The study examined multicredentialed allied health workers in rural Wisconsin hospitals. The objectives identified differences in perceptions between rural allied health employers and employees regarding (1) allied health personnel shortages; (2) interest for multicredentialed allied health workers; (3) the educational preparation of rural multicredentialed allied health workers, and (4) factors affecting the utilization of rural multicredentialed allied health workers. An additional objective determined if existing credentialed allied health workers were interested in acquiring a second allied health credential.

Data were collected by a 64-item instrument developed and validated using the DELPHI procedure. Sixty-nine percent of the research instruments were completed. Study hypotheses were tested with the F statistic at the .05 level. The Scheffé's test located significant differences between employers and allied health employees mean scores.

The findings revealed no significant differences between the
perceptions of rural hospital employers and allied health employees regarding the (1) existence of allied health shortages, and (2) utilization of multicredentialled allied health personnel. Significant differences existed between the perceptions of rural hospital employers and employees regarding (1) interest in multicredentialled personnel and (2) factors affecting the acquisition of additional education in another allied health career. The employer and employee group responses ranged from "don't know" to a "low level of agreement" with (1) use of multicredentialled allied health personnel and (2) factors facilitating and/or impeding the utilization of multicensualled allied health employees, and (3) the educational preparation of existing credentialled allied health personnel for another allied health credential.

Recommendations centered on identifying: (1) the nature and existence of allied health personnel shortages; (2) rural allied health personnel desirous of reentry into and/or retraining in another allied health area; (3) educational offerings relevant to rural health care needs and facilitating the upgrading and cross training of existing allied health workers in more than one allied health service area; (4) instructional delivery systems facilitating the re-education of employed allied health personnel and the educational requirements necessary to provide allied health services; (6) personnel management practices affecting horizontal and lateral career mobility, and (7) credentialling requirements affecting the occupational versatility and utilization of rural allied health personnel.
An Assessment of Needs and Interests for Multicredentialed Allied Health Workers in Rural Wisconsin Hospitals

by

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An Assessment of the Need for Multicredentialed Allied Health Workers in Rural Wisconsin Hospitals

CHAPTER I

INTRODUCTION

Historically, allied health manpower has been a constant and costly problem for the rural health care industry. The allied health work force employed by one of the fastest growing and largest industries in the United States, represents 66 percent of all health manpower (National Commission on Allied Health Education, 1980). Daniel Whiteside (1977) has described the health manpower situation as being worse in the rural and medically underserved areas in the country. The major manpower concerns of the health care industry have been related to: One, the cost; two, the supply; and three, the preparation of the health care personnel (Bloom, 1980).

Thirty-one counties in Wisconsin have been identified as being medically underserved by the former Department of Health, Education and Welfare (Federal Register, 1978). Sixteen of these counties have been classified within the highest degree of shortage category. An examination of the Guide to General and Special Hospitals in Wisconsin (1979) revealed that of the 72 small and rural Wisconsin hospitals, 29 were located in 17 of these counties.

What are the underlying causes of the rural allied health personnel problems? For rural areas, any number of these factors may have
contributed to the rural health personnel dilemma.

The study approached the allied health personnel problem and the underlying causes from the perspectives of personnel availability, utilization, and retention. The interlocking systems responsible for the education, the credentialing, and the utilization of allied health personnel were studied to assess the influence which these systems have had on rural allied health personnel problems.

Statement of the Problem

The present study focused on examining the need and interest for the utilization of "multicredentialed" allied health workers in rural hospitals. The problem consisted of four major dimensions:

1. The interest which employed credentialed allied health personnel in rural hospitals have in acquiring additional allied health credentials to function in more than one allied health specialty.

2. The interest which employers in rural hospitals have in utilizing and compensating allied health employees who have multicredentialed qualifications.

3. Factors perceived by credentialed allied health employees and rural hospital employers which affect the utilization of multicredentialed allied health personnel in rural hospitals.

4. Factors perceived by credentialed rural allied health employees and rural hospital employers which affect the educational preparation of multicredentialed
allied health personnel.

**Purpose of the Study**

The purpose of the study was to establish a rationale which could be used for the design, development, and implementation of allied health education programs which could increase the availability and capability of allied health workers in rural Wisconsin hospitals. The findings of the study determined if a need for and interest in the utilization of multicredentialed allied health workers in rural hospitals existed in Wisconsin.

**Objectives of the Study**

The objective of the study was to determine the differences in perceptions between allied health employers and employees in rural Wisconsin hospitals regarding the need for and use of multicredentialed allied health personnel. The achievement of this outcome was determined through a comparison of the employer-employee perceptions of the defined problem. Contributory objectives of the study were as follows:

1. To determine the existence of a shortage of credentialed allied health workers in rural Wisconsin hospitals.

2. To determine if there was an interest in the utilization of multicredentialed allied health workers in rural Wisconsin hospitals.

3. To identify factors which could affect the educational preparation of multicredentialed allied health workers in rural hospitals.
4. To identify factors which could affect the utilization of multicredentialed allied health workers in rural hospitals.

5. To determine if single credentialed rural allied health workers were interested in acquiring a second allied health credential.

All designs consist of compromises; all variables cannot be actively controlled in any research. Those variables which appear to have been compromised in the present study include the following:

1. Established "mind sets" of credentialed allied health specialists may have resulted from traditional allied health education preparation, credentialing practices, staffing patterns, job structure, and the influence of allied health organizations.

2. Variations which may have been present in the work loads and health care services provided within the various rural hospitals.

3. Location of the study sample hospitals to urban centers and educational programs preparing allied health personnel.
4. The quantitative need for credentialed rural allied health workers was not determined. The aim was to obtain "opinions" only as to whether or not an actual shortage of credentialed allied health workers existed in rural hospitals.

5. All hospitals which had bed capacities of 100 or more, which were located in communities with a population of 10,000 or larger, and which were located within Standard Metropolitan Statistical Areas were excluded from the study.

**Definition of Terms**

Several terms used in the study required definition. Most common among them were the following:

*Accreditation* is a credentialing process through which educational resources are evaluated and recognized in terms of predetermined criteria and standards for facilities, faculty, and curricula (Balija and Hedrich, 1980).

Allied health personnel are those persons who, while exercising independent judgment within their areas of competence, work under the supervision or direction of a physician in providing medical services to a member of the public (Balija and Hedrich, 1980). The definition included those specialties accredited by the Committee on Allied Health Education and Accreditation (see Appendix A).
CEHEA, the Committee on Allied Health Education and Accreditation which represents an:

... an umbrella structure for the coordination, improvement, and development of a coherent system for the accreditation of educational programs preparing persons for selected allied health occupational titles (Balija, 1980).

Certification is a credentialing process by which a nongovernment agency or association (usually an allied health organization) grants recognition to persons who have: one, met predetermined qualifications as specified by that agency; two, demonstrated acceptable performance on an examination; and three, have completed a given amount of work experience (Department of Health, Education and Welfare, June, 1971). Credentialed allied health employees are persons who, after having successfully completed a written and/or a performance examination, then become licensed, certified, or registered to function in a given health service or health occupations area.

Health care industry includes facilities such as hospitals, long-term care agencies, physician offices, clinics, and community health care centers which render health care services in an institutional type setting or on an outpatient basis.

Health care services consist of types of medical care rendered by the various allied health specialties within the health care industry; i.e., medical laboratory, radiologic technology, respiratory therapy, and others.

Health professionals include physicians, dentists, podiatrists, veterinarians, pharmacists, optometrists, and registered nurses.
Licensure is a process by which an agency of state government gives permission to persons to engage in a given profession or occupation and/or to use a specific title. This process certifies that the persons who are licensed have attained the competency necessary to insure that the public health, safety, and welfare will be reasonably protected (Department of Health, Education and Welfare, June 1971).

Medically underserved areas are those geographical areas which have been designated by the Federal government as having unmet needs such as primary medical, dental, visual, podiatry, pharmaceutical, psychiatric, and veterinarian care (Federal Register, 1978).

ML respondents refers to medical laboratory workers such as certified laboratory assistants, medical laboratory technicians, and medical technologists participating in the study survey.

Multicompetent technicians are allied health workers who, as generalists, possess more than one skill in such areas as medical assisting, medical laboratory, and radiography (University of Alabama, 1975).

Multicredentialed technicians are proposed allied health workers who could possess the knowledge, skills, and credentials necessary to function in more than one allied health service area.

Rural hospitals as used in this study included hospitals which has less than a 100 bed capacity, were located in communities having a population of 10,000 or less and were outside of Standard Metropolitan Statistical Areas.

RAT respondents refers to radiological technology workers participating in the study survey.

RET respondents refers to persons employed in respiratory therapy.
usually as respiratory therapy technicians and/or as respiratory therapists.

**Standard Metropolitan Statistical Area:** A county containing at least one city of 50,000 inhabitants or more, plus as many adjacent counties as are metropolitan in character and are socially integrated with that city.

**Summary**

The availability, utilization, and retention of credentialed allied health personnel in rural health care agencies has and continues to represent a problem. A concept involving the preparation and utilization of allied health persons to function in more than one allied health area has been proposed as a possible solution to the rural allied health personnel dilemma. The study sought the opinions from credentialed rural allied health employees and rural hospital employers, regarding the need for multicredentialed allied health personnel and the factors affecting the utilization and educational preparation of multicredentialed allied health technicians.
CHAPTER II

REVIEW OF RELATED LITERATURE

The independent and interdependent characteristics of allied health education, allied health credentialing and health care systems were reviewed in Part I of this chapter. The review focused on the influences which these systems have had on the availability, utilization and retention of allied health personnel in rural hospitals. This information assisted with substantiating the problem, purpose and objectives of the study. Part II of this chapter examined literature which was pertinent to the utilization of multicompetent and multicrodentialled allied health personnel as a possible solution to the rural allied health personnel problem.

Part I

Rural Allied Health Personnel

The delivery of health care is dependent upon the availability and utilization of manpower. Kennedy (1979) contended that rural health care delivery problems have been primarily related to allied health personnel. These persons have also been cited by Kennedy as being the most necessary as well as the most costly resource in hospitals.

Martin (1975) contended that rural health care problems were more grave than those in urban areas. He further claimed that the problem had been magnified by some major differences between urban and rural areas such as: greater personnel shortages in rural areas, lesser availability of health services in rural areas, and greater occupational
injury rates in rural areas. Martin also cited other factors as having had significant implications for the delivery of rural health care services. They included: shrinking economic and employment base in rural areas, the greater incidence of poverty in rural areas, the decreased availability of education and transportation in rural areas and a larger percentage of rural Americans who were over age 65. Martin also contended that a type of isolationism existed in sparsely populated rural areas. This itself perpetuated recruitment and retention problems involving technical and professional health care delivery personnel.

The problems of providing rural health care were also addressed by Kane (1978) from the perspectives of the distribution of health workers, the availability of health care facilities, the availability of preventive medicine and the quality of care. Kane stated that the most crucial and basic problem of rural health care was the distribution of and availability of physicians, dentists, and other health workers in rural areas.

According to Whiteside (1977), the rural health personnel problem was heightened by a high degree of medical specialization which occurred as the result of the explosive growth in technology and an increased demand for health care services. The effects which this medical specialization had on the numbers and types of allied health personnel needed to support the health professional has been illustrated by Terry (1977). He reported that in 1900 there was one allied health person per physician; in 1940, three per physician; in 1950, seven per physician; in 1972, twelve per physician, and a projected sixteen to twenty per physician in the 1980's.
In a Report on Allied Health Personnel, the Bureau of Health Manpower (1980) acknowledged that the quality and quantity of information on the availability of allied health personnel had been obsolete, fragmentary and sparse. It was reported, however, that small or rural health care facilities continued to encounter difficulties in obtaining qualified health care personnel with specific clinical skills.

Ginzberg and Ostow (1969) noted that personnel shortages persisted in nearly all fields which were dependent upon trained manpower. These shortages were further perpetuated by archaic and cumbersome staffing patterns. Ginzberg (1978) also questioned the existence of a serious maldistribution of rural health personnel, claiming that more than 98 percent of the American population lived within an hour's drive of a medical facility. The rural health care problem as perceived by Ginzberg was one of access to care rather than one of distribution of health care personnel.

The resolution of the rural allied health personnel problem was perceived in this study as being within the structure and practices of those systems responsible for the preparation, credentialing and utilization of allied health work force. How then have these systems influenced the availability, the utilization and the retention of rural allied health personnel?

Allied Health Education System

Concerns with allied health education have been relative to the urban location of the programs, the appropriateness or relevancy of the preparation, the single skilled preparation of personnel and the limited
mobility within and between allied health specialties.

Location

An examination of the Allied Medical Education Directory (Balija, 1980) revealed that the greatest number of accredited allied health training programs were located in urban areas affiliated with the larger health care centers.

Karolevec (1978) described the location of allied health training programs in relation to the size of the hospitals involved with allied health training programs. Hospitals of 100 beds or over showed substantial involvement with educational programs while those of 500 beds showed the greatest affiliation. Only 4.1 percent of the hospitals with bed capacities between 50 and 100 were affiliated with educational programs while 1.6 percent of the hospitals with less than 50 beds were involved with some type of training affiliation.

The significance of Karolevec's findings were further heightened by Munroe and Schuman (1980) with the American Hospital Association who reported that over 50 percent of the hospitals in the country were classified as being small and rural. Seventy-four percent of these hospitals had capacities of less than 100 beds.

Recognition of the importance of the relationship between the location of the allied health education programs and the availability of rural allied health personnel has also been acknowledged by others. Warner (1975) directed a manpower distribution project which studied methods which would be effective in encouraging health science students to practice in rural and medically underserved areas. The project
itself focused on locating allied health students in the actual settings which were in need of health personnel.

The Carnegie Commission on Higher Education (1970) addressed the need to adapt the education of health personnel to the changes needed for an effective system for the delivery of health care in the United States. One of the major objectives of the Commission was to improve the geographic dispersion of personnel and educational facilities particularly for the rural areas.

Luganbeel (1978) at Southern Illinois University, contended that the location of the allied health education programs adversely affected the recruitment practices in rural health care facilities. He claimed that allied health personnel trained in urban settings showed little interest in locating in rural settings. Rural residents who left rural communities to obtain educational preparation in allied health rarely returned to their former communities to practice. Luganbeel also emphasized the need to utilize the services of persons who had a personal commitment to the rural community by way of family responsibility, home ownership, job responsibility and cultural identity if allied health personnel were to be available to rural health care facilities.

Findings of a study of the "Migration of Allied Health Care Personnel In and Out of Underserved Areas" conducted by Phillips, et al. (1978) reinforced Luganbeel's concept of how the urban location of educational programs affected rural allied health programs. Phillips demonstrated that 85 percent of the graduates from allied health education programs located in medically underserved areas returned to work
in medically underserved areas. In addition, he recommended the establishment of satellite schools within the rural and underserved areas so that appropriate and high quality health care training programs would be available and accessible.

In efforts to obtain allied health personnel, Friedman (1981), of the American Hospital Association, cited the remoteness of the location of rural hospitals to allied health training programs as being a major recruitment handicap for rural health care facilities.

Relevancy of Education

Previously in the study, it was illustrated that at least 50 percent of the hospitals in the nation; namely, the small and rural hospitals, had minimal if any involvement in providing clinical learning experiences for allied health students, therefore, it remained questionable if learning activities for allied health students were relevant in meeting the health service needs of the rural health care facilities.

Sharfstein (1978) explored the relationship of the settings where allied health students were trained to their adaptation to the rural health care settings in which they took employment and established residence. He maintained that:

... training for health care disciplines lacked relevance in that much of the training took place in settings radically different from community health centers, thus resulting in a culture shock and high turnover rates of personnel.

Bloom (1980), representing the hospital employers in a response to the Report on Allied Health Manpower, alleged that many graduates of
allied health education programs were not adequately prepared to function on the job. Having the right kind of worker in adequate numbers in the right setting was more important to health care employers than merely providing a balance of supply and demand. Bloom further urged greater collaboration between educators and employers in providing educational programs to meet changing job requirements.

The inappropriateness of the educational preparation of many allied health personnel was recognized by the National Commission on Allied Health Education (1980). The need for relevancy in allied health education was reinforced by the Commission's emphasis on the need to study the educational preparation of allied health personnel in the context of the health care delivery system and the consumer needs.

The Bureau of Health Manpower (1980) addressed the need for relevancy in allied health education. It emphasized the need to develop program content appropriate to health service demands, to link educational objectives to practice needs and to improve the integration of clinical and didactic instruction. The expansion of the range and type of clinical education sites and the adaptation of various methods in meeting health service demands was further advocated by the Bureau.

The relevancy of the educational preparation of allied health personnel was studied by Goldstein and Horowitz (1978) at the Center for Medical Manpower Studies at Northeastern University. They examined the realism of the varying educational requirements for job entry-level positions and found that a limited number of health personnel felt that their formal education had significantly prepared them for their medical functions. On-the-job training was considered by health care personnel to be the
most important and relevant preparation, accounting for at least 50 percent of their relevant learning experiences.

Single Skilled Preparation

Allied health personnel have typically been prepared and credentialed to function in one health service area within a health care facility. Thus, they have been referred to as specialists or single skilled or single credentialed. Friedman (1981) contended that the continued employment of the single skilled allied health specialist had become economically unfeasible for rural hospitals. She claimed that the fluctuating and often decreased workloads in rural hospitals often do not keep the specialist productively engaged for the period of time for which they were employed. As a result, the specialist frequently represented surplus staffing as they were unprepared to function elsewhere within the health care facility. Some responses from various allied health personnel regarding the single skilled specialists were described by Friedman. They staunchly defended the single skilled preparation on the grounds that generalists would not be as competent as the specialists. Other arguments relative to the use of single skilled specialists have been related to issues surrounding credentialing and economic benefits of the specialist versus the generalist.

Pearl Fryer (1978), administrator of a rural hospital in Idaho, has developed and implemented staffing plans which enable health care personnel to be utilized in more than one area in the hospital. She stated that she herself was:

... originally hired as an administrator because the
hospital needed a laboratory technologist who could also take x-rays and might be able to administer the operations of the hospital.

Luganbeel, who has headed up a program preparing multiskilled technicians, was interviewed by Friedman (1981):

... if the professional organizations would look at the need that exists in rural areas, they would establish a process for entry into their specialties by multiskilled personnel. But the professional associations are more interested in upgrading their requirements than looking at the need.

The single skilled preparation has been linked to the lack of educational and career mobility for the allied health specialist.

Mobility in Allied Health

The development of allied health education programs paralleled the proliferation of the allied health specialties. These programs were and are established in various settings such as vocational technical institutes, junior and community colleges, senior colleges and the health care facilities themselves. They have been separately operated by both civilian and military organizations. In addition, there has been a broad range and size of knowledge and skills within the educational programs. Allied health organizations representing allied health specialties arose to identify and protect group identities. These organizations further defined job functions and delegated tasks according to levels within the specialty; i.e., the aide, the technician and the technologist. A hierarchical differentiation of educational and occupational levels resulted. Entry into and movement within and
between the specialties and educational levels became rigidly controlled by the establishment of educational and credentialing requirements. Failure to recognize the interrelationships and commonalities between and within the allied health specialties has been the rule rather than the exception. Dead-ended jobs have been created, perpetuating the problems of personnel shortages, utilization, and retention.

Eleanor Gilpatrick (1972) directed a Health Services Mobility Study in New York City for the purposes of facilitating upward mobility of health workers and to establish ways to overcome credentialing barriers. She reported that as new functions evolved, specialization increased and allied health associations arose to guard the new titles and functions. Ultimately there was a proliferation of health occupations and overlapping and duplicative functions. The educational and credentialing requirements for the new occupations usually did not recognize a person's previous training and/or work experience. These persons could acquire entrance into the "new" occupations only by returning to full-time schooling. In addition, training required for the necessary credentials was often redundant and not necessarily fully utilized on the job. Gilpatrick further cited the education and training of health care personnel as being the greatest social cost in the health care industry, with the allocation of functions of personnel and the redundancy of training being the greatest social waste. She called for an emphasis to be placed on training which would upgrade and retrain workers instead of preparing persons for dead end entry-level positions.

The American Hospital Association (1971) addressed both the health care industry and the educational institutions on the use of career
mobility programs to cope with health care personnel problems. The Association contended that career mobility would reduce personnel shortages, reduce high rates of turnover, and break down barriers for advancement in health occupations. Since training costs were less costly than the expense of employee turnover, improved mobility via job upgrading was cited as being more economical to health care institutions. In addition, career mobility was cited as having a positive effect on the recruitment as well as on the retention of health care personnel. The Association echoed the concern of others in that the advancement of many health personnel was dependent upon their returning to formal education programs on a full-time basis, an economic impossibility for most. The Association, as did Gilpatrick, stated that the employee returning to school had often been forced into redundant and irrelevant educational experiences. Two pathways for career mobility were proposed by the Association: one, education ladders and the education necessary to ascend these ladders, and two, the development of occupational ladders within the health care system.

Doris Meek (1970) directed a project for the study of educational mobility for health manpower in California. She indicated there was no shortage of health manpower, however, there was a need to effectuate better personnel utilization by upgrading present personnel through educational mobility. She found that lateral or vertical transfer in allied health education programs was virtually impossible. She recommended the development of articulated pathways with core curriculum to provide for lateral mobility from one allied health area to another with a minimum of retraining or duplication. She further stated that:
... as a result of a continued tightening of financial resources, the smaller hospitals, particularly those who could not afford the true-blue workers from each of the specialties when the workload was to equal a full-time job, were caught between the budget and the patient.

Blayney and Joiner (1974) discussed allied health manpower mobility. They found that its lack had resulted in dead-ended jobs, personnel shortages and inefficiency, all of which were components of the country's health care problem. Additional adverse effects of the lack of career mobility were described as being: restriction of entry into the health care field, high turnover rates and decreased productivity. They, as others, recommended that emphasis should be placed on upgrading personnel from one level of health service to the next, based on experience and continuing education. Health manpower was identified by Blayney and Joiner as being the output of the educational system which in turn has become the input for the health care industry. Thus, the educational system was cited as often being a part of the problem rather than a solution, having established some of the barriers to personnel mobility and utilization.

The allied health education system has also been strongly controlled and influenced by the allied health organizations and credentialing agencies responsible for the accreditation of education programs and the certification of graduates from the educational system. It was necessary, therefore, within the study to examine the allied health credentialing system for the influences it has had on the availability, the utilization and the retention of allied health personnel.
The Credentialing System

The expansion of the allied health credentialing system paralleled the prolific growth and development of allied health occupations and educational programs. The system, representing private, professional and government agencies, is large and complex. It has established and directly or indirectly enforces the educational and entry-level requirements for employment in the health care field.

The National Commission for Health Certifying Agencies (1980) reported that a minimum of 100 health occupation groups were now being regulated or seeking regulation in at least one state. In addition, there were over 100 health certifying bodies in the United States. It has been said that the purpose of the credentialing process has been to offer the public an assurance that health services are provided adequately and with at least a minimum degree of competence. (National Commission for Health Certifying Agencies, 1980). Credentialing processes in allied health have consisted of: accreditation and personnel credentialing such as certification, registration and/or licensure.

Accreditation

Allied health education programs preparing allied health personnel have been most commonly accredited by the Committee on Allied Health Education and Accreditation, CAHEA. The membership of CAHEA consists of collaborating national medical specialties (physicians) and allied health societies which sponsor review committees (Balija and Hedrich, 1980). These collaborating agencies draft and determine the minimum standards for an educational program to meet for the purposes of
of program accreditation. Areas in educational programs subjected to this control include: curricula, faculty, students, resources, facilities, evaluation, planning and program review.

