should possess at least one item of each kind of equipment listed, yet this is far from the case (see Table 74 for recommended lists). Both Tables 20 and 21 reveal the really low level of equipment and materials possessed by the colleges.

Table 21
Quantities and Condition of Equipment Possessed by Colleges

Equipment	Quantity	No. Good (Serviceable)	No. Poor (Unserviceable)
8mm Projector	0	0	0
16mm "	15	8	7
Overhead Projector	11	6	5
Filmstrip "	13	7	6
Slide "	14	8	6
Record Player	18	11	7
Radio (rediffusion box)	13	10	3
Wireless Receiver	3	3	0
Television	28	12	6
Camera	1	1	0
Video Tape Recorder	3	3	0
Public Address System	7	7	0
8mm Loop Projector	1	1	0
Radio Cassette Recorder	1	1	0
Tape Recorder	2	0	1
Radio Phonograph	1	1	0

Storage and Retrieval Arrangements for Media

There is indication from the numbers obtained here that an institution may have more than one place for storing its equipment. For instance, globes and maps may be kept in the resource center or with the social science tutor, while a record player or tape recorder may be kept with the music tutor.

Tables 22 and 23 show that a variety of places are employed by colleges to solve the problem of storage. The science department provides a favorite storage place; 13 colleges (48%) have special storage which is also used for

Table 22
Storage and Retrieval Facilities

	Equipment	
Place	No.	Percentage
Principal/Vice-Principal's Office	8	30
Library	7	26
Science Department	15	56
Special Store	13	48
Other: Music Master,	1	4
Resource Center	1	4
Home Science Center	1	4
Art Store	1	4
Language Laboratory	1	4
Social Sciences Room	1	4
Declining Response	2	8

storage of other things. During the investigator's visits, he came across four of such special stores. In two of them the equipment was arranged on open shelves and was coated with thick layers of dust. In one of the stores, the equipment was in steel cabinets; in another, what little equipment there was appeared to be in constant use.

Table 23
Places Where Software and Other A-V Materials Are Stored

Place	No.	Percentage
Principal/Vice-Principal's Office	3	11
Library	2	8
Science Department	5	19
Special Store	10	37
Others: Resource Center	1	4
Home Science Center	1	4
Music Department	1	4
Social Science Room	1	4
Department Requiring Items	1	4
No Software	2	8
Declining Response	9	33

The principal's office and the library again appear to be favorite storage places.

Other places that are also used as storage places are the music tutor's residence, home science center, art store, language laboratory, and social science room. One institution that has a resources center uses it to store equipment and materials.

Twelve principals (44.4%) judged these arrangements to be adequate to very adequate. On the other hand 10 principals (37%) expressed dissatisfaction with their arrangements, describing them as barely adequate or very inadequate (see Table 24).

Table 24
Adequacy of Storage Facilities as Judged by Principals Responding

Description	No.	Percentage
Very Adequate	1	4
Adequate	8	30
Fairly Adequate	3	11
Inadequate	7	26
Very Inadequate	3	11
Declining Response	5	19

The following staff members are usually placed in charge of equipment and materials: science tutor, art and crafts tutor, or librarian. Single instances are cited of the following also being in charge of media: laboratory assistant, home science tutor, music tutor, audiovisual tutor, and education tutor.

Fifteen colleges (56%) do not have any arrangements for previewing equipment and materials; on the other hand, seven colleges (26%) maintain some previewing arrangements. All principals responding to the questionnaire consider the previewing facilities to be adequate (see Tables 25 and 26).

Table 25
Colleges Reporting Facilities Were Available
For Previewing of Equipment and Materials

Availability/Non-Availability	No. Colleges	%
There are facilities	7	26
There are no facilities	15	56
Those not responding	5	19

Table 26
Description of How Principals Perceived Previewing Facilities

Description	No. Colleges	%
Very adequate	0	0
Adequate	6	22
Fairly adequate	1	4
Inadequate	0	0
Very inadequate	1	4
Declining response	17	63

Table 27 depicts how principals view the distribution and retrieving facilities on their campuses. A significant proportion, 56%, consider the arrangements to be adequate to very adequate; 15%, also a significant proportion, think their arrangements are not adequate; 30% declined to comment on the question. It is quite easy also for staff members to gain access to equipment and materials available on campuses (see Table 28).

Table 27
Appraisal of Distribution and Retrieving Facilities

How principals perceived facilities for distribution and retrieval of equipment and materials.

Description of Facilities	No. Principals	Percentage
Very Adequate	1	4
Adequate	11	41
Fairly Adequate	3	11
Inadequate	4	15
Very Inadequate	0	0
Declining Response	8	30

Table 28
Accessibility to Materials and Equipment by Faculty Members

(Judgement as expressed by principals)

Description	No. Principals	Percentage
Very Difficult	0	0
Difficult	0	0
Fairly Difficult	1	4
Easy	18	67
Very Easy	3	11
Declining Response	4	15

Facilities for preparing materials for teaching exist in 17 colleges (63%), six (22%) do not possess such facilities, and four (15%) declined to comment (see Table 29).

Table 29
Availability of Facilities for Preparation of Materials for Teaching*

	No. Colleges	%
Colleges responding that such facilities exist	17	63
Colleges responding that no such facilities exist	6	22
Those declining response	4	15

*Facilities available are mainly for making charts and mounting pictures.

Ten principals (37%) describe their facilities for preparing materials to be either adequate or fairly adequate; four (15%) consider what exists on their campuses as very inadequate (see Table 30).

Table 30
Description of the Facilities for Preparation of Materials

Description	No. Colleges	%
Very inadequate	4	15
Inadequate	5	19
Fairly adequate	4	15
Adequate	6	22
Very adequate	0	0
Declining response	8	30

Principals gave the following suggestions for improving existing facilities for audiovisual education: (a) appointing an audiovisual specialist and acquiring audiovisual production equipment, (b) just acquiring production equipment, (c)

just appointing an audiovisual specialist, (d) providing an audiovisual resource room, (d) providing spare parts, and (e) opportunities for staff to attend workshops and seminars (see Table 31). Other suggestions were to provide an A-V resource room, provide spare parts, provide opportunities for staff to attend workshops and seminars.

Table 31
Suggestions for Improving Existing Facilitites

	No. Principals	%
Appointing audiovisual specialist	3	11
Acquisition of equipment for production	4	15
Appointing A-V specialist and acquiring production equipment	15	56
Declining response	5	18.5

This section of the questionnaire was intended for assessing media utilization facilities in classrooms. Provision of certain physical facilities such as electrical fixtures and window shades facilitates the use of films during normal school hours.

Table 32 shows that 13 colleges (48%) have at least one classroom provided with such facilities. However, 41% are lacking such facilities--no electrical outlets, no means of darkening classrooms, and no daytime power supplies.

Table 33 tells how principals appraise these utilization facilities. Eight (30%) describe their facilities as very inadequate or inadequate, 15% consider the facilities as barely adequate, and another 15% are of the opinion that their facilities are either adequate or very adequate.

Principals gave the following suggestions for improving utilization facilities: provision for classroom darkening, provision for electrical outlets in classrooms, provision for an audiovisual resources room, provision for equipment, repair and maintenance facilities, screens, 24-hour electricity supply, more funds, and a language laboratory (see Table 34 for suggestions and numbers of colleges giving them).

Table 32
Facilities for Easy Utilization of Media in Classrooms

	No. Principals	%
Colleges reporting availability of facilities	13	48
Colleges reporting non-availability of facilities	11	41
Colleges declining response	3	11

Table 33
How Principals Perceived Classroom Utilization Facilities

Description	No. Principals	%
Very inadequate	2	8
Inadequate	6	22
Barely adequate	4	15
Adequate	3	11
Very adequate	1	4
Declined response	11	41

Table 34
Suggestions for Improving Facilities for Utilization

Suggestion	No. Principals	%
Provision of A-V room	5	19
Provision of classroom darkening	10	37
Provision of electrical outlets in classrooms	8	30
Repair and maintenance facilities	2	7
Provision of equipment	3	11
Screens	2	7
24-hour electricity supply	1	4
Language laboratory	1	4
Provision of more funds	1	4
Declining response	7	26

Media Utilization by Faculty/Staff of Colleges

This section was designed to assess the extent of media use, including use of broadcast programs, by faculty members, as judged by principals.

Table 35 shows that principals perceived that use of the following items was frequent and, therefore, satisfactory: chalkboard use was rated satisfactory to very satisfactory by 89% of principals; maps, satisfactory to very satisfactory by 81%; 68% rated charts from satisfactory to very satisfactory; globes and specimens were thought to have been satisfactorily used by 82% and 63% of principals, respectively; 52% of principals thought that educational tours received satisfactory use.

Some items were given significantly low ratings. Flannel board, models, flat pictures, and resource persons received barely satisfactory to very

Table 35
Evaluation of the Extent of Use of Media by Faculty Members as Perceived by Principal

Item Description	Numbers & Percentages of Colleges Reporting Use					
	A(%)*	B(%)*	C(%)*	D(%)*	E(%)*	F(%)*
Chalkboard	19(70)	4(15)	1(4)	1(4)	0(0)	2(8)
Flannel board	0(0)	5(19)	4(15)	0(0)	4(15)	14(52)
Maps	9(33)	12(44)	1(4)	0(0)	0(0)	5(19)
Charts	5(19)	8(30)	5(19)	3(11)	1(4)	5(19)
Globes	9(33)	11(41)	2(8)	1(4)	0(0)	4(15)
Models	1(4)	8(30)	2(8)	4(15)	1(4)	11(41)
Specimens	4(15)	9(33)	4(15)	1(4)	2(8)	7(26)
Disc recordings	0(0)	0(0)	1(4)	1(4)	5(19)	20(74)
Filmstrips	0(0)	2(8)	0(0)	3(11)	7(26)	15(56)
Slides	0(0)	3(11)	1(4)	6(22)	4(15)	13(48)
16mm films	1(4)	4(15)	0(0)	2(8)	5(19)	15(56)
8mm films	0(0)	2(8)	0(0)	0(0)	7(26)	18(67)
Overhead transparencies	1(4)	1(4)	1(4)	1(4)	7(26)	16(59)
Flat pictures	3(11)	2(8)	5(19)	0(0)	1(4)	16(59)
Dramatization	1(4)	8(30)	4(15)	0(0)	4(15)	10(37)
Video tape recordings	0(0)	1(4)	0(0)	2(8)	5(19)	19(70)
Television	2(8)	5(19)	3(11)	2(8)	3(11)	12(44)
Educational tours	3(11)	6(22)	5(19)	3(11)	0(0)	10(37)
Resource persons	2(8)	5(19)	2(8)	3(11)	2(8)	13(48)
Tape recordings	0(0)	5(19)	1(4)	3(11)	6(22)	12(44)

*A: Very satisfactory
B: Satisfactory
C: Barely satisfactory
D: Unsatisfactory
E: Very unsatisfactory
F: Declining response
0: No information was obtainable.

unsatisfactory use as seen by less than 50% of principals. With the exception of models, which would probably have to be imported, all the others are locally available and could have been given greater use.

Table 36 shows that causes of unsatisfactory media use by college faculty were given by principals as follows: non-availability of software, non-availability of hardware, lack of training, unfamiliarity with equipment, lack of technicians to operate equipment. Only one principal gave lack of interest in audiovisual media as a cause for poor media use by faculty.

Table 36
Causes of Unsatisfactory Utilization of Media as Perceived by the Principals in Order of Reducing Gravity

	Number of Principals	%
Non-availability of software	9	33
Non-availability of hardware	9	33
Lack of training	8	30
Unfamiliarity with equipment	7	26
Lack of technicians to operate	7	26
Lack of interest on part of tutors	1	4
Declining response	5	19
Use is adequate	0	0

Table 37 indicates that 59% of principals supported workshops, seminars, and inservice training as a means of promoting media use among tutors; 48% supported the idea that preservice training in educational media will contribute to increased media use among tutors. Making equipment and materials more available is suggested by 19% of principals as one way of encouraging tutors to use them more. Appointment of an audiovisual tutor and/or a technician,

provision of more funds, and visits by a specialist were seen by principals, one in each case, as other ways of furthering the use of media among training college staff. Seventy-four percent of principals recommended some form of media training for their colleagues as a priority need. One principal (4%) did not think this was necessary, while six (22%) declined to make any comment.

Table 37
Suggestions for Promoting Use among Tutors as Given by Principals

Suggestions	No. Principals	%
Provide inservice training for staff	16	59
Provide workshops and seminars	16	59
Provide preservice training	13	48
Provide materials and equipment	5	19
Appoint A-V tutor	1	4
Appoint A-V technician	1	4
Provide more funds for A-V education	1	4
Make visits by specialists available	1	4
Declined to make suggestions	4	15

Table 38 shows principals' opinions regarding educational broadcast programs. Thirty-seven percent of them were of the opinion that their scheduling was unsuitable, while 30% thought that their scheduling was suitable.

Regarding the quality of educational programs, 63% of principals rated them from fair to excellent, while four percent rated them poor (see Table 39).

Table 38
Scheduling of Educational Radio and Television Programs*

Number reporting that scheduling was suitable	8(30%)
Number reporting that scheduling was unsuitable	10(37%)
Other comments:	
Radio program not suitable	1(4%)
No power to operate equipment	2(8%)
Equipment not operating	2(8%)
Declined to comment	4(15%)

*Opinion of principals concerning scheduling of educational broadcasts.

Table 39
Quality of Educational Radio and Television Programs as Judged by Principals

	No. of Colleges	%
Excellent	1	4
Very good	9	33
Fair	7	26
Poor	1	4
Declined comment	9	33

While they are liked for their conciseness, informative nature, and the fact that they facilitate teaching, educational broadcast programs were also criticized for their outmoded teaching methods, low standards of work, and occasional breakdowns. Other criticisms were that the preparation by presenters was sometimes poor, equipment used in the television lessons was often not

available in the colleges, that radio and television equipment was not available, teachers' guide notes arrived late, and, finally, there were fluctuations in power supply or signals (see Tables 40 and 41).

Table 40
Reasons for Liking Educational Broadcast Programs

	No. of Colleges	%
Conciseness of programs	2	7
Informative nature of programs	2	7
Facilitates teaching	2	7
Guide notes for use of radio	1	4

Table 41
Reasons for Not Liking Educational Broadcast Programs

		No. Colleges	%
1.	Teaching methods not modern	1	4
2.	Timing (scheduling)	7	26
3.	Occasional breakdowns	1	4
4.	Low standard of work	1	4
5.	Poor preparation on part of presentor	1	4
6.	Equipment used in TV lessons not available in colleges	2	7
7.	Radio and TV equipment not available	2	7
8.	Guide notes arrive too late to be of use	3	11
9.	Fluctuations in power supply or signals	6	22
10.	Declining comment	9	33

Administration of Educational Media Programs

This section discusses arrangements in the colleges for administering educational media programs. Several colleges have some kind of arrangement to take care of some aspects of the educational media program. Twenty-six percent of them have committees to attend to budgeting needs. Thirty percent have committees that are in charge of selection of materials (see Table 42).

