

THE EFFECTIVENESS OF TELENET FOR TRAINING
SCHOOL FOODSERVICE EMPLOYEES

by

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B.S., College of St. Elizabeth, 1978

A MASTER'S THESIS

submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE

Department of Dietetics, Restaurant
and Institutional Management

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1981

Approved by:


Major Professor

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ACKNOWLEDGMENTS

Sincere appreciation and gratitude is extended to Dr. Deborah Canter and Dr. Allene Vaden for the continuous time and expertise they contributed during the completion of this study. Appreciation is expressed to Dr. Richard Owens for serving as a member on my committee. Thanks is also expressed to Dr. Arthur Dayton for the statistical analysis of the data.

I would also like to thank my husband Frank for his encouragement and support throughout the duration of my time in graduate school. A very special thanks to my cooperative daughter, Gina.

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INTRODUCTION

The benefits of providing effective training programs for foodservice personnel have been widely acclaimed. Mitchell (1) maintained that a successful training program results in better quality foodservice operations, lower labor costs, and improved relations and better cooperation among foodservice workers. Hoglund (2) concurred that effective training can improve the quality of work performance, increase the rate of learning, reduce the number of accidents, and increase productivity.

With the enactment of Public Law 91-248 (3), the importance of training school foodservice personnel was recognized by Congress. That law provided up to 1 percent of the child nutrition program funds for nutritional training and education of workers, cooperators, and participants in these programs and for surveys and studies of requirements for child nutrition food programs.

Congress further acknowledged the significant role that training plays in the child nutrition programs in Public Law 95-166 (4) enacted in 1977. Section 19 states that ". . . many school food service personnel have not had adequate training in food management skills and principles, and many teachers and school food operators have not had adequate training in the fundamentals of nutrition of how to convey this information so as to motivate children to practice sound eating habits." As a result of the legislation, the Secretary of Agriculture was authorized to formulate and carry out a nutrition information and education program (NETP) through a system of grants to state educational agencies to provide for (a) instructing students with regard to the nutritional value of foods

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and the relationship between food and human health; (b) training school foodservice personnel in the principles and practices of foodservice management; (c) instructing teachers in sound principles of nutrition education; and (d) developing and using classroom materials and curricula.

In order to meet the increased need for education, Wedemeyer (5) contended that the new educational technology in teaching and learning must be utilized. He stated that one requirement of education is that it should be capable of operation any place where there are students, whether or not there are teachers at the same place at the same time. This requirement, he believed, is radical because of its incompatibility with conventional teaching. To achieve this requirement, the space-time barriers to learning must be broken without separating teaching from learning. Wedemeyer further stated that tools are available for accomplishing this separation.

Glueck (6) asserted that telelectures are useful in many settings that involve multiple site training. Beilis (7) concurred that telelecture is proving to be an increasingly valuable means for providing information to the public. According to Yeomans and Lindsey (8), telelecture is a low-cost technique which brings the lecturer to the audience by means of a telephone call. Speakers' voices are amplified through loudspeakers with equipment provided for members of the audience to talk directly with the lecturer. If desired, the speaker's picture can be projected on a screen to the viewers.

Telelecture has been used successfully in the training of foodservice personnel. Spears et al. (9) found that participants of a telelecture series and a workshop, with identical material in each medium, had attained the same level of competence upon completion of the course.

Gormican and Dickie (10) indicated that telelecture provided an opportunity for convenient instruction of foodservice employees in the state of Wisconsin which appeared to be highly popular among participants.

Due to the existing need for training school foodservice personnel in Kansas, Nutrition Education and Training Program (NETP) funds were provided to Kansas State University (KSU) in the fall of 1979. These funds were to be utilized in the evaluation of a telelecture course for foodservice employees entitled "Nutrition Update for School Foodservice Personnel." The course was taught in the spring of 1980 and the purpose was to introduce school foodservice workers to basic nutrition, particularly in relation to the school age child, with emphasis also on correct principles of quantity food production which would preserve and enhance the nutritional quality, palatability, and acceptability of food products. A total of 185 school foodservice workers participated in the course in 29 locations throughout the state of Kansas.

The objective of this research was to study the effectiveness of telelecture as a method of providing training to school foodservice personnel. Participants in the course were asked to complete a pretest, posttest, and retention test to assess cognitive learning of course content. Also, effectiveness was measured by assessing the extent of involvement in nutrition-related activities prior to and following the telelecture course.

REVIEW OF LITERATURE

Principles of Learning

According to Commins and Fagin (11) learning is a process or sequence of activities leading to a modification of functional tendencies. McGeoch (12) defined learning as a change in performance which occurs under the conditions of practice. Cantor (13) believed that all genuine learning takes place when the learner has a problem, becomes dissatisfied, and discovers through his/her own effort how to resolve the problem.

Gagne (14) defined eight types of learning:

1. "Signal learning" in which an individual learns to respond to a signal.
2. "Stimulus-response learning" in which the learner acquires a precise response to a discriminated stimulus.
3. "Chaining" in which two or more stimulus-response connections are acquired.
4. "Verbal association" in which chains that are verbal are learned.
5. "Multiple discrimination" in which an individual is able to make different identifying responses to a variety of stimuli, which may resemble one another in appearance.
6. "Concept learning" in which a learner becomes capable of making a common response to a class of stimuli that may differ from each other widely in physical appearance.
7. "Principle learning" in which a learner distinguishes from a chain of two or more concepts.
8. "Problem solving" in which an individual uses knowledge from previously acquired principles to arrive at a solution.

Bloom (15) disclosed three major domains of learning: cognitive, affective, and psychomotor. Cognitive objectives place an emphasis on

remembering or reproducing something previously learned. Affective objectives stress feelings, emotions, or a degree of acceptance or rejection, and psychomotor objectives emphasize muscular or motor skill and neuromuscular coordination. Bloom indicated that these taxonomies of educational objectives are hierarchial, meaning that objectives at higher levels presuppose learning at lower levels.

Schroeder (16) stressed the difficulty of teaching when attitudes are involved. To change an attitude, a careful study of the motives and other psychologic factors may be necessary, followed by a detailed plan of action to take place over a period of time.

Commins and Fagin (11) distinguished three types of changes (cognitive, motivational, and behavioral) that occur in the learning process. They emphasized that all of these changes occur together in learning and are interactive.

Cantor (13) contended that educators need to acquire insight into the knowledge of personality development and the process of learning in order for training to be effective. The sequence of steps involved in the learning process has been identified by several individuals (11, 17, 18). Commins and Fagin (11) viewed the learning sequence as a four step process in which the individual first becomes ready to respond, meets a learning situation, interprets the situation and responds according to his/her needs, and lastly, assesses if the response elicited was desired so that in future similar situations a determination can be made on whether or not to handle the situation in the same manner.

Gammill (17) stressed that training must be based on considerable knowledge of human beings and principles affecting how they learn. He has developed a learning theory based on the following premises:

1. The learner must be motivated.
2. The learner must be ready to learn, *understand what is to be learned*, and have no resistance to learning.
3. The learner must direct his/her attention toward the learning process.
4. Activities must be provided which enable the learner to practice.
5. The learner must gain satisfaction toward the accomplishment of the task.

Craig (18) maintained that the learning process is composed of a number of steps which include attention, interest, confidence, desire/want, action, and satisfaction.

The importance of the visual factor in the teaching process has been emphasized (16, 18). Schroeder (16) asserted that good communication which involves verbal, visual, emotional, and spiritual dimensions is essential in the teaching of a skill. Craig (18) stated that according to the data from the 1940 Socony Vacuum Company studies 85 percent of what is learned is done *so through the eyes* and only 10 percent through the ears. Their beliefs hold implications in the presentation of telelecture programs because the visual dimension of such a program may sometimes be deficient.

Jones (19) claimed that the learning process is affected by major groups of variables which include the nature of the material to be learned, presentation variables, reinforcement variables, the learning environment, and theories of instruction.

Several authors (11, 16, 20, 21) discussed conditions which facilitate learning in the teaching process. Commins and Fagin (11) identified conditions of a good learning situation. These consist of the following: providing suitable cues to the goals of the learner, providing distinctive

cues, grouping or patterning combinations of cues, and making inappropriate cues distinct. They further stated that the teacher can control the process of learning by motivating the learner, providing appropriate situations or experiences, teaching interpretive skills, providing for appropriate practice, and providing suitable consequences to the learner. Schroeder (16) examined ways in which learners can be motivated. He asserted that the most difficult motivator is knowledge itself. Other motivating devices include biologic or organic motives, social motives, security, and autonomous activities. Tough (21) maintained that the most common motivator for an adult learner is an anticipated use of application of the knowledge taught.

Spears (20) indicated that the team approach was used successfully in teaching adult learners. A single concept was selected for the course topic and participants were divided into small learning teams. After completing an intensive one-week course on purchasing, participants from this course revealed favorable responses toward this learning technique.

Possessing an awareness of the processes involved in learning holds implications for all teachers responsible for the planning and instructing of any type of educational activity. Craig (18) reported that due to the fact that the learning and change rate varies from one individual to another, teachers must recognize that the information must be adapted to individual learning patterns. He further stated that because all people do not go through all of the steps different training and teaching methods and techniques should be used at different points in the learning process. He also emphasized that leaders of training programs should involve the learners in planning, teaching, and evaluating because generally, the more a person is involved the more he/she will learn and

change. He concluded by stating that the material to be learned must meet a need or satisfy a desire. Cantor (13) concurred that when the trainee becomes actively involved in the training procedure learning can result. Hoglund (2) also maintained that trainees are more receptive to learning when their activities and demands are compatible with their abilities and interest and if the tasks they perform seem to be useful and necessary and bring personal satisfaction.

Training

Sheehan (22) asserted that a good training program has two purposes, developing skills and influencing attitudes. Training was defined by Gammill (17) as developing a multitude of habits in a group of individuals so that they will function as satisfactory employees.

Dinkin (23) believed the aims of training programs should be maximizing employee productivity and providing a process for aiding the individual employee in gaining more immediate personal satisfaction through the development of appropriate attitudes and action, knowledge, and skill. To reduce training time and eliminate any unnecessary instruction, Sandell (24) recommended that the total requirements of the job minus what the person already knows about the job equals what the person needs to be taught.

Planning Training Programs

Considerations in Planning. Gammill (17) reported that attention to training must be given in the following three areas:

1. The casual contacts which involve errands and odd jobs.
2. Development and learning of specific skills.
3. Development of people.

Some authors (17, 23) stressed that training is a continuous job that requires constant effort. Lester (25) emphasized the need for management to devote more analytical thinking to the identification of training needs and requirements in order to achieve maximum efficiency. According to Rummler (26), the key to effective training deals with asking the right questions. Rummler contended that by additional questioning of the problem, the trainer can guide the requestor to see better what the problem is, the real value of solving it, and the extent to which it can be solved by training. The trainer is then in a position to develop a course that is relevant and to know what will constitute success for the effort. The answers found in the questioning process make it possible to set priorities as well as to determine realistically what impact a training effort will have on job performance. Rummler concluded that training can have a positive effect on employees work performance in most situations.

Claycombe et al. (27), in a study designed to identify strengths and weaknesses in management skills and provide a basis for developing specialized supervisory training courses, found that training in personal communication with an emphasis on motivation is needed. Schweitzer and Gines (28) contended that a decision of how to train, prior to the implementation of a training program, needs to be based on data about the real training/learning needs of the employee.

Planning Steps. Sheehan (22) believed that managers and supervisors should discuss with their employees the needs and desires for training and then use this material in the planning of a training program. Gammill (17) stated that training often lacks concern for human values and that the need exists for working patterns of relationships that are not only technologically productive but humanly satisfying as well. Bounds (29)

expressed the importance of establishing reasonable measures of performance and accomplishment. Sandell (24) contended that employees should be given a detailed outline of what is to be learned for training to be more effective.

Newell (30) asserted that a pilot program should be given before the initiation of the training program. She further stated that an evaluation of the pilot program by both participants and trainers should occur so that the necessary prior revisions can be made in the training program.

Newell (30) identified several phases in the training program. One step in the development of a training program is the determination of objectives. The objectives according to Gines and Schweitzer (31) can be used to evaluate the success of the training program and can help clarify areas that need improvement. In the design phase, resources and strategies for training are determined. During the implementation phase, actual training takes place.

Another essential part of any training program is evaluation (31, 32). According to Hoglund (32), evaluation has a two-fold purpose. It points out the strengths and weaknesses of the curriculum as well as revealing the effectiveness of instructional techniques used. Schweitzer and Gines (28) stated that evaluation data can be utilized to determine if the objectives were met through training and if those objectives were appropriate to the real needs of the foodservice system.

Zacarelli (33) discussed the importance of explaining to employees why a specific task is important and gearing training sessions to the individual learner's ability. He believes that constant encouragement is essential to reinforce the employee's interest during the training program.