**Personnel credentialing**

This process has consisted of certification, registration, and/or licensure. These processes have been independent and yet interdependent with each other and with the educational preparation of allied health personnel. The purposes and effects of health personnel credentialing has caused considerable controversy. Has it insured occupational competency? How has it affected health manpower availability, utilization and retention?

Hatch (1976) questioned the purpose of credentialing and suggested that the allied health specialties followed a credentialing pattern which perpetuated a protection of self-interest. First, there was an establishment of a national organization to represent the members; second, there was a development of a mechanism (accreditation) which would assure itself that the educational programs were preparing personnel according to the organization's perceptions; third, a development of personnel certification; and fourth, licensure. Hatch further contended that credentialing practices had not operated to their optimum potential in addressing such problems as the supply of manpower, the stability of the work force, and the competency or quality of personnel entering practice. Instead, Hatch cited credentialing as presenting major barriers in resolving health manpower needs. The availability of manpower for employment had been legally limited via licensure.
Occupational versatility and career mobility had been restricted by the lack of educational equivalency and work proficiency examinations. This, in turn, has contributed to personnel turnover. Lastly, Hatch questioned some practices in allied health education such as: the length of the programs, the sequencing of the academic and clinical training, and the lack of articulation at all levels in allied health education programs. These practices were controlled and influenced by the processes of accreditation.

Allied health educators in response to a survey conducted by the National Commission on Allied Health Education were dissatisfied with the manner in which credentialing standards were determined (Holmstrom et al., 1978). They indicated that certifying examinations were inconsistent with the demands of the particular job and did not necessarily reflect the health needs of the public. They also expressed concern regarding the restricted horizontal, vertical and geographical mobility which resulted from a lack of uniform nationwide credentialing standards. The power of the American Medical Association and other allied health professional groups in determining standards and practices was opposed by the allied health educators.

Major studies relative to health manpower credentialing have been undertaken by the Federal government. Some of the major reports of the former United States Department of Health, Education and Welfare (DHEW) were made available in 1971, 1973, and 1977. These reports addressed the credentialing practices of health manpower which had grown into a system of varying requirements, responsibilities and controls. Additional concern of the DHEW were the practices of credentialing which:
restricted geographic and career mobility, impeded the effective utilization of health manpower and fostered unequal licensure standards and procedures in different regions of the country. The reports further contended that there had been a tendency to emphasize formal education and expand occupational entry requirements while failing to focus attention on the beginning level and continuing occupational competencies required of those persons already licensed.

In the Report on Allied Health Personnel, the Bureau of Health Manpower (1980) discussed the competency of allied health workers, stating that health manpower credentialing had: one, affected the supply of personnel by controlling entrance into practice; two, influenced the stability of the work force by limiting vertical and horizontal career mobility, and three, affected the quality of care by providing standards for education and the measurement of competency. Some specific concerns relative to this study which were included in the Bureau of Health Manpower's (1980) report on Allied Health Personnel were:

... The lack of reciprocity of licensure among states, thereby reducing manpower mobility.

The adoption by states of inappropriate or unnecessary health manpower credentialing requirements that have questionable benefit to the public and which lead to more rigidity in the use of manpower and higher health care costs.

The fragmentation of the work force, resulting from pressures by small groups of specialists or technicians for recognition as unique health occupations.

The adoption by health care financing and regulating agencies of manpower standards which embraced existing credentials and without regard to their necessity, the validity or effect on manpower utilization costs.
Goldstein and Horowitz (1978) studied the utilization of health personnel and stated that licensure and certification directly limited entrance into the occupations. The advancement of workers in the professions was indirectly limited. Other relevant effects of credentialing practices were cited as being: an increase in the cost of entry into the occupation, the production of favorable income effects for licensees, higher age of entry into the field, and longer periods of education than were necessary for acquiring skills relevant to the job.

The National Commission on Allied Health Education (1980) discussed the role that accreditation and certification had on the inflation of allied health education. Accreditation standards have exerted pressures from allied health groups to upgrade minimum degree requirements. These pressures have frequently occurred from the perception of greater awards associated with higher degrees rather than with the relationship of additional education requirements to practice needs.

There has been little question that credentialing practices have in the past provided a means by which minimum standards for safe practice have been set. There have been questions, however, regarding the fulfillment of the purpose: Has it been in the interest of health service clients or for the protection of self-interest on the part of the allied health groups? In addition, the rigid nature of the credentialing processes has become a major barrier to maximizing the availability, the utilization and retention of allied health specialists especially in the rural areas. These processes must demonstrate flexibility and acknowledge ways by which persons could acquire the competencies necessary to
become and advance as safe health care practitioners.

**Health Care System**

Factors inherent in the health care system which have affected the rural allied health personnel problem have been identified as being personnel utilization and managerial and personnel practices.

Goldstein and Horowitz (1977) conducted studies relevant to allied health personnel problems. In *Health Personnel, Meeting the Explosive Demand for Medical Care* a personnel shortage was acknowledged; however, the authors stated that:

> . . . if the market for health manpower operated efficiently without artificial barriers, supply and demand would ultimately correct shortages.

They contended that employing institutions had not acted adequately to recruit and retain employees, to improve job satisfaction, to increase the relatively low-wage levels and to provide opportunities for career mobility. Goldstein and Horowitz suggested that the hiring in standards and pay scales should be restructured, in-service training programs be implemented and new sources for recruitment be explored. They further claimed that allied health personnel had formed interest groups thereby limiting entry into the health care field and curtailing the mobility of workers with or without professional credentials. A pattern for the utilization of health personnel in the United States was described by these authors as being:

> . . . An inflation of the number of budgeted positions which did not necessarily reflect the need for qualified workers.

The substitution of lower level workers for higher level workers in random, piecemeal effort
to lower operating expenses.

The persistence of relatively low-wage levels for health workers.

The existence of high turnover rates, job dissatisfaction and limited opportunities for vertical and horizontal career mobility.

In another study on the Utilization of Health Personnel in Hospitals, Goldstein and Horowitz (1978) presented the hypothesis that the hiring in standards for health personnel in hospitals were higher than necessary and that there was a considerable overlap of functions among workers at different skill levels within an occupational structure. These hiring in standards were usually established by the hospital on a departmental or general administrative basis; however, the vested interests of accrediting agencies, professional societies and educational institutions also had influenced these standards. In addition, defects in personnel utilization were found in the study and included:

- Substantial overlap of job functions
- Little or no on-the-job training for advancement
- Dead end entry-level positions
- Low job satisfaction, especially among personnel in entry-level positions.

In a third study, Entry-Level Health Occupations, Development and Future, Goldstein and Horowitz (1977) selected a single hospital which was representative of many other hospitals in the United States. They described the characteristics of entry-level health personnel as being: high turnover rates, lack of opportunities for career mobility, chronic personnel shortages, and a high degree of overlapping of functions in the work environment. In this study, Goldstein and Horowitz also
examined the current patterns of utilization and presented findings paralleling those found in the two previous studies completed by Goldstein and Horowitz. These authors contended that the research findings of this study indicated that:

1. Changes in the utilization of health manpower personnel could be made.
2. Hiring standards for some occupations could be lowered.
3. Mobility could be provided through occupational restructuring.
4. Wider opportunities for promotions could be made.

They further recommended that the practices of licensure and certification undergo a major revision under the auspices of the professional organizations and at the various levels of the government. Work experience could be more meaningful and satisfying for the allied health workers with resultant increased job productivity and decreased job turnover.

Others have addressed issues paralleling those cited in the Goldstein and Horowitz studies. Ginzberg (1978) described the health care system as a service industry which characteristically has been labor intensive. Labor intensive industries have had difficulty in structuring effective management and supervisory structure. He claimed that in the absence of such a structure, low productivity occurs. Ginzberg stated that the addition of personnel provided "no increment of useful work because of the difficulties of supervising and coordinating them."

Ginzberg and Ostow, in *Men, Money and Medicine* (1969), cited
characteristics such as inflexibility, weak leadership and conservative attitudes as being responsible for the health care field being unable to make more effective and efficient use of its resources. They suggested that personnel problems could be dealt with by: eliminating or merging some tasks performed within occupational areas, delegating tasks to others with less formal training, substituting money for manpower in performing in some functions and transferring more responsibility for health from the provider to the consumer.

Boe (1978) discussed the problem of personnel retention in hospitals. He stated that hospitals traditionally showed high turnover rates which in turn affected cost control practices. Some causes of turnover cited by Boe included: poor selection of applicants, personal reasons, personality conflicts, lack of enough or challenging work, inadequate training, lack of recognition, lack of advancement and general job dissatisfaction.

Broski and Cook (1978) studied the job satisfaction of selected allied health groups in terms of how they felt about their jobs in general and in relation to specific job functions. Sources for satisfaction were cited as being: increasing opportunity for autonomy, promotion, upward mobility and self-esteem.

Calhoun (1980) related job dissatisfaction and the high levels of stress in health care work to such personnel problems as: decreased productivity, high rates of job turnover and absenteeism, increased accident rates and work errors, and decreased productivity. Calhoun contended that a responsibility for people created greater stress than did a responsibility for things. Other major causes of stress cited by
Calhoun were inherent in the organization and management of health care institutions. They included multiple levels of authority, heterogeneity of personnel and work interdependence and job specialization. Additional stress agents were identified by Calhoun as being job insecurity, poor mobility between jobs, role ambiguity, underutilization, working in unfamiliar areas and unfulfilled ambitions.

Silber and Prae (1979) discussed job satisfaction as being related to the problem of "burn out." Burn out was accompanied by a significant loss of productivity and mobility in making decisions. The results of burn out included: A "do enough to get by syndrome," a decrease in the quality of work and inadequate handling of changes and crisis. Causes of "burn out" were cited as being: restriction and constriction on the job, being at the same job too long, and performing repetitious and routine tasks leading to boredom and decreased creativity. Silber and Prae further claimed that hospital employees needed new responsibilities, recognition and a full utilization of their talents and abilities, job expansion and changes in personal and life objectives.
Part II

Multicompetent and Multicredentialed Allied Health Personnel

A solution to the rural allied health manpower problem proposed in this study focused on developing an educational model(s) which would facilitate the preparation of "multicredentialed allied health personnel." These persons would possess the knowledge, skills and credentials necessary to function in more than one health service area within rural hospitals. The educational approach emphasized the training and/or retraining of allied health personnel currently employed in rural hospitals. The multicredentialed concept was cognizant of the need:

1. To provide allied health personnel who could be utilized in a more efficient and effective manner in rural hospitals.
2. To maintain and improve the delivery of health care services.
3. To increase career options and career mobility for credentialed allied health personnel already employed in rural hospitals.
4. To provide accessible and relevant educational offerings to persons currently employed in rural health care settings.
5. To improve the professional recognition and the economic stature of credentialed allied health personnel.
6. To abandon and/or modify traditional education, credentialing and utilization practices.
The philosophy underlying the recommended solution has been reflected by Bowen and Bailey's discussion of the effective use of financial and human resources. Three moral issues involving manpower approaches were cited by Bowen and Bailey (1976):

... One, the most sacred freedom each person has is to choose his area of study and vocation, allowing for personal talents, interests and market opportunities and to develop his own capacities. It is wrong to deny access to employment and morally questionable to plan the educational system in a way that rations places and denies choices.

Two, morally questionable assumption is that the main purpose of education is to prepare people for specific jobs and it is somehow wasteful or wrong to provide an education that will not be used.

Three, education should produce persons of vision and sensitivity who will be motivated to direct technology into humanly constructive channels. The limits of education are set by the capacity of humans to learn and not by the dimensions of jobs we see around us.

ERIC AND MEDLINE literature searches were conducted and revealed an absence of studies and/or models which specifically addressed the "multicredentialed allied health personnel" concept.

Luganbeel’s Rural Allied Health Manpower Project (1978) at Southern Illinois University, provided the most significant relationship to the solution proposed in the study. Luganbeel's project, sponsored by the Bureau of Health Manpower, was for the purpose of developing a viable allied health training model which could be utilized in other rural areas of America. Several hospital administrators and educators in Southern Illinois met to discuss the rural allied health manpower needs in their respective areas. Factors underlying the allied health manpower problem in Southern Illinois were identified
as being the recruitment, retention and utilization of credentialed allied health personnel. Causes contributing to the problem were identified as being:

1. The lack of interest on the part of persons trained in urban allied health centers to practice in rural communities.
2. The failure of rural residents who trained in urban allied health programs to return to their rural communities to practice.
3. The small fluctuating work loads in some rural hospitals which usually did not justify more than a minimal number of full-time allied health specialists.
4. The occurrence of a critical shortage with a single resignation, since no backup for these allied health personnel was available to small rural hospitals.

The training model developed by Luganbeel was one which would:

1. Adapt a training strategy specifically geared toward the atypical student.
2. Utilize the "generalist concept" of two allied health specialties in a single curriculum to satisfy rural communities health service needs.
3. Make extensive use of specifically developed allied health media instruction.
4. Offer opportunities for preparation in an entry-level health career and to obtain educational advancement.
5. Meet the health service needs of rural and underserved areas.
The target population to which Luganbeel's project directed itself consisted of the indigenous rural population likely to stay and practice in the rural areas. Health care facilities involved included eleven hospitals and one clinic. The bed capacities of these hospitals ranged from 66 to 145 beds, with eleven hospitals having bed capacities of 100 or less. Successful outcomes from the four-year study indicated that the model developed could:

1. Develop qualified health care personnel while utilizing hospitals as the major training site and an accredited educational agency as the coordinating component.

2. Improve the stability of the rural allied health work force by the recruitment and selection process that taps the local resources and more permanent residents of the hospital's service area.

3. Improve the allied health educational offerings and manpower development capacity of a rural community by educational and health resource sharing.

4. Develop a multicompetent technician, but the full utilization of the dual trained health practitioner was, however still a debatable issue based on the findings of this particular rural setting.

Factors which hampered the utilization of the multicompetent technician were identified by Luganbeel as being:

1. National regulations and certification requirements which impeded the full utilization of the generalist technician.

2. Hospital management practices, organizational structure and administrative responsiveness which have limited the utilization of this concept.

3. Departmental territory protection and the professional allegiance of the hospital supervisor or department head which aligns itself with single skill specialty development.
4. Multicompetency technician graduates were influenced by the system, internally and externally, have tended to view single area practice and professional certification as their major role.

Recommendations from Luganbeel's project included:

1. The encouragement of more extensive efforts in multicompetent health manpower utilization and development.

2. The training of students in their local areas, i.e., rural people for rural training and employment, medically underserved areas by and for those areas.

3. A definition of the roles, responsibilities and functions of multicompetent technicians in order that meaningful assessment and evaluation may be ascertained.

4. The provision of funding for national health manpower demonstration and experimentation in the development of multicompetent technicians and their utilization.

Another, but less extensive, study of the multicompetent technician concept was conducted by the School of Community and Allied Health at the University of Alabama (1975). It was reported that in 1970 a delegation from the United States Office of Education and the Department of Labor approached the University seeking a means by which to delay the proliferation of allied health specialties. A preliminary curriculum for a multiclinical technician was proposed and developed. Students in the program were essentially trained as medical assistants with additional training in x-ray, medical transcription, medical laboratory, emergency care and an introduction to physical therapy. Persons graduating from the program were certified as medical assistants. This program differed somewhat from Luganbeel's.
focused on the preparation of persons primarily for physicians' offices and clinics, was conducted in urban settings and had not involved the extensive use of on-site individual instruction.

**Task Force on Multicompetency Education**

The Committee on Allied Health Education and Accreditation (CAHEA) created a Task Force on Multicompetency Allied Health Education in October of 1978. The purpose of this Task Force was to study the concept, score, concerns and acceptance of multicompetency education. In January of 1979 directors of multicompetency allied health education programs convened under the auspices of CAHEA to present overviews of their respective programs. Directors whose views were similar to those previously presented by Luganbell and Truelove included E.G. Metropolous, M.D., Director of the Early Detection Center, PV, Warren, Michigan, and William M. Pierce with the American College of Health Careers, Oklahoma City, Oklahoma.

Dr. Metropolous presented his perspective from the viewpoint of a private medical practice. He proposed that multicompetency was not a new concept, however, the focus was now on the establishment of standardization in training multicompetency individuals in the allied health field. William M. Pierce (1979) described a program for multicompetency technician training. Pierce earlier had conducted a survey of skills needed to perform adequately in the physician's office in rural areas. A pilot curriculum for multicompetency technicians was then developed and a multicompetency training program established. Students enrolled in the program received instruction in medical laboratory techniques, x-ray, physical therapy, ultrasonography and medical
record skills. Graduates from this program were certified by the American Association of Medical Personnel of Oklahoma. The biggest appeal for this worker was in the physician's office and clinic, however, graduates were also employed in smaller rural hospitals.

Recommendations for direction from the Committee on Allied Health Education and Accreditation regarding the multicompetent technician concept which evolved from the task force on Multicompetency Education programs (1979) included:

1. Informing employers of the availability of multicompetency individuals.
2. Validating the multicompetency approach.
3. Promoting a better understanding of the concept of multicompetency among allied health organizations and professions.
4. Conveying the advantages of apprenticeship training to gain better understanding.
5. Assuring employers and the public that multicompetency individuals were trained professionals.

Comparison of Multicompetent and Multicredentialed Allied Health Personnel

The basic premise underlying the multicompetent and multicredentialed allied health technician concept has been viewed as being one and the same. The multicredentialed concept differed from the multicompetent concept in that it recognized the need to:

1. Provide allied health training which was at least equivalent to training currently offered in the credentialed allied health specialty areas, and
2. Provide opportunities for multiskilled persons to obtain
recognized credentials in those health service areas in which they would be prepared to advance as safe health care practitioners.

The major features distinguishing the multicompetent and multicredentialed allied health technician concepts are depicted in Table 1.

Table 1

Distinguishing Features of the Multicompetent and Multicredentialed Allied Health Technician

<table>
<thead>
<tr>
<th>Distinguishing Features</th>
<th>Multicredentialed Technician</th>
<th>Multicompetent Allied Health Technician</th>
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<tbody>
<tr>
<td>Prepares persons to function in more than one health service area</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Prepare persons indigenous to rural areas</td>
<td>X</td>
<td>X</td>
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<tr>
<td>New occupation</td>
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<td>X</td>
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<tr>
<td>Established as a generic program</td>
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<td>X</td>
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<tr>
<td>Offer established courses/programs currently accredited by CAHEA</td>
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<td>X</td>
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<tr>
<td>Provide opportunities to obtain recognized allied health credentials</td>
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<td>X</td>
</tr>
<tr>
<td>Focuses on retraining persons currently prepared and credentialed in one allied health speciality</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Provide allied health training at least equivalent to that training currently offered by accredited allied health programs</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Focuses on improved career mobility and economic benefits for existing credentialed allied health personnel</td>
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<td>X</td>
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The development of an educational model to prepare multicredentialed allied health personnel would be dependent upon:

1. The rural hospital's perceived need for an interest in the employment of multicredentialed allied health personnel.

2. The interest which rural allied health employees had in acquiring the knowledge, the skills and credentials necessary to function in more than one allied health specialty area.

3. The flexibility of credentialing agencies to accept alternative means to meet credentialing requirements.

4. The flexibility and capability of allied health education institutions to develop alternative educational delivery systems.

Summary

There have been no simplistic solutions to the complex and costly rural allied health personnel problem. Practices within those systems responsible for the educational preparation, the credentialing and utilization of allied health personnel have created and perpetuated the problem. The use of multicompetent personnel has been recently proposed as a possible solution to the problem. The utility, as well as the limitations of the concept, has been recognized. Multiple concerns and factors inherent in the allied health educational, credentialing and health care systems have impeded the universal preparation and utilization of this concept.

The multicredentialed concept investigated in this study as a
possible solution to the rural allied health personnel problem essentially embraced the philosophy underlying the multicompetent approach. The multicredentialed approach, however, focused on retraining and/or cross-training personnel already prepared and credentialed to work in one allied health area. Existing accredited allied health education programs could be restructured and delivered so as to:

1. Assist rural hospital employers in delivering quality health care services in a more effective and efficient manner; and

2. Provide existing credentialed allied health personnel with realistic opportunities for vertical and horizontal career mobility.

The dependent and interdependent roles and functions of the educational, credentialing, and health care systems have been recognized and appreciated in this study. Cooperation, collaboration and communication between these systems was considered essential in examining the desirability and utility of the multicredentialed concept in rural hospitals. However, the actual use of the concept would have to be deemed necessary and acceptable by the two primary performers in the health care field: the employer and the allied health employee. To quote Prosser and Quigley (1950):

Effective vocational education for any profession, calling, trade, occupation or job can only be given to the selected group of individuals who need it, want it and are able to profit by it.
CHAPTER III

METHODOLOGY AND PROCEDURES

The study consisted of an examination of the need for and interest in the use of multicredentialed allied health personnel in rural Wisconsin hospitals. Four groups of respondents, including hospital administrators and three groups of credentialed allied health personnel from rural Wisconsin hospitals, were utilized in the study. The research looked for the differences between hospital employers and selected credentialed allied health employees in rural hospitals regarding:

1. The existence of credentialed rural allied health personnel shortages.
2. The interest in the utilization of multicredentialed allied health personnel.
3. The factors which could affect the educational preparation of multicredentialed allied health personnel employed in rural hospitals.

The specific procedures followed in the study were categorized according to population and sample selection, statistical design, development of the instrument and the collection of data.

Population and Sample Selection

Population

The population of the study consisted of hospital employers and credentialed allied health employees employed in 70 rural Wisconsin hospitals. Rural hospitals included all facilities which: (1) had
bed capacities of less than 100; (2) were located in communities with a population of 10,000 or less; and (3) were located outside of Standard Metropolitan Statistical Areas. The hospitals were distributed throughout Wisconsin representing health care and health care personnel needs of the various geographical areas of the State.

Sample Size and Selection

The sample was based on the minimum sample size recommended by Cohen (1969). A minimum cell size of 26 provided a power level of .80 when the effect size was .40 and the significance level was set at .05. The sample size of the study exceeded the minimum cell size of 26. The sampling matrix used in the study is depicted in Table 2.

<table>
<thead>
<tr>
<th>Hospital Employers (Group I)</th>
<th>Credentialed Rural Allied Health Employees (Group II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Administrators</td>
<td>Respiratory Therapists</td>
</tr>
<tr>
<td>N=70</td>
<td>Radiologic Technologists</td>
</tr>
<tr>
<td></td>
<td>Medical Laboratory Technician/technologists</td>
</tr>
<tr>
<td></td>
<td>N=70</td>
</tr>
<tr>
<td></td>
<td>N=140</td>
</tr>
</tbody>
</table>

The unequal cell size was a result of the actual difference in the numbers of persons employed in the various allied health specialty groups. Winer (1971) contended that when the experimenter is forced to work with intact groups having equal size, or when the required number of persons in a given category may not be available at specified times, or when respondents do not complete their part of a study, unequal cell size occurs. He claimed that the data may be
appropriately analyzed by the method of unweighted means. This method considers each cell in the research as if it contained the same number of observations as all other cells. The number of observations within each cell will, with this method of analysis, be given the same order of magnitude.

The sample of hospital employers was represented by the population of hospital administrators from 70 rural Wisconsin hospitals. This group was selected from the Guide to General and Special Hospitals in Wisconsin (1979). The population of administrators was selected because of the variations in administrative philosophy, the health services provided, and the work loads in each hospital. In addition, the group was relatively small and fairly accessible.

The employee sample was represented by 350 credentialed allied health personnel employed in the 70 rural Wisconsin hospitals. The sample represented three health services areas; namely, respiratory therapy (RET), medical laboratory (ML), and radiologic technology (RAT). These groups were identified because they provided services required in most hospitals, represented current and potential shortage personnel, and held the greatest potential for becoming multicredentialed. The sample was randomly selected. The risk of bias was further controlled by the use of a large sample size and by enlisting the assistance of the personnel director in each hospital. The personnel director identified the survey respondents from each of the allied health service areas.