Table 42
Functions that are the Responsibility of Individuals or Committees for Audiovisual Education

Function	No. of Colleges	%
Budgeting	7	26
Selection of materials	8	30
Procurement	6	22
Cataloging	6	22
Distribution and retrieval	9	33
A-V committee	1	4
According to subject	2	8
No one in charge	8	30
Declined response	5	19

Procurement, cataloguing, circulation, and retrieval are functions assigned to committees in 22%, 22%, and 33% of colleges, respectively. Audiovisual needs appear to be taken care of in most colleges on an ad hoc basis, as they occur on the agendas of departmental committees. Only one college indicated that it maintains an audiovisual committee. Two colleges state that audiovisual matters are addressed on a subject by subject basis. Each department deals with

its own audiovisual concerns as the need arises. A significant number of colleges (30%) reportedly had no arrangement at all for dealing with audiovisual matters.

Table 43 reveals that a variety of methods are used for selecting the committees mentioned above. Tutors are selected on the grounds that they (a) have had some inservice training in audiovisual education, (b) had preservice training in audiovisual education, (c) expressed interest, or (d) were appointed by the principal. In one instance members serving on the committee were elected by their colleagues. The performances of the committees were rated by principals to be satisfactory (six), good (five), and very good (one). The committees can be said to be generally effective in their work (see Table 44).

Table 43
How Committee on Audiovisual Education was Formed

How Committee Formed	No. Colleges	%
Staff expressed interest	3	11
Staff had some inservice education in A-V	3	11
Staff had some preservice education in A-V	6	22
Appointed by principal	3	11
Elected by colleagues	1	4
Declined to response	12	44

Table 44
Effectiveness of Committees on A-V Education as Perceived by Principals

Description	No. Principals	%
Excellent	0	0
Very good	1	4
Good	5	19
Satisfactory	6	22
Poor	0	0
Declined to respond	15	56

Information deduced from Table 45 shows that two main communication channels are used for reaching staff members: (a) by means of announcements of staff meetings, and (b) by means of bulletin boards. One college uses a newsletter to announce information to colleagues. In another college, information regarding audiovisual media is done by contact with the heads of departments who then pass on the word to colleagues in their departments.

Table 45
Information Dissemination Among Faculty Regarding Acquisition of Equipment and Materials

Method	No. Colleges	%
By announcements at staff meetings	9	33
By notices on bulletin boards	8	30
By college newsletters	1	4
By informing heads of departments	1	4
Declining response	8	30

Table 46 provides information about record keeping on audiovisual media use by colleges. Only four colleges (15%) kept records which could tell the extent of media use by staff members. Eighteen colleges (67%) kept no records.

Table 46
Records of Extent of Use of Audiovisual Instructional Materials by Faculty

	No. Colleges	%
Those with records	4	15
Those with no records	18	67
Those declining response	5	19

Table 47 gives information regarding whether a list of resources is maintained in the colleges. Such a list would provide tutors with guidance regarding sources of media with which to teach. Nine colleges (33%) maintain such lists, while 14 (52%) maintain no such lists.

Table 47
Availability of Sources List for Materials

	No. Colleges	%
Colleges with such a list	9	33
Colleges with no such list	14	52
Those declining response	4	15

Suggestions for improving the administration of the educational media program are provided in Table 48. Twelve principals (44%) recommended that activities of the audiovisual unit be reported regularly to the staff; 33% of the principals recommended the appointment of a chairperson for an audiovisual committee.

Table 48
Suggestions for Improving Administration of Media Program in Colleges

Suggestions	#	%
Appoint a chair for committee	9	33
Report on activities of A-V program regularly to faculty	12	44
Committee to report regularly to staff	1	4
Declined to make any suggestions	8	30

The following are ten recommendations for improving the quality of preservice audiovisual preparation of teachers made by seven principals. Their general thinking seemed to be that given appropriate guidance, equipment, and other relevant inputs, the audiovisual education programs pursued in the training colleges would be considerably improved.

1. Audiovisual aids centers or teachers resource centers should organize exhibitions of improvised teaching and learning materials for schools and colleges on a district or regional basis. Prizes should be awarded for exhibits from the institutions. Audiovisual specialists should give demonstrations.

2. Courses should be organized for tutors in charge of audiovisual education in the colleges.

3. Facilities for improving audiovisual education in the training colleges such as an audiovisual room and better repair and maintenance facilities should be provided.

4. Provide facilities to make us familiar with audiovisual education. We believe in the effectiveness of audiovisual education.

5. Scholarships for training in audiovisual education should be given and more funds provided for equipment.

6. "The fusion of audiovisual education and the new training college program should be considered as top priority - especially with the Integrated Science Syllabuses."

7. Provide facilities to make training college staff familiar with audiovisual education. We believe in its effectiveness.

8. Improvisation of audiovisual materials with local materials and adaptation of foreign and sophisticated ones should be embarked upon.

9. An organizational setup especially charged with repair and maintenance of equipment and materials in schools and colleges should be given top consideration.

10. Teachers' notes accompanying the radio and television programs should be sent to the institutions well in advance so that both tutors and students can prepare adequately before the telecasts.

Analysis of Follow-up Questionnaire to Principals of Initial Teacher Training Colleges

The questionnaire was designed to assess the status of audiovisual education in 1981-82, five years after the administration of the first questionnaire. Thirty-three questionnaires were mailed out; there were 11 returns. Two of the responses came from three-year, post-secondary teacher training colleges; two came from four-year post-primary teacher training colleges; one came from a college offering two-year and three-year training programs; and, finally, six were returned from colleges that had both three-year post-secondary and four-year post-primary training programs (see Table 49).

Table 49
Analysis of Returned Follow-up Questionnaires
from Principals of Initial Teacher Training Colleges

Number of principals repsonding to questionnaire	11
three-year training colleges	2
four-year training colleges	2
two- and three-year training colleges	1
three- and four-year training colleges	6

Only one training college acquired audiovisual equipment since 1976. The equipment purchased was a 16 mm projector. One training college acquired the following items as aid from the French government:

16 mm projector	1
filmstrip projector	6
reel tape recorder	6
opaque projector	1
record player	1
television receiver	1
duplicator	1
language laboratory	2

According to Table 50, two of 11 training colleges reported they acquired items. It can be concluded that acquisition of audiovisual materials during these years was insignificant.

Funding for audiovisual education from government sources increased by insignificant amounts during 1977-1982, as shown in Table 51. Only two colleges reported increases in their funds for audiovisual education.

Table 50
Audiovisual Materials Acquired by Training Colleges since 1976

Item Description	Number Acquired
Audiotapes	*
Globes	1
Specimens	1
Films	1
Slides	*
Filmstrips	*
Stencils	*
Flannel boards	1
Flat pictures	1

* These colleges gave no figures for these items.

Table 51
Funding for Audiovisual Education

One college recorded the following increases in its audiovisual materials budget 1976/77 $87.50

Period	Number of colleges reporting increases in A-V fundings	$ Amount (Increases)
1976/77	1	32.41
1977/78	1	31.48
1978/79	1	35.67
1979/80	2	148.14; 29.63
1980/81	2	100.00; 20.00
1981/82	2	140.00; 92.00

In the 1976-77 survey, 11 principals (41%) reported that their colleges received funding towards their audiovisual programs (Table 16). In the 1982-83 survey, however, only 18% of colleges responding indicated that they received funds. It is difficult to know whether these are increases over previous allocations or initial grants. Considered as increases, this amounts to $232.00 for 11 colleges or $21.09 per college in 1983 (exchange rate in 1983 was about ¢5.00 to $1.00 US).

Table 52 reveals the situation regarding specialist staff in audiovisual education in the training colleges. Indications are that there has been no significant increase in the number of audiovisual specialists, judging by raw scores. Also the number of colleges reporting possession of a syllabus in audiovisual education was nil. This information and that given by the director of the Institute of Education, University of Cape Coast, are conflicting.

Table 53 shows that one college reported that it offered courses in which audiovisual methods are integrated with other methods courses; three colleges

reported that a separate course was offered, but at the same time methods courses incorporated audiovisual education. Two colleges reported that this information did not apply to the situation. Apparently, they do not offer a course in audiovisual education which is unusual, despite the general scarcity of equipment and specialist staff in audiovisual education and the absence of policies to guide principals.

Table 52
Number and Percentage of Colleges that have an Audiovisual Specialist or Faculty Member in Charge of Audiovisual Education and Teaching the Subject

	#	%
The breakdown by training is as follows:		
Diploma in Art Education	1	9.1
Postgraduate certificate in Education	1	9.1
Training in France	1	9.1
3-months training in United Kingdom (UK) but not teaching	1	9.1
Diploma in advanced studies in education plus additional training in UK.	1	9.1
Number of colleges possessing an audiovisual syllabus, as reported by principals.	0	0.0

Table 53
Number of Colleges Offering some Pattern of Audiovisual Training

Pattern of training	Number of colleges	Percentage
A) Integrated with methods course	1	9.1
B) As separate course	0	0.0
C) Combination of A & B	3	27.2
Those reporting non-applicability	2	18.2

Table 54
Number and Percentage of Colleges Teaching Audiovisual Media Item by Item as Reported by Principals

Item	Number of Colleges	Percentage
Flipchart	0	0
Flannel chart	2	18.2
Magnet board	0	0
Models	1	9.1
Charts and diagrams	2	18.2
Stencils	1	9.1
Templates	1	9.1
Electric board	0	0
Radio programs	0	0
Tape recorder	1	9.1
Resource persons	1	9.1
Field trips	0	0
Filmstrips	1	9.1
Slides	1	9.1
Motion pictures	0	0
Maps	1	9.1
Globes	0	0
Specimens	1	9.1
Flash cards	2	18.2
Drama	1	9.1
Puppets	0	0
Flat pictures	2	18.2
Programmed texts	0	0
Games	0	0
Cartoons	0	0
Others	0	0

The topics treated in the audiovisual programs are still very limited in number. Of the two colleges spelling out the content of their audiovisual programs, one covers the following items: flannel boards (charts), charts and diagrams, flash cards, and flat pictures. The other college gives coverage of all of the above, including the following items: models, stencils, templates, tape recorders, resource persons, filmstrips, slides, maps, specimens, and drama (see Table 54).

None of the other principals responding to the questionnaire gave any details of the content of the audiovisual course, if it were given as a separate course.

As shown in Table 55, five principals indicated that their students are required to show competency in utilization of audiovisual materials during practice teaching. One principal indicated that production as well as utilization competency was expected of students.

Table 55
Colleges Indicating Type of Competency Required of Students

Competency	No. Colleges	%
Production of items	1	9.1
Utilization of items (during practice teaching)	5	45.5
Going through introductory course	1	9.1

An in-depth study of the audiovisual courses in all colleges would seem to be indicated, since principals did not provide much information in this area. Table 56 gives the impression that only three of the colleges responding to the

questionnaire (27.2%) prepare their students to answer questions on audiovisual education introduced in the final examinations in 1978.

Table 56
Colleges Whose Students Attempt Questions on Audiovisual Education in the External Examination

Response	No. Colleges	%
Positive	3	27.2
Negative	8	72.7

Analysis of Questionnaire to Classroom Teachers Who Graduated Between 1950 and 1980

The type of training in audiovisual education that prospective teachers received would also give a picture of the status of audiovisual education from the consumer's point of view. This information was obtained from classroom teachers who qualified between the years 1950 and 1980. An analysis of the questionnaire to the classroom teachers is given below.

Total population of certified teachers in the system is about 51,000. The selected sample consisted of 210 teachers, and 117 responses were received. Table 57 shows the breakdown of those responding by duration of training.

Table 57
Analysis of the Sample of Classroom Teachers by Duration of Training

Responses	No. Teachers	%
Four-year trained	83	70.7
Two-year post-secondary trained	29	25.0
Three-year post-secondary trained	5	4.3

In order to answer the question of whether there had been any differences in the audiovisual training given during the period 1950 to 1980, an analysis of variance using the F test was carried out. It sought to determine whether the media in which teachers are expected to acquire competency varied by any appreciable amounts. The numbers listed against the intervals refer to the number of items that individual teachers claimed they were taught to select, produce, or use during their training (see Table 58).

Table 58
Numbers of Media Items Learned in College by Students

Intervals (Groups)	No. of Media Taught Per Teacher	Totals	No. of Teachers
1950-55	8, 12, 15, 11, 10, 9, 9, 13, 9, 15, 6, 15	132	12
1956-60	11, 10, 7, 8, 14, 14, 8, 1, 0, 13	86	10
1961-65	5, 6, 7, 5, 12, 12, 12, 15, 13, 13, 8	108	11
1966-70	6, 8, 8, 10, 5, 6, 19, 19, 8, 8, 9, 11, 6, 9, 2, 18, 9, 16, 8, 7, 8, 10	210	22
1971-75	4, 7, 9, 8, 5, 7, 9, 15, 14, 3, 10, 9, 13, 13, 12, 13, 8, 12, 5, 7, 12, 9, 15, 12, 8, 5, 14, 12, 13, 0, 7, 6, 10, 7, 10, 10, 12, 17, 8, 13, 8, 15, 12, 12, 12, 15, 11	468	47
1976-80	7, 6, 9, 6, 8, 5, 13, 4, 14, 8, 15, 9, 11, 11, 13	139	15

The calculated value of F is less than 2.21, indicating that the null hypothesis cannot be rejected; i.e., there are no significant differences in the audiovisual training that teachers received over the 30 year period from 1950 to 1980 (see Table 59).

Table 59
Analysis of Variance for Differences in Training

Source	SS	df	MS	F
Treatments (between groups)	120.57	5	24.114	
Error (within groups)	1455.65	111	13.114	$\frac{24.114}{13.114} = 1.84$
TOTAL:	1576.20			

$F (\alpha = .05, V_1 = 5_1 V_2 = 111 = 2.21.$

The distribution of teachers by year of graduation in intervals is shown in Table 60. The investigator had hoped that their distribution would be even as shown in Figure 4 in Chapter III.

Table 61 gives an idea of the number of those responding who had various types of "sensory" education during their training. By comparing the distribution with Table 60, a clearer picture of the nature of the "sensory" training is obtained. Larger proportions of respondents received audiovisual training in the latter part of the 30-year period (see Figure 5).