Utilization of Visuals in the Training Process. Hoglund (2) indicated that a trainer should use a variety of instructional materials to appeal to the employees interest. Demonstrations, cartoons, charts, posters, check sheets, and written guides also aid the trainees in learning at a more uniform rate and help them to develop a more cooperative attitude toward the work to be performed. Bounds (29) emphasized the importance of remaining aware of every existing tool of learning. The training resources were classified into four areas by Gines and Schweitzer (31):

1. Media--films, books, slides;
2. Personnel--planners, implementers, persons to formulate and evaluate the training program;
3. Information--data concerning various topics to be discussed;
4. Facilities and resources--classrooms, demonstration areas.

Training for Foodservice Employees

Childress (34) reported that at the Veterans Administration hospital in Washington employees receive on the job training through employee rotation and course work. The course work includes a supplemental training course in leadership for supervisors designed to increase their skill in management. Refresher courses also are offered for special groups such as bakers, meat cutters, and foodservice supervisors. These courses of two to six weeks are designed to provide the employee with additional training in their work, to emphasize supervisory and training responsibilities of first line supervisors, and to increase employees' effectiveness through standardization of procedures and the use of work saving techniques. The refresher courses include on-the-job experiences, lectures, and discussions.

Pelto and Sweatt (35) analyzed data from seventeen hospitals to determine if a relationship existed between the use of an organized personnel program and the relative stability of the work force. In eight dietary departments, classroom instruction was utilized as a method of training new employees while all seventeen of the hospitals employed an on-the-job training program. The authors found that in hospitals with turnover rates over 25 percent only two used classroom instruction for training personnel. In the remaining six dietary departments using classroom instruction, the findings revealed that fewer employees left the organization in the first two years of employment than in the other hospitals surveyed. They postulated from these data that classroom teaching could be used as a method of teaching policies and procedures as well as for continuing education for both new and old employees. Reduction in employee dissatisfaction and an improvement in morale were possible organizational benefits.

Hoglund (2) found that the job-breakdown method of instruction, in which specific tasks are broken down into all their component parts, is a useful instructional technique. It can assist the employee in performing the job in the manner they were instructed by organizing and clarifying steps in the operation.

Harwood and Brown (36) found that audio-visual aids were the least utilized of the teaching methods in both individual and group training programs in twenty Baltimore-Washington area hospitals. They believed, however, that these training aids could be developed and used successfully in many of the hospitals and even more extensively with the training of employees with little formal education. Jernigan (37) contended that

training systems should teach both theory and practice and should include lesson materials, films, and demonstrations.

The American Dietetic Association (ADA) (38) indicated that the knowledge of program planning, evaluation, and organization and management of educational systems and public health and community resources are necessary components for the teaching of nutrition education. The ADA (39) takes the position that nutrition education and foodservice management should be integrated into continuing in-service staff training.

According to Jernigan (37), a well-trained employee has both the means and motivation to take pride in their job. Harwood and Brown (36) found significantly lower turnover rates in hospitals using more indoctrination and orientation procedures and aids. A positive relationship also was revealed between the excellence of the indoctrination, orientation, and training programs and job satisfaction of hospital foodservice personnel.

Training for School Foodservice Personnel

Sheehan (22) contended that a worker with an understanding of the relationship between the school lunch program and the health of children is more likely to have a positive attitude toward food preparation and sanitation procedures. Bounds (40) maintained that more in-service training is needed for all school lunch personnel with emphasis placed on organization of work and management efficiencies. Brown (41) proposed developing a training handbook for school lunchroom personnel which includes clearly stated standards of performance.

Head's (42) study of school foodservice personnel revealed that 96 percent of the workers surveyed agreed that learning is important. A survey of 2,300 schools conducted by the Food and Nutrition Service and

Information Planning Associates, under contract with the United States Department of Agriculture, sought to obtain information on the level of education, experience, and training of school foodservice personnel (43). A desire for training was reported by 44 percent of employees. This interest in supplementary training courses increased up to the tenth year of work in school foodservice and then dropped significantly. Improving job performance, increasing knowledge, and learning new techniques were reasons cited by school foodservice employees for wanting more training.

Certification and Training. Martin (44) asserted that one of the most significant forces influencing school nutrition programs is the American School Food Service Association (ASFSA). The American School Food Service Association is a non-profit, professional organization representing state and local school foodservice directors, supervisors, managers, assistants, and other educational personnel throughout the United States (45). ASFSA's purposes include working for the highest standards in nutrition education and school foodservice programs and encouraging and developing the highest standards for school foodservice personnel through the provision of appropriate educational programs.

In 1975, the ASFSA Certification/Professional Growth Committee delineated the competencies needed by school foodservice personnel (46). Several professional growth components also were identified. One of these components which relates directly to school nutrition competencies is education. ASFSA believes that improvement and enlargement are needed for both formal and informal educational opportunities. Martin (44) contended the certification program administered by ASFSA has enabled many workers to receive the continuing education they desire.

In 1978 ASFSA's/Executive Board gave The School Food Service Foundation (TSFSF) control of the certification program for school foodservice personnel (46). TSFSF established a new policy requiring individuals interested in certification status to have been employed in school foodservice for a year prior to making application for initial certification (47). Also, a minimum credit must be earned prior to making application for certification.

Certification has served as an incentive to employees to attend nutrition education and training programs (48). Since the development of ASFSA's certification program, the number of persons receiving certification has increased greatly. The level of certification for ASFSA's members is dependent upon their level of education and experience. To remain certified, the member must earn a certain number of instruction hours which may be obtained in a variety of different ways.

Curry and Toma (49) maintained that certification for foodservice workers is a viable source for nutrition education. They found that personnel in South Dakota who had attended one or more of the certification classes performed higher on a true/false questionnaire than those with no attendance. Clingman (50) emphasized that training and certifying of foodservice managers is essential in providing increased food protection for the consumer.

State certification requirements for school foodservice managers in Nebraska mandate that a manager must complete 130 hours of instruction, 15 of which are in laboratory experiences in quantity food preparation (51). The School Food Service Department, Lincoln Public Schools, and Lincoln Technical Community College developed a program to assist foodservice employees in obtaining the necessary requirements. The Lincoln

Technical Community College offers 137 hours of instruction to foodservice personnel, 45 hours of which are laboratory experiences. Students are able to obtain the laboratory work in a secondary school in the area. This school provides the students with practical experiences by allowing them to utilize the foodservice facilities for laboratory work. Tuition is paid to employees participating in this program by the Lincoln School Food Service Department.

Eifler (52) reported that Pennsylvania developed opportunities for school foodservice personnel to obtain certification in 1957. Individuals wishing to complete certification must fulfill the general educational requirements, as well as an approved program of specialized preparation with courses in food and nutrition and institutional administration. A permanent certificate can be obtained only after an individual completes three years of successful experience as a school foodservice manager, as evidenced by a rating of satisfactory or better by the county or district superintendent.

An innovative training course entitled "Food for Youth" was developed in South Dakota (53), consisting of ten 30-minute filmed segments dealing with food preparation and nutrition aired once weekly on television. The course permitted South Dakota foodservice personnel to receive some of the necessary credit points needed each year to maintain certification.

A foodservice management certification program established in the state of California (54) was designed to develop competencies in financial management, organizational and executive management, personnel training, and production management. Ten units of the 20-unit certificate program are core courses in topics such as school foodservice administration,

finance, personnel management, and nutrition standards. The remaining ten are in courses chosen by the student with guidance from the program director.

Various Training Approaches. Ford (55) commented that the demonstration method and use of "Talk Shops" were highly acceptable in the presentation of information to school foodservice personnel at a one week school lunch training program. "Training in Depth" is a comprehensive training program in Georgia available to school foodservice managers (56). The intent is to improve the quality of school foodservices by providing the managers with minimum essentials in philosophy, content, skills, and understanding. The program utilizes vocational educational requirements as a basis for determining minimum policy needs. Classes are held in the local school district and are offered at a wide variety of times. Attendance is stressed because students must attend 90 percent of the hours to earn state credit for the course.

At the U.S.D. #233 in Olathe, Kansas, a vocational educational program was offered to foodservice employees (57) which met twice a week for 36 hours and dealt with topics such as nutrition education, menu planning, and menu calculations. Most effective techniques were found to be discussions among class members and individual experimentation with different methods and techniques. The basic role of the instructor was to serve as a facilitator of learning and a resource person. The students reacted favorably to this unstructured learning experience with the majority expressing a desire to continue with another class as soon as possible.

In the Hampton City Schools in Virginia (58), foodservice employees are encouraged to attend the variety of training programs offered by the

foodservice director. A typical training program includes a short film, announcements, short lectures, and mini-demonstrations. The training sessions usually are held on days when school is not in session. To stimulate intellectual growth further, employees are rewarded with a salary increase commensurate with each level of continuing education.

According to Carlson (59), the Lincoln public school system promotes the education of foodservice personnel by providing special workshops twice yearly. A workshop on sanitation and safety is scheduled prior to the opening of school and is mandatory for all school foodservice personnel. The second workshop is concerned with the skills necessary for specific areas such as payroll procedures or job descriptions and is available to all managers and assistant managers.

The University of New Hampshire has introduced an innovative method of training foodservice employees (60). A mobile learning center provides employees the opportunity to obtain training. The mobile learning center and its training programs were developed for the Food and Nutrition Service of the New Hampshire Department of Education. The learning center, which includes large demonstration facilities, a fully equipped kitchen, and an audio-visual center, usually remains in one location for approximately eight to ten weeks to allow ample time for all nearby employees and supervisors to attend classes. Alonzo contended that one of the major benefits of the learning center is the achievement of uniformity and consistency in training because personnel in all parts of the state are trained under similar conditions.

One activity made possible because of the NET program was the opening of the Institute of Nutrition Education and School Food Service in Massachusetts (61). This training facility provides classroom activities

in which the foodservice employee can learn by doing. Study units and visual aids also are available through the NET program to assist managers in the training of foodservice personnel.

Planning and Evaluation of Training Programs in School Foodservice.

Bunge (62) and Ninemeier (63) concurred that the amount of experience has an effect on the type of training which should be presented. Data indicated that participants with less experience gained more from training than the high experience group.

Bunge et al. (64) examined three groups of school lunch personnel in Iowa to determine the effects of an in-service training program for foodservice workers and the relationship of selected factors to the effectiveness of this training. They found that managers possessed significantly more job knowledge than did those workers in non-supervisory positions in seven subject matter areas. The authors contended that this substantiates the need for separate training sessions for supervisors and non-supervisors, at least in different subject areas. Also, level of education and nature of job responsibility may be related more positively to learning in on-the-job and other informal learning situations than to formally structured training programs. They further stated that the relationship of education to pretest and gain scores supports the need for preplanned systematic training programs for employees with lower educational backgrounds.

Ninemeier et al. (65) evaluated aptitudes of trainees related to learning from on-the-job and other experiences and to short-term retention. A school lunch training program was developed which consisted of three, five-day short courses for personnel working in Iowa school lunch programs. The groups of school lunch employees included a one-year

experimental group, a three-year experimental group, and a control group. Significant positive relationships existed between aptitudes scores and gains in job knowledge due to training.

A total of 13 schools in one Ohio county took part in a study conducted by Craig and Patton (66), in which management factors and the changes affected by in-service training were examined. An initial survey was used to determine the numerical ratings on a score card of the factors selected for the study. From these findings, specific training practices were developed to improve practices and increase the scores. After the training was completed, factors again rated and differences between the initial and final survey scores were utilized for evaluating the effect of training. A significant increase was found in total scores for employees in thirteen schools, as well as significant individual increases among employees in three of the schools after completion of these training programs.

Ewing (67) found that after completion of a two day workshop 98 percent of the participating foodservice personnel reported that the experience proved to be worthwhile; 94 percent of the principals to whom the employees reported also saw benefits in such a program. All of the surveyed principals stated that improvements in the performance of foodservice personnel were clearly visible as a result of attendance at the workshops. Specific improvements cited by 76 percent of the principals noted as a result of these workshops included better menu planning, greater variety in meals, and better attitudes on the part of workers.

Telelectures

In recent years (68), there has been an increased need for more adult education programs. According to Donaldson (69), the profession of dietetics needs to accept the opportunities available for meeting the current education needs and challenges, seek opportunities for utilizing technology, be aware of and make use of resources of specialists to implement new programs, and continue improvement through experimentation and research.

Edelman (68) contended that the expansion of adult education programs in the 1960's and the problem of teacher shortages created a need to discover ways and means to teach adult groups in widely scattered geographic regions. Partially responsible for this increased need for education is the recognition that for substantial number of persons education must be continuous throughout life (6).