The population of credentialed respiratory therapy personnel was small, unstable, and unknown. In addition, contract service from
outside agencies have frequently been used to provide respiratory services for some hospitals. Therefore, a minimum of one person, providing the respiratory service for each hospital, was identified for an estimated total of 70 respiratory therapy respondents.

The population of medical laboratory and radiologic technology personnel was larger and more stable than that within the respiratory therapy area. Usually each area employs at least four persons, part-time and/or full-time, for each of the departments; however, the exact identity of these persons was unknown. Hence, the personnel director within each hospital was asked to randomly select two credentialed persons from each of these two health service areas to participate in the study. A total of 140 respondents from each of these two areas was selected to participate.
Statistical Design

The overall objective of the study was to determine if differences existed between the perceptions of rural hospital employers and credentialed rural allied health employees regarding the need for and use of multicredentialed allied health personnel. Specific objectives were identified in relation to the purpose of this study; (1) to determine if a shortage of credentialed allied health workers existed in rural hospitals; (2) to determine if there was an interest in the utilization of multicredentialed allied health workers in rural hospitals; (3) to identify factors which could affect the educational preparation of multicredentialed allied health workers in rural hospitals; (4) to identify factors which could affect the utilization of multicredentialed allied health workers in rural hospitals; and (5) to determine if existing credentialed rural allied health workers were interested in acquiring a second allied health credential.

The first four objectives were translated into the following null hypotheses:

Study Hypothesis #1  \( H_0 : \mu_1 = \mu_2 \)

There is no significant difference between rural hospital employers and credentialed rural allied health employees regarding the existence of shortages of credentialed rural allied health personnel.

Study Hypothesis #2  \( H_0 : \mu_1 = \mu_2 \)

There is no significant difference between rural hospital
employers and credentialed rural allied health employees regarding an interest in the utilization of multicredentialed allied health employees in rural hospitals.

**Study Hypothesis #3**  \( H_0 : \mu_1 = \mu_2 \)

There is no significant difference between rural hospital employers and credentialed rural allied health employees regarding factors affecting the utilization of multicredentialed allied health employees in rural hospitals.

**Study Hypothesis #4**  \( H_0 : \mu_1 = \mu_2 \)

There is no significant difference between rural hospital employers and credentialed rural allied health employees regarding factors affecting the education preparation of multicredentialed allied health workers.

The fifth objective of the study was examined to determine if existing credentialed rural allied health workers were interested in acquiring a second or another allied health credential. The mean score of the employees' responses, along with the numbers of persons who were in agreement with those items which described the interest credentialed allied health personnel might have in another allied health career, were calculated.

**Variables**

The dependent variables of the study consisted of the scores...
assigned by the study respondents to the statements reflective of allied health personnel shortages, interest in the utilization of multicroendialed allied health workers, factors affecting the utilization of multicroendialed allied health workers, and factors affecting the educational preparation of multicroendialed allied health personnel. Table 3 identifies the four dependent variables and the study items used to measure each variable.

Table 3

Identification of Dependent Variables and Instrument Items Used for Measurement

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allied health personnel shortages in rural hospitals.</td>
<td>Items 1 through 14</td>
</tr>
<tr>
<td>Interest in the utilization of multicroendialed allied health personnel in rural hospitals</td>
<td>Items 15 through 28</td>
</tr>
<tr>
<td>Factors affecting the educational preparation of multicroendialed allied health personnel.</td>
<td>Items 29 through 42</td>
</tr>
<tr>
<td>Factors affecting the educational preparation of multicroendialed allied health personnel.</td>
<td>Items 51 through 64</td>
</tr>
</tbody>
</table>

Statistical Analysis

Each of the four hypotheses in the study was tested with the F statistic. The sum of the employer and employee group responses to all items in each part of the instrument, designed to measure each dependent variable, was obtained. The mean score of the employer and employee groups was calculated from this sum of responses.
The F statistic was applied at the .05 level to test for significant differences between the mean score responses of the employer and employee. The variance of the scores was established through the use of a fixed one-way analysis of variance. The ANOVA layout used to examine each hypothesis is depicted in Table 4.

<table>
<thead>
<tr>
<th>Source of Variations</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>1</td>
<td>A</td>
<td>A/1</td>
<td>MS_B/MS_W</td>
</tr>
<tr>
<td>Within</td>
<td>288</td>
<td>B</td>
<td>B/288</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>289</td>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The next task was to determine where the differences in group mean scores existed. A mean score of the response of the employer and employee allied health subgroups, including RET, RAT, and ML respondents, was obtained on each item on the instrument. The F test was applied to these individual mean scores. The Scheffé's test was then applied at the .10 level to identify where significant differences existed between the employer and the three employee allied health subgroups.

Edwards (1968) claimed that Scheffé's test will be more conservative than procedures described for testing planned comparisons; that is, "larger differences will be required for significance." Scheffé's (1953) suggests that with his test one might consider taking a $\alpha = .10$ rather than $\alpha = .05$. 


The Scheffé's test allows for the examination of data for the purpose of making any and/or all comparisons on those items where the treatment mean square was significantly larger than the within mean square. Edwards' claim is that "if the treatment mean square is significant, then at least one comparison will be significant and, of course, there may be more."

The ANOVA layout used for the analysis of significant differences between the employer and the three employee allied health subgroups is depicted in Table 5.

Table 5

One-Way Analysis of Variance to Examine Mean Score Responses of Employer and Employee Allied Health Subgroups

<table>
<thead>
<tr>
<th>Source of Variations</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>3</td>
<td>A</td>
<td>A/3</td>
<td>MS_B/MS_W</td>
</tr>
<tr>
<td>Within</td>
<td>285</td>
<td>B</td>
<td>B/285</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>289</td>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mathematical model applied in the study is as follows:

\[ Y_{ij} = \mu + \alpha_i + \varepsilon_{ij} \]

Where \( \mu \) is an unknown constant

\( \alpha_i \) is the differential effect associated with variable A

\( \varepsilon_{ij} \) is a random variable (normally distributed, with a mean of 0 and a variance of \( \sigma^2 \)).

The results of the F test indicated whether differences existed between the mean scores of the employer and employee respondents. For
a more practical interpretation of the data, the mean scores for each variable were examined and classified on a Likert-type scale. This information was considered useful for the fulfillment of the purpose of the study; namely, the establishment of a rationale which could be used for the design, the development and the implementation of allied health education programs which could increase the availability and capability of allied health workers in rural hospitals.

**Decision Rules**

The four null hypotheses were tested using a .05 significance level. If the computed $F$ was equal to or greater than the tabular $F$, the null hypothesis was rejected. The null hypothesis was retained if the computed $F$ was less than the tabular $F$. A rejected null hypothesis indicated the existence of a significant difference. Scheffé's test for multiple comparisons was, therefore, performed on those items where the mean scores were found to be significant when $F$ was applied.

**Development of the Instrument**

A review of literature revealed an absence of valid and reliable instruments to collect data relative to the problem of this study. Therefore, an instrument, using a Likert-type scale, was developed and validated by means of a DELPHI panel. The DELPHI technique provided for a collection of expert opinions and an achievement of a group consensus regarding the content and structure of the instrument utilized for the collection of data for the study. A copy of the completed
The research instrument is in a pocket at the end of the study.

The instrument consisted of six sections. Items in the first five sections of the instrument reflected the five study objectives. The sixth section of the instrument dealt with demographic data describing the study respondents according to place of residence, affiliation with allied health societies, employment history and the size of the health care facility in which the respondent had been and/or was employed. The response choices in sections one through five were structured on the basis of a Likert-type scale which was assumed to yield equidistant interval data. This type of response scale allowed for a more detailed statistical analysis and description of identified significant differences. Scores assigned to the dependent variables by the respondents were used to indicate the respondent's level of agreement with each item on the instrument. Study participants were asked to evaluate each item on a scale ranging from (1) strongly agree, (2) agree, (3) don't know, (4) disagree, and (5) strongly disagree. Items in section six of the instrument were designed to obtain demographic data by the use of a modified checklist.

DELPHI Procedure

The DELPHI procedures and processes used in this study were based primarily on the works of Nelson (1979) and Halfin (1973). Nelson recommended the use of the DELPHI technique in the development and evaluation of research instruments. Halfin concluded that the DELPHI technique appeared to have the greatest application in the search for solution to problems where answers were vague and subject to various
interpretations. The DELPHI technique in this study involved four steps.

**Step One.** Nelson (1980) and Halfin (1973) recommended a panel size of 30 members. Criteria for membership in the present study were identified for the selection of the panel and included a familiarity and/or working knowledge of:

1. The educational preparation of allied health personnel.
2. The credentialing requirements of allied health personnel.
3. The utilization of allied health personnel.
4. The multicompetent or multicredentialed allied health technician concept.

The membership of the panel had diverse educational and professional backgrounds in allied health education, administration and/or practice. Seven states throughout the country were represented on the panel. The demographic data describing the panel membership is provided in Appendix C. Halfin (1973) was of the opinion that a jury with varied backgrounds and interests related to a field of study makes the results of an investigation more valid. The panel membership was categorized in the study according to four **categorical groups:** Group A, Hospital Administration; Group B, Allied Health Education Administration; Group C, Allied Health Education Support Personnel; and Group D, Allied Health Education and Practice.

The procedure included the processes of development, distribution, return, and analysis of three interrogations and ran through a 17-week period of time.
Step Two. Initial Delphi probe. The purpose of the initial probe was to generate opinions regarding the acceptability of the structure and content of 77 specific items generated by the researcher. A set of decision-making rules, established prior to the distribution of the initial probe, provided a framework within which decisions regarding panel recommendations were made. These rules were relative to:

1. The relevancy of the changes to the objectives of the study.
2. Terminology and clarification.
3. Grammar and sentence structure.
4. Placement and sequencing of items.
5. The number and percent of members recommending acceptance, modifications and/or omission of items. Recommendations were accepted upon the suggestion of 30 percent or more of the panel members. This level was arbitrarily established.
6. Factors other than the numerical analysis which determined the acceptance of suggested changes included: The issue itself, the credibility and expertise of the panel members recommending the change and the number of persons responding from any one categorical group.

Thirty questionnaires were distributed in the initial probe. For an explanation of and introduction to the initial probe, see Appendix D. Twenty-eight or 93 percent of these questionnaires were returned, sorted, and examined according to categorical panel membership and total panel membership responses. Recommendations were quantified according to the number and percent of responses to each item. Written statements from
Panel members were examined within the context of the remaining decision-making rules. The results of the analysis of the initial DELPHI probe according to the total panel membership's recommendations were depicted in Table 6.

**Table 6**

| Percent of Acceptance, Modification and Omission of Items on the Initial DELPHI probe |
|---------------------------------|-----------------|
| Total Panel Acceptance of Items  | 90%             |
| Total Panel Modification of Items| 18%             |
| Total Panel Omission of Items    | 13%             |

**Step Three.** Second DELPHI probe. A 64-item questionnaire generated from the initial probe was used for the second DELPHI interrogation. The purpose of the second probe was to further define and refine the remaining 64 items with the intent of obtaining a consensus on those statements to be included in the final research instrument. Recommendations from the initial probe which were incorporated into the second probe were relative to: The addition of statements contributing to the study objectives, the reorganization of statements for clarification, logical and sequential placements of questions, rewording and restructuring of items for clarification of purpose and content, the correction of spelling and grammatical errors and the omission of statements considered to be irrelevant to the objectives and purpose of the study. For an introduction to and explanation of the second DELPHI probe, see Appendix E.
Thirty questionnaires were distributed to the DELPHI panel. Panel members indicated their level of agreement with each of the 64 items on a Likert-type scale ranging from 1 (strongly disagree) up through 5 (strongly agree). These responses were analyzed within the previously established decision-making rules; however, the quantitative analysis differed from that in the initial probe in that a mean score ranging from 3.0 (neutral) to 5.0 (strongly agree) was identified as being the acceptable area of consensus. Mean scores within the acceptable area of consensus were required to validate the inclusion of each item in the final research instrument. Twenty-nine, or 96% of the 30 questionnaires, were completed, returned, sorted, and examined according to the categorical and total DELPHI panel membership. The mean scores of the items on the questionnaires returned by the total DELPHI panel membership ranged from 3.8 through 4.7, representing a consensus with the 64 items. See Figure 1 for a description of the area of consensus of the total panel membership as a result of the second DELPHI probe.
The mean scores of the items on the questionnaires returned by the categorical panel membership ranged from 3.0 through 5.0 representing a consensus with the 64 items. Figure 2 described the range consensus for the categorical panel membership as a result of the second DELPHI probe.

The overall analysis of the second DELPHI probe indicated a consensus from the panel membership; however, some discrepancies in responses from individual and categorical panel memberships existed. Discrepancies referred to responses which were neutral or in the areas of disagreement and/or failure to complete the second probe as directed. The uniqueness of the topic being studied, along with some apparent procedural misunderstandings on the part of some panel members, substantiated the need to conduct a third DELPHI probe.
Step Four. The purpose of the third DELPHI probe was to provide an opportunity for panel members who had discrepancies on the second DELPHI probe to change their responses if so desired. For an explanation of and introduction to the third DELPHI probe see Appendix F. The third probe involved 25 panel members since four of the twenty-nine respondents to the second DELPHI probe had no discrepancies on their returned surveys. Each of the 25 members received a third round of questioning which was exactly the same as the second probe except for the individual discrepancies which were identified for each of the panel members. All 25 members completed and returned the third DELPHI probe as directed. The numbers of discrepancies incurred on the second probe and the percent of discrepancies converted to an agreement status in the third probe are depicted in Table 7.

Table 7

<table>
<thead>
<tr>
<th>Discrepancy Incurred</th>
<th>Number of Discrepancies</th>
<th>Percent of Discrepancies Converted to Agreement Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>131</td>
<td>90%</td>
</tr>
<tr>
<td>Disagree</td>
<td>45</td>
<td>96%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>8</td>
<td>87%</td>
</tr>
</tbody>
</table>

Final Results. The research instrument was finalized upon the completion of the third probe. Items for inclusion in the demographic section of the instrument were then selected. A review team consisting of four allied health educators and one research consultant evaluated
the instrument for format, clarity, and content of the items. The final study instrument is provided in a pocket on the inside back cover of the dissertation.

Collection of Data

Data for the study were collected from 70 hospital employers and 350 credentialed allied health employees in 70 rural Wisconsin hospitals. Personnel directors or other persons responsible for personnel management in each of the 70 hospitals were contacted by telephone. The cooperation and assistance from these persons was solicited for the purposes of selecting study participants, distributing the survey instruments and for making follow-up contacts of nonresponding participants. The instructions given to the personnel directors for the distribution and follow up of the survey instruments are shown in Appendix G. The instrument itself was self-contained with regard to the cover letter. An explanation of the focus of the study and the procedure for completing and returning the instrument was included within the cover letter. Each instrument was assigned a code which identified the hospital and the employer and/or the employee group represented by the respondent. Precautions were taken to protect human subjects by not requesting names on the research instruments.

Confidentiality was assured. Respondents were asked to sign their names only if a summary of the results of the study were desired. The instrument was mailed June 27, 1981. Ample time was allowed for the study participants to respond to the survey because of the fluctuating availability of employees during the summer months. In addition, deliberate efforts were taken to reduce the pressure and
harassment frequently encountered by hospital personnel as a result of excessive regulatory practices which required the completion of burdensome paperwork.

A follow-up letter, plus a second instrument, was sent to the nonrespondents (see Appendix H). Two hundred and eighty-nine of the 420 survey instruments were returned for a 69% rate of return. An analysis of the returns of the surveys revealed that 48 of the 70 hospital administrators responded while 241 of the 350 credentialed rural allied health employees returned the survey. The employee group was further analyzed for an appropriate distribution of returns. This analysis revealed that 47 of the 70 respiratory therapy personnel responded, 104 of the 140 radiologic technology personnel participated and 90 of the 140 medical laboratory personnel completed the survey. Table 8 identifies the number and percent of study participants responding.

Table 8

Identification of the Number and Percent of Study Participants

<table>
<thead>
<tr>
<th>Study Participants</th>
<th>Number Involved</th>
<th>Number Responding</th>
<th>Percent Responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Hospital employers/administrators</td>
<td>70</td>
<td>48</td>
<td>69%</td>
</tr>
<tr>
<td>Credentialed allied health employees:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory therapy personnel</td>
<td>70</td>
<td>47</td>
<td>67%</td>
</tr>
<tr>
<td>Radiologic technology personnel</td>
<td>140</td>
<td>104</td>
<td>74%</td>
</tr>
<tr>
<td>Medical laboratory personnel</td>
<td>140</td>
<td>90</td>
<td>65%</td>
</tr>
</tbody>
</table>
The returned instruments were categorized into group 1, employer, and group 2, employee, to facilitate data entry and analysis. The employee group was then categorized according to three allied health subgroups: group 2, RET; group 3, RAT; and group 4, ML. This categorization facilitated the application of the Scheffé's test in locating the significant differences in mean scores among the study's samples.

The responses were entered into the computer at the University of Wisconsin-Stout, Center for Research and Educational Improvement (CREI), Menomonie, Wisconsin. The data were processed with the Descriptive Inferential Analysis Package, DISAP. This package consisted of the Likert and DES101 programs. The Likert program is designed to summarize Likert-type data. Its distinctive feature was the data display of the respondent groups; namely, hospital administrators, respiratory therapy, radiologic technology and medical laboratory personnel. Total scores for subjects of items and item analyses were included in the printout. The DES101 program produced data displays for the groups and was used to obtain a summary of the responses of each group to each item on the instrument. It was designed to summarize survey data.
CHAPTER IV

PRESENTATION AND ANALYSIS OF FINDINGS

The findings relevant to the study's hypotheses are the focus of this chapter. The research examined the difference in perceptions between rural health employers and credentialed rural allied health employees regarding the need, utilization and preparation of multi-credentialed allied health personnel. The results of the examination are presented in six parts: Part I, Demographic Data; Part II, Credentialed Rural Allied Health Personnel Shortages; Part III, Interest in the Utilization of Multicredentialed Allied Health Personnel; Part IV, Factors Affecting the Utilization of Multicredentialed Allied Health Personnel; Part V, Interest in Acquiring an Additional Health Credential; and Part VI, Factors Affecting the Acquisition of Additional Education.

The four null hypotheses in the study were tested using the F statistic. The .05 level of significance was used in determining if significant differences existed between the mean scores of the employer and employee. The Scheffé test for multiple comparison of mean scores was then applied at the .10 level to individual items on the instrument when the treatment mean scores were found to be significant using the F test. This showed where the significant differences in mean scores between the employer and employee groups were located.

The mean scores were calculated by assigning a numerical value to the responses on a five-point Likert scale ranging from strongly
disagree to strongly agree. The five-point response scale assigning the numerical values is described in Figure 3.

**Figure 3**

Numerical Values Assigned to Participant Responses

<table>
<thead>
<tr>
<th>SA</th>
<th>A</th>
<th>DK</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

The individual employer and employee study participants' mean score response to each item on the research instrument was obtained. These scores were then combined to formulate the employer group mean score response and the employee group mean score response to each item. These mean scores were then analyzed to identify the presence of significant differences between the two groups. The mean scores were further classified according to "agree," "don't know" and "disagree," thereby allowing for a practical application of the data in fulfilling the purpose of the study. Figure 4 describes the scale used in classifying the mean score responses. This numerical value should be observed as the data are presented and analyzed.

**Figure 4**

Scale Classifying Participant Responses

<table>
<thead>
<tr>
<th>A</th>
<th>A</th>
<th>DK</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>4.</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>3.5 - 5.0</td>
<td>2.6 - 3.4</td>
<td>1 - 2.5</td>
<td>Disagree</td>
</tr>
<tr>
<td>Agree</td>
<td>Don't know</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The mean score response to each study item was also formulated for each allied health subgroup. This allowed for a multiple comparison of mean scores between the employer and each subgroup and within the individual subgroupings by means of the Scheffé's test.

Descriptive statistics were used to interpret and present the demographic data describing the study participants (Part IV of the instrument). These data are summarized and presented in Part I of the chapter. A summary of the narrative data relative to questions on each part of the study is provided in Appendix H.
Part I: Demographic Data Describing Study Participants

The demographic findings are discussed according to the study participant's place of residence and employment, education preparation, employment history and participation in professional allied health organizations. A summary of the demographic data describing the study participants is presented in Appendix I.

Place of Employment

The 70 rural hospitals in the study ranged in size from 26 to 92 beds. The average size hospital represented in the study was 52.3 beds. One of 70 facilities had no respondents. Fifty-three percent of 153 of the 289 respondents were employed in hospitals ranging in size from 25 to 50 beds. Fourteen percent or 41 of the respondents worked in hospitals ranging from 76 to 99 beds. Thirty-three percent or 95 of the 289 respondents were employed in facilities ranging from 51 to 75 beds.

Educational Preparation

Eighty-one percent, or 234 of the 289 respondents, were prepared to work in the health care field by hospital training programs, one-year vocational and two-year associate degree programs or by on-the-job training (OJT), which could include military programs. Some persons could also have been trained by a combination of programs; i.e., vocational and OJT or associate degree and OJT. Nineteen percent, or 55 of the 289 respondents, held baccalaureate degrees.
Employment History

Thirty-six percent, or 104, of the 289 respondents work or had worked in areas in the hospital other than the areas in which they had been prepared and credentialed; however, many of these other areas had no requirements for formalized training and/or credentials. Fifty-five percent, or 159 of the 289 respondents, had been employed in their specialty areas from one to ten years. Forty-five percent, or 130 of the respondents, had remained in specialty areas 10 years or more. Ninety-two percent, or 266 of the respondents, indicated they had changed places of employment from one to four times while 8 percent, or 23, of the respondents had changed jobs five times or more.

Participation in Professional Allied Health Organizations

Memberships in allied health organizations were held by 74 percent, or 213 of the respondents; some of the respondents held memberships in more than one society. This represented a strong alliance with professional organizations. Luganbeel (1978) cited strong professional alliance as being a hindrance to the acceptance and utilization of multicompetent personnel. Educational facilities, such as a university or vocational technical campus, were within thirty miles for 66 percent, or 191 of the respondents, while 31 percent, or 98 of the respondents, lived over 30 miles from either type of educational agency.
Part II: Credentialed Rural Allied Health Personnel Shortages

Part I of the research instrument collected data used to study Hypothesis I: There is no significant difference between rural hospital employers and credentialed rural allied health employees regarding the existence of credentialed rural allied health personnel shortages.

The F test was applied to the mean scores of the sum of the employer and employee responses to all 14 items in Part I of the research instrument. The F value of 1.359 was not found to be significant at this .05 level; therefore, the null hypothesis was retained. The statistical analysis for Hypothesis I is depicted in Tables 9 and 10.

Table 9

Analysis of Variance Summary Regarding Shortages of Credentialed Rural Allied Health Personnel

<table>
<thead>
<tr>
<th>Source:</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments:</td>
<td>1</td>
<td>81.250</td>
<td>81.250</td>
<td>1.359</td>
</tr>
<tr>
<td>Error</td>
<td>287</td>
<td>17157.700</td>
<td>59.783</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>288</td>
<td>17238.900</td>
<td>141.033</td>
<td></td>
</tr>
</tbody>
</table>

Table 10

Statistics Describing Participant Responses to Shortages of Credentialed Rural Allied Health Personnel

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer</td>
<td>47.54</td>
<td>8.17</td>
<td>48</td>
</tr>
<tr>
<td>Employee</td>
<td>48.97</td>
<td>7.64</td>
<td>241</td>
</tr>
<tr>
<td>TOTAL</td>
<td>48.73</td>
<td>7.74</td>
<td>289</td>
</tr>
</tbody>
</table>
The mean score response of the combined employer and employee groups to all 14 items in Part I of the instrument was 3.48. This score is classified between the "don't know" and "agree" responses in describing credentialed rural allied health personnel shortages. A diversification of respondents' opinions was apparent from the responses which ranged from 1 to 5 (disagree to agree). Eleven of the 14 statements had standard deviations about 1.0, verifying the diversification of responses. The Likert component calculations for items 1-14 in Part I are displayed in appendix K.