Table 60
Distribution by Intervals During Which Teachers Graduated

Interval	Number of Teachers	Those with AV Training	Percentage
1950-55	12	1	10.2
1956-60	10	1	8.5
1961-65	11	2	9.4
1966-70	22	9	18.8
1971-75	47	15	40.2
1976-80	15	5	12.8

Table 61
Distribution by Type of Training

Sensory Training	No. Teachers	%
Some	100	85.5
Visual only	77	65.8
Audiovisual	33	28.2
Declined to respond	7	5.9

An insignificant proportion of teachers responding to the questionnaire were given audiovisual education courses by audiovisual specialists (see Table 62). This is a faithful reflection of the number of audiovisual specialists serving on the staffs of the training colleges, as revealed by Table 10.

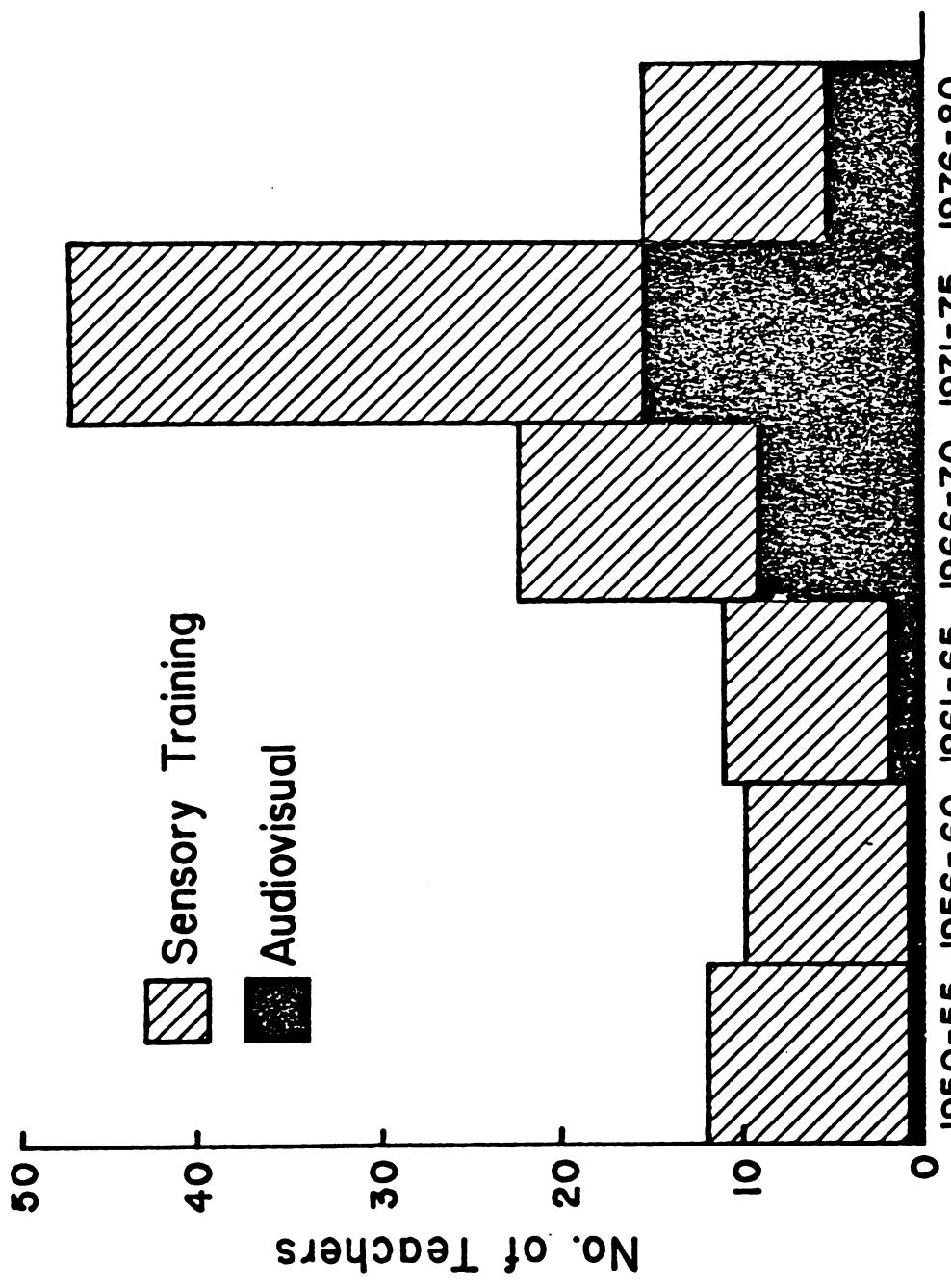


Figure 5. Distribution of teachers by interval of certification and by type of training. Sensory training was mainly visual training while audiovisual emphasized both visual and aural training.

Table 62
Distribution by Specialization of Instructor (Tutor)

Specialization	Mp. Teachers	%
Audiovisual specialist	4	3.4
Methods tutor	75	64.1
Art and crafts specialist	18	15.4
Art and crafts specialist plus methods tutor	8	6.8
Undefined	4	3.4
Declined to respond	8	6.8

Information gleaned from Table 63 shows that a significant proportion of teachers who were served with the questionnaire described their training in audiovisual education as satisfactory, good, or very good. However, it does not reveal how limited their training was. A close examination of the contents of their courses (Table 66) shows that most of them were exposed only to visual education.

Table 64 shows that 20 teachers (17.9%) had their audiovisual courses separate from other methods courses, while 71 (60.7%) received their audiovisual training as part of their regular methods courses.

Table 63
Distribution by Description of Opinion of Quality of Training

Description	No. Teachers	%
Very good	21	17.9
Good	30	25.6
Satisfactory	34	29.1
Poor	5	4.3
Very poor	5	4.3
No response	22	18.8

Table 64
Distribution by Strategy of Training

Pattern	No. Teachers	%
Separate	20	17.9
Integrated into regular methods course	71	60.7
Undecided	25	21.4

In Table 65, a highly significant proportion of teachers is revealed to have expressed the opinion that methods tutors should utilize media more during their teaching.

Table 66 gives an indication of the media that are most frequently taught and reveals also that quite significant numbers of teachers are not exposed to

Table 65
Teachers' Opinions as to Whether Methods Tutors Should Incorporate Media More in Their Lessons

Opinion	No. Teachers	%
Strongly agree	45	38.5
Agree	55	47.0
Undecided	1	.9
Disagree	1	.9
Strongly disagree	0	0.0
No response	15	12.8

such simple items as flip charts, magnetic boards, field trips, radio programs, resource persons, and puppets.

Inservice training in audiovisual education has received very little attention as revealed by Table 67. Seventy-six teachers (65.0%) of those responding to the questionnaire had not had any inservice education at all in this subject area, despite the fact that some had been in active teaching for almost 30 years. The supplementary chart (see Figure 6) gives a picture of how these 76 teachers are distributed by intervals indicating years of service.

Table 68 shows the duration of the inservice courses that teachers experienced and those who experienced them.

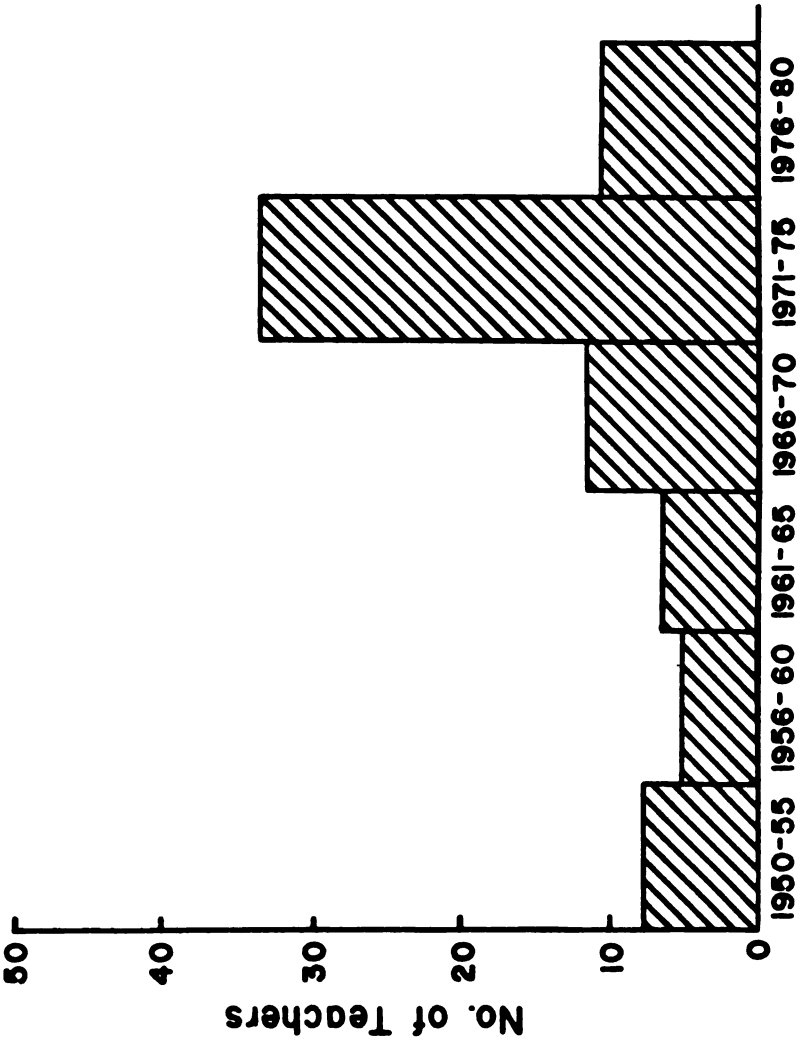


Figure 6. Distribution of teachers who have had no inservice training by interval of years of service.

Table 68
Preservice Training in Media
(Arranged according to descenging order of exposure
by numbers of teachers)

Item	Number	Percentage
Charts	104	88.8
Maps	100	85.5
Flashcards	95	81.2
Pictures	92	78.6
Models	74	63.2
Flannel graph	71	60.7
Puppets	36	30.8
Resource persons	29	24.8
Radio programs	22	18.8
Field trips	19	16.2
Slides	18	15.4
Films	18	15.4
TV programs	17	14.5
Tape recordings	15	12.8
Flip chart	12	10.3
Records	11	9.4
Magnetic board	11	9.4
Declined to respond	11	9.4

Table 67
Distribution by Those Who Have Had Some Inservice Training in Audiovisual Education

Experience	No. Teachers	%
Teachers with inservice experience	30	25.6
Teachers with no inservice experience	76	65.0
Those declining response	11	9.4

Table 68
Duration of Inservice Courses Experienced by Teachers

Duration	Number
One hour	6
One day	3
2-3 days	3
One week	8
Two weeks	9
Four weeks	1

Table 69 indicates that audiovisual equipment is used more often for educational purposes than for entertainment. A significant proportion of teachers, however, thought that the entertainment component was quite large.

A significant number of teachers either agrees or is strongly of the opinion that training college instructors in general should use media more often in their teaching. Apparently 77.2% of the teachers believe that college instructors do not use instructional materials as often as they should (see Table 70).

Table 69
Analysis of Opinion Regarding Use of Audiovisual Equipment
(Equipment used mostly for entertainment education)

Opinion	No. Teachers	%
Strongly agree	10	8.5
Agree	28	23.9
Undecided	2	1.7
Disagree	40	34.2
Strongly disagree	10	8.5
Declined comment	27	23.1

Table 70
Analysis of Opinion Regarding Frequency of Media Use
by Instructors in the Teacher Training Colleges
(Instructors should use media more frequently in their teaching)

Opinion	No. Teachers	%
Strongly agree	46	39.3
Agree	43	37.9
Undecided	3	2.6
Disagree	3	2.6
Strongly disagree	0	0.0
Declined to comment	21	17.9

There is decidedly a need for more inservice training courses or workshops in audiovisual education for teachers. As shown in Table 71, 70.1% of teachers

would welcome some inservice experience in audiovisual education at the time they responded to the questionnaire.

Table 71
Distribution of Responses by Teachers Regarding Whether They Would Welcome an Inservice Training/Workshop in Audiovisual Education (Now)

Response	No. Teachers	%
In favor	82	70.1
Against	4	3.4
Declined comment	31	26.4

Teachers' suggestions for improving the quality of audiovisual training were not limited to preservice training. These include (a) making audiovisual education compulsory, (b) providing more audiovisual equipment and materials, (c) providing more resource rooms in all training colleges, and (d) appointment of audiovisual specialists. They suggest also that instructors should emphasize and use audiovisual materials more frequently and that local materials should be used for improvising teaching and learning aids (see Table 72).

Analysis of Questionnaire to Officials of Government and Quasi-Government Organizations

The questionnaires to CRDD, NTTC, and the Institute of Education, University of Cape Coast, produced two responses. The responses from CRDD and the Institute of Education, University of Cape Coast, are summarized here (see Tables 73 and 74); the questionnaires and how they were answered are reproduced for easy reference. A letter from a former director of CRDD is also summarized since its contents are pertinent to the issue.

Table 72
Suggestions by Teachers for Improving the Quality of Audiovisual Training

There should be a place on the time table for audiovisual education which should be part of the training of teachers.	8
There should be a media specialist on the staff to teach the subject.	6
Training colleges should be well equipped with audiovisual materials which should be put to good use by instructors.	11
Audiovisual education at the training college should be made compulsory.	5
Government should provide the training colleges with audiovisual materials and equipment so that audiovisual specialist can do an effective job.	3
Enough materials and equipment should be provided in the training colleges to enable students to improve their competency in their use.	3
Audiovisual education should be made a subject on the curriculum and more time devoted to it.	2
There should be enough teaching aids for each student to handle.	2
Local materials should be used for making audiovisual aids.	2
Instructors should emphasize and use audiovisual materials more frequently.	1
Provide an audiovisual room in all training colleges.	2
Make audiovisual training interesting so that teachers continue to use it after qualifying.	1
Appoint audiovisual specialists to visit teachers in their schools.	2
Open resources centers in the districts where teachers can obtain assistance with making their instructional materials.	2
Hold more inservice courses.	3

Figures refer to numbers of teachers making the suggestion.