Beilis (7) maintained that telelecture is one solution to counteract the problem of growing enrollments, teacher shortages, and economic constraints. Grabowski (70) contended that teleteaching is one of the more flexible means of instruction in adult education.

According to Madden (71), the first telelecture was used in 1957 by a social studies professor at Stephens College. The University of Omaha shortly afterward began to use the technique. Madden contended that in the past the amplified telephone system was limited in its effectiveness because it did not enable the use of the blackboard and other aids.

The electrowriter was one of the most important accessories which led to an improvement in the effectiveness of telelecture as a teaching method (71). Yeomans and Lindsey (8) described electrowriters as electronic devices which permit the lecturer to transmit handwriting by

telephone lines. A special projector is used which enlarges and projects images recorded on the electrowriter by the lecturer. Dobbs and Mowrer (72) claimed that the telephone lecture possesses three important characteristics of good extension education: voice, visualization, and learner to learner interaction during the question and discussion period.

Advantages of Telelecture

The telelecture system offers flexibility in planning and scheduling and is convenient (8). Faculty sharing among schools is made possible through telelecture (73). Also, major speakers do not have to be provided for each telelecture location which leads to a reduction in costs (74).

Telelecture enables any interested party to utilize continuing education programs which would otherwise be unavailable to them due to remoteness of location or time constraints (62, 72). Rao and Hicks (73) contended that telelectures act as a motivator for students as well as an ego satisfier. Based on a review of several studies, they stated that students learn as much or more in telelectures as compared to learning from other means of instruction.

In some instances universities are able to share costs, which decreases the cost of the program as well as providing students with higher quality programs (73). Costs also are reduced because of the elimination of travel and time costs for instructors.

Planning a Telelecture

Puzzuoli (78) believed that telelecture is a viable and appropriate method for teaching university extension classes when planned properly. When developing a telelecture program, Cook (75) recommended that detailed planning is needed including determining the visuals to be used

and orienting the projectionist, ushers, and the audience. Boswell et al. (76) found that simultaneous telelectures in which the instructor transmits the telelecture from a location with a class present generates several problems and may detract from the teaching moment. They emphasized the necessity for carefully controlled transmission conditions.

Monts and Peterson (77) advised that students be oriented to the mechanical aspects of the telelecture experience. They further recommended that physical conditions in the classroom as well as recording devices be adequate to provide students with quality recordings.

To ensure that the telelecture presentation at Dover High School proceeded efficiently, Kruck and Tversky (79) revealed the steps taken before its initiation, which included developing a resource file, establishing procedures to be followed by staff members, planning for staff in-service activities, involving students in selecting and evaluating speakers, setting up a plan for movement of equipment, and determining costs for operating the program. Students also became involved in the preparation by suggesting names of prospective speakers, preparing questions for the telelecture, and helping the teacher evaluate the program. Student technicians were trained for setting up and moving equipment.

Class length was found to be a significant factor in the effectiveness of telelecture. Puzzouli (78) asserted that lecturing should be limited to twenty to twenty-five minutes. McKay (80) found that communication between the speaker and groups suffered when speakers talked longer than twenty minutes without a break for questions. Parker (81) reported that short learning segments enable the student to absorb the most in telelecture courses.

Monts and Peterson (77) advised selecting course content in relation to its applicability to make learning more effective in a telelecture class. The importance of speakers adapting their messages to a particular audience was emphasized by McKay (80). Paulson (82) determined that question and answer periods after completion of the lecture contributes to the effectiveness of telelecture programs.

Edelman (68) asserted that a closed-circuit television in combination with the electrowriter would greatly accelerate the progress of this method of teaching. Monts and Peterson (79) concurred that television or videotapes improve presentations and give the impression that the instructor is present.

Puzzuoli (78) stated that if possible the speaker should make an appropriate number of visits to the telelecture classroom. The University of Missouri-Columbia (72) utilizes colored slides in its presentations to offset the absence of the speaker. McKay (80) reported that a color slide of the speaker was presented at the start of the class session.

Utilization of Visuals

Cook (75) maintained that visuals can be integrated with a reasonable amount of planning. He believed that the integration of visuals into a telelecture provides a focus for audience attention and assists in illustrating and explaining the lecture.

McKay (80) contended that when visuals are used in conjunction with the presentation they should be planned by someone with audio-visual experience along with the lecturer. Visuals should be prepared well ahead of time and mailed to the group. He used visuals in all but one extension program meeting and found that audience interest was lower in the meeting in which they were not used.

Miscellaneous Uses of Telelecture

The telelecture method of teaching has been used with success in the Topeka public school system (83) for teaching science, social studies, and language in three high schools. Microphones were placed in the classrooms to enable students to question the speaker directly and a telewriting device also was utilized.

The Carbon County Coordinated Instructional Center works in conjunction with the University of Wyoming, with resource people, and among the various schools using the Victor Electrowriter Remote Blackboard (70). The Center and University of Wyoming have transmitting and receiving sets for telelectures. A portable transmitting set also is available when needed. Six high schools in the area are able to participate in the various telelectures given. The many facets of educational enrichment made available include guest lecture series from the University of Wyoming, classroom participation with direct contact with the University, in-service training, and graduate courses for small groups of professionals.

Student Responses to Telelecture

An evaluation by Cook (75) indicated that approximately 66 percent of the respondents believed that telelecture was "as effective" as a lecture "in person." Twenty-five of the students stated that the lecture was "less effective." Quinn (74) reported that, overall, participants of a telelecture class appeared satisfied with both the method and content of the presentation.

Monts and Peterson (77) reported that changes in the attitudes of participants of a telelecture course in home economics occurred upon completion of the course. The students were found to give less attention to the mechanical aspects of classroom learning and instead exhibited an

increased awareness of the value of internalized learning. They concluded that telelectures appear to have some worth in teaching and should be explored further.

Cooper and Lutze (84) indicated that nurses enrolled in a telelecture class commented that they found the telelectures interesting and helpful in preparing them to return to nursing. Boswell et al. (76) found no overall differences in student attitude among a control group on campus, a second group also on campus, and a third group receiving the same class via telelecture when they were asked to complete a teacher evaluation form. The teacher evaluation form dealt with content and presentation characteristics.

McKay (80) reported that approximately 33 percent of the students participating in extension courses taught through a telelecture revealed that they liked this method very much and 60 percent liked it fairly well. Eighty-five percent stated that they thought the amount of material covered and level of difficulty was about right and two-thirds reported the program was good technically.

Wakefield and Vaden (85) noted that student response toward a nutrition education course taught via telelecture was positive. The students indicated that the purposes of the class were partially to well satisfied.

Effectiveness of Telelecture

Edelman (68) concurred that telelecture can be an effective method of teaching. Two adult groups were taught the elements of Hebrew reading and writing simultaneously utilizing the telelecture and the electrowriter. A third group was taught live from where the telelecture was being transmitted. An evaluation of the achievement tests after completion of the

course showed a high degree of similarity in the test results of all three groups.

Griver and Robinson (86) summarized the results of a training program provided for purchasing agents in remote locations in California. Nine procurement agents took part in the training program in four sites. After the training, learning of off-site participants was comparable to that of on-site participants. The off-site participants also displayed an increase in morale and a strengthening of communication with on-site personnel.

The University of Wisconsin (84) utilized a telephone/radio hook-up for training nurses. The objectives were to assist non-practicing nurses in keeping up-dated during periods of inactivity and to make information available to nurses in remote areas of the state. An evaluation of the program revealed that 102 of 589 participants returned to practice as a result of the program.

The question concerning the effectiveness of the telelecture method of teaching was examined by Boswell et al. (76). They analyzed data from an introductory psychology class presented to a control group who received a traditional lecture on the home campus. A second group received a live lecture transmitted via telelecture to a third group located in a remote classroom. Upon the administration of a pretest, no significant differences in content knowledge was found among the groups. A posttest given immediately after completion of the course revealed no differences among the groups after training.

In a study dealing with teaching university extension classes by telelecture, Puzzuoli (78) disclosed that the achievement of students in the telelecture classes was equal to or greater than the achievement of

students enrolled in an on-campus course. Frye (87) also examined the effectiveness of telelecture as an educational delivery system at the college level. The evaluations of the telelecture experience for students and teachers indicated that telelecture was as effective as on-campus instruction.

Hershey (88) compared the efficiency of a one hour graduate course taught via telelecture and in the conventional classroom setting. He found that the telelecture participants scored significantly higher than did the face-to-face participants.

Donaldson (69) summarized the results of a telelecture program at the University of Wisconsin for teaching graduate courses in institutional management. A subjective evaluation of students at the end of the first semester revealed a possible difference between the traditional and telelecture students. After the second semester, however, the range of grades for the students in both locations in a food administration course were similar. Donaldson attributed this finding to the fact that both groups of students had become more acquainted with the media and requirements of the faculty.

Gormican and Dickie (10) found that telelecture was an opportunity for convenient instruction of hospital foodservice employees. They contended that telelectures appear to be highly popular among dietitians, foodservice personnel, and foodservice supervisors.

Spears et al. (9) also illustrated the effectiveness of telelecture. She found that dietitians enrolled in a telelecture series and workshop had attained the same level of competence after completion of the course.

Wakefield and Vaden (85) contended that telelecture is an effective medium for imparting nutrition knowledge to persons unable to obtain

education through any other means. They reported that student evaluations based on pre- and posttests revealed a significant gain in nutrition knowledge during a graduate-undergraduate telelecture class in nutrition education for elementary school teachers.

METHODOLOGY

Overview of the Study

In response to the existing need for training of Kansas school foodservice personnel in foodservice management and nutrition education, a course taught via telenet was conducted in the spring of 1980. This course, as part of the Kansas Nutrition Education and Training Program (NETP), was partially supported by funds provided by Public Law 95-166 (4).

The objective of this research was to study the effectiveness of telelecture as a method of providing training to school foodservice personnel. Participants in the course were asked to complete a pretest, posttest, and retention test to assess the cognitive learning of course content. Also, effectiveness was measured by assessing the extent of involvement in nutrition-related activities prior to and following the telelecture course.

The Study Sample

To promote participation in this course, brochures were sent to schools, hospitals, and various other sites throughout the state of Kansas. Advertisements for the course also were included in newsletters of the Kansas State Department of Education and the Kansas School Food Service Association. A total of 185 students enrolled in this program in 29 locations across the state of Kansas. Approximately 91 percent of the participants were involved directly in school foodservice programs either

as managers, cooks and assistant cooks, or foodservice workers. Registration for the course took place at each of the 29 sites broadcasting the telelecture and a registration fee was required of each participant.

The students taking part in this course were presented with a letter the first day of class which explained the NET program and the purpose of this Telenet course. The students were asked to participate in the evaluation to ensure the success of the study. A consent form for indicating willingness to participate in the study was also given to students for their signatures (Appendix A).

Developmental Phase of Course

The course, entitled "New-trition Update for School Foodservice Personnel," was developed by faculty in the KSU Departments of Dietetics, Restaurant and Institutional Management and Foods and Nutrition and the Kansas Regents Continuing Education Network in the fall of 1979. The objective of the course was to provide current nutrition information to foodservice personnel. A variety of different topics relating to food and nutrition were addressed with an emphasis placed on applicability to school foodservice. Some of the topics under discussion included the 1979 Recommended Dietary Allowances (RDAs) and their use in menu planning, food additives and labeling, sanitation, and the relationship of diet to health and disease.

The ten-session course was presented in the spring of 1980 and was scheduled every Monday and Wednesday from 2:15-3:45 p.m. The course outline was as follows:

March 17 "Getting to Know You"
Introduction to class and gathering of information concerning class participants and their nutrition awareness.

- March 19 "Recommended Dietary Allowances (RDA's) and the 3 P's of Good Nutrition"
An introduction to the use of the 1979 revised edition of the RDA's as a guide for deciding how much and what kinds of food we should eat.
- March 24 "How Does Your Menu Measure Up"
Use of the RDA's in evaluating the nutritional adequacy of your breakfast and/or lunch menus for various age groups. An analysis of one day's menu.
- March 26 "Read the Label--But Don't Panic"
Some straight talk about food additives, fabricated foods, and their place in your foodservice operation.
- March 31 "Don't Be a Fool--Foodborne Illness Isn't Cool"
The importance of sanitation in your operation as well as a look at a new area of concern: food toxicants.
- April 2 "You Are What You Eat?--Oh, No!"
Dietary goals--Can Americans change their eating habits? An update on congressional recommendations and the Surgeon General's report. How can you use this information as a guide in menu planning and preparation.
- April 7 "Diet and Health--Dental Caries and Cancer"
A look at today's controversies over cancer causing agents in our foods; how the changing American diet is causing an increase in periodontal disease.
- April 9 "Diet and Health--Obesity and Heart Disease"
Problems and concerns in the area of the two main killers of Americans today. What does this mean to school foodservice?
- April 14 "How Can You Help"
A sharing of ideas for promoting good nutrition and good health in your schools.
- April 16 "The Party's Over . . ."
Summary and conclusion. Evaluation of course effectiveness.