The individual items in Part I of the research instrument were further tested with the F statistic and the Scheffé's test. The mean scores, standard deviations, F values and significance levels for these items are described in Tables 11, 13, and 15. The items to which the Scheffé's test was applied in locating the difference in means scores have been identified and are shown in Tables 12, 14, and 16. A discussion of the findings relative to the F test and Scheffé's test is presented according to three categories: (1) the existence of credentialed rural allied health shortages; (2) the possible causes of credentialed rural allied health personnel shortages, and (3) the possible causes of credentialed rural allied health personnel turnover.

Existence of Credentialed Allied Health Personnel Shortages

Items 1 through 5 on the instrument collected data describing credentialed rural allied health personnel shortages in general and in selected allied health areas (see Table 11). The means scores for items 1, "shortage of credentialed rural allied health personnel exists,"
2, "existence of funded vacant positions," and 4, "shortages in medical laboratory," were significantly different at the 0.5 level. Both the employer and employee groups "agreed" that "shortages of credentialed rural allied health personnel" did exist in some rural hospitals with the mean score of the employer being slightly higher than that of the employee group. However, the "existence of funded vacant positions in selected allied health departments" elicited a difference in agreement between the two responding groups. The employer's score indicated a "don't know" response whereas the employee group "disagreed" with the statement reflecting funded vacancies. Responses to shortages in selected allied health service areas also yielded a variety of opinions. The employer's response indicated an "agreement" with the existence of personnel shortages in radiologic technology, medical laboratory and respiratory therapy areas. However, the employees' responses ranged from a "don't know" to an "agree" position regarding personnel shortages in these areas.

The treatment mean scores were found to be significant for items 1, "shortages of credentialed rural allied health personnel," and 2, "the availability of funded vacant position." Therefore, the Scheffé's test was applied to these items (see Table 11).
Table 11

Comparison (F Test) of Employer and Employee Responses on Items Describing Credentialed Rural Allied Health Personnel Shortages

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employer Group N=48</td>
<td>Employee Group N=241</td>
<td>Employer Group N=48</td>
<td>Employee Group N=241</td>
</tr>
<tr>
<td>1. A shortage of credentialed allied health personnel exists in some rural hospitals.</td>
<td>4.31</td>
<td>3.86</td>
<td>.59</td>
<td>.96</td>
</tr>
<tr>
<td>2. Funded vacant positions for credentialed allied health personnel exist in my department.</td>
<td>2.88</td>
<td>2.25</td>
<td>1.45</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Shortages in the following allied health areas exist:

<table>
<thead>
<tr>
<th></th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Radiologic technology.</td>
<td>3.73</td>
<td>3.39</td>
<td>1.01</td>
<td>1.15</td>
</tr>
<tr>
<td>4. Medical laboratory.</td>
<td>3.83</td>
<td>3.36</td>
<td>1.93</td>
<td>1.14</td>
</tr>
<tr>
<td>5. Respiratory therapy.</td>
<td>3.83</td>
<td>3.68</td>
<td>1.04</td>
<td>1.07</td>
</tr>
</tbody>
</table>
Table 12

Application of Scheffé in Locating Significant Mean Scores Regarding Credentialed Rural Allied Personnel Shortages

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
</tr>
<tr>
<td>1. A shortage of credentialed allied health personnel exists in some rural hospitals.</td>
<td>1</td>
</tr>
<tr>
<td>2. There are funded vacant positions for credentialed allied health personnel in my hospital.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

1 = Employer  2 = Respiratory therapy personnel 3 = Radiologic technology personnel 4 = Medical laboratory personnel

NOTE: Code identifies study participants

The mean score for the employer (1) respiratory therapy (2) and radiologic technology groups (3) was significantly larger than that of the medical laboratory (4) respondents in item 1. The mean score response of the employer (1) to item two was greater only than that of the radiologic technology (3) and medical laboratory personnel (4).

Possible Causes of Credentialed Allied Health Personnel Shortages

Data relative to possible causes of rural allied health personnel shortages were collected in items 7, "difficulty in recruiting personnel" and 8 "high turnover of credentialed allied health workers" (see Table 13).
### Table 13

Comparison (F Test) of Employer and Employee Responses on Items Describing Possible Causes of Credentialed Allied Health Personnel Shortages

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>When and if shortages of credentialed allied health personnel do exist, some possible causes include:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Difficulty in recruiting personnel who have been trained in larger hospitals and cities.</td>
<td>4.08</td>
<td>1.07</td>
<td>1.05</td>
<td>1.05356 No</td>
</tr>
<tr>
<td>8. High turnover rates of credentialed allied health workers.</td>
<td>3.15</td>
<td>1.03</td>
<td>1.12</td>
<td>4.35912 Yes</td>
</tr>
</tbody>
</table>
The employer and employee groups both "agreed" that it was difficult to "recruit personnel who had been trained in larger hospitals and cities." This finding is consistent with that of Luganbeel (1978) and Phillips (1978). The distribution of responses from the employer to item 7 ranged from "disagree" to "strongly agree" whereas the employee replies spanned the entire response scale from "strongly disagree" to "strongly agree."

A significant difference in the mean scores of the employer and employee groups was found on item 8. The employee group "agreed" with item 8, a "high turnover of credentialed allied health workers contributed to personnel shortages" whereas the employer group was "undecided" as to whether or not personnel turnover rates significantly contributed to personnel shortages. Again, there was a distribution of responses among both groups ranging from "strongly disagree" to "strongly agree" on item 8.

The Scheffé test, when applied to items 7 and 8, located the difference in mean scores on item 7 only (see Table 14).

Table 14

Application of the Scheffé Test in Locating Significant Mean Scores Regarding Causes of Credentialed Rural Allied Health personnel Shortages

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Difficulty in recruiting personnel for employment who have been trained in larger hospitals and cities.</td>
<td>Group</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Respiratory therapy 2) personnel responded with a moderately higher level of "agreement" whereas the mean score of the radiologic technology (3) and medical laboratory (4) groups was smaller indicating a lower level of "agreement" with item 7.

Possible Causes of Personnel Turnover

Five items, 10 through 14, collected data identifying some possible causes of credentialed allied health personnel turnover in rural hospitals (see Table 15). Significant differences in mean scores between the employer and employee groups were found on items 10, "limited opportunities for career advancement," 11, "limited opportunities for career mobility," 12, "limited opportunities for additional job responsibility," 13, "limited recognition of work performance," and 14, "limited economic returns."

The responses of the employee to the "possible causes of personnel turnover" ranged from a "don't know" to a moderately high level of "agreement." The range of responses from the employer, however, were distributed from "disagree" to a low level of "agreement" with the "possible causes of personnel turnover." Both employer and employee groups "agreed" that "limited opportunities for career advancement and career mobility" contributed to the turnover of credentialed allied health personnel. However, a difference of opinion existed between the two groups regarding the causes of personnel turnover such as "limited opportunities for additional job responsibility, limited recognition of work performance and limited economic returns."

The treatment mean scores on items 10, 13 and 14 were found to
Table 15

Comparison (F Test) of Employer and Employee Responses on Items Describing Possible Causes of Credentialed Allied Health Personnel Turnover

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employer Group N=48</td>
<td>Employer Group N=241</td>
<td>Employee Group N=48</td>
<td>Employee Group N=241</td>
</tr>
<tr>
<td>Some possible causes of personnel turnover when and if it does exist include:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Limited opportunities for career advancement.</td>
<td>3.83</td>
<td>.93</td>
<td>11.8808</td>
<td>Yes</td>
</tr>
<tr>
<td>11. Limited opportunities for career mobility.</td>
<td>3.67</td>
<td>1.00</td>
<td>5.94918</td>
<td>Yes</td>
</tr>
<tr>
<td>12. Limited opportunities for additional job responsibility.</td>
<td>3.27</td>
<td>1.22</td>
<td>4.48328</td>
<td>Yes</td>
</tr>
<tr>
<td>13. Limited recognition of work performance.</td>
<td>2.48</td>
<td>1.15</td>
<td>20.353</td>
<td>Yes</td>
</tr>
<tr>
<td>14. Limited economic returns.</td>
<td>3.00</td>
<td>1.30</td>
<td>33.89999</td>
<td>Yes</td>
</tr>
</tbody>
</table>
be significant on these items. Thus, the Scheffé's test was applied to these items to locate where the difference in mean scores did exist (see Table 16).

Table 16

Application of Scheffé in Locating Significant Mean Scores Regarding Possible Causes of Personnel Turnover

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td>Score</td>
<td>Group</td>
</tr>
<tr>
<td>10. Limited opportunities for career advancement.</td>
<td>4</td>
<td>(4.34) &gt; 1 (3.83)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>(4.32) &gt; 1 (3.83)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(3.69) &gt; 1 (2.48)</td>
<td></td>
</tr>
<tr>
<td>13. Limited recognition of work performance.</td>
<td>3</td>
<td>(3.31) &gt; 1 (2.48)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(3.15) &gt; 1 (2.48)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(4.19) &gt; 1 (3.00)</td>
<td></td>
</tr>
<tr>
<td>14. Limited economic returns.</td>
<td>3</td>
<td>(3.96) &gt; 1 (3.00)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(2.94) &gt; 1 (3.00)</td>
<td></td>
</tr>
</tbody>
</table>

The mean score response was found to be greater for medical laboratory (4) and radiologic technology (3) personnel than the mean score response of the employer (1) to item 10. The allied health subgroups; namely, medical laboratory (4), respiratory therapy (2), and radiologic technology (3) had higher mean scores than the employer (1) group on items 13 and 14.

Part III: Interest in the Utilization of Multicredentialled Rural Allied Health Personnel

Part II of the research instrument consisted of 14 items, 15 through 28, which collected data used to study Hypothesis 2: "There is no significant difference between rural hospital employers and cre-
dentialed rural allied health employees regarding an interest in the utilization of multicredentialed allied health personnel in rural hospitals."

The F test was applied to the mean score of the sum of the employer and employee group response. The F value of 15.948 was found to be significant at the .05 level; therefore, the null hypothesis was rejected. The statistical analysis pertinent to hypothesis II is presented in Tables 17 and 18.

Table 17

Analysis of Variance Summary Regarding Interest in the Utilization of Multicredentialed Allied Health Personnel

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
<td>1</td>
<td>925.938</td>
<td>925.938</td>
<td>15.948</td>
</tr>
<tr>
<td>Error</td>
<td>287</td>
<td>16663.600</td>
<td>58.061</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>288</td>
<td>17589.538</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 18

Statistics Describing Participant Responses to Interest in the Utilization of Multicredentialed Allied Health Personnel

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer</td>
<td>49.08</td>
<td>6.70</td>
<td>48</td>
</tr>
<tr>
<td>Employee</td>
<td>44.27</td>
<td>7.79</td>
<td>241</td>
</tr>
<tr>
<td>TOTAL</td>
<td>45.07</td>
<td>7.82</td>
<td>289</td>
</tr>
</tbody>
</table>

The overall mean score of the combined response of the employer and employee was 3.22 which indicated a "don't know" position regarding
the utilization of multicredentialed allied health personnel. There was a variation of responses ranging from "disagree" to "agree" throughout the combined employer and employee group replies. The Likert component calculations pertinent to the examination of the items 15-27 in Part II of the research instrument are reported in Appendix L.

The individual study items in Part II were further tested with the F statistic at the .05 level and with the Scheffé test at the .10 level. The mean scores, standard deviation, F values and significance levels are illustrated in Tables 19, 21, and 23. The findings of the Scheffé test have been identified and are shown in Tables 20 and 22. A discussion of these findings is presented according to: (1) the desirability and practicality of utilizing multicredentialed allied health personnel; (2) the benefits of having persons prepared to function in more than one allied health service area; and (3) some possible combinations of allied health service areas in which multicredentialed allied health personnel could function.

Desirability and Practicality of Utilizing Multicredentialed Allied Health Personnel

Items 15 through 19 collected data pertinent to the desirability and practicality of utilizing multicredentialed allied health personnel. The analysis of the responses to items 15, "helpful to have credentialed allied health workers prepared to work in more than one area;" 16, "impractical to have credentialed allied health workers do work in more than one area;" 17, "credentialed allied health workers do work in more than one area;" 18, "allied health workers should not work in
other areas unless credentialed to do so;" and 19, "this hospital would be interested in multicredentialed allied health workers," are depicted in Table 19.

The mean score response of the employer group in general was in accord with the items pertinent to the desirability and practicality of utilizing multicredentialed allied health workers in rural hospitals. The employee's mean response indicated an "undecidedness" as to the desirability and practicality of the utilization of allied health workers in more than one allied health service area in rural hospitals. There was a high degree of consensus between the employee and employer groups regarding item 17, "credentialed allied health workers did work in more than one area in some rural hospitals."

Both the employer and employee "agreed" that allied health workers should not work in other allied health areas unless credentialed to do so. Responses from both groups to all items except #17 were spread substantially over the agreement scale indicating a mix of "agrees," "don't knows" and "disagrees." The difference between the mean scores of the employer and employee and within the groups as well, could be attributed to such factors as: traditional single skilled educational preparation and utilization, staffing patterns designed according to directions from allied health specialty groups, the influence of credentialing agencies controlling the specialty groups, and attitudes of professional turfdom. Luganbeel (1978) cited these factors as interfering with the universal acceptance and utilization of multi-competent allied health personnel.
Table 19

Comparison (F Test) of Employer and Employee Responses on Items Describing the Desirability and Practicality of Utilizing Multicredentialled Allied Health Personnel

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employer Group</td>
<td>Employee Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=48</td>
<td>N=241</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. It would be helpful to have credentialed allied health workers prepared to work in more than one allied health area in a rural hospital.</td>
<td>3.85</td>
<td>3.12</td>
<td>1.11</td>
<td>12.1786</td>
</tr>
<tr>
<td>16. It would be impractical to have credentialed allied health workers in more than one allied health area in some rural hospitals.</td>
<td>2.33</td>
<td>2.84</td>
<td>1.06</td>
<td>6.56794</td>
</tr>
<tr>
<td>17. Credentialed allied health workers do work in more than one allied health area in some rural hospitals.</td>
<td>3.77</td>
<td>3.68</td>
<td>.72</td>
<td>.643511</td>
</tr>
<tr>
<td>18. Allied health workers should not work in more than one allied health area unless credentialed to do so.</td>
<td>3.69</td>
<td>3.99</td>
<td>1.07</td>
<td>3.47701</td>
</tr>
<tr>
<td>19. This hospital would be interested in employing allied health workers who could work in more than one area.</td>
<td>3.88</td>
<td>3.17</td>
<td>1.00</td>
<td>20.1499</td>
</tr>
</tbody>
</table>
The Scheffé test was applied to items 15, 16, 18, and 19 where the treatment mean scores were found to be significant (see Table 20).

Table 20

Application of Scheffé in Locating Significant Mean Scores Regarding the Desirability and Practicality of Utilizing Multicredentialed Allied Health Personnel

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
</tr>
<tr>
<td>15. It would be helpful to have credentialed allied health personnel prepared to work in more than one allied health area in a rural hospital.</td>
<td>1 (3.85) &gt; 3 (3.12)</td>
</tr>
<tr>
<td></td>
<td>1 (3.85) &gt; 4 (2.97)</td>
</tr>
<tr>
<td>16. It would be impractical to have credentialed allied health personnel working in more than one allied health area in a rural hospital.</td>
<td>4 (3.03) &gt; 1 (2.33)</td>
</tr>
<tr>
<td>18. Allied health personnel should not work in more than one allied health area unless credentialed to do so.</td>
<td>4 (4.12) &gt; 2 (3.66)</td>
</tr>
<tr>
<td>18. This hospital would be interested in employing allied health workers who could work in more than one allied health area in the hospital.</td>
<td>1 (3.88) &gt; 2 (3.66)</td>
</tr>
<tr>
<td></td>
<td>1 (3.88) &gt; 3 (3.22)</td>
</tr>
<tr>
<td></td>
<td>1 (3.88) &gt; 4 (3.00)</td>
</tr>
</tbody>
</table>

The employer's (1) mean score was in greater agreement than the response of the medical laboratory (4) and the radiologic technology (3) group in relation to the "helpfulness of having credentialed allied health workers prepared to work in more than one allied health area." There was a difference in agreement between the medical laboratory (4) group and the employer (1) group regarding the practicality of
utilizing credentialed allied health personnel in more than one allied health area. Likewise, the mean score of the medical laboratory (4) group was greater than that of the respiratory therapy (2) group in relation to the need to have "only credentialed persons working in other allied health areas." The employer (1) group's response to employing allied health workers "capable of working in more than one allied health area" was in greater agreement than that of each of the three allied health subgroups.

Benefits of Having Persons Prepared to Function in More than One Allied Health Service Area

Items 20 through 24 collected data describing the benefits of having multicredentialled allied health personnel (see Table 21). The mean scores for items 20, "improved utilization of existing credentialed allied health personnel;" 21, "improved retention of existing credentialed allied health personnel;" 22, "be cost effective;" 23, "provide increased career options and mobility opportunities" and 24, "improved economic benefits" for credentialed allied health workers" were found to be significant at the .05 level. The employer's overall response to these five items was indicative of "agreement." There was a general consensus of the employer with these items as indicated by the low standard deviation values. The employee's overall response to these five items, however, was in much lesser "agreement." The employee group responded with a "don't know" position toward the benefits of having persons prepared to function in more than one allied health area. The range of responses of the employee was greater than that of the employer with standard deviation values for all items, but one
Table 21

Comparison (F Test) of Employer and Employee Responses on Items Describing Benefits of Having Persons Prepared to Function in More than One Allied Health Area

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employer Group</td>
<td>Employee Group</td>
<td>Employer Group</td>
<td>Employee Group</td>
</tr>
<tr>
<td>Having persons prepared to function in more than one allied health area in a rural hospital would:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Improve the utilization of existing credentialed allied health personnel in rural hospitals.</td>
<td>4.02</td>
<td>3.34</td>
<td>.79</td>
<td>1.06</td>
</tr>
<tr>
<td>21. Improve the retention of existing credentialed allied health personnel in rural hospitals.</td>
<td>3.67</td>
<td>3.15</td>
<td>.97</td>
<td>1.04</td>
</tr>
<tr>
<td>22. Be cost effective.</td>
<td>4.13</td>
<td>3.66</td>
<td>.79</td>
<td>.92</td>
</tr>
<tr>
<td>23. Provide increased career options and mobility for credentialed allied health workers.</td>
<td>3.92</td>
<td>3.46</td>
<td>.87</td>
<td>1.02</td>
</tr>
<tr>
<td>24. Result in improved economic benefits for credentialed allied health workers.</td>
<td>3.92</td>
<td>3.10</td>
<td>.85</td>
<td>1.07</td>
</tr>
</tbody>
</table>
being above 1.0; however, both the employer and employee groups did 
"agree" that "having persons prepared to function in more than one 
alloyed health area would be cost effective."

The Scheffé test was applied to the mean scores on items 20 
through 24 as described in Table 22.

Table 22

Application of Scheffé in Locating Significant Mean Scores 
Regarding Benefits of Having Multicredentialed Allied Health Personnel

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>Group</td>
</tr>
<tr>
<td>20. Improve the utilization of existing credentialed allied health personnel.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>21. Improve the retention of existing credentialed allied health personnel.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>22. Be cost effective</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Provide increased career options.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Result in improved economic benefits.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

The employer (1) group's mean score was significantly greater than the 
mean score of the radiologic technology (3) and medical laboratory (4) 
groups on all five items, thereby indicating a greater level of "agree-
ment" with all items describing the benefits of utilizing multicreden-
tialed allied health personnel. The mean score of the respiratory 
therapy (2) group was in greater "agreement" with items 20, 21, and 24 
than were the responses of the medical laboratory (4) and radiologic 
technology (3) groups.
Some Possible Combinations of Allied Health Service Areas

Items 25 through 27 collected data covering the feasibility of combining the following allied health service areas: Respiratory therapy and medical laboratory, medical laboratory and radiologic technology and respiratory therapy and radiologic technology. The employer's overall response was in "agreement" with all combinations suggested in items 25 through 27 (see Table 23). However, the employee group responded with a "don't know" position regarding the proposed combinations. The diversification in responses for the employee group was considerable in that all standard deviation values were over 1.0. Narrative comments from employee respondents verified the diversity of these responses (see Appendix I). Some suggestions received from the respondents regarding combinations other than those cited in items 25 through 27 included: combining the medical laboratory or radiologic technology or respiratory therapy areas with electrocardiography, emergency medical care and management and administrative functions. Narrative comments also reflected concern regarding the dilution of the quality of care rendered by the combining of more than one skill. The responses from the employer showed less diversification in responses in that the standard deviation values for all three items were less than 1.0. These responses from the employee groups are inconsistent with the recommendations of Lugan-beel (1978), Truelove (1979) and Metropoulos (1979) who advocated the combination of medical laboratory, respiratory therapy and radiologic technology allied health service areas.
### Table 23

Comparison (F Test) of Employer and Employee Responses on Items Describing Possible Combinations of Allied Health Service Areas

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score Employer Group N=48</th>
<th>Mean Score Employee Group N=241</th>
<th>Standard Deviation Employer Group N=48</th>
<th>Standard Deviation Employee Group N=241</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health service areas in which multiscoped allied health workers could be utilized include:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Respiratory therapy and medical laboratory.</td>
<td>3.56</td>
<td>3.06</td>
<td>.92</td>
<td>1.21</td>
<td>6.86763</td>
<td>Yes</td>
</tr>
<tr>
<td>26. Medical laboratory and radiologic technology.</td>
<td>3.58</td>
<td>2.89</td>
<td>.99</td>
<td>1.25</td>
<td>13.1742</td>
<td>Yes</td>
</tr>
<tr>
<td>27. Respiratory therapy and radiologic technology.</td>
<td>3.54</td>
<td>2.84</td>
<td>.87</td>
<td>1.13</td>
<td>16.4983</td>
<td>Yes</td>
</tr>
</tbody>
</table>
The Scheffé's test, when applied at the .10 level, located differences in the treatment mean scores for items 26 and 27 (see Table 24).

Table 24

Application of Scheffé in Locating Significant Mean Scores Regarding Combinations of Allied Health Specialties

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores Group</th>
<th>Score</th>
<th>Group</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. Medical laboratory and radiologic technology.</td>
<td>1</td>
<td>(3.58) &gt; 2</td>
<td>(2.98)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>(3.58) &gt; 3</td>
<td>(2.71)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(3.69) &gt; 1</td>
<td>(2.48)</td>
<td></td>
</tr>
<tr>
<td>27. Respiratory therapy and radiologic technology.</td>
<td>1</td>
<td>(3.54) &gt; 4</td>
<td>(2.86)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>(3.54) &gt; 3</td>
<td>(2.74)</td>
<td></td>
</tr>
</tbody>
</table>

The mean score response of the employer (1) was in greater "agreement" with the suggested combinations of allied health specialties in item 26 than was the response of the respiratory therapy (2) and radiologic technology (3) groups. Likewise, the employer's (1) mean score was in greater "agreement" with the combinations suggested in item 27 than was the mean score of the medical laboratory (4) and radiologic technology (3) groups.