Table 73

Analysis of Questionnaire on Audiovisual Education to Director, Curriculum, Research and Development Division. CRDD, Ghana Education Service

Question	Response
1. Is there a syllabus for an audiovisual course in the training colleges? Yes/No	No
2. If there is, could you let me have a copy?	--
3. Who or what group prepared it and when was it prepared?	--
4. Have you any idea whether it is being followed by the training colleges: ( )It is being followed by 80% of training colleges. ( )" " " " " 60% " " " ( )" " " " " 40% " " " ( )" " " " " 20% " " " ( )" " " " "< 20% " " "	
5. Is the use of the audiovisual syllabus monitored by your office or others? ( ) By a team of inspectors from the Inspectorate Division. ( ) By a team of audiovisual specialists from your division. ( ) By a team from your division. ( ) Other (please specify)_____ ( ) Not monitored.	--
6. How do you assist training colleges with their audiovisual education programs? ( ) By means of inservice courses for tutors. ( ) " " " induction " held in the colleges. every year. ( ) By means of a newsletter. ( ) By means of radio programs. ( ) Other (please specify) _____	--
7. How would you rate the quality of training in audiovisual education generally? ___ Excellent ___ Very good ___ Fair ___ Poor ___ Very poor	

Table 74
Analysis of Questionnaire to Director, Institute of Education, University of Cape Coast A Quasi-Government Organization

Question	Response
1. Is an audiovisual course a requirement for all students in training? Yes/No	Yes
2. If yes, what competencies are they expected to acquire? Please place a check(✓) next to the appropriate item.	
Production and/or utilization of:	
Charts and diagrams	Yes
Flat Pictures	"
Models	"
Specimens	"
Magnet board	-
Flip charts	
Flannel graph	Yes
Puppets, marionettes	"
Radio programs	"
Disc recordings	-
Field trips	Yes
Drama	"
Resource persons	"
Tape recordings	"
Slides and filmstrips	-
Motion pictures	-
Cartoons	Yes
Maps	Yes

Programmed texts	-
3. Is there a prepared syllabus for audiovisual education as there are for other subjects taught in the training colleges? Yes/No	Yes
4. If yes, could I please have a copy?	Institute does not have a copy. The National Teacher Training Council (NTTC) has.
5. If a syllabus exists, by whom and when was it prepared?	Prepared by curriculum Research Development Division (CRDD) Date prepared: Not sure; consult CRDD.
6. When did questions on audiovisual education begin to appear in the examinations administered by the Institute?	1978

Director of Curriculum, Research, and Development Division (CRDD) of the Ghana Education Service

There is no syllabus on audiovisual education for the initial training colleges, and the CRDD has very little information regarding how this training is being carried.

Most equipment in the colleges, if any, has broken down. Repair and maintenance facilities are not very effective.

Audiovisual equipment is so scarce that very few students are training to operate it.

The rationale for the use of audiovisual instructional materials is taught as part of the principles of education:

> Aspects of the place of teaching aids in education that are taught are their educational value, proper use to derive maximum benefit, and how to make or obtain some of them. Education tutors and arts masters/mistresses help students to make visual aids like pictures, charts, models, cartoons, puppets, etc. (Director, CRDD, 1982; see Appendix G).

This state of affairs is quite different from what existed some years ago, for a letter from a former director of CRDD in 1977 says that the following papers were sent to the training colleges:

1. audio-visual education in training colleges,
2. the place of audio visual aids in teaching and learning,
3. use of learning and teaching aids by students on teaching practice, and
4. outline notes for audio visual education in training colleges.

Two audiovisual workshops were organized for training college tutors in 1969 and 1971 (see Appendix H).

Director, Institute of Education
University of Cape Coast

This response painted a less gloomy picture of the status of audiovisual education in the training colleges.

1. An audiovisual course is a requirement for all students in training colleges.
2. A syllabus for audiovisual education does exist and could be obtained from the National Teacher Training Council (NTTC).
3. A syllabus is supposed to have been prepared by CRDD. (This seems to have disappeared from among the files in training colleges themselves.)
4. A syllabus which is quite comprehensive is supposed to be in existence. The Director suggested that the NTTC might have a copy of this syllabus. This could not be substantiated since the NTTC did not respond to the questionnaire sent to it.
5. Questions on audiovisual education began to appear in the final examination for teacher certification in 1978. These examinations are administered by the Institute of Education.

Questionnaire to Secretary, National Teacher Training Council (NTTC)

There was no response to this questionnaire.

Summary

This chapter has dealt with analyses of the questionnaires. The responses were hand-tallied and summary statistics calculated. For the purposes of this study, all values of five percent and above obtained from the calculations were regarded as practically significant. An analysis of variance was calculated for the differences in training in audiovisual education for the period 1950 to 1980 using an F test of significance. A significant proportion of principals did not respond to many of the questions. The general impression obtained by going through the analysis of the data is that there is a lot to be done to raise the status of audiovisual education in initial teacher training colleges in Ghana. Specifically, there appeared to be deficiencies in the following aspects of the program: administrative policy, qualified staff, equipment and materials, physical facilities, media utilization by faculty, and financing. While the F test revealed no significant differences in the training offered during the period 1950 to 1980 when just numbers of items treated in the audiovisual courses were considered, an examination of the contents of courses given to students indicated a shift from the mainly visual education to audiovisual courses.

In Chapter V, the findings revealed by the analyses of data will be discussed, conclusions drawn, and implications for further study listed. The chapter will conclude with a set of recommendations.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS IMPLICATIONS FOR FURTHER STUDY, AND RECOMMENDATIONS

A need for prospective teachers to be competent in the selection, production, and utilization of audiovisual instructional materials in order to improve communication between themselves and the learner has been expressed by educators over and over again. There is also considerable evidence that there is a high correlation between classroom use of media and preservice training in the selection, production, and utilization of media. A need for a study of the practices in audiovisual training seemed to be indicated when administrators in education expressed concern about the poor quality of instruction in the schools and the absence of audiovisual materials from classrooms.

The purpose of this study was to assess the status of audiovisual education in preservice teacher preparation in the initial teacher training colleges of Ghana. Such a study will make available to policy makers in education more information regarding this aspect of the professional training of teachers and will also assist them in making decisions regarding government policy on basic audiovisual training as well as facilities in the colleges for such training.

A review of the literature revealed that several studies of a similar nature had been carried out, particularly in the United States of America and Canada. These studies then provided guidelines for the questionnaires that were developed for this study. The questionnaires which were submitted to professors of educational technology at Michigan State University were pilot tested with principals of training colleges before they were sent out to all 33 principals.

Also, 210 classroom teachers, the Director of CRDD, the Director of the Institute of Education at the University of Cape Coast, and the Secretary of NTTC were sent questionnaires. As a means of gathering on-the-spot information, 10 colleges, selected by virtue of their accessibility by road and their distance from a regional capital, were visited, their facilities inspected, and interviews held with principals or their representatives. The questionnaires were designed to elicit information regarding the following factors that affect the adoption of audiovisual education: (a) staffing, (b) physical facilities, (c) financial resources, (d) availability of media, (e) administrative support, and (f) curriculum.

Classroom teachers provided information regarding the type of preservice audiovisual training they received. Information on the official position regarding audiovisual education was obtained with questionnaires to the heads of the following: the CRDD, the NTTC, and the Institute of Education at the University of Cape Coast. Educational media programs pursued in the United States of America the United Kingdom, some European countries, and Canada were studied in an attempt to obtain a standardized program that could be suggested to the educational authorities in Ghana.

The data obtained from the principals, officials, and classroom teachers were analyzed using summary statistics, and a cut-off point of five percent was chosen for purposes of practical significance. In addition, an F test was used to determine whether there were significant differences in the audiovisual training offered to prospective teachers during the period 1950-80.

Limitation

A sample size of 380 should normally have been randomly selected out of a teacher population of about 51,000. However, an acute shortage of paper and

rising costs caused the investigator to cut down this figure to 210. Severe transportation problems also limited the movement of the investigator's assistants. This led to their inability to reach a larger number of teachers in order ot collect the questionnaire. A breakdown in the postal services and transportation difficulties also prevented the director of CRDD from obtaining a higher return for the follow-up questionnaire to principals of the training colleges.

These factors would not adversely affect the findings since the results of the analyses of these questionnaires tended to support each other as well as the data from the initial survey conducted in 1976-77.

Findings

The following are the findings disclosed by the analysis of the data.

1. There was no comprehensive government policy on audiovisual education in the training colleges. In 1976-77 only two of 27 training colleges possessed syllabi on audiovisual education. In 1982-83 only two of 11 training colleges professed they had syllabi which were prepared by their own staffs. Items that are covered in the courses offered in the institutions show a wide variety (see Tables 10, 12, 54, 55, and 56).
2. Staffing of the colleges in terms of audiovisual specialists and technicians is very deficient. Only one college could boast of an audiovisual specialist in 1976-77. In 1982-83, there was only one audiovisual specialist among the 11 responding colleges. The assumption that all tutors have a basic audiovisual education and, therefore, ought to be able to handle it with competence in their methods courses is quite prevalent. Principals were

receptive to the idea of their staffs attending audiovisual workshops immediately (see Tables 11, 14, 15, 52, and 62).

3. Equipment like 16mm projectors, slide projectors, record players, and shortwave radios were in short supply, averaging less than one per college per item. Audiovisual materials such as globes, charts, models, and flannel graphs were equally in short supply (see Tables 18, 19, 20, 21, and 50).
4. Storage facilities were inadequate. A variety of locations was used for storage. In some cases there was a special store for this purpose (see Tables 22 and 23). In two instances, the investigator saw equipment in various states of disrepair, coated with thick dust. Record players and tape recorders were just as likely to be found in the principal's office, the vice principal's office, or in the care of the music specialist or science tutor. Facilities for previewing materials and equipment were lacking in most of the colleges (see Table 25).
5. Facilities for faculty to prepare teaching and learning materials were not always available, and students often had to rely on their own resources when preparing materials for practice teaching (see Tables 29 and 30).
6. Despite the wide range of media, faculty utilization of media was limited to a few items: chalkboard, maps, charts, globes, specimens, flat pictures, educational tours, and resource persons. Lack of equipment and materials, lack of training, and unfamiliarity with with media on the part of faculty were blamed for this situation (see Tables 35 and 36).

7. Aspects of the administration of audiovisual programs such as budgeting and acquisition were being handled on an ad hoc basis by different departments and committees (see Tables 42, 46, and 47).
8. Workshops and inservice courses in audiovisual education are infrequently held, and very few of the responding teachers had been exposed to such an experience. The majority of them indicated their willingness to attend an inservice courses at the time of response to the questionnaire (see Tables 67, 68, and 71).
9. There is no syllabus for audiovisual education according to one authoritative source, while another equally authoritative source indicated that there is, but no one could produce a copy (see Tables 73 and 74).
10. The conclusion to be drawn is that there is no separate syllabus currently being used in the training colleges, and audiovisual instructional materials are treated under "principles of education" and in subject matter methods courses (see Table 73 and Appendix G).
11. Guidelines on audiovisual education, apparently sent to training colleges in 1971, cannot be traced in any of the colleges (see Tables 7, 10, 73, and 74 and Appendix H).
12. Funding for audiovisual educiaton is grossly inadequate, amounting to less than $1.00 per student. This is far below what the French government was spending per pupil in 1954 (Lefranc, 1959) or the $22 per pupil that Erickson suggested in 1968.
13. The F test revealed that considering only the number of media taught to prospective teachers, there were no significant differences in the programs pursued during the period 1950 to 1980. Considering the content of the programs, however, reveals that some interesting

developments occurred (see Figure 5). The bar graph shows that during 1950-55, 1956-60, and 1961-65, only 0.08, 0.1, and 0.18% of teachers responding to the questionnaire, respectively, claimed they were given audiovisual training. By contrast, 0.41, 0.31, and 0.33, respectively, are recorded for the periods 1966-70, 1971-75, and 1976-80 as having been exposed to audiovisual training (see Tables 57 and 58).

Conclusions

The following conclusions were arrived at by the investigator as a result of the study. The first six were drawn directly from the analysis of the data while the last three were derived from relevant literature.

1. The absence of an audiovisual syllabus did not prevent some preservice teachers from being exposed to some audiovisual training. It lead, however, to wide differences in the content of courses offered.
2. While the absence of an audiovisual specialist does not necessarily mean that student teachers will receive a watered-down form of audiovisual training, the evidence from this investigation points to the fact that students could do with more exposure in both separate and integrated courses. Greater emphasis on the media in methods courses and greater media use by methods tutors in their own teaching seem to be indicated.
3. A well spelled out audiovisual program is lacking in most colleges. An audiovisual specialist on the staff of each training college will help coordinate all audiovisual activities. As Meierhenry (1966) points out, " . . . the media competencies must

now be deliberately planned with purposes and functions to be met rather than developed haphazardly, incidentally or not at all" (p. 219).

4. The expertise of tutors in the selection, production, and utilization of media is not being questioned. However, the suggestion by principals that inservice courses or workshops in audiovisual education and the call by classroom teachers for tutors to utilize the media more frequently in their teaching point to the need for upgrading the media competencies of the tutors themselves.
5. The absence of uniformity in audiovisual courses offered in the training colleges, lack of equipment and materials, the scarcity of funds for media, inadequate staffing and physical facilities all point to the low status of audiovisual education in preservice teacher preparation.
6. Although the numbers of teachers surveyed and falling within the time intervals were not large, the findings indicate that there was a definite move from "visual" training toward "audiovisual" training. The impact of educational technology on teacher education is evidenced by the fact that in some colleges, topics such as radio, television, and tape recorders were dealt with as part of the educational media training even if the coverage was purely theoretical in nature.
7. The investigator is led to the conclusion that the provision of a syllabus for audiovisual education is no longer the responsibility of any one body, but of the three bodies, namely the CRDD, the NTTC, and the Institute of Education, University of Cape Coast.
8. In both the initial and follow-up surveys of colleges, there were questions to which some principals did not respond. The investigator is

led to the conclusion that the principals refused to give the information because of (a) apathy or (b) ignorance of the information required or because (c) they did not want to reveal embarrassing information. In the case of the classroom teachers, the reasons are likely to be (a) apathy or (b) ignorance of the required information. The investigator believes that in either case, more knowledge regarding audiovisual education on the point of the respondents would have resulted in greater interest and induced more responses from them.

9. The investigator has come to the conclusion that the availability of an audiovisual specialist, a media technician, and a syllabus are not a sine qua non for a successful preservice professional training in audiovisual media. A combination of these together with funds, equipment, support from the administration, and cooperation from other faculty members will go a long way to ensure success of the educational media programs in training colleges.

Implications for Further Study

1. The classroom teacher responses indicated that training college tutors should utilize the media more in their own teaching. An interesting research study would be to investigate the attitude of training college tutors towards the use of media.
2. Another project that suggests itself is the use of radio programs to supplement training college courses and for inservice training. Television programs were used quite extensively during the late 1960s and early 1970s to supplement regular courses in

mathematics, science, English literature, and social sciences. A cost effectiveness study could be done to ascertain whether radio programs combined with some other medium could be used now, considering the country's present financial resources and the shortage of qualified audiovisual specialists.