Most of the class time was devoted to lecture followed by a question and answer period. Participants were encouraged to communicate their ideas freely and not feel inhibited to ask any questions. The instructor encouraged students to participate by asking questions and attempting to promote discussion among students. The last class session was devoted to discussion of nutrition education techniques. A variety of different

handouts were presented to students to supplement the lecture (Appendix B). These handouts were developed in conjunction with faculty in Foods and Nutrition at Kansas State University.

Arrangements were made for the project director to present three classes from different Telenet locations enabling her to meet some of the students participating in the course. One class was taught from Topeka, another from Abilene, and a third lesson from Garden City, Kansas, in the western part of the state.

Participation in this course offered students the option of receiving one hour of undergraduate credit from Kansas State University. Members of The American School Foodservice Association could receive nine certification points upon completion of this course and Kansas adult care home administrators and administrator candidates received fifteen educational credits.

Evaluation Instruments

To evaluate the effectiveness of Telenet as a teaching medium, the students agreeing to participate in this study were given a nutrition-knowledge pretest, posttest, and a follow-up posttest (Appendix C). All of these three tests, which were identical, were developed by the project director in cooperation with a Foods and Nutrition faculty member. The tests were composed of fifty true/false questions adapted from an instrument used in a study conducted by Peitz (89). A u (for uncertain) also was provided as a response alternative with each question for students who were unsure of the correct answer. A degree of certainty, ranging from one to five was assigned to each question, with one being uncertain

and five most certain. The students were instructed that no degree of certainty was to be indicated if they were completely unsure of an answer.

The participating students also were asked to complete a brief questionnaire providing demographic data, educational background, job duties, and information relating to their nutrition activities (Appendix D). The questionnaire was adapted from those used in several nutrition related studies (90-92). Also, participants were asked to identify their immediate supervisors for distribution of a supervisory form later. Both the questionnaire and nutrition knowledge pretest were administered to students during the second class period. The posttest was completed by students on the last day of class and the follow-up posttest was mailed to students two months after completion of the course in mid-July.

To determine if participants demonstrated more nutrition awareness as a result of their involvement in this course, immediate supervisors of the participants were asked to report nutrition-related activities of the participants four months after the final session. This list of nutrition activities used was identical to one included on the questionnaire completed by participants on the first day of class. A few questions concerning class time, whether or not the employee was allowed time off with pay, and whether or not the enrollment fee was paid by the school district also were included. A space was provided for comments of the supervisors on effectiveness of the telenet course.

Distribution of the Supervisory Instrument

In late August, a letter and the questionnaire were sent to all of the immediate supervisors of the participants (Appendix E). The letter

included an explanation of the purposes of the project and the importance of the supervisor's contributions.

In some cases, the person listed by the participant as immediate supervisor did not work closely or frequently enough with the telenet participant to be able to complete the questionnaire. In other instances, the telenet participant neglected to list their immediate supervisor. As a result, a total of 155 supervisory questionnaires were distributed. A follow-up letter was sent to non-responding supervisors in mid-September (Appendix E). Upon completion of this phase of the study, the information received from both the participants and supervisors was coded and then keypunched on six eighty-column computer cards.

Use of NET Funds

Funds from the NET project were utilized in the compilation, analysis, and interpretation of data from questionnaires, nutrition knowledge tests, and supervisors' questionnaires. Quarterly reports were submitted to the School Food Service Section of the Kansas State Department of Education to record progress on the project. These reports included general information, a description of the sample, the progress of activities, and the accomplishments made toward meeting the objectives.

RESULTS AND DISCUSSION

Description of the Sample

A total of 185 persons participated in the telenetwork course in 29 locations around the state as illustrated in Figure 1. The greatest number of participants (N = 28) at one location attended at the Topeka site. At the site at Kansas State University where the instructor taught most of the sessions, 11 persons took the course. A total of 116 participants enrolled for one hour of undergraduate credit while 69 participants enrolled in the course for no credit.

A demographic profile of participants (N = 155) in this study is shown in Table 1; 30 were unwilling to take part in the effectiveness assessment. All but two were females and about 80 percent were between the ages of 31 and 60 years of age. Only 10.4 percent were under 30 and 9.1 percent over 60.

About three-fourths (78 percent) of the participants had been employed in school foodservice for three or more years. Approximately 60 percent had been employed six or more years. Only 10 percent had been employed in the field for less than one year.

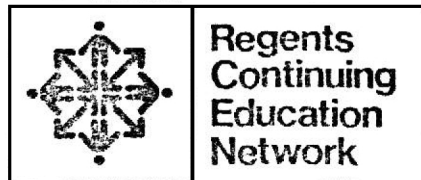
About 40 percent of the personnel were in job titles of manager or supervisor. Approximately 42 percent held job positions of cook/baker or assistant cook/baker. A small percentage (9 percent) were employed as foodservice workers. The remaining eight percent held nonfood preparation jobs.

Almost 40 percent of the respondents indicated that they had completed high school and an additional 9.7 percent had received a G.E.D.

ILLEGIBLE DOCUMENT

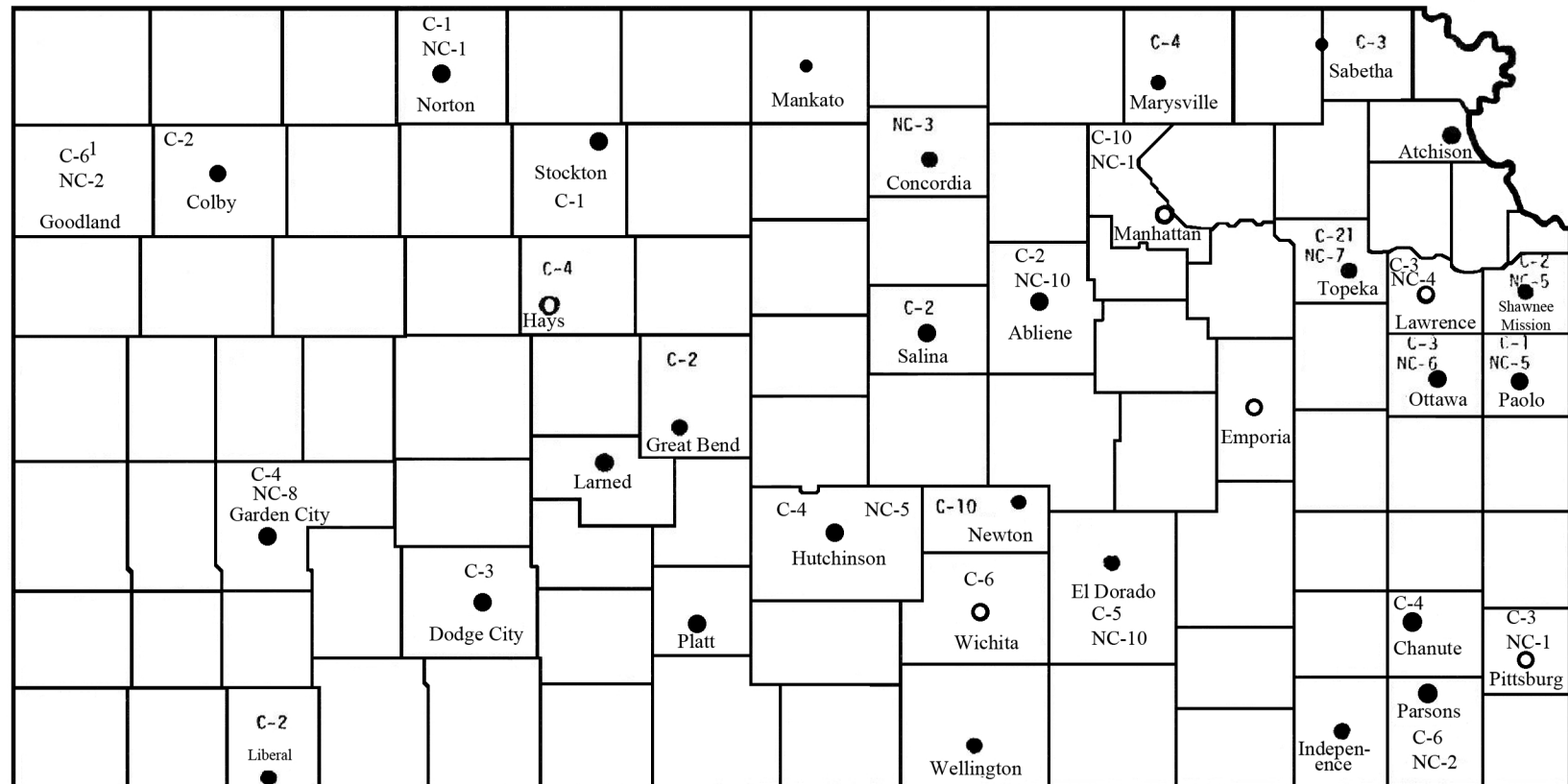
**THE FOLLOWING
MAP(S) / PLAN(S) IS OF
POOR LEGIBILITY IN
THE ORIGINAL**

**THIS IS THE BEST
COPY AVAILABLE**



Emporia State University
Fort Hays State University
Kansas State University

Pittsburg State University
University of Kansas
Wichita State University



CENTRAL OFFICE: Regents Network
Umberger: 312
Kansas State University
Manhattan, KS 66506

¹C = Credit
NC = Noncredit
Number indicates students enrolled C or NC.

Fig. 1. Telenet locations and number of participants at each location.

Table 1: Characteristics of Kansas school foodservice personnel participating in telenet course evaluation (N = 155)

characteristic	N	%
age		
under 21 years	3	2.0
21-30 years	16	8.4
31-40 years	33	21.4
41-50 years	49	31.8
51-60 years	42	27.3
over 60 years	14	9.1
sex		
male	2	1.3
female	152	98.7
years employed in school foodservice		
less than 1 year	15	10.0
1-2 years	18	12.0
3-5 years	26	17.3
6-7 years	24	16.0
8 or more years	67	44.7
job title		
manager/supervisor	63	40.6
cook/baker/assistant cook/baker	65	42.0
foodservice worker	14	9.0
other--nonfood preparation jobs	13	8.4
highest level of educational background		
completed elementary/secondary school	11	7.1
completed high school	60	38.7
did not complete high school but have G.E.D.	15	9.7
attended college, no degree	23	14.9
completed a college degree	8	5.2
working on a graduate degree	6	3.9
completed vocational/technical training	30	19.4
other	2	1.3

Only a few held bachelor's degrees or were working on master's degrees (9.1 percent) although an additional 14.9 percent had attended college but had not received a degree. About one-fifth of the foodservice personnel had completed vocational/technical training.

A nationwide survey of school foodservice personnel conducted by Information Planning Associates, Inc., under contract with the United States Department of Agriculture, Food and Nutrition Service (USDA/FNS), characterized the portrait of a typical foodservice worker (43). The typical worker was 45 to 50 years of age and held a high school diploma with approximately eight years of experience in school foodservice.

Data describing the characteristics of Kansas school foodservice personnel was recently made available from the Nutrition Education and Training Program (NETP) in Kansas (90). An average Kansan school foodservice worker was found to be a 31 to 60 year old female with a high school degree and three or more years of experience. Most held positions of cook/baker, assistant cook or baker. The profile of the participants from this study was similar to that described in reports of those other studies.

Job Responsibilities of Kansas School Foodservice Personnel

About 50 percent of the respondents indicated that the duties they performed relating to production and service included pre-preparation of raw produce and the selection of new recipes (Table 2). Duties that 60 percent or more of participants performed included the receiving of food and non-food items, storing and organization of food and non-food items in inventory, the adjustment of recipes, dishwashing, potwashing, and scraping trays, and the establishment of portion sizes. Over 70 percent

Table 2: Job responsibilities of Kansas school foodservice personnel
(N = 155)

	%
<u>job duties relating to production and service:</u>	
cooking, baking, actual food preparation	72.3
clean-up of production area	71.6
deciding what to do with leftover food	71.0
serving on the cafeteria line	71.0
storing and organizing of food and non-food items in inventory	67.1
dishwashing, potwashing, scraping trays	67.1
receiving of food and non-food items	65.8
establishing portion sizes	65.2
adjusting recipes	64.5
pre-preparation of raw produce	58.1
selecting new recipes to try out	52.3
taking money, tickets, etc. from students, customers	21.3
monitor school lunchroom while students are eating	12.3
<u>job duties relating to supervision and administration:</u>	
keeping required records	60.6
ordering food and non-food items	55.5
supervising other employees	51.6
planning menus	44.5
scheduling workers	39.4
arrange for repair of existing equipment	36.8
calculating food, labor, other costs	35.5
contacting backup workers or replacements	34.2
evaluating employee performance	29.0
buying new equipment	25.8
presenting in-service training to foodservice workers	22.6

of the foodservice personnel revealed responsibilities for actual food preparation and cooking and baking, decisions on the use of leftover food, clean-up of production areas, and service on the cafeteria line.