Part IV: Factors Which Could Affect the Utilization of Multi-credentialed Allied Health Personnel in Rural Hospitals

Part III of the research instrument consisted of 14 items, 29 through 42, which collected data used to study Hypothesis 3: There is no significant difference between rural hospital employers and credentialed rural allied health employees regarding factors affecting the utilization of multi-credentialed allied health employees in rural
hospitals.

The F test was applied to the mean scores of the sum of the employer and employee responses to the 14 items. The F value of .986 was not significant at the .05 level; therefore, the null hypothesis was retained. The statistical analysis of Hypothesis 3 is presented in Tables 25 and 26.

Table 25

Analysis of Variance Summary Regarding Factors Affecting the Utilization of Multicredentialed Allied Health Personnel

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
<td>1</td>
<td>0.063</td>
<td>0.063</td>
</tr>
<tr>
<td>Error</td>
<td>287</td>
<td>18190.8</td>
<td>63.382</td>
</tr>
<tr>
<td>TOTAL</td>
<td>288</td>
<td>18190.8</td>
<td></td>
</tr>
</tbody>
</table>

Table 26

Statistics Describing Responses Regarding Factors Affecting the Utilization of Multicredentialed Allied Health Personnel

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer</td>
<td>49.60</td>
<td>6.59</td>
<td>48</td>
</tr>
<tr>
<td>Employee</td>
<td>49.56</td>
<td>8.20</td>
<td>241</td>
</tr>
<tr>
<td>TOTAL</td>
<td>49.57</td>
<td>7.95</td>
<td>289</td>
</tr>
</tbody>
</table>

The mean of the combined employer and employee response to the 14 items in Part III of the instrument was 3.54, a low level of "agreement." The responses within the employer and employee groups were varied, consisting of a mix of "disagree," "don't know," and "agree." The Likert
component calculations used in the analysis of Part III are displayed in Appendix M.

The individual items, 29 through 42, were further tested with the F statistic at the .05 level. The Scheffé's test, when appropriate, was applied at the .10 level to locate where the differences in group mean scores existed. The mean scores, standard deviations, F values and levels of significance are described in Tables 27, 29, and 31. The items to which the Scheffé's test was applied and the ranking of the mean scores for the employer and employee groups are shown in Tables 28 and 30.

A discussion of these findings follows according to (1) when multicredentialed allied health personnel could best be utilized; (2) factors which could interfere with the utilization of multicredentialed allied health workers, and (3) the financial compensation for credentialed allied health workers prepared to work in more than one allied health area.

When Multicredentialed Allied Health Personnel Could Best be Utilized

Items 29 through 35 described the times and/or periods and situations when multicredentialed allied health personnel could best be utilized. The mean scores for items 30, "on the afternoon shift;" 33, "on call," and 34, "on holidays," were found to be significant (see Table 27). The employer's overall mean response for these seven items indicated an "agreement" with all but item 29, "on the day shift." This is understandable as the work load during the day shift is usually steady and routine. The employee's mean responses were somewhat more
Table 27

Comparison (F Test) of Employer and Employee Responses on Items Describing the Factors Affecting the Utilization of Multicredentialled Allied Health Personnel in Rural Hospitals

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score Employer Group N=48</th>
<th>Mean Score Employee Group N=241</th>
<th>Standard Deviation Employer Group N=48</th>
<th>Standard Deviation Employee Group N=241</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multicredentialled allied health personnel could best be utilized:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. On the day shift.</td>
<td>3.13</td>
<td>2.96</td>
<td>1.18</td>
<td>1.17</td>
<td>.746726</td>
<td>No</td>
</tr>
<tr>
<td>30. On the afternoon shift.</td>
<td>3.58</td>
<td>3.19</td>
<td>1.07</td>
<td>1.18</td>
<td>14.55</td>
<td>Yes</td>
</tr>
<tr>
<td>31. On the night shift.</td>
<td>3.60</td>
<td>3.44</td>
<td>1.11</td>
<td>1.27</td>
<td>.694165</td>
<td>No</td>
</tr>
<tr>
<td>32. On the weekends.</td>
<td>3.90</td>
<td>3.55</td>
<td>1.12</td>
<td>1.21</td>
<td>3.29835</td>
<td>No</td>
</tr>
<tr>
<td>33. On call.</td>
<td>4.17</td>
<td>3.62</td>
<td>.86</td>
<td>1.16</td>
<td>9.60933</td>
<td>Yes</td>
</tr>
<tr>
<td>34. On holidays.</td>
<td>3.96</td>
<td>3.59</td>
<td>1.07</td>
<td>1.19</td>
<td>3.97005</td>
<td>Yes</td>
</tr>
<tr>
<td>35. As &quot;backup&quot; help in case of an emergency or personal leave.</td>
<td>4.08</td>
<td>3.99</td>
<td>1.01</td>
<td>1.05</td>
<td>.309816</td>
<td>No</td>
</tr>
</tbody>
</table>
varied, however, indicating that the group was "unsure" toward the utilization of multicredentialed staff on any of the various work shifts. Both employer and employee groups were in "agreement" that multicredentialed allied health personnel could best be utilized during times when the work loads were not steady and routine; namely, on call, holidays, and as backup help. These responses were somewhat consistent with the rationale given by Luganbeel (1978) and Friedman (1980) for the need for multicredentialed allied health personnel in rural hospitals. Weekends, on call assignments, and holidays frequently represent "down" times for the smaller facilities. In addition, emergencies or vacation times create staffing difficulties as there are not sufficient numbers of single skilled practitioners available as backup help.

The standard deviation values for the employer and employee responses were somewhat varied, with all but one being above the 1.0 value. Some of the factors which could account for the diversification of responses included: the location and work load of the health care facility, the size of the facility, and the educational preparation and orientation of the single skilled allied health practitioners. Some of the respondents were multicompetent or multicredentialed; other allied health respondents had worked in various areas within the health care field prior to their formalized educational preparation.

The Scheffé's test located significant differences between the employer response and the mean score of the medical laboratory and respiratory therapy respondents to item 33 only (see Table 28).
Table 28

Application of Scheffe in Locating Significant Mean Scores on Items Describing When Multicredentialed Allied Health Personnel Could be Utilized

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multicredentialed allied health personnel could best be utilized:</td>
<td></td>
</tr>
<tr>
<td>33. On call.</td>
<td>1 (4.17) &gt; 4 (3.60)</td>
</tr>
<tr>
<td>33. On call.</td>
<td>1 (4.17) &gt; 2 (3.55)</td>
</tr>
</tbody>
</table>

Factors Which Could Interfere with the Utilization of Multicredentialed Allied Health Personnel

Items 36 through 40 of the study instrument collected data identifying factors which could impede the utilization of multicredentialed allied health personnel (see Table 29). There was a significant difference in mean scores between the employer and employee on items: 37, "reimbursement requirements of third-party payers," and 39, "keeping job knowledge and skills proficient."

The employee group responded with a moderately high level of "agreement" with the factors cited which could limit the utilization of multicredentialed allied health personnel; namely, "credentialing requirements and the "need to keep job knowledge and skills proficient." This "agreement" was consistent with the findings of Friedman's (1981) interview with allied health personnel regarding the utilization of this type of allied health worker. The employer group was concerned with "credentialing requirements." The employer, however, was "unsure" of the effects which the utilization of allied health workers in more than one allied health area might have on "keeping job knowledge
<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>35. Credentialing requirements.</td>
<td>Employer Group N=48</td>
<td>4.00</td>
<td>.95</td>
<td>.281</td>
</tr>
<tr>
<td></td>
<td>Employee Group N=241</td>
<td>3.98</td>
<td>.89</td>
<td></td>
</tr>
<tr>
<td>37. Reimbursement requirements of third-party payers.</td>
<td>Employer Group N=48</td>
<td>2.96</td>
<td>1.03</td>
<td>7.420</td>
</tr>
<tr>
<td></td>
<td>Employee Group N=241</td>
<td>3.39</td>
<td>.99</td>
<td></td>
</tr>
<tr>
<td>38. Traditional staffing patterns.</td>
<td>Employer Group N=48</td>
<td>3.25</td>
<td>1.14</td>
<td>1.412</td>
</tr>
<tr>
<td></td>
<td>Employee Group N=241</td>
<td>3.46</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td>39. Keeping job knowledge and skills proficient and current in more than one allied health area.</td>
<td>Employer Group N=48</td>
<td>3.40</td>
<td>1.18</td>
<td>14.094</td>
</tr>
<tr>
<td></td>
<td>Employee Group N=241</td>
<td>4.02</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>40. Negotiated union contracts.</td>
<td>Employer Group N=48</td>
<td>2.97</td>
<td>.93</td>
<td>.477</td>
</tr>
<tr>
<td></td>
<td>Employee Group N=241</td>
<td>3.09</td>
<td>1.04</td>
<td></td>
</tr>
</tbody>
</table>
current and proficient in more than one allied health area." Both the employer and employee groups were "undecided" regarding the effect which "reimbursement requirements," "staffing patterns" and "negotiated union contracts" would have on the utilization of allied health workers in more than one allied health service area. Again, there was a wide distribution of response to many of the items. Standard deviation values of 1.0 and above were obtained on all but two items for the employer and allied health employee respondents.

The differences in mean score responses were located by the Scheffe's test on items 37 and 39 between the radiologic technology (3) and medical laboratory (4) respondents (see Table 30).

Table 30

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors which could interfere with the utilization of allied health workers in more than one allied health service area in a rural hospital include:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. Reimbursement requirements of third-party payers.</td>
<td>3 (3.45) &gt; 1 (2.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. Keeping job knowledge and skill proficient and current.</td>
<td>4 (4.13) &gt; 1 (3.40)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Financial Compensation for Multicredentialed Allied Health Workers

Items 41 and 42 on the research instrument collected data describing the financial remuneration which persons who are prepared to
work in more than one allied health area should receive (see Table 31). The mean score for item 42, "receive a differential pay for the time spent working in a second allied health area" was significantly different between the employer and employee. The employer's overall response on items 41 and 42 ranged from a "don't know" to a low level of "agreement" with the two statements. The employee group indicated an "agreement" with both forms of financial remuneration. The responses to the items were somewhat diversified, with standard deviation values being 1.0 and above, with one exception. There was some degree of consensus on the part of the employers that credentialed allied health workers prepared to work in more than one allied health area should receive a higher base salary.

The Scheffe's test did not locate any significant mean score differences within the employer and employee allied health subgroups; namely, respiratory therapy, medical laboratory and radiologic technology personnel.

Part V: Interest Which Credentialed Rural Allied Health Personnel Have in Acquiring An Additional Allied Health Credential

Part IV of the instrument consisted of seven items, 43 through 50, which collected data relevant to objective number five of the study: "To determine if single credentialed allied health workers were interested in a second allied health credential."

The interest which the employee allied health subgroups; that is, the respiratory therapy (RET), radiologic technology (RAT) and medical laboratory (ML) respondents, have in acquiring a second allied health credential is described according to the mean score responses of the
Table 31

Comparison (F Test) of Employer and Employee Responses on Items Describing Financial Compensation for Multicredentialled Allied Health Personnel

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>If credentialed allied health workers were prepared to work in more than one allied health area they should:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. Receive a higher base salary.</td>
<td>3.5</td>
<td>3.71</td>
<td>.95</td>
<td>1.24567</td>
</tr>
<tr>
<td>42. Receive a differential pay for the time spent working in a second allied health area.</td>
<td>3.1</td>
<td>3.58</td>
<td>1.02</td>
<td>6.67524</td>
</tr>
</tbody>
</table>
group and the numbers of "agree," "disagree" or "don't know" responses (see Tables 32 and 33). The mean scores and numbers of responses are discussed according to interest in: (1) working in more than one allied health area; (2) increased career options and mobility opportunities; (3) working in medical laboratory (ML), radiologic technology (RAT), or respiratory therapy areas (RET), and (4) the benefits of an additional education in another allied health career.

Interest in Working in More than One Allied Health Area in a Rural Hospital

The employee subgroup's mean scores on item 43 indicated a low level of "agreement" and a "don't know" position toward working in another allied health area in a rural hospital. Ninety-two of the 241 (38%) respondents were interested in working in more than one allied health area. However, there was some diversification of responses within the employee subgroup's response as indicated by the standard deviation values. Of importance is the number of respiratory therapy personnel (31) who indicated an interest in working in more than one allied health area. This response represented 11 percent of the total number of respondents or 65 percent of the respiratory therapy personnel responding.

Interest in Having Increased Career Options and Mobility

The employee subgroup's mean scores on item 44 indicated an interest or an "agreement" with the desirability of having increased opportunities for career options and mobility. One hundred seventy-five of 241 (73%) of the respondents were in "agreement" with this item. The
### Table 32

Summary of Statistics Describing the Interest Which Credentialed Rural Allied Health Personnel Have in Acquiring an Additional allied Health Credential

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>Total Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RET  N=47</td>
<td>RAT  N=104</td>
<td>ML  N=90</td>
</tr>
<tr>
<td>43. I would like to work in more than one allied health area in a rural hospital.</td>
<td>3.51  2.66  2.50</td>
<td>1.48  1.48  1.24</td>
<td>92  107  36  54</td>
</tr>
<tr>
<td>44. I would like to have increased career options and mobility.</td>
<td>3.81  3.64  3.70</td>
<td>1.36  1.37  1.25</td>
<td>175  40  21  53</td>
</tr>
<tr>
<td>I would like to be prepared and credentialed to work in a second allied health career such as:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. Medical laboratory.</td>
<td>2.77  2.35 -</td>
<td>2.03  1.65 -</td>
<td>69  93  35  92</td>
</tr>
<tr>
<td>46. Radiologic technology.</td>
<td>2.45 - -</td>
<td>2.02 - 1.79</td>
<td>71  96  31  92</td>
</tr>
<tr>
<td>47. Respiratory therapy.</td>
<td>-  2.26  2.20 -</td>
<td>1.60  1.54</td>
<td>60  117  34  78</td>
</tr>
<tr>
<td>Additional education in another allied health area would:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49. Contribute to increased job satisfaction for me.</td>
<td>3.72  3.16  3.0</td>
<td>1.41  1.45  1.21</td>
<td>122  75  40  52</td>
</tr>
<tr>
<td>50. Make working in a rural hospital more challenging and interesting.</td>
<td>3.74  3.27  3.21</td>
<td>1.31  1.42  1.20</td>
<td>133  61  43  52</td>
</tr>
</tbody>
</table>

RET = Respiratory Therapy      RAT = Radiologic Technology     ML = Medical Laboratory
### Table 33

Summary of Credentialed Allied Health Personnel's Interest in Acquiring a Second Allied Health Credential

<table>
<thead>
<tr>
<th>Item</th>
<th>Agree</th>
<th></th>
<th>Disagree</th>
<th></th>
<th>Don't Know</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RET N=</td>
<td>RAT N=</td>
<td>ML N=</td>
<td>TOTAL N=</td>
<td>RET N=</td>
<td>RAT N=</td>
</tr>
<tr>
<td>43. Work in more than one allied health area.</td>
<td>31</td>
<td>40</td>
<td>21</td>
<td>92</td>
<td>13</td>
<td>48</td>
</tr>
<tr>
<td>44. Increased career options.</td>
<td>37</td>
<td>74</td>
<td>64</td>
<td>175</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>I would like to be prepared to work in:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. Medical laboratory</td>
<td>17</td>
<td>30</td>
<td>-</td>
<td>47</td>
<td>14</td>
<td>52</td>
</tr>
<tr>
<td>46. Radiologic laboratory</td>
<td>15</td>
<td>-</td>
<td>19</td>
<td>34</td>
<td>18</td>
<td>-</td>
</tr>
<tr>
<td>47. Respiratory therapy</td>
<td>-</td>
<td>28</td>
<td>17</td>
<td>45</td>
<td>-</td>
<td>53</td>
</tr>
<tr>
<td>48. Other (Narrative inputs).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49. Increase job satisfaction.</td>
<td>34</td>
<td>49</td>
<td>39</td>
<td>122</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>50. Make work more challenging.</td>
<td>33</td>
<td>58</td>
<td>42</td>
<td>133</td>
<td>8</td>
<td>28</td>
</tr>
</tbody>
</table>

86
replies were widely distributed along the response scale (Figure 4).

Interest in Working in Medical Laboratory, Radiologic Technology and Respiratory Therapy as a Second Allied Health Career

The employee subgroup's mean scores for items 45, "medical laboratory," 46, "radiologic technology," and 47, "respiratory therapy" as second allied health careers indicated little, if any, interest on the part of the respondents. Forty-seven of the 151 (31%) respiratory therapy and radiologic technology participants indicated an interest in working in the medical laboratory. Thirty-four of the 137 (25%) respiratory therapy and medical laboratory respondents were interested in radiologic technology as a second allied health career. Forty-five of the 194 (23%) radiologic technology and medical laboratory respondents were interested in respiratory therapy as a second allied health career.

Benefits of Additional Education in Another Allied Health Career

The employee subgroups were "undecided" regarding statements 49, "additional education in another allied health career would increase job satisfaction," and 50, "make working in a rural hospital more challenging and interesting." The participants' responses to these items were widely distributed on the agreement classification scale indicating a mix of "disagrees," "don't knows" and "agrees." One hundred twenty-two of the 241 (51%) respondents were in "agreement" with item 49. One hundred thirty-three of the 241 (55%) respondents were in agreement with item 50.
Part VI: Factors Which Could Affect the Acquisition of Additional Education in Another Allied Health Career

Part V of the instrument consisted of 13 items, 51 through 64, which collected data used to test Hypothesis 4; "There is no significant difference between the perceptions of rural hospital employers and credentialed rural allied health employees regarding factors which could affect the acquisition of education in another allied health career."

The F test was applied to the mean scores from the sum of the responses of the employer and employee group to all 13 items in Part V of the research instrument. The F value of 20.282 was found to be significant at the .05 level; therefore, the null hypothesis was rejected. The statistical analysis of hypothesis 4 is presented in Tables 34 and 35.

Table 34

Analysis of Variance Summary Regarding Factors Affecting the Acquisition of Education in Another Allied Health Career

<table>
<thead>
<tr>
<th>Source:</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments:</td>
<td>1</td>
<td>1827.750</td>
<td>1827.750</td>
<td>20.282</td>
</tr>
<tr>
<td>Error</td>
<td>287</td>
<td>25863.500</td>
<td>90.116</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>288</td>
<td>27691.250</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Statistics Describing Responses to Factors Affecting the Acquisition of Education in Another Allied Health Area

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer</td>
<td>43.48</td>
<td>15.89</td>
<td>48</td>
</tr>
<tr>
<td>Employee</td>
<td>50.24</td>
<td>7.63</td>
<td>241</td>
</tr>
<tr>
<td>TOTAL</td>
<td>49.11</td>
<td>9.81</td>
<td>289</td>
</tr>
</tbody>
</table>

The overall mean score of the employer and employee response to all 13 items was 3.51, a low level of "agreement;" however, the responses of the employer and employee groups were quite diversified, with standard deviation values ranging from a low of .87 to a high 1.60. The greatest diversification of responses was within the employer group where standard deviation values ranged from a low of 1.32 to a high of 1.66. The majority of the items in Part V of the research instrument related specifically to the individual employee's personal needs, personal interest and life circumstances which could account for the greater variation in responses. The Likert component calculation describing the analysis of items 51-64 in Part V are presented in Appendix N.

The individual items in Part V, 51 through 64, were further tested with the F statistic, using the .05 level of significance. The Scheffé's test, when appropriate, was applied to locate where the mean scores differed significantly. The descriptive statistics, F values, and levels of significance are described in Tables 36, 38, and 40. The items to which the Scheffé's test was applied and the ranking of the
mean scores for the employer and employee allied health subgroups are displayed in Table 36. A discussion of these findings follows according to: (1) obstacles to obtaining additional education; (2) the distance allied health personnel would be willing and/or able to travel to obtain additional education, and (3) the types of assistance which could facilitate the acquisition of additional education.

Obstacles to Obtaining Additional Education

Items 51 through 56 of the study instrument collected data relative to obstacles to obtaining additional education (see Table 36). The mean score responses of the employer and employee differed on items 51, "money;" 52, "work responsibilities;" 53, "family responsibilities;" 55, "having to repeat courses previously taken;" and 56, "not receiving credit for work experience." The employees' responses were in "agreement" with all 6 items describing obstacles to education, with money and work responsibilities receiving the highest level of "agreement." The small standard deviation values for items 51, 52, 53, and 57 revealed a consensus of responses from the employees. There was a greater diversification in the employees' responses to items 54 and 55. The employer's overall response between a "don't know" and a low level of "agreement" with the items describing obstacles to education. The distribution of the employer's responses indicated a mix of "agrees," "undecided" and "disagree" positions.

The Scheffé's test located the differences between mean scores among the allied health subgroups and the employer group on five of the six items, 51, 52, 53, 55 and 56 (see Table 37).
## Table 36

Comparison (F Test) of Employer and Employee Responses on Items Describing Factors Which Could Interfere with the Acquisition of Additional Education for Another Allied Health Career

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employer Group N=48</td>
<td>Employer Group N=241</td>
<td>Employer Group N=48</td>
<td>Employer Group N=241</td>
</tr>
<tr>
<td>Obstacles to obtaining additional education could include:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51. Money.</td>
<td>3.54</td>
<td>4.12</td>
<td>1.41</td>
<td>.89</td>
</tr>
<tr>
<td>52. Work responsibilities.</td>
<td>3.38</td>
<td>4.02</td>
<td>1.35</td>
<td>.86</td>
</tr>
<tr>
<td>53. Family responsibilities.</td>
<td>3.48</td>
<td>4.09</td>
<td>1.40</td>
<td>.86</td>
</tr>
<tr>
<td>54. Travel.</td>
<td>3.63</td>
<td>3.97</td>
<td>1.36</td>
<td>1.09</td>
</tr>
<tr>
<td>55. Having to repeat courses previously taken.</td>
<td>3.23</td>
<td>3.67</td>
<td>1.42</td>
<td>1.04</td>
</tr>
<tr>
<td>56. Not receiving credit for work experience.</td>
<td>3.48</td>
<td>3.98</td>
<td>1.41</td>
<td>.95</td>
</tr>
</tbody>
</table>
Table 37

Application of Scheffé in Locating Significant Mean Scores Regarding Factors Which Could Interfere with the Acquisition of Education in Another Allied Health Career

<table>
<thead>
<tr>
<th>Items</th>
<th>Ranking of Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
</tr>
<tr>
<td>51. Money.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>52. Work responsibilities.</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>53. Family responsibilities.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>55. Having to repeat courses previously taken.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>56. Not receiving credit for work experience.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

The individual mean scores for respiratory therapy (2), radiologic technology (3), and medical laboratory (4) respondents were significantly greater than the mean scores of the employers (1) for items 51, 52, and 53. The mean scores for respiratory therapy (2) and medical laboratory (4) respondents were significantly greater than the mean scores of the employer (1) in item 55. The mean scores for respiratory therapy and radiologic technology (3) personnel were found to be significantly greater than the mean scores of the employer (1) for item 56.
Distance Personnel Would be Willing to Travel to Obtain Additional Education

The distance which allied health personnel might be willing to travel to obtain additional education was described by data collected in items 57 through 60 (see Table 38). The mean score on item 57, "10 to 20 miles," was found to be significant at the .05 level. The overall response of the employer and employee indicated that personnel would be willing to travel 10 to 20 miles, to obtain additional education. The employer and employee groups, however, responded with a "don't know," to having to travel 20 to 30 miles. Both the employer and employee groups indicated that personnel would most likely not be willing and/or able to travel more than 30 miles to obtain additional education. Various factors affect the ability to travel, such as: work, time, money, climate, or weather conditions, work and family responsibilities, and in some situations the availability of a means by which to travel. The responses from both groups of participants were quite diversified indicating a mix of opinions regarding travel factors affecting the acquisition of additional education.