3. The concept of educational technology is still very much linked to hardware in the minds of most people in Ghana. A research project that will investigate, inexpensive materials to be used for improvising teaching and learning aids is worth undertaking. This will go a long way to erase the erroneous concept and broaden people's ideas about educational technology.
4. Some students receive their exposure to audiovisual education only through their methods specialists; others receive theirs through audiovisual specialists. Research projects to determine the quality of training for these two groups might be undertaken to determine which of the two systems is more effective.
5. Research to determine the differences in media training given during the years 1950 and 1980 in which a larger sample of teachers is involved than in this study could also be undertaken.
6. Again, further research into the differences in media competencies acquired by teachers qualifying from different colleges might reveal some interesting characteristics among the colleges and is worth undertaking.
7. The extent of use of media by training college tutors and how this use affects their effectiveness as perceived by their students is another piece of research worth carrying out.

Recommendations

The study has revealed that deficiencies exist in the educational media programs in training colleges. These deficiencies have to be tackled realistically in order to bring about an improvement in the quality of training that prospective teachers receive. The following recommendations are for consideration as a means of tackling the problems or deficiencies that have come to light as a result of this study.

1. The initial training colleges should be supplied with equipment, physical facilities, and personnel that should be considered basic.
2. Radio cassette recorders, videotape recorders, and television receivers/monitors should be part of the basic equipment in every college. Programs could then be recorded off the air and used at convenient times. In this way, unsuitable scheduling of programs can be overcome.
3. Merely providing media facilities in the training colleges will not automatically lead to increased utilization of media. It must be accompanied by training of the faculty in their use. Audiovisual workshops should be organized for training college faculties on a regular basis.
4. The setting up of an association of educational media specialists is a matter that should be taken up seriously.
5. The publication of a newsletter for educational media for schools and colleges should be given serious thought. This newsletter should aim at the following readership: training college staffs, secondary school teachers, elementary school teachers, and training college students.

6. An audiovisual room should be considered a must for all training colleges. The purpose of this is to provide a facility in which both staff and students will receive assistance in making their learning and teaching materials. Students in particular should be encouraged to use this facility not only prior to practice teaching, but also in doing projects for their regular methods courses. This is similar to the kind of laboratory described by Combs in which students have many opportunities to experiment with materials, make materials, do demonstrations, and watch others demonstrate, and critically assess the usefulness of materials and techniques (McMahan, 1968, p. 121).
7. Tutors in training colleges should be given every encouragement to involve students in their own planning and development for media utilization. Ackerman (1979) describes an arrangement practiced at Valdosta State College in which media students design and develop instructional materials with professors.
8. The setting up of an audiovisual committee by the NTTC, to be responsible for drawing a syllabus and guidelines for audiovisual education, should be taken up as a matter of priority. This committee will be similar to the subject matter committees already in existence that have been doing a commendable job.
9. The formation of a unit to be responsible for evaluating audiovisual materials and equipment and for making recommendations should also be given serious consideration. The need for standardizing equipment acquired from abroad cannot be underestimated, especially at this time when the country's economic plight has severely curtailed its purchasing power.

10. The establishment of a unit to be responsible for the repair and maintenance of equipment and materials in colleges and schools should also be given priority consideration.

11. A mobile unit consisting of several media mobiles--audiovisual centers on wheels--at least one for each region, is also worth considering. These media mobiles, staffed by qualified media specialists and technicians, will tour colleges and schools and provide assistance in the form of distributing audiovisual literature and materials, carrying out minor maintenance jobs, demonstrating new materials and equipment, and conducting workshops for teacher training faculty and teachers in the field.

12. The Ministry of Education should seek external aid from UNICEF or UNESCO in order to meet its equipment needs.

Reference Texts and Journals

The scarcity of texts and journals on audiovisual education should engage the attention of officials at CRDD. Until local talent have specialized in media and begun to publish, some foreign texts are recommended as reference material:

Wilkinson, C. E. (1971). Audiovisual media and you. Toronto: General Learning Corporation, Educational Materials Services, Ltd.

Kemp, J. E. (1975). Planning and producing audiovisual materials, 3rd ed. New York: Thomas Y. Crowell.

Coppen, H. (1969). Aids to teaching and learning. Oxford: Pergamon Press.

Cable, R. (1965). Audio visual handbook. London: University of Oxford Press.

Visual education. London: National Committee for Audio-Visual Aids in Education.

Instructional innovator. Washington, DC: Association for Educational Communications and Technology.

Minor, E., & Frye, H. R. (1970). Techniques for producing visual instructional media. New York: McGraw-Hill.

Brown, J. W., Lewis, R. B., & Harcleroad, F. F. (1977). AV instruction, technology, media, and methods. New York: McGraw-Hill.

Wittich, W. S., & Schuller, C. F. (1979). Instructional technology: Its nature and use. New York: Harper and Row.

A Suggested Syllabus

A start should be made in developing a syllabus with a "local flavor" for the training colleges to use in training prospective teachers in audiovisual education. Its local flavor lies in the fact that it is being tailored to the existing facilities in the country. Operation of equipment may be limited to a few simple things such as radio, tape recorder, opaque projector, slide projector, and filmstrip projector. Other items of equipment may be mentioned and their use discussed. Use of local materials and improvisation should be given strong emphasis.

1. Introduction: definition of media, their place in education, their value, their selection and utilization.

2. Community resources: educational tours, resource people, museums.

3. Dramatization devices: dramatic play, dramatization, puppets, marionettes, simulation.

4. 3-D devices: objects, models, dioramas, mock-ups, specimens, globes.

5. Demonstration devices: chalkboards, flannel boards, plastic boards, magnetic boards.

6. Display devices: bulletin boards, pay boards, hook and loop boards, displays.

7. Projected devices: motion pictures, television, videotape.

8. Still picture devices: flat pictures, filmstrips, slides, transparencies, stereographs, microprojectors, slides.

9. Audio devices: disc recordings, tape recordings, radio.

10. Graphic devices: maps, charts, diagrams, graphs, cartoons.

11. Teaching testing devices: teaching machine programs, programmed text, scrambled books, electric boards, computer assisted instruction.

In the treatment of these topics, it should be born in mind that this is merely an outline and that there is room for creativity and ingenuity on the part of the instructor. For example, in treating chalkboards, chalkboard aids and techniques for using them effectively should not be neglected. In considering community resources, the chief's house, his/her linguist, the blacksmith's forge, the watch repairer's stall, the auto mechanics's yard are all people and places that can yield a great deal of instructional information.

For any syllabus or audiovisual education program to have a chance of success, the audiovisual specialist, with his/her intimate knowledge of the media and the subject methods specialists with their knowledge of the disciplines should combine their efforts to give the students as much media exposure as possible.

Recommended Equipment

The equipment listed in the column designated "Recommended" on the following chart (Table 75) should be acquired in phases. This equipment is not the optimum.

The acquisition of equipment should keep pace with the following (a) the development of adequate storage facilities, (b) the establishment of efficient maintenance and repair facilities, (c) the building up of a system of retraining of college tutors to be able to utilize equipment and facilities and the training of specialists, and (d) the design and development of instructional materials to be used with and alongside the equipment.

Table 75

Audiovisual Equipment for Initial Teacher Training Colleges

Equipment	Basic/Good	Advanced	Recommended
8mm projector	1	1 per 3 ts	1 per coll.
16mm projector	1 per ts	1 per 10 ts	1 per coll.
combination film-strip/slide projector	1 per 5 ts	1 per 3 ts	2 per coll.
slide projector	1 per 5 ts	1 per 3 ts	2 per coll.
opaque projector	1 per 12 ts	1 per 8 ts	2 per coll.
overhead projector	1 per 4 ts	1 per ts	4 per coll.
record player	1 per 3 ts	1 per ts	2 per coll.
tape recorder (reel to reel)	1 per 15 ts	1 per 10 ts	1 per coll.
cassette tape recorder	1 per 10 ts	1 per ts	8 per coll.
cassette player	--	--	8 per coll.
television receiver	1 per ts	1 per dept.	1 per dorm
television receiver/ monitor	--	--	1 per res. center
radio (short wave)	1 per 3 ts	1 per ts	1 per dorm
radio cassette recorder	--	--	1 per dept. & res. ctr.
screen, portable (70 x 70)	1 per coll.	2 per coll.	1 per coll.
screen, portable (50 x 50)	--	--	1 per coll.
listening center	1 per ts	2 per ts 12 per rc	8 per res. ctr. or coll.

ts: teaching station or classroom
rc: resource center in college

This recommended list is based on lists found in Wilkinson (1971), Faris (1965), Erickson (1968), and Brown, Norberg, and Srygley (1972).

Physical Facilities

The acquisition of materials and equipment is meaningless unless instructors can use them in classrooms. These classrooms, therefore, should be provided with the means to facilitate the use of equipment.

1. Electrical fittings: each classroom should be provided with at least one electrical outlet, preferably in front of the room, near the instructor's desk or chalkboard.
2. Light control: this can be accomplished by the provision of drapes or blinds. However, a less expensive method is to paint existing louvred blades with a dark color. Alternatively, wooden slats should be used in place of glass louvred blades that are the current fashion. One or two classrooms in addition to the assembly hall should be given this treatment.

Personnel

Every college should have one audiovisual specialist on the staff and should be supported by one media technician (Wilkinson, 1971).

The audiovisual specialist will, in addition to teaching students and holding inservice workshops for colleagues, be responsible for supervising the acquisition of media, their evaluation, their circulation, and management. S/He will also assist other staff members in designing and developing their own instructional materials for teaching (Brown, Norberg, & Srygley, 1972).

The media technician will be responsible for first-line repair jobs, general maintenance of equipment, operation of equipment, and audiovisual production. S/He will keep an inventory of all equipment and materials and report on their

condition to the audiovisual specialist on a regular basis. The technician will also keep a record of the movement of all media (Brown, Norberg, & Srygley, 1972).

It is expected that graphics production will be done principally by the art and crafts department. Close cooperation between the audiovisual specialist and this department is recommended.

Accommodation

A room to be used as a resource center should be set aside. This is where both students and faculty can produce their instructional materials and also obtain help for doing so. They can also learn how to operate equipment here.

It is an advantage that such a center have an adjacent room that can be used as a store. Then equipment can be put on display and demonstrated, as well as being put away when necessary.

Summary

In order to determine the status of audiovisual education in preservice teacher preparation in the initial teacher training colleges, questions were raised regarding (a) the official policy on basic audiovisual training for all preservice teachers; (b) the adequacy of facilities in terms of human, physical, and financial resources; (c) the existence of an audiovisual syllabus; and (d) the possible influence of developments in educational technology on media training in Ghana.

The following tasks were undertaken: a search of related literature; development of questionnaires later sent to principals, government, and quasi-government officials and classroom teachers; and, finally, visits to 10 training colleges in Ghana and three in the United States. Summary statistics were calculated for most of the data. And for purposes of practical significance, all values below five percent were regarded as negligible.

Official policy on audiovisual education expects that all students will undergo audiovisual training. Little appears to have been done to train and staff the colleges with qualified personnel to ensure that students really obtain this training. Facilities in terms of human, physical, and financial resources are inadequate and inequitably distributed. Rooms are ill-equipped for day-time use of electrically-powered equipment. Most equipment has broken down and chances of replacement are remote.

A syllabus released by CRDD around 1970 seems to have been lost. Neither CRDD nor any of the colleges has a copy of this document. Consequently, there is no uniformity in the audiovisual courses offered in the colleges.

There are indications that developments in educational technology have influenced media training. "Visual" training offered in the 1950s and early 1960s gave way to "audiovisual" training in the late 1960s and 1970s. The audiovisual movement appears to be gaining ground. Topics like radio, tape recorders, and television came to be included in courses offered in some colleges. However, not all colleges exposed their students to these innovations. Course content varied so much that the F test yielded no significant differences among the courses offered during the period 1950 to 1980.

Recommendations for consideration by the education authorities have been made. But after all this, very little can be achieved if the policy makers in education, principals, and training college tutors do not embrace wholeheartedly any plan aimed at improving training of teachers in educational media.

APPENDIX A

QUESTIONNAIRE ON AUDIO-VISUAL EDUCATION

Audio-Visual Section,
Dept. of Science Education,
University of Cape Coast,
Cape Coast.

June 4, 1976

Dear Principal,

QUESTIONNAIRE ON AUDIO-VISUAL EDUCATION

I have the pleasure to announce to you that your institution has been selected for a research study on the status of certain aspects of educational technology in pre-service teacher education in Ghana.

It is my impression that a lot can be done to improve the teacher's potential to communicate more effectively with his pupils in the classrom as well as outside it. His skill as a teacher depends to a very large extent on how he is able to utilize the media at his disposal. A great deal depends on whether he has been trained in the use of the various media. This research is meant to find out (a) to what extent our audio-visual education programs equip our pre-service teachers with the necessary skills, (b) to bring out the defects in the sudio-visual education programs, if any, and (c) to elicit proposals for their improvement. Your assistance is being solicited in this exercise.

I would like to assure you from the start that apart from its being a research project, the outcome will help our education authorities to plan a better audio-visual education program for the educational system as a whole. For a true picture to emerge, it is therefore importnt that your responses to each question item be as accurate as possible.

I would further urge you to try as much as possible to attend to this questionnaire as early as convenient. Putting off action on it will tend to create problems later. So the earlier the action on it the better. It will be appreciated if you will complete the questionnaire and return it to me prior to 9th July, 1976. A stamped addressed envelope is enclosed for the purpose.

Attached is a glossary of some technical terms designed to assist you in responding to the questionnaire.

I wish to thank you in advance for your kindness in spending part of your time in responding to the questionnaire. Please feel free to send me any other comments on areas you feel have not been covered adequately in the questionnaire. A result of this survey will be sent to you later if you desire it.

Again, I thank you for your time and assistance.

Yours very sincerely,

M. G. A. Laryea

QUESTIONNAIRE ON AUDIO-VISUAL EDUCATION IN INITIAL TEACHER TRAINING COLLEGES

1. Name of Institution: _____

2. Address: _____

3. Year established: _____

4. Enrollment: _____

   Male:_____ Female:_____

5. No. of staff members: _____

   Male: _____ Female: _____

6. Is your college a two-year post-secondary, three-year post secondary or a four-year post-primary teacher training institution?

   Please, specify which:_____

MISCELLANEOUS INFORMATION

7. What is the time period allocated for training in audio-visual education (if any):

   _____1 hour per week for a term
   _____2 hours per week for a term
   _____1 hour per week for two terms or three terms
   _____2 hours per week for two terms or three terms
   _____Other: _____

8. State whether the audio-visual education course lasts for one year, two years, or three years:

   _____

9. How much of the training is practical as opposed to theoretical? Please underline the appropriate proportion: 25%; 40%; 50%; 60%; 100%.

   Other: _____

10. What practical learning situations are provided in the courses?

    _____Operation of equipment
    _____Chart making
    _____Model making

_____Papier mache making
_____Clay modelling
_____Lettering
_____Puppetry/marionettery
_____Paper cutting
_____Use of local materials for improvisation
_____Chalkboard use
_____Picture mounting and preservation
_____Other (please indicate):

11. Please indicate the educational qualifications and experiences of your audio-visual teacher(s) by placing the number of teacher(s) and their qualifications under the appropriate columns:

		Teaching Experiences	
No. of A. V. Teachers	Educational Qualifications	Years of Classroom Teaching	As A-V Tutor

12. Have any of your tutors been exposed to workshops, seminars or in-service training courses in audio-visual education?