Overall, the number of supervisory and administrative responsibilities required of participants was lower in comparison to those related to production and service. Only one duty relating to supervision and administration was performed by over 60 percent of respondents. This consisted of keeping required records. Over 50 percent reported ordering food and non-food items, and supervising other employees. The presentation of in-service programs, the purchase of new equipment, and the evaluation of employee performance were administrative duties performed by only 30 percent or less of respondents. As indicated in Table 1, only 40.6 percent, however, were in supervisory positions.

Type and Recency of Training

The data indicated that 72.7 percent of the school foodservice personnel had training in nutrition (Table 3). The type of training varied from completion of a high school course to completion of various types of post-secondary training. Almost 17 percent revealed they had completed a high school course and 18.7 percent completed a college or continuing education nutrition course. About 37 percent of the school foodservice personnel had attended workshops on nutrition and only 6.5 percent had completed a correspondence course. Approximately 42 percent of the respondents had completed a 36-hour vocational course for school foodservice personnel sponsored by the Kansas State Department of Education; most within the last 10 years. Several respondents reported attending several of these 36-hour courses. Almost 25 percent had attended

Table 3: Reports of Kansas school foodservice personnel on type of nutrition training (N = 155)

educational activity	N	%
completed nutrition training (type not specified)	112	72.7
completed high school nutrition course	26	16.8
completed college nutrition or continuing education course	29	18.7
attended workshop on nutrition	57	36.8
completed correspondence course on nutrition	10	6.5
completed 36-hour course for school foodservice personnel	65	42.0
attended annual state school foodservice meeting or other professional meeting	38	24.5
completed previous telenet course	38	24.5

annual state school foodservice meetings or other professional meetings.

About one-fourth of the school foodservice personnel reported they had completed previous telenet courses. All of these courses were completed within the past three years.

Reports of Nutrition Education-Related Practices

Nutrition sources and materials are summarized in Table 4. Books and newspapers were listed by over one-half of the respondents as sources of nutrition information. Approximately 36.1 percent of the school foodservice personnel indicated that magazines were utilized as nutrition education sources. Magazines mentioned included Good Housekeeping,

Table 4: Percentage of Kansas school foodservice personnel using various nutrition sources and materials (N = 155)

nutrition source	%
books	62.0
School Foodservice Journal	62.0
meetings, workshops, conferences	58.7
newspapers	58.1
extension bulletins	40.0
friends	39.4
magazines	36.1
TV, radio	34.2
nutritionists/dietitians	31.0
family members	25.2
home economists	18.7
home economics teachers	16.1
other scientific or professional journals	11.6
health food stores	9.7
health food magazines	9.7
School Foodservice Research Review	9.0
other health professionals	9.0

Family Circle, Womans Day, Redbook, Ladies Home Journal, McCall's, Weight Watchers, Cuisine, Better Homes and Gardens, Bon Appetit, and Let's Live. A large percentage (62 percent) of the participants listed the School Foodservice Journal as a nutrition source. Other scientific or professional journals listed by participants included Journal of Home Economics, Institutions, and the American Journal of Clinical Nutrition. Extension bulletins, meetings, workshops, conferences, and television and radio also were listed fairly frequently as sources of nutrition education.

Almost 40 percent of the school foodservice personnel listed friends as sources of nutrition information and approximately 31 percent of respondents listed nutritionists/dietitians. Less than 20 percent listed home economists and home economics teachers and a few listed doctors, nurses, the Nutrition Department at Kansas State University, and Weight Watchers lecturers.

Results on Nutrition Knowledge Test

Percentages of the survey group responding correctly to the individual items on the nutritional knowledge test are listed in Table 5. An analysis of the pretest indicated that the class mean score was 58 percent and the posttest mean was 73 percent. On the retention test, however, the mean percentage score declined to 60 percent. The pretest and posttest scores were significantly different ($P \leq .05$); however the pretest and retention scores did not differ.

On the pretest, posttest, and retention test, over 90 percent of the participants recognized that an obese person may be malnourished (item 11) and 100 percent knew that meals could be used as teaching aids in nutrition instruction for children (item 13). Respondents also scored high

Table 5: Responses of Kansas school foodservice personnel on nutrition knowledge test (N = 155)

item no.	summary of question content	% correct		
		pretest	posttest	retention test
1	knowledge that food eaten before bed is more likely to cause weight gain	89.0	89.0	88.8
2	knowledge that a nursing mother's nutritional requirements are increased	83.2	96.8	89.5
3	nutritional requirements of teenage boys and girls	62.0	86.5	76.7
4	relationship between white bread and dental caries	68.0	75.5	69.4
5	understanding of the Recommended Dietary Allowances	81.8	82.0	82.7
6	relationship between organically grown fruits and vegetables and their nutritive value	57.1	83.2	68.0
7	protein requirements of an athlete	17.6	29.7	22.4
8	necessity of vitamin and mineral supplements for most people	68.8	93.5	88.1
9	knowledge that one pound of weight loss is equivalent to a 3500 calorie deficit	50.3	85.1	79.1
10	knowledge of the caloric content of bread and potatoes and their consumption in a reducing diet	85.1	97.4	89.4
11	recognizing that an obese person may be malnourished	91.4	97.4	97.7
12	recognizing that sweetened carbonated beverages and chewy caramels are not equally harmful for teeth	11.3	33.8	29.5
13	knowledge that meals can be teaching aids in nutrition instruction for children	99.3	100.0	100.0

Table 5: (cont.)

item no.	summary of question content	% correct		
		pretest	posttest	retention test
14	knowledge that milk in all forms are equally good sources of protein and calcium	89.0	94.2	89.4
15	knowledge that instant non-fat dry milk provides less energy than whole milk	26.3	49.0	43.2
16	knowledge that cholesterol is a normal body constituent	68.2	83.2	86.3
17	recognizing that women age 18-50 require more iron than children age 0-10	81.7	96.1	90.2
18	knowledge that a pound of weight loss per week is equal to a 500 calorie deficit per day	66.9	95.5	93.2
19	identification of a meat substitute	91.0	94.2	97.0
20	knowledge that 400 grams of fat results in a weight increase of one pound	32.0	81.3	81.7
21	recognizing that the Basic Four Food Groups have use throughout the world in nutrition education	85.7	87.7	85.6
22	recognizing that sodium intake should be restricted on a reducing diet	83.0	93.5	90.1
23	identification of the use of nitrites	76.5	95.5	94.6
24	purpose of fortifying food products	78.6	86.5	88.6
25	recognizing that the fortification of food does not always result in a superior product	46.1	75.5	68.2
26	recognizing that hot foods should not be cooled at room temperature	51.3	73.0	69.0

Table 5: (cont.)

item no.	summary of question content	% correct		
		pretest	posttest	retention test
27	applicability of the dietary goals to the total U.S. population	21.6	52.6	48.5
28	storage of excess protein	48.3	51.0	52.2
29	knowledge that milk does not contain all the essential nutrients	48.7	56.5	47.4
30	recognizing that vitamin C is not the "sunshine vitamin"	47.1	60.0	65.0
31	knowledge that corn oil, soybean oil and coconut oil are not high in polyunsaturated fats	24.0	21.3	25.8
32	identification of emotional stress as a factor affecting the utilization of nutrients	86.4	94.2	98.5
33	a source of cholesterol	42.9	61.3	59.0
34	knowledge of basal metabolism	55.0	19.5	14.4
35	recognizing that the consumption of large amounts of vitamins and minerals is not beneficial	90.1	98.7	99.3
36	composition of diet margarine versus regular margarine	72.1	94.8	88.8
37	knowledge that people who do not eat meat are not always in poor health	78.6	87.0	85.8
38	ascorbic acid content of frozen versus fresh orange juice	58.3	68.2	59.4
39	sources of vitamin C	91.6	96.1	93.3
40	major source of riboflavin	60.3	79.7	86.4
41	knowledge that grapefruit does not burn up fat	27.5	58.1	51.9

Table 5: (cont.)

item no.	summary of question content	% correct		
		pretest	posttest	retention test
42	caloric value of toasted versus untoasted bread	70.1	79.4	77.6
43	recognizing that a strict vegetarian diet does not lack vitamin B ₆	17.7	27.6	27.5
44	knowledge that foodborne illness can occur in any kitchen	84.3	93.0	88.8
45	relationship between gelatin capsules and the strengthening of fingernails	31.4	55.5	51.5
46	knowledge that an equivalent weight of carbohydrate has the same amount of calories as protein	17.3	52.0	47.0
47	effect of pasteurization	51.6	56.8	48.5
48	recognizing that vitamins and minerals do not provide energy	27.6	60.0	52.2
49	knowledge that a diet high in polyunsaturated fats may require additional vitamin E	13.0	23.4	22.0
50	recognizing that candy and sweets do not indicate a need for additional sugar	88.4	92.2	88.7

(over 90 percent) on item 19, in which peanut butter was identified as a meat substitute. Over 90 percent identified broccoli, cabbage, and tomatoes as sources of vitamin C (item 39) on the pretest, posttest, and retention test.

On the posttest, over 90 percent of the participants recognized that a nursing mother has increased nutritional requirements (item 2) and 93.5 percent knew that vitamin and mineral supplements are not necessary for most people (item 8). Most participants (97.4 percent) recognized that bread and potatoes need not be eliminated on a reducing diet. The knowledge that milk in all forms are equally good sources of protein and calcium (item 14) was identified on the posttest by 94.2 percent. Respondents also scored well (94.8 percent) on item 36 dealing with the composition of diet margarine, and most recognized that foodborne illness can occur in any kitchen (item 44). Results of the posttest also revealed that 92.2 percent of school foodservice personnel recognized that candy and sweets do not indicate a need for additional sugar (item 50).

On the posttest and retention test, over 90 percent recognized the need for additional iron for women of child bearing age (item 17) and over 90 percent knew that a pound of weight loss per week is equal to a 500 calorie deficit per day (item 18). Most of the respondents knew that sodium intake should be restricted on a reducing diet (item 22), that nitrites are used as preservatives (item 23), and that emotional stress can affect the utilization of nutrients (item 32). Results on the posttest and retention test also revealed that a high percentage of participants (over 90 percent) recognized that the consumption of large amounts of vitamins and minerals is not beneficial (item 35).

Incorrect responses were most frequent on the item concerning the protein requirements of an athlete (item 7), the recognition that sweetened carbonated beverages and chewy caramels are not equally harmful for teeth (item 12), and on the item dealing with the energy level of instant non-fat dry milk (item 15). Participants also scored poorly on the item dealing with the composition of corn oil, soybean oil, and coconut oil (item 31), on the definition of basal metabolism (item 34), the recognition that a strict vegetarian diet does not lack vitamin B₆ (item 43), and the knowledge that a diet high in polyunsaturated fats may require additional vitamin E (item 49).

Increases from pretest to retention test were noted on several items. On the item dealing with the knowledge that cholesterol is a normal body constituent (item 15), an 18.1 percent increase was noted from pretest to retention test; also, on the item that a pound of weight loss per week is equal to a 500 calorie deficit (item 18), a 26.3 percent increase was seen. Scores from pretest to retention test on the item dealing with the knowledge that 400 grams of fat results in a weight increase of a pound (item 20) increased 49.7 percent and an 18 percent increase was seen on the item dealing with the use of nitrites as a preservative in meats (item 23). A large increase (22 percent) was noted for the question concerning the fortification of foods (item 25) and an increase of 18 percent from pretest to retention was noted for the item dealing with the cooling of hot foods (item 26). The response for the recognition that vitamin C is not the "sunshine vitamin" (item 30) increased almost 18 percent from pretest to retention test.

Nutrition Related Activities of Kansas School Foodservice Personnel

The extent of nutrition related activities of Kansas school foodservice personnel before and after telenet are listed in Table 6. The data indicated that upon the completion of the telenet course, a significantly greater number of persons were participating in nutrition activities than had been true before. According to supervisors' reports, a significant increase was found for 12 out of the 20 given activities. The activities that seemed to increase the greatest included suggesting menu ideas having special nutritional merit, providing parents with information on nutrition, initiating "nutrition awareness" projects among students, checking the serving temperatures of foods regularly, monitoring cooking times of foods to enhance nutritional quality, and using a table of nutritive values to calculate nutrient content of school lunch. Other nutrition related activities which had a significant increase included making nutritional facts available to students through bulletin board displays or similar types of publicity, giving class tours of foodservice facilities, working with teachers on nutrition projects, conducting in-service training sessions for foodservice workers, consulting school administrative officers concerning initiating or expanding nutrition education, and encouraging students to taste the foods served at lunch.