Assistance Which Could Facilitate the Acquisition of Additional Education

Items 61 through 64 identified ways by which various means of assistance could be made available to allied health personnel wishing to acquire additional education (see Table 39). The mean scores on items 61, "tuition reimbursement;" 62, "financial assistance from employers;" and 63, "flexibility in scheduling work hours" were found to be significant at the .05 level. There was an overall "agreement" with
Table 38

Comparison (F Test) of Employer and Employee Responses on Items Describing Distance Credentialed Allied Health Personnel Would be Willing to Travel for Additional Education

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employer Group</td>
<td>Employee Group</td>
<td>Employer Group</td>
<td>Employee Group</td>
</tr>
<tr>
<td>57. 10 to 20 miles.</td>
<td>3.63</td>
<td>4.13</td>
<td>1.66</td>
<td>1.19</td>
</tr>
<tr>
<td>58. 21 to 30 miles.</td>
<td>3.17</td>
<td>3.13</td>
<td>1.59</td>
<td>1.61</td>
</tr>
<tr>
<td>59. 31 to 40 miles.</td>
<td>2.21</td>
<td>2.44</td>
<td>1.50</td>
<td>1.52</td>
</tr>
<tr>
<td>60. 41 to 50 miles.</td>
<td>1.92</td>
<td>2.29</td>
<td>1.46</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Allied health personnel currently working in rural hospitals would be more apt to participate in educational programs if they did not have to travel more than:
## Table 39

Comparison (F Test) of Employer and Employee Responses on Items Describing Factors Facilitating the Acquisition of Additional Education

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean Score Employed Group</th>
<th>Mean Score Employee Group</th>
<th>Standard Deviation Employed Group</th>
<th>Standard Deviation Employee Group</th>
<th>&quot;F&quot; Value</th>
<th>Existence of Significant Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allied health personnel currently employed in rural hospitals would be likely to pursue additional education if the following assistance could be made available by hospitals:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61. Tuition reimbursement plan with stipulated employee obligation.</td>
<td>3.69</td>
<td>4.22</td>
<td>1.32</td>
<td>.72</td>
<td>15.6821</td>
<td>Yes</td>
</tr>
<tr>
<td>62. Financial assistance on an individual basis if the allied health worker remained employed at the same hospital for a specified period of time upon completion of education.</td>
<td>3.56</td>
<td>4.10</td>
<td>1.46</td>
<td>.92</td>
<td>10.7824</td>
<td>Yes</td>
</tr>
<tr>
<td>63. Flexibility in scheduling work hours.</td>
<td>3.73</td>
<td>4.10</td>
<td>1.33</td>
<td>.85</td>
<td>6.1798</td>
<td>Yes</td>
</tr>
</tbody>
</table>
the three items identifying ways financial assistance could be made available on the part of both the employer and employee. The employee's responses to these items were higher in terms of "agreement" than were the responses of the employer. In addition, the range of responses was smaller for the employee. The employer's range of responses was somewhat more diversified with standard deviation values ranging from 1.32 to 1.47. Item 61, "tuition reimbursement," and item 63, "flexibility in scheduling work hours" elicited the highest levels of "agreement" and the lower diversification of responses among the employer and employee groups.

The Scheffe's test (Table 40), when applied to the mean scores of the employer and employee allied health subgroups means; namely, respiratory therapy (2) and radiologic technology (3) and medical laboratory (4) personnel, found the individual mean scores for the allied health subgroups as being significantly greater than the mean score of the employer (1) on items 61 and 62. Only the mean scores of the respiratory therapy (2) and medical laboratory (4) respondents were significantly greater than the employer's (1) mean score on item 63.
Summary

Hypotheses one and three were retained at the .05 level of significance. No significant difference was found to exist between rural hospital employers and credentialed rural allied health employees regarding the existence of shortages of credentialed rural allied health personnel and rural hospital employers and credentialed rural allied health employees regarding factors affecting the utilization of multicredentialed allied health technicians in rural hospitals.

Hypotheses two and four, however, were rejected at the .05 significance level; there was a significant difference between rural hospital employers and credentialed rural allied health employers regarding and interest in the utilization of multicredentialed allied health employees in rural hospitals, and there was a significant difference between
rural hospital employers and credentialed rural allied health employees regarding factors affecting the acquisition of additional education in another allied health career. Responses from credentialed rural allied health personnel revealed a diversification of opinion regarding an interest in acquiring a second allied health credential.
CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY

This study focused on examining the need for and interest in the utilization of multicredentialed allied health workers in rural Wisconsin hospitals. The research looked for differences between rural hospital employers and selected credentialed rural allied health employees regarding: (1) the existence of credentialed rural allied health personnel shortages; (2) the interest in the utilization of multicredentialed allied health personnel, and (3) factors which could affect the utilization and educational preparation of multicredentialed allied health personnel.

Literature was reviewed which was relevant to the influence which the allied health education, the health credentialing, and health care systems have on the availability, utilization and retention of rural allied health personnel. This review substantiated the problem as well as purpose and objectives of the study. Related literature and research pertinent to the utilization of multicompetent and multicredentialed allied health personnel was examined as a possible solution to the rural allied health personnel problem.

A seventy-four item research instrument, using a Likert-type response scale, was developed and validated by means of a thirty-member DELPHI panel. The instrument developed consisted of six sections designed to collect information:

1. Identifying the existence of credentialed rural allied health personnel shortages;
2. Describing the interest which might exist for the utilization of multicredentialed allied health personnel in rural hospitals;

3. Identifying factors which could affect the utilization of multicredentialed allied health personnel in rural hospitals;

4. Determining if credentialed rural allied health workers were interested in acquiring an additional allied health career;

5. Describing factors which could affect the acquisition of additional education in another allied health career; and

6. Depicting demographic data describing the study participants.

Study participants consisted of two major groups; 70 rural hospital employers and 350 credentialed rural allied health employees. Allied health employees consisted of persons from the respiratory therapy, radiologic technology and medical laboratory areas. These two groups represented 70 rural Wisconsin hospitals distributed throughout the State. Two hundred eight-nine of the 420 study participants completed and returned research instruments for a 69% rate of return.

Four hypotheses were established in the study and were tested at the .05 level using the F statistic to determine if significant differences in mean scores existed between the employer and employee. In addition, the F test was run on the mean scores of each individual item on the instrument. The Scheffé’s test for multiple comparison of mean
scores was then applied at the .10 level to determine where the significant differences in mean scores actually existed between the employer and the three employee allied health subgroups. Data collected describing the interest which credentialed rural allied health employees had in obtaining another allied health career were analyzed and presented with descriptive statistics.

The specific need for, and interest in, the use of the multicredentialed rural allied health personnel has not been specifically identified in this study; however, information relative to the interest in the multicredentialed concept has been obtained and presented in Chapter IV. On the basis of these findings, the following conclusions and recommendations for further study are presented in the ensuing pages of this final chapter of the study.

Conclusions

The following conclusions are presented according to each of the five objectives of the study.

Objective One. "To determine the existence of shortages of credentialed allied health workers in rural hospitals."

Existence of Shortages. Shortages of credentialed allied health personnel do exist in some rural hospitals. Opinions regarding the existence of funded vacant allied health positions varied among and between the employer and employee groups. This could be related to a multiplicity of factors, such as variations in requirements among
hospitals and within departments in the hospitals; the elimination in some hospitals of funded allied health positions due to the inability to recruit personnel, and the restriction of the employment of additional personnel even though a need may exist. The diversification of responses to the existence of personnel shortages between the employer and employee groups and within the groups themselves reflects the multiple opinions existing within the allied health education, the health care and health credentialing systems regarding the balance of the supply and demand and the distribution of allied health personnel. This further parallels the Bureau of Health Manpower's (1980) inference that the real need for allied health personnel, especially in rural areas, is unknown.

Causes of shortages. Difficulty in recruiting and retaining allied health personnel contributes to personnel shortages in rural hospitals. Narrative input (Appendix I) received from the study participants indicated that a lack of social and cultural opportunities in rural areas contributed to recruitment problems. Personnel trained in larger hospitals and cities are often unaccustomed to working in and living in rural areas, thus compounding the recruitment problem. This parallels Luganbeel's (1978) and Phillips' et al., (1978) recommendations that persons indigenous to rural areas should be trained if allied health manpower needs in rural areas were to be met. Low salaries and stressful working conditions related to excessive on call and weekend assignments perpetuated recruitment and personnel turnover problems.

Limited opportunities for career advancement and mobility, additional
job responsibility, a lack of recognition of work performance and limited economic returns contributed to personnel turnover. Blayney and Joiner (1974) concluded that limited opportunities for career mobility and advancement contributed to allied health personnel shortages. Boe (1978) also claimed that the lack of challenging work, limited recognition and limited opportunities for job advancement contributed to personnel turnover.

The difference between the employer and employee responses regarding practices affecting recruitment and retention of allied health personnel could suggest that "labor and management" might differ with respect to personnel practices affecting the recruitment and retention of allied health personnel. Ginzberg and Ostow (1969) discussed the need to examine personnel management practices in dealing with health care personnel shortages.

**Objective Two.** "To determine if there was an interest in the utilization of multicredentialed allied health workers in rural hospitals."

**Desirability and Practicality of Multicredentialed Personnel.** Both the employer and employee groups viewed the multicredentialed concept as being desirable. The practicality of the utilization of multicredentialed allied health personnel, however, remained questionable. Various concerns, feelings of uncertainty and possible resistance exist to the multicredentialed concept. The allied health employees had concern with the problem of keeping job knowledge and skills current and proficient in more than one allied health area. Respondents
who were multicredentialed or multicompetent claimed that it had been possible to work in more than one allied health area in the past; however, they questioned the capability of a person to function effectively and safely in more than one allied health area today. Study participants suggested that allied health personnel could assist other allied health departments with nontechnical job responsibilities. It was also suggested that multiskilled personnel could be utilized in physicians' offices as was proposed by the multicompetent program at the University of Alabama (1975).

It can be concluded that it would be undesirable to utilize health care personnel in other allied health areas unless they were credentialed to function in that area. Multiple written comments indicated that credentialing implied a minimum standard of effectiveness and safety in allied health practice, both employer and employee groups conceded that persons in some rural hospitals did work in more than one area within the health facility. These "other" areas did not necessarily require credentialed knowledge and skills.

The utilization of allied health personnel in the following combinations were deemed to be undesirable: medical laboratory and respiratory therapy, respiratory therapy and radiologic technology, or medical laboratory and radiologic technology. This is in contradiction to the recommendations put forth by Luganbeel (1978), Truelove (1979), and Metropoulas (1979).

Benefits of Multicredentialed Personnel. Some benefits in being
able to utilize allied health personnel in more than one health service area were recognized by both the employer and employee groups. These benefits paralleled those cited by Luganbeel (1978); that is, improved personnel utilization, personnel retention, more effective cost control practice and improved career mobility opportunities and economic benefits for allied health employees.

In summary, interest was demonstrated by both employer and employee groups in the multicredentialed allied health concept, however, both groups remained uncertain about the feasibility of utilizing this type of person. Limited information is available which could support or refute the functional use of multicredentialed allied health personnel.

Objective three. "To identify factors which could affect the utilization of multicredentialed allied health workers in rural hospitals."

When Multicredentialed Personnel Could be Utilized. The utilization of multicredentialed allied health personnel could be influenced by the various work shifts and the types and complexity of health services provided. The utilization of multicredentialed allied health personnel was not considered to be practical during the day shift. This could be attributed to the steadiness of the work load which usually occurs during day hours, Monday through Friday. Multicredentialed personnel could be utilized as "backup" help on holidays, on call and on the weekends. This conclusion was somewhat consistent with the rationale underlying the need for multiskilled allied health workers as given by Luganbeel (1978) and Friedman (1981).
Factors Affecting The Utilization of Multicredentialed Personnel.

A lack of certainty as to how allied health persons could be expected to assume increased weekend and on call assignments in another allied health field in addition to current weekend and on call allied health responsibilities. It remains questionable if multicredentialed persons could function safely and effectively in emergency situations which require prompt and skillful action. Multicredentialed allied health personnel might have difficulty in keeping job knowledge and skills current and proficient in more than one allied health area. This correlates with the opinions of allied health personnel who were interviewed by Friedman (1981) regarding the use of "generalists" versus "specialists" in rural hospitals.

Credentialing requirements for allied health personnel were identified as presenting barriers to the utilization of multicredentialed allied health personnel. Luganbeel (1978) and Hatch (1976) cited credentialing requirements and practices as being barriers to the effective utilization and recruitment of allied health personnel.

It can be concluded that additional financial compensation awarded to allied personnel prepared to work in more than one allied health area could facilitate the utilization of multicredentialed employees. The diversification of responses revealed dissatisfaction with the current economic benefits received by allied health employees. Skepticism as to whether or not a multicredentialed person would be adequately compensated for the additional education and job responsibilities existed among allied health respondents (see Appendix I).
In summary, knowledge and understanding of the factors which could facilitate or impede the utilization of multicredentialed allied health personnel in rural hospitals is greatly limited. The major concerns affecting the utilization of multicredentialed allied health personnel include: the provision of prompt, safe, and effective emergency care services, the feasibility of keeping job knowledge and skills proficient in more than one allied health area and the increased work loads which could occur as a result of having persons prepared to work in more than one allied health area.

Objective Four. "To determine if single credentialed rural allied health personnel were interested in acquiring a second allied health career."

Medical laboratory and radiologic technology employees were not interested in acquiring a second allied health career. A marginal interest in another allied health career exists amongst respiratory therapy personnel. This could be attributed to a variety of factors. Persons in respiratory therapy have frequently worked in another health service area within the health care facility prior to or concomitant with working in respiratory therapy. Thus, these persons may have less rigid mind sets than persons who have experiences in only one allied health area. In addition, respiratory therapy personnel frequently experience lighter work loads and thus have more time to assume additional job responsibilities than the other two allied health groups. Procedures in respiratory therapy are not as "routinely" utilized as are those in the medical laboratory and radiologic technology areas.
which represent major diagnostic tools regularly used by all physicians.

Allied health employees desired increased opportunities for career advancement and career mobility. Uncertainty within the employee groups exists as to how these opportunities could be provided.

Relevant and accessible continuing education offerings could enhance the utilization and productivity of allied health practitioners within their own allied health service areas.

Accessible and relevant continuing education by means of extended study opportunities, and the provision of some credit and/or recognition for prior work and educational experiences could also positively influence the allied health employee's interest in additional education in another allied health career.

Allied health employees would be willing to travel up to 20 miles to participate in educational programs; however, it remains questionable if they would be willing and/or able to travel over 20 miles.

Flexibility in work hours and financial assistance from employers could be major facilitators in motivating single credentialed allied health personnel to pursue additional education in another allied health career.

Allied health employees are interested in obtaining additional relevant continuing education. The findings of this study are inclusive in determining if the interest is in the pursuit of another allied health career or in educational offerings relevant to the employee's current allied health specialty.
Objective Five. "To identify factors which could affect the educational preparation of multicredentialed health personnel."

Money, work, and family responsibilities are major obstacles in obtaining additional education. Factors such as travel and the lack of credit for previous educational and work experiences adversely affects allied health persons' decisions to seek additional education. The employer's undecided responses to factors affecting the educational preparation of allied health personnel could be expected as the employer perhaps did not wish to respond to the employee's needs. It could reflect a lack of understanding on the part of the employer to the employee's professional development needs, a factor relevant to personnel management practices.
Recommendations for Further Study

As a result of the findings and conclusions of this research, a number of suggestions for further research activities have evolved which could assist in providing allied health manpower services to facilitate the delivery of health care in rural Wisconsin. Basic to such recommendations is the establishment of a statewide committee representing the allied health education, the health care and allied health credentialing systems. This committee, representing all rural geographic regions of Wisconsin, should cooperate and collaborate in carrying out the findings of this research.

1) It is recommended that a personnel needs study be conducted to identify the current and projected supply and demand for rural allied health personnel in rural Wisconsin. The aim of this study would be to determine the actual existence and nature of rural allied health manpower shortages.

2) It is suggested that a study be initiated to identify the numbers and types of unemployed health care workers residing in rural vicinities who might be interested in returning to employment in the health care field. The focus should be on retraining persons who possess entry-level knowledge and skills in the health care field, thereby facilitating a more effective utilization of human resources. Gilpatrick (1972) emphasized the need to retrain persons already in the health care field, citing the redundancy of training as being the greatest social cost in the health care industry. This
process would focus on utilizing persons who are indigenous to the rural areas. Phillips (1978) and Luganbeel (1978) demonstrated positive recruitment and retention effects in rural and medically underserved areas by training persons indigenous to the area of employment.

3) A study should be conducted to determine if it is practical to prepare allied health personnel to function in more than one allied health service area. This examination would focus on identifying the unique and common technical and nontechnical job duties, tasks and responsibilities of allied health personnel in rural hospitals. Such a study could analyze the complexity of the tasks and the frequency with which they are performed.

4) It is recommended that the organizational structures in allied health service departments, along with the staffing patterns and assignments of allied health personnel in rural hospitals be examined. The objective of this investigation would be to redesign organizational structures and staffing patterns which could facilitate the utilization of allied health personnel to perform technical and nontechnical tasks in more than one allied health area. Recommendations two and three would provide a means by which career mobility and advancement could be developed and facilitated.

5) It is suggested that an educational need analysis relevant to keeping job knowledge and skills of allied health personnel
current and proficient be completed. The unique and common educational needs should be compiled and cross-checked. Educational offerings unique to the continuing technical development needs of rural allied health practitioners could then be developed. Educational needs common to a variety of allied health specialties should be developed using an inter-disciplinary approach. This would facilitate the acquisition of knowledge and skills in more than one allied health specialty area and enhance opportunities for career mobility.

6) It is recommended that allied health educational delivery systems which could facilitate the offering of accredited allied health education courses be studied. These methods should focus on recognizing and utilizing existing allied health personnel's knowledge and skills so as to minimize a redundancy in training. The delivery systems should be cognizant of making educational offerings accessible so as to make it possible for allied health personnel to continue employment in rural hospitals as needed by both the employer and/or employee.

7) It is suggested that rural hospitals examine and evaluate all allied health occupations to determine the exact job requirements for each occupation. Educational requirements should be correlated with the knowledge and skills required to be performed in an allied health setting in a rural hospital.
8) Personnel management practices in rural hospitals should be examined. Such a study would focus on identifying sources of job satisfaction and job dissatisfaction existing in the work settings. The objective would be to develop personnel practices which could enhance job satisfaction, thereby improving the recruitment and retention of allied health personnel and increasing employee productivity.

9) It is recommended that the requirements and practices of credentialing agencies be studied to determine the relevancy of the credentialing requirements to the functions and responsibilities assumed by rural allied health personnel. Credentialing requirements unnecessary and/or unrelated to the performance of the jobs should be identified.


Friedman, E. "The Dilemma of Allied Health Professions Credentialing," Hospitals, February 1, 1981, 47-51.

------. "Less is More in Rural Hospital Staffing," Hospitals, November 1, 1979, 115.


----- and Ostow, M. Men, Money and Medicine, New York: Columbia University Press, 1969, 133-134.
Goldstein, H. and Horowitz, M. Health Personnel: Meeting the Explosive Demand for Medical Care, Germantown, Maryland: Aspen Systems Corporation, 1877, 12, 15-16.


Kennedy, R. "Education and Training: Fulfilling the Demand of the Future," Hospitals, April 1, 1979, 74-77.


Metropolous, E.G., M.D. Director of the Early Detection Center, PV, Warren, Michigan, Member of Task Force on Multicompetency Allied Health Education, CAHEA, Chicago, Illinois, 1979.


University of Alabama, School of Community and Allied Health.
"Multiple Competency Clinical Technician." A Narrative Statement of Proposal to Kellogg Foundation, Birmingham, Alabama: University of Alabama, October, 1975.


APPENDIX A

CAHEA Allied Health Specialties
APPENDIX A

CAHEA Allied Health Specialties

Assistant to the Primary Care Physician
Cytotechnologist
Diagnostic Medical Sonographer
Electroencephalographic Technician
Electroencephalographic Technologist
Emergency Medical Technician-Paramedic
Histologic Technician
Medical Assistant
Medical Assistant in Pediatrics
Medical Laboratory Technician (Associate Degree)
Medical Laboratory Technician (Certificate)
Medical Record Administrator
Medical Record Technician
Medical Technologist
Nuclear Medicine Technologist
Occupational Therapist
Ophthalmic Medical Assistant
Perfusionist
Physical Therapist
Respiratory Therapist
Respiratory Therapy Technician
Specialist in Blood Bank Technology
Surgeon's Assistant
Surgical Technologist
APPENDIX B

Demographic Data Describing DELPHI Panel
# APPENDIX B

## Demographic Data Describing DELPHI Panel

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Name withheld</td>
<td>Instructor in Allied Health Education</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>Eugene W. Arnett</td>
<td>President, Hospital</td>
<td>Memorial Hospital, Taylor County</td>
<td>Medford, Wisconsin</td>
</tr>
<tr>
<td>Wayne R. Atkins</td>
<td>Assistant Director Planning and Development</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>Keith Blayney</td>
<td>Dean, School of Community and Allied Health</td>
<td>University of Alabama</td>
<td>Birmingham, Alabama</td>
</tr>
<tr>
<td>Wallace G. Clark</td>
<td>Director of Allied Health Education Accreditation (CAHEA)</td>
<td>American Medical Association</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>*Pearl S. Fryar</td>
<td>Administrator, Hospital</td>
<td>Caribou Memorial Hospital</td>
<td>Soda Springs, Idaho</td>
</tr>
<tr>
<td>Roger Schaefer</td>
<td>Curriculum Supervisor</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>James W. Truelove</td>
<td>Director, Spec. Programs and Instructional Research</td>
<td>University of Alabama</td>
<td>Birmingham, Alabama</td>
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</table>

*Represents both allied health education and allied health practice

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<thead>
<tr>
<th>CMA</th>
<th>Certified Medical Assistant</th>
<th>MT (ASCP) Medical Technologist, American Society of Clinical Pathologists</th>
</tr>
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<tr>
<td>RN</td>
<td>Registered Nurse</td>
<td>RRA Registered Record Administrator</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RRT Registered Respiratory Therapist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ARRT Accredited Registered Radiologic Technologist</td>
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APPENDIX B (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution</th>
<th>Location</th>
</tr>
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<tr>
<td><em>Sr. Francis Regis Dobiesz, MT (ASCP)</em> (Multicredentialed)</td>
<td>Chairperson, Medical Laboratory Technician Program</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>*Joan M. Schnagl, RRA</td>
<td>Instructor, Medical Record Technician Program</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>*Sr. Nora Purtell, RRA</td>
<td>Chairperson, Medical Record Technician Program</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>*Sr. Doris Steinfeldt, RT, ARRT, MT (ASCP) (Multicredentialed)</td>
<td>Chairperson, Radiologic Technology Program</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>*Sharon M. Negrini, RRA</td>
<td>Instructor, Medical Record Technician Program</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
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<tr>
<td>*James A. Morrell, RRA</td>
<td>Director, Respiratory Therapy</td>
<td>Mid-State Technical Institute</td>
<td>Marshfield, Wisconsin</td>
</tr>
<tr>
<td>*Rosanne Heidenreich, ARRT</td>
<td>Instructor, Radiologic Technology</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
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<tr>
<td>*Margaret Kinderman, RN</td>
<td>Ward Clerk Instructor</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>E.G. Metropoulos, M.D.</td>
<td>Medical Director</td>
<td>Early Detection Center</td>
<td>Warren, Michigan</td>
</tr>
<tr>
<td>Mary Lee Seibert, MT (ASCP)</td>
<td>Associate Coordinator Minority Allied Health Project</td>
<td>American Association State Colleges and Universities</td>
<td>Washington, D.C.</td>
</tr>
<tr>
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<td>Title</td>
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<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>*Beth Rolland, MT (ASCP)</td>
<td>Instructor, Medical Laboratory Technician Program</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>Suzanne Van Ort, RN</td>
<td>Dean, School of Nursing</td>
<td>UW-Eau Claire</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>Arch Luganbeel</td>
<td>Assistant Professor and Projects Coordinator</td>
<td>School of Technical Careers, Southern Illinois University</td>
<td>Carbondale, Illinois</td>
</tr>
<tr>
<td>John B. Gerberich MT (ASCP)</td>
<td>Director, Division of Allied Health Professions</td>
<td>UW-Eau Claire</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>William Boyle</td>
<td>Assistant Director of Instructional Services</td>
<td>District One Technical Institute</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>Robert E. Kinsinger</td>
<td>Vice President</td>
<td>W.K. Kellogg Foundation</td>
<td>Battle Creek, Michigan</td>
</tr>
<tr>
<td>Mary Jane Kolar</td>
<td>Director of Education</td>
<td>National Moving &amp; Storage Assn.</td>
<td>Alexandria, Virginia</td>
</tr>
<tr>
<td>Richard Rau</td>
<td>Administrator</td>
<td>Osseo Area Municipal Hospital and Nursing Home</td>
<td>Osseo, Wisconsin</td>
</tr>
<tr>
<td>Name Withheld (Multicompetent)</td>
<td>Administrator</td>
<td>Barron Memorial hospital</td>
<td>Barron, Wisconsin</td>
</tr>
<tr>
<td>John Grossmeier</td>
<td>Assistant Administrator</td>
<td>Sacred Heart Hospital</td>
<td>Eau Claire, Wisconsin</td>
</tr>
<tr>
<td>*Ina L. Yenerich, RT CMA-AC (Multicredentialed)</td>
<td>Executive Director</td>
<td>American Assn. of Medical Assistants</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>Institution</td>
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<tr>
<td>---------------</td>
<td>--------------------------------------------</td>
<td>------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Virginia Van Vuren</td>
<td>Teaching Assistant</td>
<td>Medical Laboratory Technician Program</td>
<td>District One Technical Institute</td>
</tr>
</tbody>
</table>
APPENDIX C

Initial DELPHI Probe
On each of the following pages are objectives plus a series of statements which have been obtained from various sources to clarify each of the objectives. The objectives are directly related to the specific questions stated on p. 2 of the accompanying letter.