Yes_____ No_____

13. If yes, please state the numbers involved under each exercise:

Type of Training	No. Involved in the Training
Workshops	
Seminars	
In-service training	

14. Does your college subscribe to a professional magazine on audio-visual education? If yes, please provide titles:

_____

_____

15. Please indicate the teaching effectiveness of your audio-visual teachers by indicating the number of teachers that fall within the level of performances specified below:

Level of Teaching Effectiveness	Number of tutors
1. Excellent	_____
2. Very satisfactory	_____
3. Satisfactory	_____
4. Unsatisfactory	_____
5. Failures	_____

16. In audio-visual training, students are generally taught the skills of evaluation, selection, production and utilization of the various media listed below:

Chalkboard
Flat pictures
Flash cards
Charts
Three dimensional displays
Puppets/marionettes
Tape recordings
Disc recordings
Filmstrips
Slides
Films (8mm)
Television
Flip chart
Modeling
Dramatization
Other

Please add other items that you think should be included.

17. Some of the possible causes why students in training do not get enough exposure to audio-visual education are listed below. In the blank space under the columns 2 - 6 put a check mark against each of the following possible causes listed to show how important it has been:

	Not important	Slightly important	Moderately important	Very important	Extremely important	Missing
1. Poor educational qualifications of tutors.						
2. Lack of in-service staff education programs.						
3. Scarcity of A-V equipment and supplies in colleges						
4. Heavy teaching schedules						
5. Poor attitudes of tutors.						
6. Lack of financing by education authority						
7. Lack of policy on A-V teacher education						
8. Non availability of qualified A-V staff						
9. Lack of relevance						
10. Lack of spare parts and repair facilities.						

QUESTIONNAIRE

A - Syllabus

1. Is there a syllabus for audio-visual education as there are for mathematics, science, etc?

_____

_____

2. If there is, who prepared it? Please indicate whether it was prepared by a member of your college or whether it came from somewhere else.

_____

Please attach a copy of the syllabus in use in your college to the completed questionnaire.

3. What is the highest qualification of the person who prepared the syllabus?

_____a. M.A./M.Sc
_____b. B.A./B.Sc
_____c. Diploma
_____d. Teacher's Certificate 'A'
_____e. Other

4. Has the person received special training in A-V? If yes, please indicate the duration of the course, and how long s/he has taught the subject.

_____

5. Which of the following media are treated in the syllabus used in your college? Please put a check mark (√) against the medium.

( ) Educational tours
( ) Museums
( ) Puppets
( ) Simulation
( ) Three dimensional displays
( ) Specimens
( ) Chalkboards
( ) Bulletin boards
( ) Television
( ) Flat pictures
( ) Resource people
( ) Dramatization
( ) Marionettes
( ) Models
( ) Mock-ups
( ) Globes
( ) Flannel boards
( ) Motion pictures
( ) Video-tape
( ) Filmstrips

( ) Slides
( ) Disc recordings
( ) Radio
( ) Charts
( ) Diagrams
( ) Transparencies
( ) Tape recordings
( ) Maps
( ) Graphs
( ) Cartoons

6. Please indicate whether the media are treated as part of methods classes or separately as a subject.

---

7. How would you assess the scope of the syllabus? (Please underline appropriate descriptive phrase)

a. Very comprehensive
b. Comprehensive
c. Not comprehensive.

B - AUDIO-VISUAL SPECIALISTS ON THE COLLEGE

1. Is there an audio-visual education tutor on the staff?

   Yes_____ No_____

2. If yes, please give his/her name:_____

3. What training in educational media does that person have? Please put a check mark (✓) against the appropriate qualification.

   a. B. A. ( )
   b. M. A. in audio-visual education or educational technology ( )
   c. Diploma in audio visual education ( )
   d. Degree in art education ( )
   e. Degree/diploma in graphic arts ( )
   f. Other (please specify)

   _____

   _____

   _____

4. How much experience in teaching the subject does the person have? Please put a check mark ( ) against the appropriate period.

   a. Less than one year _____
   b. 2 - 4 years _____
   c. More than 4 years _____

5. How do you evaluate his qualifications in relation to his work? Please indicate with a check mark ( ) against the appropriate description.

   a. Very adequate _____
   b. Adequate _____
   c. Barely adequate _____
   d. Inadequate _____
   e. Very inadequate _____

C - FINANCIAL RESOURCES

1. How much money is allocated to the purchase of audio-visual equipment and materials every year on the average? Please put a check against the appropriate range.

   a. Nothing at all _____
   b. 0 - ¢500.00 _____
   c. ¢500.00 - ¢1,000.00 _____
   d. Above ¢1,000.00 _____

2. How adequate is the amount: please put a check mark ( ) against the appropriate phrase.

   a. Very inadequate _____
   b. Inadequate _____
   c. Barely adequate _____
   d. Adequate _____
   e. Very adequate _____

3. What is the source of this money? Please indicate with a check mark ( ).

   a. Government grants _____
   b. Institution's own resources _____
   c. Private donations _____
   d. Other (please specify)

_____

_____

_____

4. If the answer to question 3 is (a), please evaluate the adequacy of the funds in terms of student enrollment per year for the past five years:

   a. Has been increasing _____
   b. Has been static _____
   c. Has been decreasing _____
   d. Has been fluctuating _____
   e. Other (please specify)

5. Obtaining money from government for educational media projects is:

   a. Easy _____
   b. Manageable _____
   c. Difficult _____
   d. Not necessary (The money is included in budget for your college, so no need to ask for it. _____).

D - AVAILABILITY OF MEDIA

A form is provided below for questions 1 and 2. Please take your time and respond by putting a check mark ( ) in the appropriate space and the remark in the space provided. Columns A, B, C, D and E are for question 1 and the remarks column for question 2.

1. Would you describe the availability fo the media listed below as (a) very satisfactory, (b) satisfactory (c) fairly satisfactory (d) unsatisfactory, (e) very unsatisfactory.

	A	B	C	D	E	REMARKS
Chalkboard						
Flannel boards						
Magnetic boards						
Peg boards						
Models						
Globes						
Charts						
Specimens						
Flat pictures						
Filmstrips						
Slides						
Transparencies						
16 mm motion pictures						
8 mm motion pictures						
Disc recordings						
Tape recordings						
Radio						
Television						
Museums						

2. In the remarks column of the form used above for question 1, please indicate the reasons for non-availability of the media with the phrases supplied: (a) poor transportation, (b) distance from sources of supply, (c) lack of funds/high costs, (d) lack of foreign exchange, (e) non-availability of spare parts, (f) (other please specify)

3. Which of the following materials does your college possess? Kindly specify the subjects in which these materials are used where appropriate.

Material	Subject
Charts	
Slides	
Filmstrips	
Globes	
Models	
Specimens	
Tape Recordings	
Disc recordings	
Flannel boards	
Overhead transparencies	
8 mm films	
16 mm films	

4. Which of the following equipment does your college possess? Please indicate the number and condition of each equipment (whether serviceable or unserviceable).

	NO.	CONDITION
8 mm projector		
16 mm projector		
Overhead projector		
Filmstrip projector		
Slide projector		
Record player		
Radio		
Wireless receiver		
Television receiver		
Camera		
Video tape recorder		
Public address system		

E - STORAGE AND RETRIEVAL ARRANGEMENTS OF MEDIA (Hardware and Software)

1. Where is your equipment stored? Please put a check mark ( ) against the appropriate place.

    a. In the principal/vice-principal's office ( )
    b. In the library ( )
    c. In the science department ( )
    d. In a special store ( )
    e. Other (please specify)

_____

_____

2. Where is your software stored? Please indicate with a check mark ( ) against the appropriate place.

    a. In the principal's/vice-principal's office ( )
    b. In the library ( )
    c. In the science department ( )
    d. In a special store ( )
    e. Other (please specify)

_____

_____

3. How adequate do you consider the storage facilities:

    a. Very adequate ( )
    b. Adequate ( )
    c. Fairly adequate ( )
    d. Inadequate ( )
    e. Very inadequate ( )

4. Who is in charge of the equipment and software materials? Please check appropriately.

    a. Librarian ( )
    b. A science tutor ( )
    c. Other (please specify)

_____

_____

5. Are there facilities for previewing materials--both hardware and software--in your college?

Yes_____ No_____

6. If yes, do you think the facilities are:

a. Very adequate ( )
b. Adequate ( )
c. Fairly adequate ( )
d. Inadequate ( )
e. Very inadequate ( )

7. How do you appraise arrangements for distributing and retrieving equipment and materials?

a. Very adequate ( )
b. Adequate ( )
c. Fairly adequate ( )
d. Inadequate ( )
e. Very inadequate ( )

Please give reasons for (a), (b), or (c)

_____

_____

_____

8. Are there facilities for preparing materials (software), e.g. slides, flat picture mounting, charts, tape recordings, lettering, etc.

Yes_____ No_____

9. If yes, how do you appraise the facilities?

a. Very inadequate ( )
b. Inadequate ( )
c. Fairly adequate ( )
d. Adequate ( )
e. Very adequate ( )

10. Give suggestions for improving the existing facilities:

a. Engage an audio-visual specialist ( )
b. Acquire production equipment ( )
c. Combine (a) and (b) ( )
d. Other (please specify)

11. Do facilities exist on campus to permit easy utilization of media, e.g. electrical outlets in classrooms, room for daytime film shows, daylight screens, curtains for darkening of classrooms?

Yes_____ No_____

12. How do you appraise these facilities?

a. Very inadequate ( )
b. Inadequate ( )
c. Barely adequate ( )
d. Adequate ( )
e. Very adequate ( )

13. What suggestions would you make for providing or improving such facilities?

_____

_____

_____

F - UTILIZATION OF EDUCATIONAL MEDIA BY COLLEGE MEMBERS

1. Which of the following are used by tutors in their teaching? And how do you appraise their use? Put a check mark ( ) in the appropriate space. (1) Very satisfactory, (2) Satisfactory, (3) Barely satisfactory, (4) Unsatisfactory, (5) Very unsatisfactory.

	1	2	3	4	5
Chalkboard					
Flannel board					
Maps					
Charts					
Globes					
Models					
Specimens					
Disc recordings					
Tape recordings					
Film strips					
Slides					
16 mm films					
8 mm films					
Overhead transparencies					
Flat pictures					
Dramatization					
Video tape recordings					
Television					
Educational tours					
Resource persons					

2. What do you think are the possible causes for unsatisfactory use of materials listed in question 1? (Please indicate).

   a. Lack of training ( )
   b. Unfamiliarity ( )
   c. Lack of technicians to operate equipment ( )
   d. Absence of operating fixtures, e.g. electrical outlets ( )
   e. Non-availability of software ( )
   f. Non-availability of hardware ( )
   g. Other causes:

_____

_____

3. How do you think the situation can be remedied? Through:

   a. In-service training for staff ( )
   b. Pre-service training ( )
   c. Workshops, seminars ( )
   d. Others (please specify)

_____

_____

4. Would you recommend some form of training for a tutor(s) now?

   Yes_____ No_____

5. The scheduling of educational radio and television programs are: (please indicate by putting a check mark ( ) against appropriate description).

   a. Suitable ( )
   b. Unsuitable ( )
   c. Superfluous ( )
   d. Other comments:

_____

_____

6. Do you think the quality and standard of the educational radio and television programs to be generally:

   a. Excellent ( )
   b. Very good ( )
   c. Fair ( )
   d. Poor ( )
   e. Very poor ( )

7. **What do you like/not like about them?**

_____

_____

_____

G - ADMINISTRATION OF EDUCATIONAL MEDIA PROGRAMME

1. Is there a committee or person(s) charged with any or all of the following functions concerning audio-visual and instructional materials. Please check appropriate descriptive phrase. Mark ( ).

    a. Budgeting ( )
    b. Selection of materials ( )
    c. Procurement ( )
    d. Cataloging ( )
    e. Circulation - retrieval ( )
    f. Others (please specify)

_____

_____

2. How was the committee or person(s) selected? Was it because
    a. They expressed an interest? ( )
    b. They have had some in-service training? ( )
    c. They have had some pre-service training? ( )
    d. They were elected by their colleagues? ( )
    e. They were selected by the principal? ( )

3. How do you rate the effectiveness of the committee or person(s)

    a. Excellent ( )
    b. Very good ( )
    c. Good ( )
    d. Satisfactory ( )
    e. Poor ( )

4. Does this committee or person(s) also evaluate educational television and radio programs?

    Yes_____ No_____

5. How are staff members informed about new acquisitions?

    a. By announcements at staff meetings ( )
    b. By notices on the staff bulletin board ( )
    c. By college newsletter ( )
    d. Other (please specify)

_____

_____

6. Is there a record of the extent of use of instructional and audio-visual aids by college members?

Yes_____ No_____

7. Is there a list of sources where materials such as films, slides, models, specimens can be purchased or borrowed?

Yes_____ No_____

8. If yes, was it prepared by

a. Someone on your staff? ( )
b. The audio-visual aids committee? ( )
c. An official of the Ghana Education Service? ( )
d. Other (please specify)

_____

_____

9. Below are some suggestions which can be made for improving the administration of the media program in your college. Please put a check ( ) against the items applicable.

a. Appoint a Chairperson and delegate responsibility ( )
b. Report to college regularly - through department heads or at college meetings ( )
c. Other (please specify)

_____

_____

10. Does the committee or person(s) organize the operation of equipment and the previewing facilities in the college?

Yes_____ No_____

NOTE:

PLEASE ADD ANY OTHER REMARKS OR COMMENTS THAT YOU THINK WILL CONTRIBUTE TO THIS STUDY BUT HAVE NOT BEEN COVERED IN THE QUESTIONNAIRE. YOUR KIND COOPERATION WILL BE GREATLY APPRECIATED.

UNIVERSITY OF CAPE COAST
FACULTY OF EDUCATION
DEPARTMENT OF SCIENCE EDUCATION
AUDIO-VISUAL AIDS SECTION

GLOSSARY OF TERMS

1. **Audio-visual materials** refers to the broad spectrum of audio materials (radio, language laboratories, tape and disc recordings etc.), visual materials (pictures, photographs, flash cards, charts, bulletin boards, etc.) as well as materials that are a combination of both audio and visual materials (television, films, videotapes, sound filmstrips, study trips, demonstrations, etc).

2. **Flannel (felt) board:** a presentation board consisting of a flannel or felt surface on which objects backed with flannel, felt, or sandpaper will adhere.