An index was devised to assess the overall nutrition related activities of participants before and after the telenet course. As indicated in Table 7, a significant increase in overall activities was seen when reports by participants of nutrition related activities prior to the course were compared with the supervisors' reports of participants' activities after completion of the course.

Table 6: Extent of nutrition education activities of Kansas school food-service personnel before and after telenet

nutrition activities	foodservice workers (prior to course) (N = 155)	supervisors (after course) (N = 95)	z value
	%	%	
suggesting menu ideas which have special nutritional merit	27.7	63.2	5.80**
providing for direct student involvement in menu planning	21.3	31.6	1.90
obtaining student evaluations or reactions to foodservice	28.4	37.9	1.57
making nutritional facts avail- able to students through bulletin board displays or similar kinds of publicity	29.7	40.0	2.03*
providing parents with informa- tion on nutrition and/or nutritional suggestions	12.3	27.4	3.18**
initiating "nutrition awareness" projects among students (e.g. keeping logs of food intake, classifying nutritional content of meals over a period of time, poster contests, etc.)	9.0	29.5	4.63**
checking plate waste	57.4	63.2	0.93
checking the serving temperatures of foods regularly	34.8	69.5	5.58**
giving class tours of the food- service facilities	17.4	30.5	2.56*
using standardized recipes	56.8	67.4	1.73
sponsoring a student taste panel	9.0	13.7	1.21

* $P < .05$ ** $P < .01$

Table 6: (cont.)

nutrition activities	foodservice workers (prior to course) (N = 155)	supervisors (after course) (N = 95)	z value
	%	%	
working with teachers on nutrition projects, experiments, animal feeding demonstrations, etc.	18.1	40.0	4.00**
monitoring cooking times of foods to enhance nutritional quality	32.3	54.7	4.18**
giving interviews for school newspaper articles on nutrition	14.2	15.8	0.36
conducting an in-service training session for foodservice workers specifically on nutrition and/or nutrition education	6.5	21.1	2.92**
consulting school administrative officers concerning initiating or expanding nutrition education	11.6	35.8	2.92**
providing more choices in luncheon items (e.g. salad plate, sandwich plate, entree choice)	29.0	37.9	1.49
encouraging students to taste all foods served at lunch	58.7	73.7	2.48*
using a table of nutritive values to calculate nutrient content of school lunch(es)	9.7	41.2	5.44**

* $P < .05$ ** $P \leq .01$

Table 7: Index of nutrition education activity of Kansas school foodservice personnel before and after telenet course

	mean	s.d.	t value
before course (reports of Kansas school foodservice personnel)	5.50 ± 3.84		5.54***
after course (reports of immediate supervisors)	8.25 ± 4.18		

*** $P \leq .001$

Supervisors' Comments on Course

Comments from the supervisors were positive concerning the telenet method of training. Over two-thirds of the participants were given time off from work to attend the class; 93.8 percent had time off with pay; and the enrollment fee was paid by the institution for 84.7 percent of the participants.

Many of the supervisors indicated that telenet met a need in assisting employees to become more aware of good food preparation methods and nutrition. Many of the supervisors reported that the telenet class increased the confidence and self-assurance of participating foodservice personnel.

When supervisors were asked about telenet as a training method, the majority reported that they believed telenet to be effective. One supervisor commented that telenet was a much more convenient way of training employees because of the reduction in travel time.

Suggestions for improvement also were received from supervisors. One supervisor suggested that more handouts be presented to participants in a telenet course. Another supervisor suggested that materials be distributed on time because materials always reached their telenet location late. Also, several recommended that more time be given for questions and answers during the class sessions.

SUMMARY AND CONCLUSIONS

Summary

The importance of providing training for school foodservice personnel has become recognized increasingly in recent years. In response to the existing need for training foodservice personnel, a training course was conducted for school foodservice personnel via a telephone teaching system (telenet). The objective of this study was to determine the effectiveness of telenet as a method of providing training to school foodservice personnel. Specific objectives of this study were to assess the effectiveness of telenet at the cognitive level of learning through an analysis of participants' scores on pretest, posttest, and retention tests and to determine if participants demonstrated more involvement in nutrition-related activities prior to and following the telenet course. The course was part of the Kansas Nutrition Education and Training Program (NETP) which was established with funds mandated in Public Law 95-166 enacted in 1977.

The ten-session course entitled "New-trition Update for School Foodservice Personnel" was developed in the Department of Dietetics, Restaurant and Institutional Management, the Department of Foods and Nutrition, and Regents Continuing Education Network Division of Continuing Education at Kansas State University and was presented in the spring of 1980. A variety of topics relating to food and nutrition were addressed with an emphasis on applicability to school foodservice. Some of the topics under discussion included the Recommended Dietary Allowances

(RDA's) and their use in menu planning, food additives and labeling, sanitation, and the relationship of diet to health and disease.

Brochures advertising the course were sent to schools, hospitals, and various other sites throughout the state of Kansas to recruit participants. Advertisements for the course were included in newsletters of the Kansas State Department of Education and also the Kansas School Food Service Association. A total of 185 students enrolled in the course of which 155 agreed to participate in the evaluation aspect of the course. Approximately 91 percent were involved directly in school foodservice programs either as managers, cooks and assistant cooks, or foodservice workers.

The nutrition knowledge tests used in the study were composed of fifty true/false questions adapted from an instrument used in a previous study. A brief questionnaire providing demographic data, educational background, job duties, and nutrition activities also was distributed to participants.

Participants were given the nutrition knowledge test on the second day of class and again at the end of the course. A significant increase in scores from pretest to posttest was revealed.

Participants answered 58 percent of the questions correctly on the pretest and 73 percent on the posttest. When the same test was mailed to participants two months after completion of the course, data indicated a significant decrease in retention of the material with participants correctly answering 60 percent of the questions. This decrease in retention probably was attributed to lack of reinforcement of the knowledge participants had gained.

Four months after completion of the course, a questionnaire was sent to the immediate supervisors of the participants. The supervisors were asked to indicate the nutrition related activities they had observed participants performing since the completion of the course. This list of activities was identical to one completed by participants the first day of class. An increase in every category of nutrition related activity was seen. Significant increases were found for 12 out of the 20 nutrition activities. Some of these activities included suggesting menu ideas which have special nutritional merit, providing parents with information on nutrition and/or nutrition suggestions, initiating "nutrition awareness" projects among students, and checking the serving temperatures of foods regularly. A significant increase in overall nutrition activity also was found from the analysis.

A large majority of the supervisors commented favorably on the telenet method of training. Of the 185 participants in the course, 69.5 percent were given time off from work to attend the class; 93.8 percent had time off with pay; and 84.7 percent of the facilities paid the enrollment fee for the participant. Many of the supervisors indicated that they believed telenet was an effective method for training foodservice employees. They believed the course had fostered more nutrition awareness among participants and a great number commented upon the increased confidence and self-assurance it gave to employees. Supervisors also expressed an appreciation for the convenience of telenet as a training program. Recommendations for improvement included allowing more time for questions and answers and utilizing more handouts.

Conclusions and Recommendations

Telenet appeared to be effective in influencing attitudes of school foodservice personnel at the affective level of learning. The significant increase in the number of nutrition related activities illustrated the implementation by participants of course-related activities on completion of the course. Supervisors indicated that participants exhibited an increased interest and awareness of nutrition and were most eager to share this knowledge with co-workers. Comments of this kind are testimony to the effectiveness of telenet at the affective level of learning. To assess learning in the affective domain, however, an evaluative device to measure affective learning which had occurred was needed.

At the cognitive level of learning, a significant decrease was evidenced in the nutrition knowledge of participants from posttest to retention test. The significant decrease in nutrition knowledge was attributed to the fact that after completion of the course participants were on leave during the summer months. To increase the retention rate of nutrition knowledge learned in the course, future telenet courses probably should be presented early in the school year so that the information learned can be reinforced directly on the job. This decrease in knowledge also indicates a need for in-service training activities or the utilization of nutrition materials provided by supervisors to assist the participant in receiving the needed reinforcement.

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APPENDIXES

APPENDIX A

Initial Correspondence and Informed Consent Form

(KSU Letterhead)

March 17, 1980

Dear Telenet Participant:

In conjunction with the Kansas State Department of Education, Kansas State University is conducting a project designed to assess the nutrition knowledge and attitudes of elementary teachers, children and foodservice personnel. This project is part of the Kansas Nutrition Education and Training Program which was established with funds from the Child Nutrition Amendment P.L. 95-166, enacted by the United States Congress in 1977. The purpose of this assessment is to identify needs for nutrition education and to provide information for planning nutrition education programs.

As a participant in this Telenet course, "New-trition Update for School Foodservice Personnel," we would like for you to take part in this study. Your cooperation would help ensure the success of our project. We hope you will take part by completing the attached questionnaire as completely as possible; however, your participation is voluntary. All responses will be kept confidential, so please be frank and open with your answers. Your name will not be linked with your responses. Data will be summarized for the entire group of school foodservice personnel.

Your help in this project will be greatly appreciated. Thank you for your cooperation.

Sincerely,

Deborah D. Canter, Ph.D., R.D.
Project Director

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KANSAS NUTRITION AND EDUCATION
TRAINING PROGRAM

Applications of Nutrition for School Foodservice Personnel Project

Kansas State University
in cooperation with the Kansas State
Department of Education

Informed Consent Form

Please
check

_____ I give permission for my questionnaire and pretest-posttest
results to be used in the nutrition education project described
in the attached letter

_____ I do not give permission for my questionnaire and pretest-
posttest results to be used in the nutrition education project
described in the attached letter

(Signature of Telenet Participant)

(date)

APPENDIX B
Supplemental Class Handouts

HOW TO DISTINGUISH A "QUACK" FROM A RELIABLE AUTHORITY by Dr. Victor Herbert, professor of medicine and pathology at Columbia College of Physicians and Surgeons.¹

A quack is someone who:

1. Tries to persuade you to buy something you wouldn't otherwise buy.
2. Lists impressive "front" titles showing that he/she is president or director of societies you have never heard of.
3. Says that most disease is due to a bad or faulty diet.
4. Says that most people are poorly nourished (they have "subclinical deficiencies"--very serious conditions with no symptoms flowing).
5. Says that soil depletion and the use of chemical fertilizers cause malnutrition.
6. Says that processed foods have no nutritional value.
7. Says that additives and preservatives are dangerous.
8. Pushes pills, powders, and liquids (you don't have to get your nutrients from foods).
9. Pushes "natural" as opposed to "synthetic" vitamins.
10. Pushes vitamins or health foods or both.
11. Promises miraculous cures.
12. Supports his/her claims with testimonials and "case histories."
13. Claims he/she is being presented by the medical profession (scientific establishment) which refuses to publish his/her work.
14. Threatens to sue if he/she is called a quack.

Taken from:

Hamilton, E.M.N. and Whitney, E.N.: Nutrition: Concepts and Controversies. St. Paul: West Publishing Co., 1979.

¹Supplemental handout for class on March 19, "Recommended Dietary Allowances (RDA's) and the 3 P's of Good Nutrition."

Getting to Know the Players¹

Calories - represent units of energy or body "fuel" provided by carbohydrates, fats, proteins, and alcohol. Fats provide 9 calories per gram, alcohol 7 calories, and protein and carbohydrate 4 each. The number of calories you need depends primarily on your age, body size, activity, and rate of growth.

Carbohydrates - are your body's most efficient energy source and help the body use other nutrients. They are seen in the form of sugars and starches.

Proteins - provide your body with the materials it needs to grow, replace worn body tissues, fight infection, manufacture hormones and enzymes, and digest food.

Vitamins - are as vital to your body as sparkplugs to a car. Without them, you would be unable to use the basic nutrients of protein, carbohydrate and fat that "fuel" all body processes. A balanced diet provides the body with all necessary vitamins.

Minerals - are necessary for the healthy development of bones and teeth, for carrying oxygen to your cells, and for muscle tone. They also help the vitamins work effectively.

Fats - provide the most concentrated source of energy, supply essential fatty acids, and enable you to absorb certain vitamins (A, D, E, and K). These are three basic types of fats:

Saturated Fats - are usually the solid fats of animal origin. For example, the dairy products are highly saturated. Exceptions: coconut and palm oils and hydrogenated fats such as shortening are also highly saturated. Saturated fats tend to raise the cholesterol level in your blood.

Polyunsaturated Fats - are liquid oils, usually of plant origins (such as safflower, sunflower, sesame, cotton, and soybean). Polyunsaturated fats tend to lower blood cholesterol levels.

Monounsaturated Fats - have little effect on blood cholesterol levels. Olive and peanut oils are monounsaturated fats.