The objectives and statements listed may not in your opinion be complete. Please revise, redefine, refine or delete any of the objectives and/or statements which are provided. Please indicate your choice by putting a circle around:

A - if you Accept
O - if you Omit
M - if you Modify

If accept or omit is encircled, you need no further response to that statement. If, however, you encircle modify, please indicate your changes or modifications in the space provided.

Keep in mind that there may be objectives and/or statements which in your opinion should be added. Please make whatever additions you think should be added on the appended pages provided at the end of the questionnaire.

Please return the completed questionnaire via the enclosed envelope by ________________ if at all possible so that the subsequent questionnaire may reach you without delay.

Please remember your task is to identify and select statements to obtain information which will determine whether or not there is a need and/or an interest in the use of multicredentialed allied health personnel in small rural hospitals. You are not being asked to evaluate the concept of multicredentialed personnel.

Please go to next page.

THANK YOU!
Dear

Your cooperation in assisting with the development of a questionnaire which can be used to conduct a survey to identify the need for and interest in the utilization and preparation of "Multicredentialed" allied health workers in rural hospitals is greatly appreciated.

The overall purpose of the survey is to obtain information which will assist with the establishment of a rationale for the design, development and implementation of a model for allied health for allied health education programs which would increase the availability and the utilization of allied health workers in rural hospitals. Emphasis will be placed on providing opportunities for allied health workers who are currently employed in rural hospitals to acquire the additional educational preparation and credentials which will enable them to function in more than one area within the rural hospital. The findings will also dispute or support the need to utilize allied health workers in more than one area within the rural hospitals.

Allied health workers includes all those specialists who have been identified and accredited by the Committee on Allied Health Education and Accreditation, EXCLUDING physicians, dentists, pharmacists, podiatrists, veterinarians and nurses. The persons who will be asked to be respondents in the survey will include: administrators, medical laboratory personnel, radiographic personnel and respiratory therapists or technicians who are employed in rural hospitals in Wisconsin with rural meaning those hospitals with bed capacities of 100 or less and with 4,000 or less admissions per year.

The "multicredentialed" allied health worker is viewed as an individual who has been prepared and credentialed to function in more than one allied health specialty. For example, a person may hold credentials as a Medical Technologist or a Medical Laboratory Technician or a Certified Laboratory Assistant and a Registered Radiographer as well. Thus, they are prepared and credentialed to function within both the laboratory and radiologic areas in the hospital.

It has been said that:

1. A shortage and/or maldistribution of credentialed allied health workers exists in many rural hospitals.

2. It is economically unfeasible for rural hospitals to continue to employ the highly skilled single credentialed allied health specialist.
3. Allied health personnel currently employed in rural hospitals frequently lack opportunities for career mobility, professional status, job satisfaction and adequate economic returns, all which contribute to high turnover rates of these personnel.

The concept of having multiskilled persons prepared to function in more than one allied health specialty has been introduced by others as a possible solution to the above-stated concerns, however, usually these persons lack the professional identity and the prescribed credentials required to function in the various areas in the hospital.

Specific questions to be addressed by the questionnaire include:

1. Is there a shortage of credentialed allied health workers in rural hospitals?

2. Is there an interest in the utilization of multicredentialed allied health workers in rural hospitals?

3. Are credentialed allied health workers in rural hospitals interested in acquiring another allied health credential or career?

4. What are the factors which would affect the utilization of multicredentialed allied health workers in rural hospitals?

5. What are the factors which would facilitate or impede the educational preparation of allied health workers who would desire another credential or career in allied health?

The procedure to be used in developing this questionnaire is:

The DELPHI Technique will be used to identify, define and redefine the questionnaire which will be utilized as the survey instrument. The technique itself involves the judgment and opinions of a panel of 30 persons who have been selected from various areas in the country and who have varying levels of expertise and/or interest in:

1. The manpower problem of rural hospitals.

2. The development of effective and efficient educational programs and delivery systems for allied health education especially in rural areas.

The panel which has been selected is representative of educational institutions, accrediting and credentialing agencies, hospital administration, nonhospital health care facilities and health professionals from various allied health areas.

The procedure will be conducted completely by mail and is intended to get expert opinions without bringing the experts together in a face-to-face confrontation. Contacts will be through the successive
use of questionnaires and feedback from each of you. The returned responses to each set of questions will be analyzed for the purpose of developing an accurate and reliable survey instrument.

1. The first questionnaire calls for you to reach each of the stated objectives and the list of statements supporting it.

You are asked to eliminate, revise or add statements as you deem necessary.

You will indicate your response to each of the statements by encircling:

A - if you Accept the statement
0 - if you Omit the statement
M - if you Modify the statement

If you encircle A or 0, you need no further statement, HOWEVER, if you encircle M, please indicate your modification in the space provided to the right of the statement.

You may also think that additional objectives and/or statements should be added. If so, please add the objectives and/or statements on the blank appended page at the end of the questionnaire.

2. The second questionnaire you will receive will consist of the results generated from the first questionnaire from the 30 different experts serving on the panel. You will then be asked to rate or evaluate these results on a level of agreement scale.

3. The third (and final, hopefully) questionnaire will include the statements and ratings, indicating the consensus of the 30 experts in response to the second questionnaire. If your opinion is different from the group, you will be asked to either revise your opinion or to specify your reasons for remaining outside the consensus of the group.

4. If necessary, a fourth questionnaire will be provided for a final change for the revision of opinions.

Each person who has been asked to serve on this DELPHI panel has indicated a concern for providing effective and efficient health care. Paralleling this concern is the recognition that educational institutions must develop educational programs and delivery systems which will provide accessible and relevant program offerings tailored to meet the needs of employers and employees in rural hospitals. We are hoping that this questionnaire will provide information which will serve as a guide for more effective program development and delivery.
Once again, I wish to express my sincere appreciation for your assistance. Please be assured that anonymity is reserved by this process and that names will not be used for tabulation.

Have a refreshment!

Sincerely yours,

Annabel B. Bauer
<table>
<thead>
<tr>
<th>OBJECTIVES AND SUPPORTING STATEMENTS</th>
<th>RESPONSE</th>
<th>MODIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 To determine if there is a shortage of credentialed allied health manpower in rural hospitals.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.1 There is a shortage of credentialed allied health workers in rural hospitals.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.2 A shortage of credentialed allied health workers exists in my hospital.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.3 Credentialed allied health manpower shortages occur because allied health education programs are not accessible to persons in rural areas.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.4 Credentialed allied health manpower shortages exist because persons trained in urban areas do not want to live in rural communities.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.5 Rural hospitals have difficulty recruiting credentialed allied health manpower.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.6 There is a high turnover of credentialed allied health manpower in rural hospitals.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.7 A major cause of personnel turnover in rural hospitals is due to job boredom and a lack of professional challenge.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.8 A major cause of personnel turnover in rural hospitals is due to inadequate economic returns.</td>
<td>A O M</td>
<td>________________</td>
</tr>
<tr>
<td>1.9 A major cause of personnel turnover in rural hospitals is the inability of personnel to adjust to working in rural hospitals and living in rural communities.</td>
<td>A O M</td>
<td>________________</td>
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</table>
1.10 A major cause of personnel turnover in rural hospitals is due to a lack of opportunity for professional growth and career advancement. There is a shortage of credentialed allied health manpower in:

1.11 Respiratory therapy.
1.12 Medical laboratory.
1.13 Radiologic technology.

2.0 To obtain information which will help determine the interest for the use of multicredentialed allied health manpower in rural hospitals.

2.1 It is a good idea to have allied health prepared to work in more than one area in a rural hospital.

2.2 It is a good but impractical idea to have allied health workers prepared to work in more than one area in rural hospitals.

2.3 Allied health personnel should be prepared but not necessarily credentialed to function in more than one area in a rural hospital.

2.4 Allied health personnel should not work in other areas in the hospital unless they are credentialed to do so.

2.5 Allied health personnel who work in this hospital would be interested in obtaining credentials in other allied health areas.

2.6 The administration of this hospital would be interested in utilizing allied health personnel in more than one area in the hospital.
Having a person prepared to function in more than one allied health area would:

2.7 Be cost effective. A O M

2.8 Increase productivity. A O M

2.9 Assist with personnel retention. A O M

2.10 Assist with recruitment of personnel. A O M

2.11 Improve job satisfaction. A O M

3.0 To determine if credentialed allied health workers in rural hospitals are interested in acquiring another allied health credential or career. A O M

3.1 Medical laboratory. A O M

3.2 Respiratory therapy. A O M

3.3 Radiologic technology. A O M

3.4 Other A O M

3.5 Additional education in another allied health area would increase the professional challenge for allied health personnel working in rural hospitals. A O M

3.6 Education in another allied health area would contribute to increased job satisfaction. A O M

4.0 To determine factors which could affect the utilization of multicredentialed allied health workers in rural hospitals. A O M
Multicredentialed workers could best be utilized:

4.1 On the day shift.
4.2 On the afternoon shift.
4.3 On the night shift.
4.4 On the weekends.
4.5 On call.
4.6 On holidays.
4.7 As backup help in case of an emergency or personal leave situation.

Multicredentialed workers could best be utilized in:

4.8 Respiratory therapy and medical laboratory combinations.
4.9 Medical laboratory and radiology combination.
4.10 Respiratory therapy and radiology combination.
4.11 Other

Factors which could impede the utilization of multicredentialed allied health workers in rural hospitals include:

4.12 Credentialing requirements.
4.13 Existing job descriptions.
4.14 Traditional staffing patterns.
4.15 Traditional methods of supervision of allied health departments.


If allied health workers were prepared and credentialed to function in more than one allied health area in the hospital, they should:

4.16 Receive a higher base salary. A O M

4.17 Receive regular pay plus hourly pay for time spent working in second specialty area. A O M

4.18 Receive no extra pay. A O M

5.0 To identify factors which could facilitate or impede the acquisition of additional education preparation for persons in another allied health career. A O M

Obstacles to obtaining additional education which allied health personnel would encounter includes:

5.1 Money. A O M

5.2 Work responsibilities. A O M

5.3 Family responsibilities. A O M

5.4 Travel. A O M

5.5 Time taken from personal and community activities. A O M

5.6 Having to repeat courses previously taken. A O M

5.7 Not receiving credit for work experience. A O M

5.8 Relevancy of the education provided. A O M

If an educational program were developed which would enable allied health personnel to acquire another allied health career, it should utilize a delivery system which would involve:

5.9 Weekly lecture sessions. A O M
5.10 Independent study.  
5.11 Independent study plus weekly lectures.  
5.12 Weekend classes.  
5.13 Opportunities to test out of courses.  
5.14 Evening classes.  

Allied health personnel would be able to participate in educational programs if they did not have to travel more than:  

5.15 1-5 miles.  
5.16 5-10 miles.  
5.17 10-15 miles.  
5.18 15-20 miles.  
5.19 20-30 miles.  
5.20 30-40 miles.  

Hospitals should assist the allied health worker who desires to obtain additional education by providing:  

5.21 Tuition reimbursement.  
5.22 Time off with pay to attend school.  
5.23 A bonus upon completion.  
5.24 Assistance only if allied health workers upon completion of program of study remains employed at the same hospital.  

ADDITIONAL OBJECTIVES AND/OR STATEMENTS TO BE ADDED INCLUDE:
APPENDIX D

Second DELPHI Probe
Dear

Thank you for your help in developing the survey instrument which will be used to assess the need for and interest in the utilization of multicrodedented allied health specialists in rural hospitals. You are now receiving the second of three questionnaires for the development of the instrument.

The objectives and statements on this second questionnaire represent the changes and modifications indicated by the panel who completed the first questionnaire. Your suggestions may or may not appear exactly as you stated them as it was necessary to combine related suggestions from the various panel members.

Included in your "package" is a copy of the first questionnaire on which I have marked those items which were "modified" or "omitted" as a result of the first questionnaire. You will also notice that there have been some changes in the overall organization of the second questionnaire. Those statements which were "added" as a result of the responses on the first questionnaire have also been identified.

Your reaction to all of the statements on the second questionnaire will be greatly appreciated. Please indicate your level of agreement for INCLUDING THE STATEMENTS by encircling the appropriate response. The scale is as follows:

- SA - Strongly Agree - 5
- D - Disagree - 2
- A - Agree - 4
- SD - Strongly Disagree - 1

Please remember that your response indicates your agreement or disagreement as to whether or not the statements should be included as a part of the survey instrument this panel is helping to develop. Your agreement or disagreement regarding the concept of multicrodedented allied health personnel is not being sought, OK?

Please proceed with DELPH Instrument #2. Return the instrument by FEBRUARY _____, 1981.

Sincerely yours,

Annabel Bauer
Items Modified, Omitted, or Added as a Result of the Initial DELPHI Probe

<table>
<thead>
<tr>
<th>OBJECTIVES AND SUPPORTING STATEMENTS</th>
<th>RESPONSE</th>
<th>MODIFICATION</th>
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<tr>
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<td>A O M</td>
<td>Statements Added on Questionnaire #2</td>
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<td>1.1 There is a shortage of credentialed allied health workers in rural hospitals.</td>
<td>A O M</td>
<td>1.2 1.3 1.4 1.5 1.6 1.9 1.11</td>
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<tr>
<td>1.2 A shortage of credentialed allied health workers exists in my hospital.</td>
<td>A O M</td>
<td></td>
</tr>
<tr>
<td>1.3 Credentialed allied health manpower shortages occur because allied health education programs are not accessible to persons in rural areas.</td>
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<td></td>
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<tr>
<td>1.5 Rural hospitals have difficulty recruiting credentialed allied health manpower.</td>
<td>A O M</td>
<td></td>
</tr>
<tr>
<td>1.6 There is a high turnover of credentialed allied health manpower in rural hospitals.</td>
<td>A O M</td>
<td></td>
</tr>
<tr>
<td>1.7 A major cause of personnel turnover in rural hospitals is due to job boredom and a lack of professional challenge.</td>
<td>A O M</td>
<td></td>
</tr>
<tr>
<td>1.8 A major cause of personnel turnover in rural hospitals is due to inadequate economic returns.</td>
<td>A O M</td>
<td></td>
</tr>
</tbody>
</table>
1.9 A major cause of personnel turnover in rural hospitals is the inability of personnel to adjust to working in rural hospitals and living in rural communities.

1.10 A major cause of personnel turnover in rural hospitals is due to a lack of opportunity for professional growth and career advancement.

There is a shortage of credentialed allied health manpower in:

1.11 Respiratory therapy.

1.12 Medical laboratory.

1.13 Radiologic technology.

2.0 To obtain information which will help determine the interest which may or may not exist for the utilization of multicrodentialied allied health manpower in rural hospitals.

2.1 It is a good idea to have allied health prepared to work in more than one area in a rural hospital.

2.2 It is a good but impractical idea to have allied health workers prepared to work in more than one area in rural hospitals.

2.3 Allied health personnel should be prepared to function but not necessary to be credentialed to function in more than one area in a rural hospital.

2.4 Allied health personnel should not work in other areas in the hospital unless they are credentialed to do so.
2.5 Allied health personnel who work in this hospital would be interested in obtaining credentials in other allied health areas.

2.6 The administration of this hospital would be interested in utilizing allied health personnel in more than one area in the hospital.

Having a person prepared to function in more than one allied health area would:

2.7 Be cost effective.

2.8 Increase productivity.

2.9 Assist with personnel retention.

2.10 Assist with recruitment of personnel.

2.11 Improve job satisfaction.

3.0 To determine if credentialed allied health workers in rural hospitals are interested in acquiring another allied health credential and/or career.

Credentialed allied health workers in rural hospitals would like to acquire educational preparation in another allied health area of:

3.1 Medical laboratory.

3.2 Respiratory therapy.

3.3 Radiologic technology.

3.4 Other ____________________________.

M Placed or Reorganized under Obj. 2
M Questionnaire #2
Statements added on Questionnaire #2

3.1 3.5
3.2 3.6
3.3 3.7
3.4 3.8
3.5 Additional education in another allied health area would increase the professional challenge for allied health personnel in rural hospitals.

3.6 Education in another allied health area would contribute to increased job satisfaction.

4.0 To determine factors which could affect the utilization of multicredentialed allied health workers in rural hospitals.

Multicredentialed workers could best function:

4.1 On the day shift.
4.2 On the afternoon shift.
4.3 On the night shift.
4.4 On the weekends.
4.5 On call.
4.6 On holidays.
4.7 As backup help in case of an emergency or personal leave situation.

Multicredentialed workers could best be utilized in:

4.8 Respiratory therapy and medical laboratory combination.
4.9 Medical laboratory and radiology combination.
4.10 Respiratory therapy and radiology combination.
4.11 Other.

Reorganized under Obj. #2
Factors which could impede the utilization of multicredentialed allied health workers in rural hospitals include:

4.12 Credentialing requirements.

4.13 Existing job descriptions.

4.14 Traditional methods of organizing and supervising the various allied health departments in the hospital.

4.15 The educational preparation of or persons to function in more than one allied health area.

4.16 Professional turf.

If allied health workers were prepared and credentialed to function in more than one allied health area in the hospital, they should:

4.17 Receive double pay.

4.18 Receive pay comparable to 1½ persons.

4.19 Receive regular pay plus hourly pay for time spent working in a second specialty area.

4.20 Receive no extra pay.

5.0 To identify factors which could facilitate or impede the acquisition of additional education preparation for persons in another allied health career.

Obstacles to obtaining additional education which allied health personnel would encounter includes:

5.1 Money.

5.2 Work responsibilities.
5.3 Family responsibilities.

5.4 Travel.

5.5 Time taken from personal and community activities.

5.6 Having to repeat courses previously taken.

5.7 Not receiving credit for work experience.

5.8 Relevancy of the education received.

If an educational program were developed which would enable allied health personnel to acquire another allied health career, it should utilize a delivery system which would involve:

5.9 Weekly lecture sessions.

5.10 Independent study.

5.11 Independent study plus weekly meetings.

5.12 Weekend classes.

5.13 Opportunities to test out of courses.

Allied health personnel would be able to participate in educational programs if they did not have to travel more than:

5.14 1-5 miles.

5.15 5-10 miles.

5.16 10-15 miles.

5.17 15-20 miles.

5.18 20-30 miles.

5.19 30-40 miles.
Hospitals should assist the allied health worker who desires to obtain additional education by providing:

5.20  Tuition reimbursement.  
5.21  Time off with pay to attend school.  
5.22  A bonus upon completion.
DELPHI QUESTIONNAIRE #2

Level of Agreement Scale

| SA | Strongly Agree | 5 |
| A  | Agree          | 4 |
| N  | Neutral        | 3 |
| D  | Disagree       | 2 |
| SD | Strongly Disagree | 1 |

### OBJECTIVES & SUPPORTING STATEMENTS

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<tbody>
<tr>
<td>1.0</td>
<td>To determine if a shortage of credentialed allied health personnel exists in rural hospitals and to identify some possible causes of.</td>
<td>5</td>
<td>4</td>
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<td>2</td>
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<tr>
<td>1.1</td>
<td>A shortage of credentialed allied health personnel exists in some rural hospitals.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>1.2</td>
<td>There are funded vacant positions for credentialed allied health personnel in my hospital.</td>
<td>5</td>
<td>4</td>
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</table>

Shortages in the following allied health specialties exists in some rural hospitals:

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<tbody>
<tr>
<td>1.3</td>
<td>Radiologic technology.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>1.4</td>
<td>Respiratory therapy.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>1.5</td>
<td>Medical laboratory.</td>
<td>5</td>
<td>4</td>
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<td>2</td>
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<tr>
<td>1.6</td>
<td>Other ____________________</td>
<td>5</td>
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</table>

Factors which may be responsible for shortages of credentialed allied health personnel in rural hospitals, when and if shortages do exist, include:

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<tbody>
<tr>
<td>1.7</td>
<td>The location of allied health education programs in that persons living in rural areas may be unable and/or unwilling to leave home for training.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</table>
Level of Agreement Scale

<table>
<thead>
<tr>
<th>OBJECTIVES &amp; SUPPORTING STATEMENTS</th>
<th>SA</th>
<th>A</th>
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<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 Difficulty in recruiting credentialed allied health personnel for employment in rural hospitals who have been trained in urban areas and larger hospitals.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1.9 Insufficient work loads in some rural hospitals which do not economically justify the full-time employment of credentialed allied health personnel who have been trained to work in only one allied health specialty area.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>1.10 High turnover rates of credentialed allied health personnel in some rural hospitals.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>Turnover of personnel not only affects the productivity of workers as well thereby contributing to the overall rural allied health manpower problem. Some possible causes of turnover, when and if it does exist, includes:</td>
<td>5</td>
<td>4</td>
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</tr>
<tr>
<td>1.11 Inability to fully utilize the abilities of the highly skilled allied health specialists in that much of the work done in rural hospitals is &quot;routine&quot; with the more &quot;interesting&quot; cases being sent to larger hospitals.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1.12 Lack of opportunities for career advancement.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1.13 Lack of opportunities for career mobility.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1.14 Lack of recognition of work performance.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1.15 Lack of opportunities for additional job responsibilities.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
</tr>
<tr>
<td>1.16 Inadequate economic returns.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>2.0 To determine if an interest exists for the utilization of credentialed allied health workers in more than one allied health area in the rural hospital.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<tr>
<td>OBJECTIVES &amp; SUPPORTING STATEMENTS</td>
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<tr>
<td>2.1 It would be helpful to have credentialed allied health workers prepared to work in more than one allied health area in the rural hospital.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.2 It would be impractical to have credentialed allied health workers working in more than one allied health area in the rural hospital.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.3 Credentialed allied health workers do work in more than one allied health area in some rural hospitals.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.4 Allied health personnel should not work in more than one allied health area unless they are fully credentialed to do so.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.5 The administration of this hospital would be interested in employing credentialed allied health personnel who could work in more than one allied health area in the hospital.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>Having persons prepared to function in more than one allied health area in a rural hospital would:</td>
<td></td>
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<tr>
<td>2.6 Improve the utilization of existing credentialed allied health personnel.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.7 Improve the retention of credentialed allied health personnel.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.8 Be cost effective.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.9 Provide increased career options and career mobility for credentialed allied health workers.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.10 Result in improved economic benefits for credentialed allied health personnel.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tr>
</tbody>
</table>

Some combinations of allied health service areas in which credentialed allied health workers could be utilized include:
Level of Agreement Scale

<table>
<thead>
<tr>
<th>OBJECTIVES &amp; SUPPORTING STATEMENTS</th>
<th>SA</th>
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</thead>
<tbody>
<tr>
<td>2.11 Respiratory therapy and medical laboratory.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.12 Medical laboratory and radiologic technology.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.13 Respiratory therapy and radiologic technology.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2.14 Other</td>
<td></td>
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</tr>
<tr>
<td>3.0 To determine if an interest exists on the part of credentialed allied health workers to acquire a second allied health career. (This section of the questionnaire will be answered by allied health workers only.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.1 I would like to work in more than one allied health area in a rural hospital.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.2 I would like to have increased career options and mobility in my work.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I would like to be prepared and credentialed to work in a second allied health area such as:</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>3.3 Medical laboratory.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.4 Respiratory therapy.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.5 Radiologic technology.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.6 Other</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Additional education in another allied health career would:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.7 Contribute to increased job satisfaction for me.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3.8 Make working in a rural hospital more challenging and interesting.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
OBJECTIVES & SUPPORTING STATEMENTS

4.0 To identify factors which could affect the utilization of credentialed allied health personnel in more than one area in rural hospitals.