3. **Flipchart:** a series of charts usually bearing information on a single theme held together at the top and mounted on an easel. It helps to present a sequence of information difficult to show on a single sheet.

4. **Hardware:** refers to the equipment - the tools (mechanical, electrical, optical) that are used in audio-visual education, e.g. projectors, record players, tape recorders, television receivers, bulletin boards, exhibition cases, cameras.

5. **Magnetic board:** a metallic presentation board to which objects with small magnetics attached to their backs will adhere.

6. **Mock-up:** a simplified version of reality - a representation of real thing so constructed as to highlight its essential parts or functions and to eliminate unneeded details. It is usually at full scale and is designed to be worked with directly by the learner for specific training or analysis.

7. **Opaque projector:** a projector that can enlarge information from paper, pages from a book, or other nontranslucent or nontransparent materials.

8. **Overhead projector:** a projector which accepts transparent and translucent film or other plastic and projects the information prepared on it onto a screen.

9. **Overhead transparency:** transparent or translucent plastic sheet on which information has been put for use on the overhead projector.

10. **Pegboards:** display boards that have 1/8 inch holes punched in a regular patternal inch apart over their entire surface.

11. **Simulation:** a teaching procedure which uses a model of a real system to provide a lifelike representation to stimulate and aid teaching.

12. **Software:** refers to tangible stimulus items e.g. tape recordings, disc recordings, filmstrips, slides, overhead transparencies.

13. **Three dimensional displays:** a display that has length, breadth and depth. This could be a landscape, or depict real-life scenes.

14. **Video tape recorder (VTR):** an electronic device used for recording and playing back video and audio signals of televison programs on a special kind of magnetic tape.

15. **Resource person:** someone who by virtue of his expertise, position, or knowledge can throw light on a particular subject or topic. Thus people in all walks of life can be resource persons depending on the circumstances.

APPENDIX B

FOLLOW-UP OF SURVEY ON AUDIO-VISUAL EDUCATION IN INITIAL TEACHER TRAINING COLLEGES

1643 I Spartan Village
East Lansing, MI 48823
U. S. A.

December 15, 1982

Dear Principal:

Follow-up of Survey on Audio-Visual Education
in Initial Teacher Training Colleges

During the 1970s, I carried out a survey on audio-visual education in the initial training colleges in our country. There is now a need to up date the information gathered at that time and I should be extremely grateful if you would spare some of your valuable time to respond to the brief questionnaire enclosed.

Your assistance in this exercise is important since the purpose is to make proposals for improving the quality of training in audio-visual education which, hopefuly, should result in the improvement of instruction in the elementary school system.

Since it is necessary to meet schedules, I should be more than grateful if you could have the questionnaire completed and mailed to me by air mail before the end of February, 1983. May I suggest that you have a copy made for your files just in case I have to write back for a copy in the event of your response going astray.

I trust I can rely on you for your unstinted support in this exercise. And I thank you in advance for your invaluable assistance.

Yours faithfully,

M. G. A. Laryea

Enclosure

Survey of Audio-Visual Education in the Initial Teacher Training Colleges in Ghana

Follow-up Questionnaire

1. Name of Institution: _____

2. Address: _____

3. Year established: _____

4. Current enrollment:

   Male: _____ Female: _____

5. Number of faculty members: _____

   Graduates: _____

   Specialists: _____

6. Please indicate the type of initial training college:

   ( ) Two-year post-secondary
   ( ) Three-year post-secondary
   ( ) Four-year post-primary
   ( ) Four-year specialist
   ( ) Other (please specify) _____

   _____

7. Has your institution acquired any audio-visual equipment since July 1976?

   Yes / No

   If "no" go on to Item 9.

8. Please place a tick (✓) against the equipment acquired since 1976 and also indicate the total number of pieces of equipment your institution now possesses.

EQUIPMENT	TOTAL NUMBER
_____ 16 mm projector	_____
_____ 8 mm projector	_____
_____ 35 mm slide projector	_____
_____ filmstrip projector	_____

8. Cont'd.

EQUIPMENT	TOTAL NUMBER
_____ slide/filmstrip projector	_____
_____ reel tape recorder	_____
_____ cassette recorder	_____
_____ slide viewer	_____
_____ opaque projector	_____
_____ overhead projector	_____
_____ radio receiver	_____
_____ record player	_____
_____ radio cassette recorder	_____
_____ 8 mm film loop projector	_____
_____ Television receiver	_____
_____ Duplicator	_____
_____ Other (please specify)	
_____	_____
_____	_____
_____	_____
_____	_____

9. Has your institution acquired any new audio-visual materials since 1976?

   Yes / No

   If "no" go on to Item 11.

10. Please place a tick (✓) next to the material acquired since 1976.

    _____ Records for teaching purposes
    _____ Audio tapes
    _____ Video tapes
    _____ Charts
    _____ Globes
    _____ Models

10. Cont'd.

_____ Specimens
_____ Films
_____ Slides
_____ Filmstrips
_____ Templates
_____ Stencils
_____ Programmed texts
_____ Multimedia kits
_____ Flannel board
_____ Magnet board
_____ Film loops
_____ Overhead transparencies
_____ Flat pictures
_____ Puppets
_____ Other (please specify):

_____

_____

_____

_____

11. Have there been any increases in your budget allocations for audio-visual equipment and materials since 1976, and if so, by how much? Please specify amounts. Just write "nil" if there is no allocation.

Allocation in 1976/7 _____

1977/8 _____

1978/9 _____

1979/80 _____

1980/1 _____

1981/2 _____

12. Please indicate whether you are satisfied with these amounts.

Yes / No

13. Is there an audio-visual specialist tutor on the staff now?

Yes / No

If "no" go on to Item 15.

14. If "yes" has s/he received training in audio-visual methods? Please indicate type, year and place of training.

	TYPE	YEAR	PLACE
( )	B.A., Dip. Ed. (with Ed. Tech. elective)	____	_____
( )	B.Sc., Dip. Ed. (" " " ")	____	_____
( )	B.Ed., Dip. Ed. (" " " ")	____	_____
( )	P.G.C.E. (" " " ")	____	_____
( )	D.A.S.E. (" " " ")	____	_____
( )	Dip. in Ed. Tech.	____	_____
( )	Others (please specify)		
	_____	____	_____
	_____	____	_____
	_____	____	_____

16. Is there a syllabus for audio-visual education in your college?

Yes / No

17. If "yes" by whom was it supplied and when?

18. How are audio-visual methods courses taught?

_____ a) Integrated into subject method courses

_____ b) Taught separately as an audio-visual course

_____ Taught as a combination of a) & b)

19. If given separately, please indicate which of the following topics are covered by placing a tick (✓) next to the appropriate item.

Production and utilization of:

_____ Flip chart	_____ Maps
_____ Flannel board	_____ Globes
_____ Magnetic board	_____ Specimens
_____ Models	_____ Flash cards
_____ Charts & diagrams	_____ Templates
_____ Stencils	_____ Drama
_____ Electric board	_____ Puppets
_____ Radio programs	_____ Flat pictures
_____ Tape recorder	_____ Programmed texts
_____ Resource persons	_____ Games
_____ Field trips	_____ Cartoons
_____ Slides	Others (please specify)
_____ Filmstrips	_____ _____
_____ Motion pictures	_____ _____
	_____ _____

20. Students are expected to show competency by:

_____ a) producing the audio-visual materials listed in question 19 above.

_____ b) utilizing them in practice teaching

_____ c) just going through an introductory course

_____ d) other (please specify)

_____

_____

_____

21. Are students required to answer a question on audio-visual education during their final examination?

Yes / No

If "no" go on to Item 23.

22. When did questions on audio-visual education begin to show up in the final examinations?

23. Were the questions written by your organization or by an external organization?

24. Are there electrical outlets and darkening facilities for showing films during the day in any of your classrooms?

Yes / No

If "yes" how many classrooms have such facilities? _____

25. Is there an audio-visual resources room where faculty are assisted with production, previewing and utilization of audio-visual materials

Yes / No

26. If "yes" is there someone in charge of this facility?

Yes / No

27. Please indicate the nature of the assistance given to the faculty members.

_____ a) Operation of equipment

_____ b) Production of materials

_____ c) Provision of existing materials

_____ d) Advice

_____ Other (please specify)

_____

_____

_____

28. Is there a technician or faculty member who is trained to operate your audio-visual equipment?

Yes / No

29. From which of the following agencies does your institution receive audio-visual assistance?

( ) Ministry of Education/Ghana Education Service
( ) University of Cape Coast
( ) British Council
Other (please specify)

_____

_____

_____

30. Please state the form that the assistance takes.

Visits and advice
Equipment loan
Materials loan
Equipment repair service
Other (please specify) _____
_____
_____

31. Do any of the following factors affect use of audio-visual methods by your tutors?

_____ Lack of funds
_____ Lack of administrative policy (from GES, NTTC) or
_____ Lack of equipment
_____ Lack of materials
_____ Lack of specialist tutors
_____ Inadequate physical facilities
_____ Lack of trained technicians
_____ Inadequate information about audio-visual education
___ Tutor attitude towards audio-visual instructional materials

32. Please indicate problems you face in promoting the integration of audio-visual methods into teaching among your staff, if any.

33. Your suggestions for the improvement of audio-visual preparation of student teachers in our educational system will be most welcome. Please put down any suggestions you care to offer.

APPENDIX C

SURVEY ON AUDIO-VISUAL EDUCATION IN INITIAL TRAINING COLLEGES IN GHANA

1643 I Spartan Village
East Lansing, MI 48823
U. S. A.

21st December 1982

Secretary
National Teacher Training Council
c/o P. O. Box M. 188
ACCRA

Dear Sir:

Survey of Audio-Visual Education in Initial Training Colleges in Ghana

During the 1970s, I carried out a survey on audio-visual education in the initial teacher training colleges in our country. There is now a need to up date the information gathered at the time, and I should be grateful if you could spare some of your very valuable time to answer a few questions for me. Please answer the attached questionnaire for me.

I assure you that your assistance is being appreciated immensely even before you have given it. I trust, however, that you will let me have your completed questionnaire at your earliest convenience, and preferably before the end of February, 1983.

Yours faithfully,

M. G. A. Laryea
Lecturer in Audio-Visual Ed.
U. C. C.

Enclosure

Survey on Audio-Visual Education in the Initial Teacher Training Colleges in Ghana

Questionnaire to Secretary
National Teacher Training Council

Please put a check ( ) or a circle against the appropriate item where required or the appropriate response.

1. Is there a syllabus for audio-visual education methods courses in the initial training colleges?

   Yes_____ No_____

   If the answer is no, go to question 3.

2. If "yes", by whom was the syllabus prepared and when was it prepared?

3. If the answer to question 1 is "yes", could you please send me a copy?

4. Do methods courses in the languages, the sciences and social sciences incorporate audio-visual methods in teaching?

   Yes_____ No_____

5. Audio-visual methods courses are given separately from other subject methods courses in:

   ( ) (a) all training colleges
   ( ) (b) the majority of training colleges (50% and more)
   ( ) (c) only a few training colleges (33% or less).

6. When did audio-visual education questions start appearing in the final external examinations?

7. How are student teachers expected to demonstrate competency in audio-visual methods of teaching?

   ( ) (a) Through laboratory experiences. In this, students go to a laboratory where they learn to operate equipment and produce materials.

( ) (b) Through an audio-visual course taught by a specialist tutor.

( ) (c) Through normal methods courses into which audio-visual methods are integrated.

( ) (d) Through some combination of (a), (b), and (c) above.

8. By what means does the Council (NTTC) insure that a basic standardized program in audio-visual education is pursued in all initial training colleges?

( ) (a) through visits by a team of inspectors.
( ) (b) through visits by a panel of a-v specialists
( ) (c) other (please explain)

9. Is there a printed set of standards for audio-visual requirements for elementary teachers?

Yes_____ No_____

10. If there is, could I have a copy please?

11. Is there a list of basic audio-visual equipment that initial training colleges are expected to possess?

Yes_____ No_____

12. Pleae send me a list of initial training colleges showing which are two-year, three-year or four-year colleges, their addresses and so on. Any other detail that you care to include will be appreciated (e. g., post-primary, post-secondary).

Your assistance in this exercise is greatly appreciated.

APPENDIX D

SURVEY OF AUDIO-VISUAL EDUCATION IN INITIAL TRAINING COLLEGES IN GHANA

1643 I Spartan Village
East Lansing, MI 48823
U. S. A.

21st December 1982

Director
Curriculum Research and
Development Division
Ghana Education Service
P. O. Box 2739
ACCRA

Dear Sir:

Survey on Audio-Visual Education in
Initial Training Colleges in Ghana

I wish to bring up-to-date some information that I gathered during the 1970s while doing a survey of audio-visual education in the initial teacher training colleges of Ghana. I need your assistance in this task.

Would you please have the attached questionnaire completed for me? Since there is a date-line that I have to meet, I should be grateful if you would let me have it back at your earliest convenience.

I thank you in anticipation for your assistance.

Yours faithfully,

M. G. A. Laryea

Enclosure

Survey on Audio-Visual Education in the Initial Training Colleges in Ghana

Questionnaire to Director
Curriculum Research & Development Division

1. Is there a syllabus for an audio-visual course in the training colleges?

   Yes_____ No_____

2. If there is, could you let me have a copy?

3. Who or what group prepared it and when was it prepared?

4. Have you any idea whether it is being followed by the training colleges?

   ( ) It is being followed by 80% of training colleges.
   ( ) It is being followed by 60% of training colleges.
   ( ) It is being followed by 40% of training colleges.
   ( ) It is being followed by 20% of training colleges.
   ( ) It is being followed by less than 20% of training colleges.

5. Is the use of the audio-visual syllabus monitored by your office or others?

   ( ) by a team of inspectors from the Inspectorate Division
   ( ) by a team of audio-visual specialists from your Division
   ( ) by a team from your Division
   ( ) other_____
   ( ) not monitored.

6. How do you assist training colleges with their audio-visual education programs?

   ( ) by means of inservice course for tutors
   ( ) by means of induction courses held in the colleges every year
   ( ) by means of a newsletter
   ( ) by means of radio programs
   ( ) other (please specify)

7. How would you rate the quality of training in audio visual education generally?

   _____excellent
   _____very good
   _____fair
   _____poor
   _____very poor

APPENDIX E

SURVEY OF AUDIO-VISUAL EDUCATION IN INITIAL TEACHER TRAINING COLLEGES OF GHANA

1643 I Spartan Village
East Lansing, MI 48823

December 15, 1982

Director
Institute of Education
University of Cape Coast
Cape Coast

Dear Sir:

Survey of Audio-Visual Education in Initial Teacher Training Colleges of Ghana

During the 1970s, I carried out a survey on audio-visual education in the initial training colleges in our country. There is now a need to up date the information gathered at that time, and I should be grateful if you could spare some of your valuable time to respond to a few questions for me.