Cholesterol - is a waxy substance related to fats which is present in foods of animal origin and is also manufactured by your body. It has an important role in food digestion, the production of certain hormones, and in providing electrical insulation for the nervous system.

Hydrogenated Fats - are polyunsaturated liquid oils which have been chemically converted into more saturated solid fats such as shortening or margarine.

¹Supplemental handout for class on March 19, "Recommended Dietary Allowances (RDA's) and the 3 P's of Good Nutrition."

Rating Your Food Choices¹

Too much fat, sugar, salt and just plain too much are the watchwords of an unwise diet...especially in light of the nation's major health problems.

How does your diet measure up in terms of these undesirable ingredients? Place a check mark next to those items you eat on a regular basis, and see.

☐ whole milk	☐ skim or low fat milk, buttermilk
☐ donuts, pastry, cake or pie	☐ bagel, English muffin
☐ cheese (Cheddar, American, Swiss, etc.)	☐ low fat cheeses
☐ bacon, sausage	☐ nuts
☐ potato chips, corn chips	☐ lean ham
☐ butter	☐ whole grain crackers
☐ sour cream	☐ soft margarine
☐ soda, fruit drinks	☐ imitation sour cream, low fat yogurt
☐ white bread, and white bread products	☐ fruit juice
☐ luncheon meats, hot dogs	☐ whole grain bread and whole grain bread products
☐ heavily marbled or fatty beef, pork	☐ fresh, frozen or canned fish
☐ hamburger, with more than 20% fat	☐ lean beef, veal, chicken, turkey
☐ sugar-coated cereals	☐ lean hamburger
☐ candy, cookies	☐ whole grain, "plain" cereals
☐ tuna packed in oil	☐ raisins, dried fruit
☐ fruit, canned or frozen in syrup	☐ water-packed tuna
	☐ fresh or frozen unsweetened fruit

Count the checks in each column. If you have more checks in the left-hand column than in the right, your total diet is probably too high in fat, salt, or sugar to be healthy for you. What can you do about it? For starters, get to know the "players" in the world of sound nutrition.

¹Supplemental handout for class on April 2, "You Are What You Eat?-- Oh, No!"

Suggestions to Cut Down Sugar in Your Diet¹

1. Cut down on the obvious "goo" in your diet (cakes, candies, etc.). Worry less about such minor sources of hidden sugar as catsup, crackers and peanut butter.
2. Set your own limits. Perhaps confine sweets to mealtimes only, or to 3 simple desserts a week.
3. Make the desserts you do eat count nutritionally. For example, pudding, yogurt, baked apple, and bread pudding provide nutrients as well as sugar.
4. The nutritionally ideal treat is fruit served fresh.
5. Use only unsweetened fruit juices and fruits canned in their own juice.
6. Read food labels to learn where sugar is lurking.
7. Lower the sugar content in recipes by using: up to $\frac{1}{4}$ less sugar called for in a recipe (exceptions: jellies, delicate baked goods like cakes, meringues, etc.). If you'd rather not experiment, look for recipes that call for the least amount of sugar.

A little more vanilla and spices. Both enhance the impression of sweetness.

Smaller amounts of sour or bitter ingredients (like lemon juice, vinegar, cocoa), so that less sugar need be used.

¹Supplemental handout for class on April 7, "Diet and Health--Dental Caries and Cancer."

Herbs and Spice and Everything Nice¹

Herbs and spices can be an excellent means for using less salt in your food preparation, while adding appealing new flavors. Here are some tips to help you:

Using herbs:

Start with $\frac{1}{4}$ teaspoon dried or 1 teaspoon fresh herbs for a dish that serves 4 people. Increase the amount, if desired, to suit your taste.

When soups and stews or other dishes are to be cooked for a long time, add herbs during the last hour of cooking.

Fresh herbs are best, and some can be grown indoors all year long. You can also preserve fresh herbs' flavor by freezing them. Simply remove the stems, seal the cleaned, fresh herbs in airtight plastic bags, and freeze. When needed snip or chop without thawing.

To receive the full benefit of dried herbs' flavor, keep these points in mind:

Crumple dried leaf herbs between your fingers to release the essential oils.

Add dried herbs to cold foods, such as tomato juice, salad dressing and cottage cheese, at least 24 hours before serving.

For foods that require a short cooking period, soak dried herbs in a small amount of liquid or oil specified in the recipe for about $\frac{1}{2}$ hour before use.

Dried herbs tend to lose their flavor, especially if stored in a warm area. Keep them in a dry, cool cupboard.

The "correct" combination of herbs for any simple food is the one that tastes best to you. Here are some "tried and true" herb combinations:

oregano and marjoram
tarragon and chives
mint and marjoram
oregano and rosemary
thyme and parsley
sage, savory and parsley

Using spices:

Use $\frac{1}{4}$ teaspoon spice per pound of fruit, meat, etc., or per pint of sauce, soup, pudding, batter, beverage, etc.

¹ Supplemental handout for class on April 9, "Diet and Health--Obesity and Heart Disease."

Add ground spices:

- to short-cooking dishes when the salt (if any) would be added.
- to long-cooking dishes at the end of the cooking period.
- to cold dishes several hours before serving.

Add whole spices:

- to long-cooking dishes at the beginning of the cooking period.
- pulverize or crumble to release flavor.

Decrease your consumption of these high-sodium foods:¹

MISCELLANEOUS

- Sauerkraut
- Canned vegetables
- Tomato juice
- Canned or dehydrated soups
- T.V. dinners
- Canned or frozen mixed dishes
- Bouillon or canned meat stock
- Cakes, pies, quick breads
- Bacon fat
- Salt pork
- Salted snack foods, pretzels, chips, etc.
- Salted crackers

PROTEIN FOODS

- Ham
- Hot dogs
- Sausage and bacon
- Bologna, other luncheon meats
- Canned or potted meat
- Anchovies
- Natural cheeses
- Processed cheeses
- Dried or chipped meat
- Smoked meat or fish
- Salted nuts

CONDIMENTS

- Table salt, sea salt
- Celery, onion, and garlic salts
- Seasoning salt
- Meat tenderizers, monosodium glutamate
- Soy, steak, and Worcestershire sauces
- Relishes
- Pickles
- Olives
- Prepared mustard
- Catsup
- Barbecue or chili sauce
- Tartar sauce

Rely less on canned, "convenience," highly processed, and restaurant foods and more on home-prepared foods made from scratch. You'll have more control over your sodium intake.

¹Supplemental handout for class on April 9, "Diet and Health--Obesity and Heart Disease."

APPENDIX C
Nutrition Knowledge Test

 Date

 Name

NUTRITIONAL KNOWLEDGE TEST

DIRECTIONS: Please answer all questions without the help of textbooks, references, or other persons.

Some statements concerning nutrition are given below. Please indicate whether you think a statement is true or false. CIRCLE "T" for TRUE and "F" for FALSE.

After you have reached this decision, indicate the degree of certainty you feel about your answer. CIRCLE:

- 5 if you are very confident that you have decided correctly.
- 4 if you are almost certain you have decided correctly.
- 3 if you are half certain that you have decided correctly.
- 2 if you are not very sure that you have decided correctly.
- 1 if you are not sure of your answer but have a guess or hunch.

If you are completely unsure of the answer to the question, circle "U" but do not indicate a degree of certainty.

Please be sure to circle both a response and a degree of certainty for each question.

	<u>True, False or Uncertain</u>			<u>Degree of Certainty</u>				
1. Food eaten before you go to bed is more likely to cause weight gain than if the same food were eaten for breakfast.	T	F	U	5	4	3	2	1
2. A nursing mother requires more calories, protein, calcium, vitamins and minerals than the average woman.	T	F	U	5	4	3	2	1
3. Teenage boys and girls require equal amounts of calories, protein, calcium, vitamins and minerals during their rapid growth years.	T	F	U	5	4	3	2	1
4. White bread is more likely to cause dental caries than whole wheat bread.	T	F	U	5	4	3	2	1
5. The Recommended Dietary Allowances represent minimum daily requirement of various age and sex groups within the American population.	T	F	U	5	4	3	2	1

	<u>True, False or Uncertain</u>			<u>Degree of Certainty</u>
6. Organically grown fruits and vegetables are more nutritious than those grown with chemical fertilizers.	T	F	U	5 4 3 2 1
7. An athlete requires more protein than a sedentary person of height and weight.	T	F	U	5 4 3 2 1
8. Most people require vitamin and mineral supplements to maintain good health.	T	F	U	5 4 3 2 1
9. To lose one pound of body fat, one must burn 3500 calories more than one takes in.	T	F	U	5 4 3 2 1
10. Bread and potatoes are high in calories and should be eliminated from the diet if one is trying to lose weight.	T	F	U	5 4 3 2 1
11. An obese person may be malnourished.	T	F	U	5 4 3 2 1
12. Sweetened carbonated beverages and chewy caramels are equally harmful for your teeth.	T	F	U	5 4 3 2 1
13. Meals can be teaching aids for instructing children in proper nutrition.	T	F	U	5 4 3 2 1
14. Skim milk, instant non-fat dry milk, 2% milk and whole milk all equally good sources of calcium and protein.	T	F	U	5 4 3 2 1
15. Instant non-fat dry milk provides as much energy as whole milk.	T	F	U	5 4 3 2 1
16. Cholesterol is a normal body constituent.	T	F	U	5 4 3 2 1
17. Women ages 18-50 years need less iron than children age 0-10 years.	T	F	U	5 4 3 2 1
18. If you want to lose a pound of body weight in a week, you would have to decrease your caloric intake by 500 calories per day.	T	F	U	5 4 3 2 1
19. Peanut butter is a good meat substitute.	T	F	U	5 4 3 2 1
20. Four hundred grams of extra fat in the diet would cause a person to gain approximately one pound of body weight.	T	F	U	5 4 3 2 1

	<u>True, False or Uncertain</u>			<u>Degree of Certainty</u>
21. The Basic Four Food Groups as used in the United States could serve as the basis for nutrition education throughout the world.	T	F	U	5 4 3 2 1
22. Most people on a reducing diet should restrict their sodium intake.	T	F	U	5 4 3 2 1
23. Nitrites are used in meat products as a preservative.	T	F	U	5 4 3 2 1
24. Fortifying food products is done to replace vitamins and minerals lost in processing.	T	F	U	5 4 3 2 1
25. Adding vitamins and minerals always make food superior to unfortified foods.	T	F	U	5 4 3 2 1
26. Hot foods should be cooled at room temperatures before placing in the refrigerator.	T	F	U	5 4 3 2 1
27. The dietary goals are not applicable to the total U.S. population.	T	F	U	5 4 3 2 1
28. Excess protein will be stored in the body until needed for growth and maintenance of tissues.	T	F	U	5 4 3 2 1
29. Milk is a perfect food since it provides all the essential nutrients in the proper amounts that will maintain health.	T	F	U	5 4 3 2 1
30. Vitamin C is referred to as the "sunshine" vitamin since exposure of the skin to the sun will result in the synthesis of vitamin C.	T	F	U	5 4 3 2 1
31. Corn oil, soybean oil, and coconut oil are high in polyunsaturated fats.	T	F	U	5 4 3 2 1
32. Emotional stress can affect the body's capacity to utilize nutrients.	T	F	U	5 4 3 2 1
33. Liver is high in cholesterol.	T	F	U	5 4 3 2 1
34. Basal metabolism represents the energy needed for involuntary body functions and physical activities.	T	F	U	5 4 3 2 1
35. It is beneficial to consume large amounts of all vitamins and minerals since the body can store these nutrients until needed.	T	F	U	5 4 3 2 1

	<u>True, False or Uncertain</u>			<u>Degree of Certainty</u>				
36. Diet margarine contains less fat and more water than regular margarines.	T	F	U	5	4	3	2	1
37. People who do not eat meat are likely to be in poor health.	T	F	U	5	4	3	2	1
38. Frozen orange juice has less ascorbic acid than fresh orange juice.	T	F	U	5	4	3	2	1
39. Broccoli, cabbage and tomatoes are good vitamin C sources.	T	F	U	5	4	3	2	1
40. Milk is a good source of riboflavin.	T	F	U	5	4	3	2	1
41. Grapefruit can assist in burning fat in the body.	T	F	U	5	4	3	2	1
42. Toasted bread has fewer calories than untoasted bread.	T	F	U	5	4	3	2	1
43. A strict vegetarian diet may lack vitamin B ₆ .	T	F	U	5	4	3	2	1
44. Foodborne illness can only occur in dirty kitchens.	T	F	U	5	4	3	2	1
45. Gelatin capsules dissolved in orange juice will strengthen fingernails.	T	F	U	5	4	3	2	1
46. An equivalent weight of carbohydrate has the same number of calories as protein.	T	F	U	5	4	3	2	1
47. Pasteurization destroys many of the vitamins in milk.	T	F	U	5	4	3	2	1
48. Vitamins and minerals do not furnish energy to the body.	T	F	U	5	4	3	2	1
49. If your diet is high in polyunsaturated fats, you may need additional vitamin E.	T	F	U	5	4	3	2	1
50. A desire for candy and sweets is a sign that your body needs more sugar.	T	F	U	5	4	3	2	1

APPENDIX D

Demographic Questionnaire

3/3/80

QUESTIONNAIRE--"NEW"TRITION UPDATE FOR SCHOOL FOODSERVICE PERSONNEL

Directions: Please answer all questions as completely as possible.