<table>
<thead>
<tr>
<th>Level of Agreement Scale</th>
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<tbody>
<tr>
<td>SA N D SD</td>
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<tr>
<td>(5) (4) (3) (2) (1)</td>
</tr>
</tbody>
</table>

Multicredentialled allied health workers could best be utilized:

4.1 On the day shift.

4.2 On the afternoon shift.

4.3 On the night shift.

4.4 On the weekends.

4.5 On call.

4.6 On holidays.

4.7 As backup help in case of an emergency or personal leave situation.

Factors which could impede the utilization of credentialed allied health personnel in more than one allied health area in the rural hospital include:

4.8 Credentialing requirements.

4.9 Reimbursement requirements of third-party payers.

4.10 Traditional staffing patterns.

4.11 Keeping job knowledge and skills proficiency current in more than one allied health specialty.

4.12 Negotiated union contracts.

If credentialed allied health workers were prepared to work in more than one allied health area, they should:

4.13 Receive a higher base salary.
### Level of Agreement Scale

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<tr>
<th>OBJECTIVES &amp; SUPPORTING STATEMENTS</th>
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</tr>
</thead>
<tbody>
<tr>
<td>4.14 Receive differential pay for the time spent working in a second allied health area.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5.0 To identify factors which could affect the acquisition of additional education for persons desiring another allied health career.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tbody>
</table>

Obstacles to obtaining additional education could include:

- **5.1 Money.**
- **5.2 Work responsibilities.**
- **5.3 Travel.**
- **5.4 Having to repeat courses previously taken.**
- **5.5 Not receiving credit for work experience.**

Allied health personnel would be more apt to participate in educational programs if they did not have to travel more than:

- **5.6 10-20 miles.**
- **5.7 21-30 miles.**
- **5.8 31-40 miles.**
- **5.9 41-50 miles.**

Allied health personnel currently employed in rural hospitals would be more likely to pursue additional education if the following assistance could be made available by hospitals:

- **5.10 Tuition reimbursement plan with stipulated employee obligation.**
- **5.11 Financial assistance on an individual basis only if the allied health worker remains employed at the same hospital for a specified period of time upon completion of the educational preparation.**
- **5.12 Flexibility in scheduling work hours.**
APPENDIX E

Third DELPHI Probe
March 16, 1981

Dear [Name],

Thank you so much for your continued assistance in developing a questionnaire which will be used to gather information about the need for and interest in "multicredentialed" allied health personnel in rural hospitals. You have been most cooperative and have made it possible to obtain return rates of 87% on round one and 97% on round two. It appears that this is the third and last round of the questionnaire for you to complete.

The analysis of the previous DELPHI round showed a response which indicated a very large percentage of agreement with the statements in the questionnaire. However, some discrepancies remain which really should be answered if the DELPHI procedure is to be used appropriately. In addition, answers to these discrepancies will make for a more valid and reliable survey instrument. I also feel that even if only a small percentage of you remained neutral or disagreed with statements it was significant as each of you have a unique contribution to make. These "minority" discrepancies are also being pursued because of the lack of information on the use of the multicredentialed or the multicompetent concept. So please bear with me one more time.

There are two enclosures for you to complete and return. Enclosure A, which represents the "discrepancies" on Questionnaire #2, and Enclosure B, representing "demographic" data on the panel members.

ENCLOSURE A

In analyzing questionnaire #2 and in talking with some of you, I got the impression that there may have been some confusion as to WHAT YOU WERE BASING YOUR RESPONSES TO THE STATEMENTS ON. (?) Please keep in mind the following:

1. We are attempting to DEVELOP A QUESTIONNAIRE which will be sent to allied health practitioners/employees and employers in rural hospitals. We are SEEKING THEIR OPINIONS ON THE NEED FOR AND USE of multiskilled allied health practitioners.

2. When YOU respond to the statements in the questionnaire, YOU should in essence be saying to me:

"I agree or disagree that THIS STATEMENT WILL OBTAIN INFORMATION needed to determine IF multiskilled allied health personnel are indeed needed."

Remember, the DELPHI approach is seeking a CONSENSUS OF AGREEMENT from this panel as to the SUITABILITY OF THE STATEMENT FOR THE FINAL QUESTIONNAIRE. At this time your opinion and my opinion about the multiskilled concept is insignificant.
We want to find out what employers and employees think about the concept—OK?

Instructions for the Completion of Enclosure A

Each statement you responded to on Questionnaire #2 was reviewed. Those statements which you marked "N" or "D" or "SD" have been identified with a red X.

Please review each of the statements identified with a red X and re-evaluate your position toward the statement.

1. Please revise the "N" responses to either agree or disagree status. If your position is to remain "N," then mark it as such and make a brief statement why you remain neutral toward the statement.

2. Please evaluate any disagreement positions. In essence, this says you have a "second" chance to change your answer from a disagreement status to an agreement status. If you do NOT elect to change to an agreement status, then mark the disagreement status as such and make a brief statement why you disagree with the statement.

REMEMBER TO ANALYZE THE STATEMENTS IN TERMS OF THEIR BEING INCLUDED ON THE FINAL SURVEY INSTRUMENT.

ENCLOSURE B

Demographic Data. All information provided is confidential. You as a panel member remain anonymous to each other while the DELPHI process is being completed. A list of the panel members with general but necessary demographic data will be displayed in the final study. If you do not care to be identified by NAME, please indicate such (see attached form).

Once again, I wish to thank you for giving me your time, energy and support in this endeavor. A summary of the results of the completed study will be forwarded to you when the "happy" day arrives.

Sincerely,

Annabel Bauer

Please return by
DEMOGRAPHIC INFORMATION FROM DELPHI PANEL

Instructions:

All information provided is confidential. You as a panel member remain anonymous to each other while working on the questionnaire. A list of the panel members with the necessary demographic data will be displayed in the study itself. If you do not care to be identified by name, please indicate so.

Please proceed to fill in the following statements.

1. Name (optional) __________________________

2. Place of employment __________________________

3. Address of employment __________________________

4. Present position/title __________________________

5. Which educational program best describes your educational preparation?
   - Hospital training program __________________________
   - Vocational Technical School __________________________
   - Community/Junior College __________________________
   - Senior College __________________________
   - Masters program __________________________
   - Doctoral study __________________________
   - Other __________________________

6. Do you hold professional credentials in the allied health or health care field?  __ Yes  __ No

   If yes, please identify the professional credential(s) __________________________

7. How many years have you been involved with the health care field in general? __________________________

8. How many years have you been involved with allied health education? __________________________
9. Which of the following best describes what you are currently doing in your work?

Allied health practitioner

Allied health educator

Administrator of allied health education

Administrator of health care facility

Research and development

Other

10. What has been your experience with multicompetent or multicro- dentialed health care personnel?

I am one

I utilize them in my facility

I administer educational programs preparing multicompetent/cre- dentialed personnel

I teach in multicompetency programs

I work in research and development relative to multicompetent personnel

I provide instructional support for multicompetent personnel educational programs

I have no experience but am familiar with the concept

Other

11. Which of the following phrases best describes your opinion toward having allied health personnel prepared and credentialed to work in more than one allied health specialty?

Agree Neutral Don’t know Disagree

I would like to be informed of the results of the study

Yes No

3-12-81
APPENDIX F

Directions Given to Personnel Directors for the Distribution and Follow Up of Nonresponding Study Participants
June 21, 1981

Dear Colleague:

Hello! Here are the surveys which I discussed with you on the telephone a short time ago. Please note that there is a code letter and number in the upper right-hand corner of the cover page of each survey. The code is as follows:

<table>
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<tr>
<th>Code Letter</th>
<th>Code Number</th>
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</thead>
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<td></td>
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<tr>
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The number is for purposes of a follow-up by myself in case personnel need to be reminded to return the survey. Distribution of the survey is as follows:

2 RAT surveys to two persons in radiology
2 ML surveys to two persons in the medical laboratory
1 RET survey to a person responsible for respiratory therapy
1 HA survey to the hospital administrator

I am also asking if you would record the name of the person you give each survey to according to the code (see below) and keep in your possession until August 7, 1981, at which time they can be destroyed. This is necessary if I have to follow up on the survey to have it returned.

Please remember that I am not interested in the identity of the person—only if it is necessary to do a follow-up.
Thank you so much for your cooperation and assistance. I fully realize how you people are bombarded with forms and the like. However, I believe that input from persons working in the health care field is absolutely essential if effective health manpower training programs are to be provided. I can be reached at (715) 836-3952 (Collect) if there are any questions and/or concerns.

Sincerely,

Ann B. Bauer
Supervisor of Allied Health
APPENDIX G

Follow-Up Letter to Nonresponding Study Participants
July 31, 1981

Dear Charles:

This is a follow-up of the survey you have been requested to participate in regarding multicredentialed allied health technicians in rural Wisconsin hospitals. The responses to the questionnaire are coming in good. However, I have not received yours as of yet. The input from as many health care personnel as possible will provide a more valid and accurate description of the opinions regarding the use of multicredentialed allied health persons in rural hospitals.

Would you please take a few minutes of your time to complete and return the enclosed questionnaire by August 10, 1981.

Your assistance is needed and greatly appreciated.

Sincerely,

Ann B. Bauer, Ed. SP.
Supervisor of Allied Health

Enclosure
APPENDIX H

Summary of Narrative Data from Study Respondents
Narrative Input from Hospital Employers (Administrators)


Responses to Some Possible Causes of Personnel Turnover:

- Lack of social and cultural activities
- No work for spouses
- Low pay
- On call responsibilities
- Persons tend to stay where they are trained
- High turnover rates exist in metro areas

Part II. Interest in the Utilization of Multicredentialed Allied Health Personnel in Rural Hospitals.

Responses to Factors Interfering with the Utilization of Multicredentialed Personnel:

- Anything in a hospital
- Professional jealousy

Responses to Some Combinations of Allied Health Services:

- Cardiac rehabilitation and respiratory therapy
- Business office skills and allied health
- Physical therapy aides and others
- Laboratory and x-ray

Part III. Demographic Data.

Responses to Areas Study Participants Worked in Hospital Other than the One Prepared and Credentialed for:
Administration, medical records and accounting
Orderly and personnel
Emergency room
Nurse aide
Radiologic technology
Medical laboratory
Management engineering

Responses to: If there was anything more which would help in developing a good allied health training program, please list:

Utilize independent study
Utilize preceptorship
Conduct classes at hospital sites so it is more accessible to students
Give credit for prior course work
Provide proficiency testing
Narrative Input from Radiologic Technology Respondents


Responses to Shortages in Other Specialties in Rural Hospitals:

Registered nurses
Emergency medical technicians
Physical therapy personnel

Responses to Possible Causes of Shortages:

Low salaries
Rural location
Too much call on evenings, nights and weekends

Responses to Additional Comments:

Rural hospitals are not progressive
Rural hospitals have to compete with larger hospitals
Part-time help is difficult to find
Limited access to new technics in one's own field in rural hospitals
Rural hospitals are too conservative
Stagnation occurs due to routine work loads
Limited job opportunities for spouse in rural areas
Limited opportunities to meet future spouse in rural areas
Limited social life in rural areas
Limited activities for shopping
Lack of career advancement opportunities
Part II. Interest in the Utilization of Multicredentialed Allied Health Personnel in rural Hospitals.

Responses to Additional Comments:

Is it in the interest of good care?

Can a person be pulled in two directions?

Departments are too busy at the same time

Multicredentialed persons could not be paid enough for their value

Being in two areas could limit effectiveness

I prefer continuing education in my own field

One would become substandard in two fields

Work is too technical to be credentialed in more than one field

Could improve personnel utilization but would create staff accountability problems

Need strong training in one area, no "smattering" in all areas

Joint Commission on Accreditation regulates regular licensed technologists

A person could work in more than one area in doctors' offices

Responses to Possible Combinations of Allied Health Services:

Registered nurse combinations

Electrocardiography and x-ray

Nuclear medicine and x-ray

Respiratory therapy and electrocardiography

Emergency medical technician and nursing

Certified laboratory assistant, radiology and electrocardiography

Anesthesia and respiratory therapy

Registered nurse and social work
Operating room and medical records

Part III. Factors Which Would Affect the Utilization of Multicredentialed Allied Health Personnel.

Responses to Additional Comments:
Salary should be based on qualifications
Higher base pay could cause personnel conflicts
Personnel should be paid for flexibility
Pay is too low therefore cross training could increase work without an increase in pay
Pay could be increased with additional cross training

Part IV. Additional Areas in Which Allied Health Respondents Were Interested.

Responses to:
Emergency room
Registered nursing
Nuclear medicine

Responses to Additional Comments:
Work is boring at times
It would be a challenge to have more training
My job is challenging enough
Too much study would be involved
Job proficiency is important
Being multicredentialed would increase call responsibility
There would be more satisfaction if further education in my own field
I prefer administration and management
Even learning about other health careers would be beneficial
I am already multicredentialed
Too much cross over working of nonqualified personnel keeps wages low
I currently work in radiology and ultrasound
I work in the laboratory, radiology and electrocardiography and like the versatility

Part IV. Demographic Data

Responses to #69
I feel we can help other departments in nontechnical work
Respiratory therapy
Medical laboratory
Orderly, nurse aide
Electrocardiography
Medical records
Medical transcription
Pharmacy
Physical therapy

Responses to #74: If there is anything more which you feel will help us in developing a good allied health training program, please list:

Please concentrate on good education in one field
Proficiency is important
Give credit for experience
Worker should be people oriented
Worker needs to be humanistic
Skills are underutilized in rural areas
Special procedures not needed in rural areas
Learning technical skills takes much time
The quality of work may decrease if persons are expected to work in more than one area

Responses to Shortages in Specific Allied Health Areas:

- Physical therapy
- Nursing, registered and practical nurses
- Emergency medical technicians

Responses to Possible Causes of Personnel Shortages:

- Pay

Responses to Additional Comments:

- Challenges and incentives are limited
- There could be increased job responsibilities without an increased demand on time

Part II. Interest in the Utilization of Multicredentialled Allied Health Personnel in Rural Hospitals.

Responses to Some Combinations of Allied Health Services:

- Could cause conflict
- Better if each area was combined with emergency medical care

Responses to Additional Comments:

- Registered nurse and radiologic technologist
- Respiratory therapist and cardiology
- Respiratory therapy and Echocardiography (sonography)
- Respiratory therapy and electrocardiography, electroencephalography

Combinations could work but not combinations of uncertified persons
Part III. Factors Which Could Affect the Utilization of Multi-credentialed Allied Health Personnel.

Responses to Additional Comments:

Many employees must have a combination of jobs in order to have full-time work.

Part IV. Additional Areas in Which Allied Health Respondents Were Interested.

Responses:

I would like to be prepared and credentialed to work in: Electrocardiography, electroencephalography and echocsonography

Physical therapy

Anesthesia

Cardiology

Emergency medicine

Responses to Additional Comments:

Respiratory therapy and registered nursing could be combined

I'm going broke working in health care

Part V. Demographic Data, Study Participants.

Responses to Areas Worked in Other Than the One in Which You Have Been Prepared and Credentialed:

Electrocradiography and orderly

Respiratory therapy and power plant

Nurse aide, central supply and laboratory

Endoscopy and surgical assistant

Blood gas laboratory
Radiologic technology
Emergency room and surgery
Infection control and dietary
Intravenous therapy

Responses to Additional Comments; if there was anything more

Which Would Help in Developing a Good Allied Health Training Program, Please List:

Home study courses
Teach student morals
Have clinical experience in small hospital
Would like to see an external degree program
Develop satellite allied health programs
Provide credit for work experience
offer night courses
make courses accessible and close to work
I like the idea of having training without leaving the hospital
Could offer training in pharmacy
Part I. Existence of Shortages of Credentialed Allied Health Personnel in Rural Hospitals.

Responses to Existence of Shortage in Other Specialties in Rural Hospitals:

Nursing
Physical therapy

Responses to Possible Causes of Shortages of Credentialed Allied Health Personnel:

Working weekends
Frequent on call responsibilities
Low salaries
Heavy work schedules
Fluctuating work schedules
Poor personnel benefits

Responses to Possible Causes of Personnel Turnover:

Excessive night call responsibilities
Limited opportunities for advancement
Limited opportunities for entertainment
Limited number of persons to share work responsibilities with rural areas lacking shopping and cultural benefits
Low pay
Excessive hours of work
Fluctuating shift assignments
Limited recognition or acknowledgment of work performance
Low pay

Too much call responsibilities in small hospital

Part II. Interest in the Utilization of Multicredentialed Allied Health Personnel.

Responses to Additional Comments:

Increased work loads would result in increased stress. This would be detrimental to patient care and employee moral.

The use of multicredentialed personnel would depend on the hospital's activity.

How can you be in two places at one time?

Not efficient to have multicredentialed persons in emergency situations.

Not safe to have multicredentialed persons in emergency situation.

Multicredentialed persons would not be too well trained in any field.

If personnel were multicredentialed, they would be taken advantage of and "worked to death".

One person cannot cover two critical areas in an emergency.

Laboratory people are too busy to think of working in more than one area.

It may be all right in a physician office or clinic but the work is too complex in hospital settings.

Should not be allowed even if credentialed in more than one field.

The work to be performed in each allied health area is too specialized to "know it all".

Laboratory and radiology were formerly combined in some situations,
but now the situations are too difficult. Having a person working in more than one area would not be practical.

Part III. Factors Which Could Affect the Utilization of Multicredentialed Allied Health Personnel in Rural Hospitals.

Responses to Additional Comments:

Need specific job descriptions
May need more supervision
There would be a conflict of interest
Patient care would suffer; cannot do blood gases and x-rays at the same time
Wages should be determined by training and credentials
Multicredentialed allied health personnel could be used on all shifts at all times

Part IV. Interest in Acquiring an Additional Allied Health Career.

Responses:

Emergency medical technician
Registered nursing
Might be for others, but not for me
Would make work much more challenging
Would create more stress
More money would make for greater rewards
Sometimes we are not busy enough to keep one person busy
Difficult to know one area well enough without having to know the details of a second allied health area
No time to work in another field
Laboratory personnel already spread too thin in rural hospitals

Some people might do it, not for me at my age

Difficult to perform enzymes, blood gasses, x-rays and EKGs at one time in an emergency situation

Part V. Factors Which Could Affect the Acquisition of Additional Education.

Responses:

Difficult to obtain education in one's own specialty

Part VI. Demographic Data.

Responses to Areas Study Participants Work in Other Than the Field Prepared and Credentialed for:

Respiratory therapy and as a nurse aide
Medical laboratory and radiology
Radiology
Cytology
Nursing service
Assisted in the emergency room, starting intravenous solutions
Physical therapy

Responses to: If there was anything more which would help in developing good allied health training programs, please list:

Encouragement
Correspondence courses
Have students spend time in rural hospitals
Make educational programs accessible
Need increased opportunities for continuing and graduate education
I disagree with this type of training

Limited opportunities exist for advancement

Need more recognition, more pay and more responsibilities

Rural hospitals are a challenge; I worked in one for 28 years

Hospitals would take advantage of a person with multicredentials
APPENDIX I

Demographic Data Describing Study Participants
APPENDIX I

Demographic Data Describing the Study Participants

65. Population of place of residence.
   1,500-2,500: 98; 2,500-5,000: 83; 5,000-7,500: 50; 7,500-10,000: 49.

66. Size of hospital of employment.

67. Allied health specialty.
    Respiratory Therapy: 48; Medical Laboratory: 90;
    Radiologic Technology: 104.

68. Preparation for working in health care field.
    Hospital Training: 96; One yr. VTAE: 41; OJT: 18; Two yr. grad: 79;
    BS or BA: 90; Omit: 41.

69. Work in areas in hospital other than area of preparation and credentialing.
    Yes: 104; No: 174; Omit: 11.

70. Length of employment in present allied health specialty.
    Number of years: Less than one: 11; 1-5: 71; 5-10: 73; 10-15: 60;
    Over 15: 66; Omit: 8.

71. Number of times employment in health field changed.
    Once: 91; Twice: 64; Three: 57; Four: 30; Five: 11;
    Over five: 10; Omit: 29.

72. Nature of work load in place of employment.
    Fluctuating: 205; Light: 8; Consistently heavy: 22;
    Differs on shifts: 9; Differs in seasons: 48.

73. Membership in professional allied health organization.
    Yes: 194; No: 88; Omit: 7.

74. Distance from a university or VTAE campus.
    Miles: Within 5: 32; 5-10: 11; 10-20: 65; 20-30: 83; 30-40: 44;
    Over 40: 45.
APPENDIX J

Likert Component Calculations for Items 1-14; Existence of Credentialed Rural Allied Health Shortages
Appendix J

Likert Component Calculations for Items 1-14; Existence of Credentialed Rural Allied Health Shortages

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APPENDIX K

Likert Component Calculations for Items 15-27; Interest in the Utilization of Multicredentialed Allied Health Technicians in Rural Hospitals
## Appendix K

### Likert Component Calculations for Items 15-27; Interest in the Utilization of Multicredentialed Allied Health Technicians in Rural Hospitals

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APPENDIX L

Likert Component Calculations for Items 29-42; Factors Which Could Affect the Utilization of Multicredentialed Rural Allied Health Personnel
Appendix L

Likert Component Calculations for Items 29-42; Factors Which Could Affect the Utilization of Multicredentialled Rural Allied Health Personnel

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APPENDIX M

Likert Component Calculations for Items 51-64; Factors Which Could Affect the Acquisition of Additional Education in Another Allied Health Career
Appendix M

Likert Component Calculations for Items 51-64; Factors Which Could Affect the Acquisition of Additional Education in Another Allied Health Career

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