I assure you that your assistance will be greatly appreciated. I trust that you will let me have your response to this brief questionnaire at your earliest convenience and preferably before the end of August, 1983.

Yours faithfully,

M. G. A. Laryea

Survey of Audio Visual Education in Initial Teacher Training Colleges of Ghana

1. Is an audio-visual course a requirement for all students in training?

   Yes_____ No_____

2. If yes, what competencies are they expected to acquire? Please place a check ( ) next to the appropriate item.

   Production and/or utilization of

   _____Charts, diagrams
   _____Flat pictures
   _____Models
   _____Specimens
   _____Magnet boards
   _____Flip charts
   _____Flannel graph
   _____Puppets, marionettes
   _____Radio programs
   _____Disc recordings
   _____Field trips
   _____Drama
   _____Resource persons
   _____Tape recordings
   _____Slides & filmstrips
   _____Motion pictures
   _____Maps
   _____Cartoons
   _____Programmed tests

3. Is there a prepared syllabus for audio-visual education as there are for other subjects taught in the training colleges?

   Yes_____ No_____

4. If yes, could I please have a copy?

5. If a syllabus exists, by whom and when was it prepared

   _____(prepared by)

   _____(date prepared)

6. When did questions or audio-visual education begin to appear in the examinations administered by the institute?

APPENDIX F

RESEARCH INTO PRE-SERVICE TEACHER PREPARATION IN AUDIO-VISUAL EDUCATION

Department of Science Education
Faculty of Education
University of Cape Coast

June 15, 1982

Dear Colleagues,

RESEARCH INTO PRE-SERVICE TEACHER PREPARATION IN AUDIO-VISUAL EDUCATION

I am engaged in research into the quality of preparation that teachers receive in audio-visual education during their training in order to find out whether or not educational technology has influenced it over the last thirty years. The objective is to use the information gathered to draw up proposals for the Ghanna Education Service which if implemented, will go to improve the quality of instruction at both the training college and elementary school levels.

Please read the attached questionnaire carefully and answer the questions candidly. The information you provide will be treated as confidential. You therefore do not have to give your name.

Do not spend more than 30 minutes oer the questionnaire.

I hope you will contribute willingly to the success of this research.

Thank you for your help.

Yours faithfully,

(M. G. A. Laryea)
Lecturer in Ed. Comm & Tech.

QUESTIONNAIRE OF PRE-SERVICE TRAINING IN AUDIO-VISUAL EDUCATION

1. Training College attended_____

2. Year of certification as a teacher_____

3. Please indicate whether you are:

   a. 4-year post primary ( )
   b. 3-year specialist ( )
   c. Post-Sec. trained (2-year) ( )
   d. 3-year Post-Sec. ( )

Please put a cross (X) against the appropriate duration of training.

4. What is your present status? (Please indicate whether you are assistant superintendent, etc.)_____
   _____

5. How many years have you been in active teaching?_____

   If still teaching, what class are you handling?_____

6. Did you receive training in the preparation, selection and utilization of visual aids or audio-visual aids during college days?

   YES_____ NO_____

   Please indicate whether training was in visual aids or in audio-visual aids.
   _____

   Are audio-visual aids a combination of both audio/aural and visual?
   _____

7. Was the course given by a specialist in audio-visual education, an art and crafts specialist, or by the regular methods tutor.?
   _____

8. Was there a special period on the time table for audio-visual education or did it form an integral part of the methods courses?
   _____

9. How would you describe the training in audio-visual education that you received? Please check the appropriate description.

   a. Very good ( )
   b. Good ( )
   c. Satisfactory ( )
   d. Poor ( )
   e. Very poor ( )

10. In order to predispose you towards greater use of aduio-visual materials your methods tutors hould have incorporated the use of the audio-visual materials in their lessons.

    a. I strongly agree ( )
    b. I agree ( )
    c. I am undecided ( )
    d. I disagree ( )
    e. I strongly disagree ( )

11. Please go through the list of audio-visual materials here and put a line under the item(s) that you were taught to prepare and use during your pre-service days.

    Pictures, charts, maps, films, filmstrips, slides, records, tape recordings

    radio programs, television programs, flannelgraph, magnetic board,

    puppets, resource persons, fieldtrips, models, flipchart, flashcards.

12. Have you had experience in audio-visual education since college?

    YES_____ NO_____

13. If yes, please state where it took place and the duration.

    PLACE_____

    DURATION_____

14. Please study this chart carefully and fill in appropriately. Please feel free to add any other aids not mentioned here.

I learned to use aids in teacher training college: YES___ NO____

FLIPCHART

FLANNEL BOARD

MAGNETIC BOARD

MODELS

CHARTS, DIAGRAMS

MAPS

GLOBES

SPECIMENS

FLASH CARDS

TAPE RECORDER

TELEVISION

TEMPLATES

STENCILS

PUPPETS

FIELD TRIPS

RESOURCE PERSONS

SLIDES

FILMSTRIPS

DRAMA

ROLE PLAYING

ELECTRIC BOARD

15. During my training most of the audio-visual equipment were used mostly for entertainment rather than for educational purposes.

    a. I strongly agree ( )
    b. I agree ( )
    c. I can't decide ( )
    d. I disagree ( )
    e. I strongly disagree ( )

16. Methods tutors and subject tutors in training colleges should emphasize and employ audio-visual aids or teaching and learning aids more frequently.

    a. I strongly agree ( )
    b. I agree ( )
    c. I can't decide ( )
    d. I disagree ( )
    e. I strongly disagree ( )

17. Would you welcome an inservice course or workshop to improve your proficiency in the use of audio-visual materials now?

    YES_____ NO_____

18. Finally, any suggestions that you care to make for the improvement of audio-visual education at the training college level will be most welcome.

_____
_____
_____
_____
_____
_____

APPENDIX G

SURVEY ON AUDIO-VISUAL EDUCATION IN THE INITIAL TRAINING COLLEGES IN GHANA

Curriculum Division
Ghana Education Service
P. O. Box 2739
Accra
My Ref. No. CRDD/H/045/Vol. IV/39

February 16, 1983

SURVEY ON AUDIO-VISUAL EDUCATION IN THE INITIAL TRAINING COLLEGES IN GHANA

COMMENTS

Strictly speaking, no separate courses or syllabuses have been designed for audio-visual education in the teacher training colleges of Ghana. What exists is that the rationale for the use of teaching aids (resource material) of all kinds have been incorporated in the education course (Principles of Education).

Aspects of the place of teaching aids in education that are taught are their educational value, proper use to derive maximum benefit and how to make or obtain some of them.

Education tutors and art masters/mistresses help students to make visual aids like pictures, charts, models, cartoons, puppets etc.

Aural aids (audio material) like tapes, records and tape recorders are non-existent in most Institutions. Where they are available, they cannot be used because they have either broken down or power is not easily accessible for their operation (lack of dry cell batteries for the battery operated ones and lack of electric power for the electricity operated ones).

Most institutions lack audio-visual aids (films, filmstrips, the TV set) and those Institutions that can boast of possessing them may agree with me that whenever the machines break down, it is difficult getting them repaired. By and by they become more of ornaments than teaching aids.

Where the audio-visual aids are available only few students are trained to operate them or to assist tutors in using them e.g. the use of the film projector in showing educative films to the students body.

With these comments I hope you will be able to elicit the information you require.

Signed,

Director/C. R. D. D.

APPENDIX H

AUDIO-VISUAL EDUCATION COMMITTEE

Curriculum Division
Ghana Teaching Service
P. O. Box 2739
Accra

My Ref. No. CRRD/H/045/Vol. III/759

March 1, 1977

AUDIO-VISUAL EDUCATION COMMITTEE

Thank you for your letter under reference.

The CRDD made several attempts to promote the use of audio visual aids in our institutions. From 1968 - 1971, the Division organized various courses on audio-visual education for tutors selected from training colleges. The first workshop was organized at the Accra Academy from 7th - 12th, September, 1968. The aims of this and other courses were:

(a) to train participants in the proper handling of audio-visual equipment,

(b) to teach participants certain skills in the preparation and use of audio-visual material and

(c) to discuss the setting up of resource centres in training colleges.

The second workshop was organized at the La Bone Secondary in 1969 and the third one at the University of Cape Coast in 1971.

In addition to the workshops, the following papers, all aimed at encouraging audio-visual education in training colleges were sent:

(a) Audio-visual education in training colleges.

(b) The place of audio-visual aids in teaching and learning.

(c) Use of learning and teaching aids by students on teaching practice.

(d) Outline notes for audiovisual education in training colleges.

In spite of all these attempts the CRDD feels teachers do not use audio-visual aids as often and as effectively as they should be used. I do not think this is due to lack of policy as Mr. Laryea says. To me it is due to lack of interest on the part of most teachers.

The use of audio-bisual aids in training colleges should be taught as part of methods lessons. What may be useful is a handbook on audio-visual aids for use by both tutors and students in training, and not a syllabus as such as suggested by Mr. Laryea.

In conclusion, the NTTC may be asked to form a panel to review the situation regarding audio-visual aids education. Such a panel may be asked to consider the need for producaing a handbook for use by teachers, tutors and students in training.

(A. F. Menka)
Director/CRDD

The Director-General,
Ghana Education Service Headquarters,
P. O. Box M.45
ACCRA

(Attn.: Mrs. S. Yedu Aggrey, Schools and Colleges.)

BKO

cc: Mr. M. G. A. Laryea
Faculty of Education
University of Cape Coast,
Cape Coast

APPENDIX I

EXAMPLES OF IMPROVISATION

EXAMPLES OF IMPROVISION

1. The Squared Chalkboard

To make the equared chalkboard, ordinary chalk, preferably white chalk should be soaked overnight in a saturated sugar solution. The chalk still moist should be used for drawing the squares. On drying the chalk marks will appear white, and will stay on the board and be used for drawing graphs of all kinds. New chalk marks can easily be erased, while the square markings remain.

To erase: Use a damp cloth or duster.

2. Shadow Box

This is an improvised screen that can be used in an ordinarily lighted room.

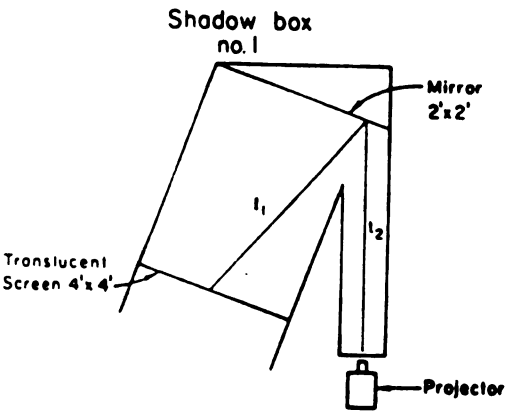


Figure 7.

$L = l_1 + l_2$ depends on the focal length of the projector lens

L = $(l_1 + l_2)$ will depend on the focal length of the projector used. Standard lenses on slide projectors are usually between 8 cm and 25 cm. L should be about 250 cm.

The inside of the box should be painted a dull black.

Limitation: this screen has a tendency to be bulky so should be left sitting in a corner of the room. It is well suited for an audio-visual resource center.

3. Flannel/Felt Board

Felt material is expensive and flannel is not easy to procure. An old cotton blanket will serve just as well. The silhouettes or cut outs can be made of light weight cartridge paper. Little strips of glass paper are attached to the backs of the sIlhouettes by stapling or by gluing.

Flock paper can also be used for backing of the silhouettes. Sandpaper is another substitute for flock paper. Glasspaper and sandpaper are not as efficient as the flock paper in their adhesiveness.

The flannel board or felt board should be inclined slightly out of the vertical.

4. Shadow Box No. 2

This is just a number of chalkboard parts that are hinged together and folded back so that they look like an ordinary chalkboard or bulletin board; and when opened up they form a cube with three sides with the wall forming the fourth side.

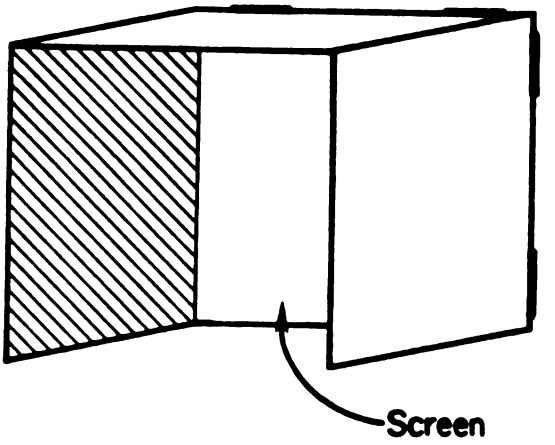


Figure 8.

The inside of the panels are painted a dull black, using the usual blackboard renovator. The wall used as a screen is painted white or sprayed with aluminum paint.

When folded up, the panels form ordinary bulletin boards.

This shadow box is situated at the rear of the classroom and for projecting, the students turn around and face it.

Limitation: Students in the last two or three rows will have to move forward to view the screen.

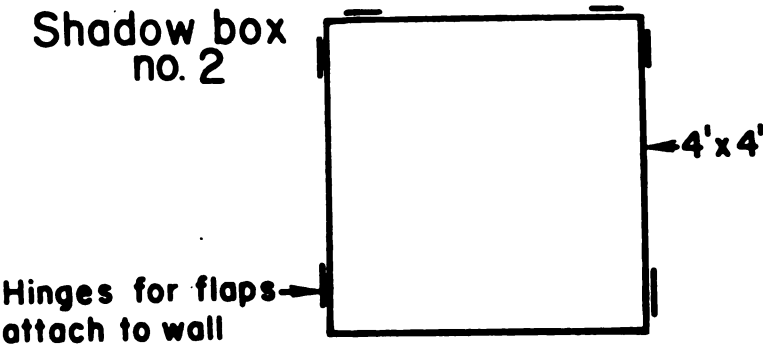


Figure 9.

APPENDIX J

LIST OF COLLEGES VISITED IN GHANA

LIST OF COLLEGES VISITED IN GHANA

1. Accra Training College, Accra
2. Ada Training College, Ada
3. Agogo Presbyterian Women's Training College, Agogo
4. Wesley College, Kumasi
5. Jasikan Training College, Jasikan
6. Evangelical Presbyterian Training College, Amedzofe
7. Komenda Training College, Komenda
8. Fosu Training College, Fosu
9. Offinso Training College, Offinso
10. St. Andrews Training College, Manpong, Ashanti

APPENDIX K

LIST OF NORTH AMERICAN UNIVERSITIES VISITED

LIST OF NORTH AMERICAN UNIVERSITIES VISITED

1. Michigan State University, East Lansing
2. University of Ohio, Athens
3. Western Michigan University, Kalamazoo

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