1. Your name: _____
2. Your age in years:
____ (1) under 21 years
____ (2) 21-30
____ (3) 31-40
____ (4) 41-50
____ (5) 51-60
____ (6) over 60
3. Please indicate:
____ (1) male
____ (2) female
4. Years employed in foodservice:
____ (1) less than 1 year
____ (2) 1-2 years
____ (3) 3-5 years
____ (4) 6-7 years
____ (5) 8 or more years
5. Job title: _____

6. Check below all functions describing your job:

DUTIES RELATING TO PRODUCTION AND SERVICE

- _____ (1) Receiving of food and non-food items
- _____ (2) Storing and organizing of food and non-food items in inventory
- _____ (3) Pre-preparation of raw produce
- _____ (4) Cooking, baking, actual food preparation
- _____ (5) Deciding what to do with leftover food
- _____ (6) Selecting new recipes to try out
- _____ (7) Adjusting recipes
- _____ (8) Clean-up of production area
- _____ (9) Dishwashing, potwashing, scraping trays
- _____ (10) Serving on the cafeteria line
- _____ (11) Establishing portion sizes
- _____ (12) Taking money, tickets, etc. from students, customers
- _____ (13) Monitor lunchroom while students are eating

DUTIES RELATING TO SUPERVISION AND ADMINISTRATION

- _____ (14) Keeping required records
- _____ (15) Calculating food, labor, other costs
- _____ (16) Planning menus
- _____ (17) Scheduling workers
- _____ (18) Contacting backup workers or replacements
- _____ (19) Supervising other employees
- _____ (20) Presenting in-service training to foodservice workers
- _____ (21) Ordering food and non-food items
- _____ (22) Buying new equipment
- _____ (23) Arrange for repair of existing equipment
- _____ (24) Evaluating employee performance
- _____ (25) Other (please describe) _____

7. Place of employment: _____
8. Business address: _____

9. Name of your immediate supervisor: _____

EDUCATIONAL BACKGROUND

10. Please check which category applies to you:

- _____ (1) I attended elementary/secondary school but did not finish
Highest grade level completed _____
- _____ (2) I am a high school graduate
- _____ (3) I did not graduate from high school but do have my G.E.D.
- _____ (4) I attended college but did not finish
- _____ (5) College graduate
Degree granted and major _____
- _____ (6) I am working on a graduate degree
- _____ (7) I have received a graduate degree
Degree granted and major _____
- _____ (8) I have had vocational-technical training (please describe)

- _____ (9) Other (please describe) _____

11. Have you ever had training in nutrition?

- _____ (1) yes
- _____ (2) no

12. If yes to question 11, please indicate the type and recency of your training. Check all the categories that apply to you:

- _____ (1) High school course; please specify year _____
- _____ (2) College course/continuing education course; please specify
hours and year _____
_____ semester hours
_____ quarter hours
- _____ (3) Workshop; please specify year _____
- _____ (4) Correspondence course; please specify year _____
- _____ (5) 36-hour course for school foodservice personnel; please
specify year _____
- _____ (6) Annual state school foodservice meeting or other professional
meeting
- _____ (7) Telenet course; specify title and year _____

13. From which of the following do you obtain information concerning nutrition? Check all of the ones which apply to you.:

- _____ (1) Books
- _____ (2) Newspapers
- _____ (3) Popular magazines (please specify) _____
- _____ (4) School Foodservice Journal
- _____ (5) School Foodservice Research Review
- _____ (6) Other scientific or professional journals (please specify) _____
- _____ (7) Extension bulletins
- _____ (8) Health food magazines (please specify) _____
- _____ (9) Family members
- _____ (10) Friends

____(11) Nutritionists/Dietitians

____(12) Other health professionals (please specify) _____

____(13) Health food stores

____(14) Meetings, workshops, conferences

____(15) TV, Radio

____(16) Home economists

____(17) Home economics teacher

THE FOLLOWING SECTION IS TO BE ANSWERED BY SCHOOL FOODSERVICE PERSONNEL ONLY:

14. Are you currently involved in activities which promote good nutrition in your school? Please check all activities in which you personally have been involved.

____ (1) Suggesting menu ideas which have special nutritional merit

____ (2) Providing for direct student involvement in menu planning

____ (3) Obtaining student evaluations or reactions to foodservice

____ (4) Making nutritional facts available to students through bulletin board displays or similar kinds of publicity

____ (5) Providing parents with information on nutrition and/or nutritional suggestions

____ (6) Initiating "nutrition awareness" projects among students (e.g. keeping logs of food intake, classifying nutritional content of meals over a period of time, poster contests, etc.)

____ (7) Checking plate waste

____ (8) Checking the serving temperatures of foods regularly

____ (9) Giving class tours of the foodservice facilities

____ (10) Using standardized recipes

____ (11) Sponsoring a student taste panel

____ (12) Working with teachers on nutrition projects, experiments, animal feeding demonstrations, etc.

- ____(13) Working with teachers on tasting experiences or food preparation in the classroom
 - ____(14) Monitoring cooking times of foods to enhance nutritional quality
 - ____(15) Giving interviews for school newspaper articles on nutrition
 - ____(16) Conducting an in-service training session for foodservice workers specifically on nutrition and/or nutrition education
 - ____(17) Consulting school administrative officers concerning initiating or expanding nutrition education
 - ____(18) Providing more choice in luncheon items (e.g. salad plate, sandwich plate, entree choice)
 - ____(19) Encouraging students to taste all foods served at lunch
 - ____(20) Using a table of nutritive values to calculate nutrient content of school lunch(es)
 - ____(21) Other (please be specific) _____
-

APPENDIX E

Questionnaire and Correspondence to Supervisors

(KSU Letterhead)

August 28, 1980

TO: Supervisors of Telenet participants
FROM: Deborah D. Canter, Ph.D., R.D.
Telenet Class Instructor
RE: Follow-up study

The Telenet class "New-trition Update for School Foodservice Personnel" taught during March and April of 1980, was developed with funds from a Nutrition Education and Training program grant from the Kansas State Department of Education. As a part of a research project to assess the effectiveness of training via Telenet, I need your help.

In a questionnaire filled out the first day of class, students were asked to give the name of their immediate supervisor. Enclosed you will find a short questionnaire, one for each person who listed you as their immediate supervisor. Would you please take a few moments to fill these out and return them to me in the enclosed stamped envelope?

Your input is vitally important to the assessment of the success of this project. Please feel free to make any comments you feel would be helpful in this study. Please try to have the questionnaires back to me by September 12.

Thank you so very much for your support and cooperation!!

(KSU Letterhead)

September 17, 1980

TO: Supervisors of Telenet Participants
FROM: Deborah D. Canter, Ph.D., R.D.
Telenet Class Instructor
RE: Follow-up study

In August I mailed you a short questionnaire concerning your employees who attended the "New-trition Update for School Foodservice Personnel" telenet sessions.

I realize that you have been extremely busy with school recently beginning, but your reply is essential to make this survey as reliable as possible.

Would you please take a few minutes to fill out and mail the questionnaire today? Your time and cooperation in this project are greatly appreciated.

Name of Telenet Participant _____

Listed below are various activities which promote good nutrition. Have you observed the above-named Telenet participant's involvement in any of these activities? If so, please check all activities which apply.

- _____ (1) Suggesting menu ideas which have special nutritional merit
- _____ (2) Providing for direct student involvement in menu planning
- _____ (3) Obtaining student evaluations or reactions to foodservice
- _____ (4) Making nutritional facts available to students through bulletin board displays or similar kinds of publicity
- _____ (5) Providing parents with information on nutrition and/or nutritional suggestions
- _____ (6) Initiating "nutrition awareness" projects among students (e.g. keeping logs of food intake, classifying nutritional content of meals over a period of time, poster contests, etc.)
- _____ (7) Checking plate waste
- _____ (8) Checking the serving temperatures of foods regularly
- _____ (9) Giving class tours of the foodservice facilities
- _____ (10) Using standardized recipes
- _____ (11) Sponsoring a student taste panel
- _____ (12) Working with teachers on nutrition projects, experiments, animal feeding demonstrations, etc.
- _____ (13) Working with teachers on tasting experiences or food preparation in the classroom
- _____ (14) Monitoring cooking times of foods to enhance nutritional quality
- _____ (15) Giving interviews for school newspaper articles on nutrition
- _____ (16) Conducting an in-service training session for foodservice workers specifically on nutrition and/or nutrition education
- _____ (17) Consulting school administrative officers concerning initiating or expanding nutrition education
- _____ (18) Providing more choice in luncheon items (e.g. salad plate, sandwich plate, entree choice)
- _____ (19) Encouraging students to taste all foods served at lunch

____(20) Using a table of nutritive values to calculate nutrient content of school lunch(es)

Are there any other activities, comments, etc. which you have observed that indicate that this person benefitted from their Telenet class? Briefly describe.

Did you allow this person time off from work to attend this class?

____ yes
____ no

If yes, was this time off with pay?

____ yes
____ no

Did your facility pay this person's enrollment fee?

____ yes
____ no

Do you personally feel that training via Telenet is effective? If you have any other comments, criticisms, or suggestions concerning this or any other Telenet class, please comment below.

THE EFFECTIVENESS OF TELENET FOR TRAINING
SCHOOL FOODSERVICE EMPLOYEES

by

KATHLEEN D. RIVAS

B.S., College of St. Elizabeth, 1978

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Dietetics, Restaurant
and Institutional Management

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1981

ABSTRACT

The importance of providing training for school foodservice personnel has become recognized increasingly in recent years. In response to the existing need for training foodservice personnel, a training course was conducted for school foodservice personnel via a telephone teaching system (telenet). The objective of this study was to determine the effectiveness of telenet as a method of providing training to school foodservice personnel. Specific objectives of this study were to assess the effectiveness of telenet through an analysis of participant's scores on pretest, post-test, and retention tests and to determine if participants demonstrated more activity in nutrition education as a result of involvement in this course. The course was part of the Kansas Nutrition Education and Training Program (NETP) which was established with funds mandated in P.L. 95-166, enacted in 1977.

The ten-session course entitled "New-trition Update for School Foodservice Personnel" was developed in the Department of Dietetics, Restaurant and Institutional Management, the Department of Foods and Nutrition, and the Regents Continuing Education Network Division of Continuing Education at Kansas State University, and presented in the spring of 1980. A variety of different topics relating to food and nutrition were addressed with an emphasis on applicability to school foodservice.

Brochures advertising the course were sent to schools, hospitals, and various other sites throughout the state of Kansas to recruit participants. A total of 185 students enrolled in the course of which 155 agreed to participate in the evaluation aspect of the course.

The nutrition knowledge test used in the study was adapted from a previous study. A brief questionnaire providing demographic data, educational background, job duties, and nutrition activities also was distributed to participants.

Participants were given the nutrition knowledge test on the second day of class and again at the end of the course. A significant increase in scores from pretest to posttest was revealed. Participants answered 58 percent of the questions correctly on the pretest and 73 percent on the posttest. When the same test was mailed to participants two months after completion of the course, data indicated a significant decrease in retention of the material with participants correctly answering 60 percent of the questions. This decrease in retention probably was attributed to lack of reinforcement of the knowledge participants had gained.

Four months after completion of the course, a questionnaire was sent to the immediate supervisors of the participants. The supervisors were asked to indicate the nutrition related activities they had observed participants performing since the completion of the course. This list of activities was identical to one completed by participants the first day of class. An increase in every category of nutrition related activity was seen. Significant increases were found for twelve out of the twenty nutrition activities. Some of these activities included suggesting menu ideas which have special nutritional merit, providing parents with information on nutrition and/or nutritional suggestions, initiating "nutrition awareness" projects among students, and checking the serving temperatures of foods regularly. A significant increase in overall nutrition activity also was found from the analysis.

A large majority of the supervisors commented favorably on the telenet method of training. They indicated that they believed it was an effective method for training foodservice employees. Many believed the course had fostered more nutrition awareness among participants and others commented upon the increased confidence and self-assurance it gave to employees. Supervisors also expressed an appreciation for the convenience of telenet as a training approach. Recommendations for improvement included allowing more time for questions and answers and utilizing more handouts.